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MIGRATION OF HEALTH PERSONNEL, SCIENTISTS AND ENGINEERS FROM LATIN AMERICA

(PRELIMINARY DRAFT)

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FOREWORD

This study was suggested by the Pan American Health Organization Advisory Committee on Medical Research at its meeting in June, 1965. A Sub-Committee on Migration consisting of the Latin American members of the Committee was established. Dr. Charles V. Kidd of the United States was asked to prepare a draft report for the Sub-Committee. This was done, and a preliminary draft was reviewed by the Sub-Committee at a meeting in Rio de Janeiro in May, 1966. A revised draft was then discussed and criticized by the Advisory Committee on Medical Research at its meeting in June, 1966. A final report was then prepared.

The Department of Scientific Affairs of the Organization of American States, which is engaged in establishing a more effective statistic base for manpower statistics in Latin America, was most helpful in providing data. Hopefully, this exploratory study of migration will provide guides to the kind of data that should be collected and analyzed on a long term basis.

Thanks are extended to the many individuals who responded to questionnaires, to busy government officials who took the time to supply data and judgements, and to many scientists who gave their ideas in personal interviews.

INTRODUCTION

1. The Basic Significance of Migration

One of the most significant developments in modern economics is the recent sharp increase in the significance given to three factors hitherto not strongly emphasized. The fact is the contribution made by the quality of the work force to the economic well being of the population of a country. Earlier economic analysis had dealt with the work force as if it were composed of equally effective units of unchanging capacity. Later studies have clearly demonstrated the education, health, alertness and motivation of workers of all kinds is a major factor in economic development. Theory thus, after many years, almost overtakes common sense. The second factor whose impact on economic development has been reassessed in recent years in science and technology. The force of innovation and change in products and in techniques of production make the process of change itself an important factor in economic growth. This is a basic change in the view of the economic processes which rests essentially upon the improvement of the efficiency of existing processes for the output of existing goods.

When the significance of the quality of the work force and the effects of science and technology are considered together, the critical importance of scientists, engineers and physicians to national development became evident. Without denying the importance of a balanced, high quality total work force, it is clear that scientists, engineers and physicians comprise a group of singular significance to developing nations.

Any measures to increase the supply of such people are important. Any factors decreasing the supply are important. Migration is such a factor.

In a number of countries in Latin America, many scientist have become so discouraged by the obstacles facing them in building a career in science and teaching that they have migrated. They are in effect pushed out of their native country. On the other hand, they are pulled towards countries where career prospects in both economic and intellectual terms are much brighter. The country with the most attraction in recent years has been the United States. While the facts with respect to migration of physicians, scientists and engineers are not known with precision, it is abundantly clear that the loss of talent is in some countries a severe handicap to National economic, cultural and intellectual development. It is also clear that the situation differs widely among Nations.

Much more attention has been paid to the flow of capital than to the flow of another fundamental National resource -- brains. This problem is not, of course, confined to the biomedical sciences. However, as is true of so many aspects of science in Latin America, the biomedical sciences are so significant thaty they can best be examined in the context of all science.

Whether the forces that repel or those that attract are most powerful is not the central problem. The central problem is how both forces may be moderated in a suitable way. There can be no realistic hope that the forces leading to migration of scientists from Latin America can be done away with and that migration wil cease. The forces at work are too deeply ingrained and too powerful. However, the cessation of migration is not only impossible but unwise. International migration of scientists is a productive phenomenon with which the world has long been familiar. The object of policy should be to establish conditions under which the rate of migration from Latin America will be moderated by the voluntary choice of

individuals. Fortunately, it appears that there are practical measures which will reduce migration at moderate cost.

The study consists first of all of relevant facts which could be secured. The numbers and characteristics of migrants have been reasonably identified, with the cooperation of the Nations concerned. Secondly, the forces leading to migration are analyzed. Finally measures are suggested to reconcile the legitimate aspirations of scientist with the legitimate needs of countries for highly trained manpower.

2. Migration to the United States

When this study was being planned, the intent was to study the migration of scientist, engineers and physicians and other health personnel from all Latin American countreis to all other countries. However, it soon became evident that from a practical point of view, the only country to which people from Latin America migrate in significant numbers is the United States. By significant numbers is meant enough to give rise to concern in the countries which people leave. Migratory of highly trained Latin Americans to Europe and to other parts of the world except the United States is at such low levels, and is expected to remain at such low levels, that no probelm of general concern are generated. For these reasons, it was decided to confine this study to migration to the United States.

3. The Countries of Latin America

For the purpose of this study, the following countries constitute Latin America:

Mexico
Central America
- Costa Rica
- El Salvador
- Guatemala
- Honduras
- Nicaragua
- Panama

South America

Argentina	Ecuador
Bolivia	Paraguay
Brazil	Peru
British Guiana	Surinam
Chile	Uruguay
Colombia	Venezuela

This classification excludes the Caribbean countries, but some data relating to them are presented.

4. Interpretation of Migration Figures

Figures on migration are both difficult to secure and difficult to interpret. This often leads to misunderstanding and to confusion. To take a specific example, the number of physicians who enter the United States in a given year from a given country is not the same as the number who migrate. The total number entering the United States includes physicians who enter as tourists, as interns, as residents, and as fully trained physicians who intend to engage in the practice of their profession. The number entering the United States is always greater than the number who migrate, but how much greater it is difficult to say. Often when individuals enter the United States, they themselves do not know whether they will eventually migrate, and people often change their minds.

Sometimes people cite figures relating to the total movement to the United States as if it were the number migrating, and this leads to exaggerated ideas as to the magnitude of the problem.

5. Migration Defined

In this report, permanent rather than temporary change of the country of residence is the center of attention. All kinds of temporary changes of residence are excluded as such. For example, thousands of Latin American

students come to the United States to study, and they then return home. Such visits are not counted as migration. However, study in the United States is considered as a factor affecting migration. It is clear that the opportunity to learn about the United States and to become familiar with the English language cannot be ignored as an important factor affecting migration. Al kinds of visits to the United States for business or pleasure are also excluded from the study.

While the idea of permanent migration is simple, the patterns of movement are extremely complex and this contributes to the difficulty of securing good statistics. For example, there is virtually no quantitative information on the number, characteristics and destination of persons leaving Latin America. On the other hand, information with respect to persons entering the United States is relatively good. In fact, the major statistical base for this report is supplied by data specially tabulated by the Immigration and Naturalization Service of the United States Department of Justice. However, some details are still lacking. For example, there is little information on the number of and characteristics of persons who return to their native lands after living for substantial periods in the United States.

One recommendation arising from this study is that the United States publish each year information on the number of professional, technical and kindred workers admitted as migrants, by country of origin and by specific occupation. Another recommendation is that Latin American countries undertake to improve their information on the movement of scientist, physicians and engineers into and out of their countries.

6. Significance of Migration by Occupational Group

So far as one can tell from the existing statistics, the migration of highly trained persons is not concentrated in certain fields. In other

words, those countries which lose highly trained persons lose all kinds of them in roughly equal proportions. This suggests that the problems giving rise to migration are common to all fields and not unique to certain specialties. Accordingly, the basic problems are related not -- as in some other parts of the world -- to priorities among fields of science, problems of allocation of resources to various scientific disciplines, and so forth. The fundamental problems are those infolved in the operation of the total society and economy, and in the attention paid to science and higher education as contrasted with other important areas of activity. This in turn suggests the importance of a strong National organization for science. 1/

7. Migration within Latin America.

There are substantial movements of highly trained people within Latin America. Unvortunately, the absence of statistics forces entire reliance upon impressions, experience and informed judgements. Fortunately, on the other hand, these impressionistic views suffice to provide the major movements.

Probably the most significant movements of skilled people in Latin America are intra-country rather than inter-country. Every nation has problems, arising from the movement of people to major cities -- usually the capital. Physicians gravitate to cities, and particularly big cities, to such a degree that it is most difficult to provide medical services to rural areas. Scientists tend to cluster around universities, and the largest and most prestigious universities are found in the largest cities. In addition, opportunities for supplemental income are generally best in large cities. As the seat of national governments, capital cities are the source of political power, and generally the center of the cultural life of nations. They tend to exercise a particular attraction for scientist, engineers, physicians and other highly

1/ See Adams, J. B., "Megaloscience", Science Vol. 48, June 1965 for interesting ideas on the relation of financing of research in Europe to migration of scientists.

people.

Just as international migration is caused by basic differences among nations which are difficult to change, so is the special status of large cities the consequence of powerful historic forces whose consequences are not easily changed. Both problems must be dealt with in the context of total national development -- social, cultural and economic.

Despite the major significance of intra-country migration, the movement of people among nations in Latin America is a phenomenon worth noting. The most obvious movement is to Venezuela. The relative prosperity of the country and the rate of growth are the basic causes of the movement. Personal incomes in Venezuela are, on the average, the highest in Latin America. The income of scientist, engineers and physicians is adequate to attract many excellent people from Western Europe. The extraordinarily high salary schedule is as follows:1/

Distribution of monthly salaries of scientists engaged full time in research in Venezuela

Monthly salary (in approsimate U. S. dollar equivalents)	Percentage of scientists
170-400	6
400-440	7
440-550	14
550-660	33
660-770	17
770-880	13
880-990	6

1/ All of the following data on Venezuela are from: Bases Para la Creación de un Consejo Nacional de Investigaciones Científicas y Tecnológicas en Venezuela. Informe que Presenta la Comisión Preparatoria Designada al Efecto. Caracas. Junio 1964.

Cont.

Monthly salary (in approximate U. S.-dollar equivalents)	Percentage of scientists
Over 990	4

There are about 750 scientists in Venezuela. Of these about 20 per cent are now foreigners, and another 17 per cent are naturalized citizens. Of the 20 per cent, (about 150) who have migrated but who have not become naturalized citizens, about 50 are from Latin America, 80 from Europe and 15 from elsewhere. Spain has supplied the largest number -- about 35 -- and Argentina the next -- about 15. Other Latin American scientists have come from Peru, Brazil, Bolivia, Costa Rica, Chile, Colombia, Cuba, Ecuador, Mexico and Uruguay. However, more migrants have come from Italy and from England than from any single Latin American country. All in all, scientists from 14 European countries have moved to Venezuela.

It is,in fact, remarkable that more scientists have been attracted to Venezuela from Europe than from Latin America. One reason for this is that there are many more scientist in Europe than in Latin America, and that conditions for scientific work in many European countries have not been the best in the world.

The case of Venezuela is particularly instructive because it illustrates the powerful influence of money. The explanation of the ability of Venezuela to attract scientist lies primarily in her rich endowment of petroleum. General prosperity along has not been enough. Venezuela has had to provide specifically for relatively high salaries for scientists. While Venezuelan salaries are very high by Latin American standards and high by European standards, they are not high by U. S. standards. This indicates that it is

not necessary to match U. S. salary levels in order to keep Latin American scientists at home and to attract scientists from other countries.

There is a moderate movement of scientists among other Latin American countries, most notably to Mexico, but this flow is not large enough to raise questions of national policy.

8 Latin American Students in the United States

(This section to be shifted later to causes of migration)

In 1964, 9,402 students from Latin America were studying in the United States[1/]. About 3,600 of these -- or almost 40 percent of the total group -- were studying engineering physical or natural sciences, or medical sciences. For every student in the medical sciences, there were two in the physical and natural sciences and four in engineering.

Most students are not migrants. They study in the United States and return to their homes. For these students, study in the United States represents an important personal gain and also an important addition to the human resources of their native countries. For the United States, the thousands of Latin American students in attendance at universities are an important means of establishing a cultural bridge to Latin America.

The relationship of study by Latin American students to migration arises from the opportunity to learn English and to become accustomed to the culture of the United States. Such exposure often makes later migration seem more feasible and desirable. Hence, the large student training program, important as it is to Latin American countries, has a hidden cost to those countries, the later migration of the students.

Informed persons in both Latin America and the United States agree that a higher proportion of those who visit the United States to study with their own funds eventually migrate than is the case among those who study in the United States with the aid of fellowships either from their own governments or from the United States. The best available

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1/ International Institute of Education, Open Doors, 1965. These figures are not absolutely accurate, but they are the best available.

Latin American Students in the United States, by Field of Major Interest

1964

Field	Number
Total	9,402
Agriculture	578
Business Administration	956
Education	273
Engineering	2,052
Humanities	2,235
Medical Sciences	544
Physical and Natural Sciences	1,058
Social Sciences	1,356
All Other	182
No answer	168

Source: International Institute of Education, Open Doors, 1964.

figures show that fewer than one percent of the students who have studied in the United States with the aid of government funds have returned as migrants to the United States. This is logical because those who study with the aid of governmental fellowships usually have a moral obligation to return, and some efforts have usually been made to design the training for employment at home in a pre-selected field where jobs exist. On the other hand, those who come with the aid of private funds are both freer to remain in the United States and typically do not have assurance of a position to which they can return.

Part One Findings

I The Number of Migrants

A. The Total Number of Professional Migrants

1. Over the period 1961-1965 - 19,100 professional, technical and kindred workers entered the United States from Latin America with immigrant visas.

Of these, 2,900 were from Mexico, 3,500 from Central America and 12,700 from South America.

(Unless specifically mentioned, emigration from Cuba is not included in this summary because of the unique circumstances causing migration from that country. Migrants from the West Indies are also excluded because the area is not part of Latin America.)

The number of actual migrants, that is persons who remain permanently in the United States - is less than these figures indicate because a large but unknown number of entrants secure inmigrant visas even though they return to their own countries after a short period in the United States. However, for purposes of considering policy and action the number entering with immigrant visas will be considered as the number of migrants with the understanding that this number is somewhat too high.

2. Over the past five years, about 4,000 persons with a university education have migrated to the United States. The cost to Latin America of training, each of these persons can be conservatively estimated at 20,000. Accordingly, the loss to Latin American countries of migration of university trained people to the United States, measured solely in terms of the cost of educating them, has been at least 80,000,000 over the past five years.

3. The number of professional technical and kindred workers migrating from Latin America (Mexico, Central America and South America) to the United States is increasing. The total was about 2, 600 in 1961 and was about 6, 400 in 1965. The number of migrants from South America more than doubled between 1961 and 1965 and of the 2, 000 increase in migration between 1961 and 1965, South American accounted for 1, 600. It is clear that when all of Latin America is considered as a unit the problem is concentrated in South America at least in terms of gross numbers. And in South America 1, 300 of the 1, 600 increase was accounted for by four countries Columbia (450), Argentina (400), Ecuador (250) and Brazil (200).

The number of migrants from Mexico has remained at about 500 per year.

The number of migrants from Central America increased from 550 in 1961 to 900 in 1965.

4. To place migration of highly trained people from Latin Ame rica to the United States in perspective, it should be noted that most migrant s in this category came from Western Europe, and that in no Latin America country is the loss of highly trained people to the United States as significant as is the case in such countries. as the Phillipines, India, Turkey, Korea and Iran.

In terms of the proportion of highly trained people who migrate as well as in terms of numbers the movement to the United States is more significant from some Western European countries than from Latin American countries.

For example the number of scientists and engineers who migrated

from the Netherlands, Norway and Switzerland in 1959 was equal to 15 to 17 percent of the new graduates in those professions in that year.

5. The primary dfficulties are generated less by the absolute numbers who migrate than by the importance to the economic and cultural development of all countries of small numbers of highly qualified professional people.

Such persons as engineers, scientists and physicians contribute to National development not only by practicing their professions but also by serving as agents of change as intellectual leaders and as teachers.

The narrower the human resource base of any Nation, the more signficant to that Nation is the migrating of small numbers of highly trained people. For this reason, the importance of migration to Latin America countries must be measured in terms of the proportion of the highly shilled labor force which migrates, rather than in terms of the number who migrate.

6. The significance of migration varies widely from country to country. The large country most adversely affected by migration in recent years has been Cuba, primarily as a consequence of unique political circumstances.

Apart from Cuba, the two countries with the largest number of migrants are Argentina and Colombia. In both of these countries, the number of migrants remained failry level in the 350 to 500 range from 1959 through 1962. But in 1963, 1964 and 1965, the number of migrants

Admission of Persons to the United States with Immigrant Visas
Selected Professions, Argentina and Colombia

1965

Professional Group	South America	Argentina	Colombia
Total, all professionals	3,562	973	868
Chemists	60	20	6
Professors (all kinds)	134	36	46
Physicians	348	140	82
Engineers, total	299	88	70
Civil	49	12	12
Electrical	28	5	10
Mechanical	36	10	6
Other	186	61	42
Biologists and Agricultural Scientists	39	6	13
Mathematicians and physicists	9	4	2
Nurses	220	43	58
Economists	33	9	14
Teachers, total	689	196	111
Technicians, total	384	130	115
Medical	61	18	19
Electronic	122	43	37
Scientific	20	11	4
Other	181	58	55

increased rapidly to 973 from Argentina and 868 from Colombia in 1965. Clearly, the problems of these two countries warrant special attention, and of the two the situation of Colombia appears to be more difficult. In the first place, per capita gross National product in Colombia is only about half of that in Argentina - approximately $300 as compared with approximately $600. Therefore, the resources required to hold people, and to establish good conditions are less plentiful in Colombia than in Argentina. Next, although the population of Colombia (about 15 million) is about 70 percent of that of Argentina (about 22 million), the base of professional people is much smaller in Colombia. For example, Colombia has only about 7, 500 physicians while Argentina has more than four times as many - about 32, 000. Colombia has 50 physicians for each 100, 000 population while Argentina has about 150 per 100, 000. Colombia has only about 7, 000 engineers while Argentina has about 22, 000. As a generalization, Argentina has a skilled, professional manpower base about three as large as that of Colombia. Therefore the loss of each person is more significant in Colombia than in Argentina, by perhaps a factor of three.

There are some important observations to be made about the group of countries from which fewer persons migrate. Take, for example, Ecuador and Brazil. For each year over the last decade, about the same number of professional and related persons has migrated to the United States from both countries. The trend of migration from each country has risen steadily but moderately. However, Brazil has more than 25, 000 physicians and 25, 000 engineers while Ecuador has fewer than 2, 000 in each category. Brazil has almost 4 physicians

per 100, 000 population while Ecuador has about 2. The total population of Brazil approximates 80 million, while there are about 5 million inhabitants of Ecuador. Per capita gross National production in the two countries is about equal about $200. Clearly when equal number of professionals migrate from each country, Ecuador suffers a more serious loss.

The same sort of comparison can be made between Bolivia and Chile. Roughly, the same number of professional persons migrate from the two countries. But Chile has about twice as many inhabitants - more than 8 million as Bolivia - about 4 million. Per capita gross National product is about $150 in Bolivia and $500 in Chile. Chile has about 5, 000 physicians, and Bolivia has about 1, ooo. Therefore, as a general proposition migration of professional persons is a more serious matter for Bolivia than for Chile.

On the other hand, very few people migrate from Venezuela to the United States. (In fact, migration to Venezuela from Europe is an important factor in expanding the total pool of professionally trained persons in Venezuela.) Similarly relatively few professionally trained people migrate from Mexico to the United States with the exception of physicians.

B. Migration before Entering the United States

Many persons enter the United States not directly from their country of birth, but rather from another country to which they migrate. For example, 440 physicians entered the United States from Canada in 1964, but only 205 physicians born in Canada entered the United States in that year. It is clear that Canada is a way station for migration to the

Physicians Admitted to the United States, by Country of Birth and by Country of Last Permanent Residence, Selected Countries, 1964

Country	Number Admitted	
	Country of Birth	Country of last residence
Total	2,249	2,249
Europe	516	623
Greece	30	44
Spain	39	108
Turkey	53	29
United Kingdom	157	165
Asia	235	204
Canada	205	440
Mexico	61	77
Cuba	401	229
South America	435	454
All others	239	57

Source: United States Immigration and Naturalization Service.

United States. Spain is another important way station. On the other hand Turks often move to another country before migrating to the United States.

In Mexico and in South America, the number of these countries as the country of last residence was somewhat greater than the number born in those countries, but not much greater. Most people migrating to the United States from South America were born there. The part of the migration accounted for by persons not born in South America who move to the United States after residing in Latin America is quite small. On the other hand, it is evident that many migrants from Cuba to the United States are entering the United States after residing in other countries.

C. Migration to Latin America

In this study no account is taken of migration to Latin America. Thus this study takes into account all of the facts unfavorable to Latin American countries and ignores two important sets of facts favorable to these countries. The two favorable factors are those who return after entering the United States with emigrant visas, and those who migrate to Latin America from other countries. Data on migration to each Latin American country for specific occupations in each year are not available, but general data on migration to Latin America are available .

The only specific data on migration of specific occupational groups in recent years that was discovered in the course of this study relate to Argentina.

General Introductory Material

Post World War II Migration From Europe

About 4.4 million people migrated from Europe and Russia during the decade (1946-1955) immediately after World War II.[1/] Of these 1.2 million came to the United States and 1.1 million to Latin America. Of the 1.1 million who came to Latin America, 600,000 came to Argentina and 200,000 came to Venezuela, leaving 300,000 who migrated to other Latin American countries. The proportion of scientists, engineers and physicians among these immigrants to Latin America may be much smaller than the proportion that these groups constitute of migrants from Latin America. Even so, the total flow of people to Latin America has been so many times greater than the migration from Latin America that Latin America as a whole has no doubt had a net in-migration of scientists, engineers and physicians since World War II. The pattern has been an inflow from Europe, and a smaller outflow almost entirely to the United States. Unfortunately, precise data on in-migration are not available, but the broad picture is clear.

Net Migration to Argentina

Argentina is a "country of immigrants." If the country had received no migrants since over the last 100 years, the current population would

1/ Kirk, D., Major Migrations Since World War II in Selected Studies of Migration Since World War II, p. 19, Milbank Memorial Fund, N.Y., 1958.

Table

MOVEMENT OF PROFESSIONAL AND TECHNICAL
WORKERS IN AND OUT OF ARGENTINA
1960-1964

Year	Immigration from all countries 1/	Emigration to the U. S. A.	Net Immigration
1960	759	508	251
1961	815	552	263
1962	793	531	262
1963	639	781	-142
1964	852	1,159	-307
Total	3,858	3,531	327

1/ Ciapusico, H. La Emigración de Técnicos Argentinos. (Typewritten study). Ministerio del Interior, Dirección de Migraciones, Buenos Aires, 1965.

The immigration figures include only those who became Argentine citizens, and they thus exclude all of those who remain in Argentina for various periods but who do not become citizens.

be only 45 per cent of the current level.[1/] As late as 1914, 30 per cent of the population of Argentina was foreign born. In 1964, the net migration to Argentina had reached a cumulative level of 5.7 million in a country of 30 million.

During the years after World War II, Argentina has continued to be a country of net in-migration, about 600,000 over the period 1946-1955. However, the picture with respect to professional and technical goups is not so favorable to Argentina. (Table A) Over the period 1960-1964, 3,858 persons in this category migrated to Argentina from all other countries. (Table A) Over the same period, 3,531 such persons migrated to the United States. In all probability, Argentina gained about as many professional and technical workers as it lost over the period 1960-1964. This assessment does not take into account the qualifications of individuals in the two groups, and it is quite possible that more outstanding individuals left the country than entered. Even so, the basic fact that Argentina has experienced only a small net loss of professional and technical persons over recent years is significant and not generally appreciated.

Few statistics on in-migrants are available by occupational group, but a special study of engineers in 1961 provides interesting information. In that year, 77 Argentine engineers emigrated to the United

1/ de Lattes, Z. Consecuencias demográficas de los movimientos migratorios internacionales en la República Argentina, 1870-1960. United Nations, World Population Conference, Belgrade, 1965.

States, but 97 engineers entered Argentina with the intention of remaining permanently, and another 246 entered temporarily.[2/] This "cross migration" is, as Capuscio points out, primarily the result of specific professional requirements generated by a developing economy, and the inability of the local universities to provide the needed training.

General Observation on In-Migration

There is a large flow of professionals, particularly engineers to Latin America, but most of the movement is temporary. The amount of permanent in-migration of all classes of professionals simply is not known. Whether more detailed study would bring to light situations like that of Argentina, where the assessment of the total migration picture is sharply changed when in-migration is considered, is problematical.

Differences in Patterns of Migration Among Scientists, Engineers and Physicians

(This section to be reviewed after more complete data are available)

The migration of scientists, engineers and physicians must be considered separately. The circumstances affecting the migration of each group differ so widely that it is useful to consider these professions separately.

The case of engineers can be dismissed quickly and easily. The only countries from which migration of engineers pose serious problems

2/ Capuscio points out that 1961 was not a particularly favorable year for Argentina, but it was the year in which detailed occupational statistics were secured.

are Cuba and Argentina. In both, the existence of unique economic and political problems, of quite different kinds, accounts for substantial migration. The migration of engineers from Latin America totally is so small that serious problems are not generated. There are several reasons for this . Engineering training in Latin America is typically oriented towards local problems. The background required for the practice of engineering in Latin America is generally different from that required in the United States. The demand for locally trained engineers is typically very high in Latin American countries, and salaries are relatively good. In many countries, engineers are needed both in private industry and in government. Many engineers move from technical positions to general managerial positions. Relatively fewer engineers than physicians and scientists speak English.

Engineers in Latin America are typically fully trained when they graduate from the university after a four or five year course. They typically require no further work in order to accept jobs and begin their careers. Only in Mexico is graduate work in engineering common. In contrast, the person who aspires to a career as a scientist has completed only his basic training when he graduates from the university either from a faculty of philosophy in sciences or from medical school. Much further graduate work is required before a person is able to assume even th the apprentice phases of full-time investigator work. Often, if not typically, this graduate work must be done abroad. These differences in patterns help to explain in part why scientists migrate in a larger proportion than do engineers.

In contrast, scientists tend more than engineers to be members of an international community, and scientists are trained in an atmosphere and by professors who accept the international movement of people as normal and expected. Scientific work itself is not as closely bound to local conditions as is engineering. To a greater degree than is true in engineering, people working on the same problem are found in different countries. Their skills are typically not in as high demand as those of engineers. Positions for scientists are restricted almost entirely to teaching and research in universities and research institutes. The profession of scientist does not have the general recognition and prestige given to physicians and engineers. The training of scientists is such that they can move with relatively little disruption of their work, and good scientists are eagerly sought after by laboratories in the United States. A relatively high proportion of scientists, particularly in recent years, have secured part of their advanced training in the United States, and most of them speak English.

Physicians are in an intermediate position between engineers and scientsts with respect to employment and income in their home countries, the demand for their services in the United States, the proportion who secure part of their advanced training in the United States, the applicability of their skills to task in the United States and the proportion who speak English.

The lines between the three professions cannot be drawn solely on the basis of the advanced degree. Some persons who hold degrees as engineers and physicians, for example, actually work as scientists.

That is, they are engaged in scientific investigation rather than in the practice of the medical and engineering profession. Such people are, so far as the study of migration is concerned, scientists. It is such considerations as these which make it difficult to interpret statistics precisely.

E. Migrating Physicians

1. A total of 4,265 physicians was admitted to the United States from Latin America. (Including Mexico, Central America and South America but excluding Cuba) over the decade from 1956 to 1965. This figure is equal to the annual production of four United States medical schools over a decade.

Area	Total	1956 1960	1961 1965
Total	4,257	1,742	2,515
Mexico	704	286	418
Central America	762	300	462
South America	2,791	1,156	1,635

2. Physicians migrating to the United States from Latin America equal about 5 percent of the output of all medical schools in the United States.

Some comprehension of the significance of this number of migrating physicians may be secured by imagining the situation to be the reverse. What would be the effect in the United States of sending in every year from 300 to 500 physicians trained in that country to Latin America? In considering assistance by the United States to Latin America in the

health and medical field, what would be the relative contribution of stopping the flow of physicians from Latin America as compared with replacing Latin American migrants by a smaller number of physicians from the United States?

3. Migration of physicians over the five-year period 1956-1960 totalled 1,742. Over the five-year period 1961-1965, migration of physicians increased to 2,515, or an increase of 45 percent.

4. Average annual migration of physicians is about 500 as a maximum. The true figure is probably about 350. Since about 6,000 physicians graduate each year from Latin American medical schools, annual migration equals about 6 percent of the annual production of new physicians.

5. The migration of physicians to the United States does not pose as severe a problem to Latin American countries as to certain countries in other parts of the world. For example, as many physicians migrate annually to the United States from the Phillipines as from all countries of South America combined. As many physicians imigrate to the United States from Turkey as from Argentina, but only a third as many physicians are produced each year in Turkey as in Argentina and Turkey has only a quarter as many physicians in relation to her population as does Argentina.

6. While figures for Latin America as a whole provide a broad picture, the situation varies widely from country to country. A few countries account both for the production of most of the physicians. Four out of every five Latin American physicians are produced by six

Number of Professionals and of Physicians with Immigrant Visas
Admitted to the United States from Mexico

1957-1965

Year	Total Professional and Kindred Workers	Pysicians	Percent
1956	746	119 1/	16 1/
1957	604	95	16
1958	423	57	13
1959	379	44	12
1960	583	66	11
1961	542	64	12
1962	700	70	10
1963	627	97	15
1964	442	77	17
1965	569	110	16
TOTAL	5,625	704	12

1/ Estimated.

Note: 1) Data only for Mexico and Argentina are available as of April 15, 1966. Data for all countries will be available for the final report.

2) Data for engineers similar to that for physicians will be available for the final report.

countries - Argentina, Brazil, Cuba, Colombia, Mexico and Venezuela. About two thirds of all Latin American physicians are produced by three countries - Argentina, Brazil and Mexico.

7. As is true of the production of physicians, most migrants come from a few countries. Three out of every four migrants leave Argentina, Colombia, Mexico and Peru.

8. The effects of migration of physicians upon individual countries depend not only on the number who migrate, but also on the proportion who leave. Annual migration in relation to the annual production of new physicians is as follows:

Area and Country	1961-1965 Physicians migrating, Average annual number	1961-1965 Physicians graduating Average annual number	Migrants as a % of graduates
Total	500	6,000	8
Mexico	80	1,000	8
Central America	90	400	22
South America	330	3,800	9
Argentina	100	1,800	6

Notes: 1) The figures for Central America will be corrected. The migrant number is too high.

2) Additional individual countries will be added as data become available.

3) The number of shown as migrants is larger than the actual total because many who enter the U.S.A. with immigrant visas do not remain in the U.S.A.

Number of Immigrant Aliens Admitted to the United States
from South America; Professionals and Physicians, 1957-1965

Year	Total Professional and Kindred Workers	Physicians	Percent Physicians
1956	940	160	17
1957	1,371	228	17
1958	1,772	285	16
1959	1,383	227	16
1960	1,625	256	16
1961	1,566	208	13
1962	1,861	298	16
1963	2,663	327	12
1964	3,417	454	13
1965	3,172	348	11
TOTAL	19,770	2,791	14

Number of Immigrant Aliens Admitted to the United States
from Central America, Total Professional and Physicians, 1957-1965

Year	Total Professional and Kindred Workers	Physicians 1/	Percent Physicians 1/
1956	397	51	13
1957	430	56	13
1958	537	70	13
1959	451	59	13
1960	491	64	13
1961	531	69	13
1962	580	76	13
1963	707	92	13
1964	849	110	13
1965	886	39 2/	5
TOTAL	5,859	762	13

1/ Percent estimated from the fact that physicians represented the following percentages of total professional and kindred workers migrating over the period 1956-1965: Mexico-12%, So.America-14%.

2/ Actual numbers. This table shows too many migrants.

Number of Immigrant Aliens Admitted to the United States
from Argentina, Total Professional and Physicians, 1957-1965

Year	Total Professional and Kindred	Physicians	Percent Physicians
1956	296	37	12
1957	490	89	18
1958	628	103	16
1959	394	70	18
1960	437	97	22
1961	477	74	16
1962	455	94	20
1963	917	116	17
1964	1045	121	12
1965	873	140	16
TOTAL	6,012	941	16

The loss of relatively few physicians by migrating can generate difficulties for countries which have few physicians. Countries which do not produce a large number of physicians, or migrants, but which have a high rate of migration, are the following:

Country	Physicians Graduating 1963	Migrating 1964	Migrants as a Per Cent of Graduates
Dominican Republic	85	12	14
Haiti	41	9	20
Nicaragua	22	4	18

Note: Number migrating to be corrected

In 1964, three quarters of all physicians who migrated to the United States had graduated from 8 Latin American medical schools, although these schools produce fewer than half of the physicians in Latin America. These schools are:

Argentina

Universidad Nacional de Buenos Aires
Universidad Nacional de Cordoba

Colombia

Universidad Nacional de Bogota

Dominican Republic

Universidad de Santo Domingo

Haiti

Université d'Haiti

Mexico

Universidad Nacional Autónoma de Mexico
Universidad de Nuevo León

Peru

Universidad Nacional Mayor de San Marcos

Six of these universities (all except the Universidad Nacional de Cordoba and the Universidad Nacional de Bogota) produced almost 60 per cent of those who migrated in 1960.

F. Migrant Engineers

In 1965, a total of 574 persons with in-migrant visas were admitted to the United States from Latin America as engineers. In contrast with scientists and physicians, it is difficult to be certain that all persons who called themselves engineers were actually professionally trained engineers with university degrees. Accordingly the figures on immigrants represent a maximum. But even if the figures are discounted the flow is still substantial.

Apart from Cuba with 119 migrating engineers, four countries account for more than half of the migrating group:

Argentina	- 88
Colombia	- 70
Mexico	- 57
Brazil	- 37

G. Migrating Scientists

(section to be added)

H. Migrating Nurses

The migration of nurses from Latin America to the United States varies widely from country to country. In all countries of Latin America, nurses are in a somewhat difficult position. Their salaries are low. Their working conditions are often unpleasant. Their opportunities for advancement are quite poor. Their social status is relatively low. Job stability is sometimes affected by political changes. Accordingly, many nurses have a clear motive to migrate, particularly to the United States where wages and working conditions are relatively good. However, many factors inhibit migration. Many nurses are member of religious orders and are completely dedicated to their work in their home countries or other Latin American countries. Girls often have very strong family ties, and migration represents a personal and cultural change which is forbidding. Many nurses do not have the kind of training required for easy employment in the United States. Many do not speak English. In many Latin American nations love for and pride in the country tends to keep migration at a low level.[1/]

Demand for Nurses in the United States

The demand for nurses is high in the United States. Indeed the shortage of nurses approaches a crisis stage.[2/] This shortage

1/ The Zone Office of PAHO, officials of Latin American governments, the central nursing office of PAHO and the American Nursing Association kindly cooperated in supplying data for this section.

2/ "National Crisis in Nursing." Medical World News. January 20, 1966.

arises from two primary sets of factors those affecting the supply of nurses and those affecting the demand. The supply is restricted by such factors as low salaries relative to those available to girls in other occupations relatively, unfavorable working conditions, and marriage. Demand is high because of rising standards of medical care, rising demand for medical care and increases in the range of services provided by nurses.

In this situation, jobs are available in the United States for well trained Latin American nurses who have an adequate command of English. Salaries, working conditions and status in the United States are all more favorable; often markedly so than in their native countries. The salary of the average registered nurse in a nonfederal metropolitan hospital in the United States is $4,500 per year. Accordingly there are strong attracting forces in the United States.

Countries from which Nurses migrate

Given the various factors in the situation, it is to be expected that there would be large variations in the migration of nurses among various countries and this is indeed the case.

In 1965, 510 nurses were admitted with inmigrant visas from Latin America to the United States. Of these, almost 60 percent were admitted from seven countries - Mexico, Cuba, Costa Rica, Argentina, Colombia, Ecuador and the Dominican Republic. Few nurses came from Bolivia, Brazil, Chile, and Perú.

Migration of nurses from most Latin American countries is not a serious problem in total, but in a few which are specifically noted below a serious situation exists.

Nurses and Medical Technicians
Admitted to the United States as Immigrants

1965

Country	Nurses	Medical Technicians
Total	510	174
Mexico	45	12
Cuba	59	55
Dominican Republic	28	6
Haiti	17	7
Trinidad & Tobago	18	5
Central America	123	28
Canal Zone	1	--
Costa Rica	36	4
El Salvador	22	4
Guatemala	20	5
Honduras	20	5
Nicaragua	7	2
Panama	10	7
British Honduras	7	1
South America	220	61
Argentina	43	18
Bolivia	10	1
Brazil	19	4
Chile	17	8
Colombia	58	19
Ecuador	28	3
Paraguay	1	--
Peru	18	3
Uruguay	2	--
Venezuela	8	3
Other	16	2

Honduras - About 20 percent of all nurses migrate, mostly to the United States.

Bolivia - Of the 464 graduates of the principal nursing schools, 114 (or 24 percent) have migrated:

Total	114
United States	69
Latin America	39
Peru	16
Venezuela	13
Brazil	6
Other	4
Other	6

Ecuador - Of the 414 living graduates of the National National School of Nurses, 78 (or 19 percent) have migrated - 47 to the United States and 31 to other Latin American countries.

Colombia - Migration of nurses is a serious problem. There are about[1/] 1,200 active nurses in the country according to an important study now in progress.[1/] Records show that about 12 percent of them - 160 - have migrated to the following countries:

1/ Estudio de Recursos Humanos para la Salud y la Educación Médica en Colombia.

Total	159	
United States	90	
Latin America	48	
Venezuela		21
Panama		11
Ecuador		4
Other		12
Europe	18	
Other, Canada and Congo	3	

Chile - Migration of nurses from Chile is a significant problem. The nurses from the best schools are very well trained, and they have a good reputation in the United States.

Jamaica - About 130 nurses graduate each year in Jamaica, But about 200 application per year for work abroad are submitted by[1/] nurses trained in Jamaica.

I. Migration Rates - Latin American and Western Europe

The complexity of the forces affecting migration, and the fact that much more than economic factors are involved, is shown by the relative rates of migration from Western Europe and from Latin Ame rica to the United States. The economic differential between Latin American

1/ ("What Happens to Jamaica's Trained Nurses," The Jamaican Nurse. December 1964, p. 8.

countries in terms of the real income of the average professional person is much greater than the differential between Western Europe and the United States. If only economic factors operated, one would expect migration to the United States to be much more prevalent from Latin America than from Western Europe. Yet the migration rate from Western Europe is as great, or greater, as from Latin America. "The total emigration to the USA . from Western Europe (France, Germany, the Netherlands and United Kingdom) amounted to 6, 500 scientists and engineers from 1956 to 1961, probably equivalent to about 6% of Western European new graduates in science and engineering in those years. This was equivalent to about 3% of new graduates in science and 9% of new graduates in engineering." 1/

Viewed from this perspective, the question is not why do so many Latin American engineers scientists and physicians migrate to the United States, but why do so few migrate. Two important related considerations are exposed by this question.

First, it is evident that the existence of relatively low income opportunities for individual in a given country does not necessarily lead to migration. This means that countries with relatively low per capita income need not be fatalistic about the migration question. It is not necessary for countries to approach the per capita level of the United States in order to keep migration within reasonable bounds.

1/ Freeman, C. and Young A., The Research and Development Effort in Western Europe, North America and the Soviet Union. OECD. Paris, 1965. p. 58.

Engineers from Latin America
Admitted with Emigrant Visas to the United States

1965

Country	Total	Civil	Electrical	Mechanical	Other
Total	574	123	66	85	300
Mexico	57	13	14	7	23
Cuba	119	34	13	29	43
Dominican Republic	16	2	1	2	11
Haiti	28	8	4	--	16
Trinidad & Tobago	8	4	--	1	3
Central America	50	13	6	10	21
Costa Rica	10	1	2	4	3
El Salvador	5	2	--	--	3
Guatemala	7	2	--	1	4
Honduras	12	1	1	3	7
Nicaragua	5	2	1	1	5
Panama	8	4	2	--	2
British Honduras	4	1	1	1	1
South America	299	49	28	36	186
Argentina	88	12	5	10	61
Bolivia	10	1	--	4	5
Brazil	37	6	5	7	19
Chile	29	7	2	3	17
Colombia	70	12	10	6	42
Ecuador	13	4	2	1	6
Paraguay	1	--	--	--	1
Peru	17	3	2	3	9
Uruguay	6	--	--	--	6
Venezuela	24	4	2	2	16

Second, since the existence of larger economic differentials compared with the United States in Latin America than in Western Europe does not lead to higher migration rates from Latin America means that significant non-economic factors have inhibited migration from Latin America

J. Employment with International Organizations

The number of highly trained and talented citizens employed by international organizations causes some Latin American countries to be concerned. In total, somewhat more than 800 Latin Americans are serving with international organizations. No details by occupation are available, but it is known that the group is composed almost entirely of highly qualified persons whose services are needed at home as well as by international organizations.

Work abroad does not necessarily mean migration because most persons who serve in international organizations return home. However, some individuals become permanent career international employees, and hence migrants. The size of this group is not known, but a quarter of the total is a reasonable estimate. If this is close to the truth, the cost of providing staff for international organizations is not a serious cost to the Latin American countries, even though exceptionally able executives are always needed at home.

Two-thirds of all Latin Americans serving with international organizations work for EAO, UN or OAS, and the remainder are scattered among all of the major international organizations.

The contributions of various countries to the staffing of international organizations are not uniform in either absolute or relative terms. About sixty per cent (500) of all employees of international organizations are from six countries, each of which provides 60 or more employees -- Argentina, Brazil, Chile, Colombia, Cuba, and Mexico. (This, it should be remembered, is a total employment figure as of 1964 and not the number hired in that year.)

In terms of the proportion of the total pool of highly trained people from various countries serving with international organizations, there are interesting differences among countries. Peru, for example, has more than four times as many persons serving in international organizations as does Venezuela. Chile has almost as many citizens in international organizations as does Brazil. Argentina has almost twice as many citizens in international organizations as does Mexico, and Colombia has just about as many as Mexico. The reasons for these differences are not clear. Perhpas the relative prosperity of Mexico and Venezuela makes work with international organizations less attractive to citizens of these countries. The quota system tends to make proportionately more jobs available to citizens of smaller countries. National traditions affect the degree of participation in international affairs. But these speculative ideas do not clearly explain the d differences.

Service of their citizens in international organizations benefits countries. The persons who serve often return to their native countries better trained to work locally. The prestige of the country tends to be increased.

Latin American Citizens Recruited
Internationally for International Agencies

Country		Number
Grand Total		819
Argentina	124	
Brazil	101	
Chile	94	
Total		319
Mexico	63	
Colombia	60	
Cuba	60	
Total		183
Haiti	47	
Peru	44	
Ecuador	35	
Total		126
Bolivia	29	
Uruguay	28	
Costa Rica	24	
Total		81
Panama	17	
El Salvador	13	
Guatemala	13	
Total		43
Paraguay	12	
Trinidad	11	
Jamaica	11	
Total		34
Venezuela	10	
Dominican Republic	9	
Nicaragua	8	
Honduras	6	
Total		33

K. Statistics

1. Enough is known almost entirely from sources in the United States about the numbers and characteristics of migrants from Latin America to the United States to provide a basis for policies and action by nations. Knowledge of the general magnitude native and causes of a problem is an adequate guide to National action, and the nature of National policies in this field does not depend on precise statistics. The appropriate actions are not affected even by quite substantial changes in magnitudes.

Detailed facts that would further illuminate problems, guide actions and stimulate action by professional and other groups are not available.

2. Data on the numbers of people in various professions and on the number graduating in each profession in each year, are inadequate in most Latin American countries. Such information is necessary to assess the significance of the absolute number of migrants. Such data can be produced only by a general strengthening of National manpower statistics. Such a program is now being advocated, aided and implemented by the Organization of American States.

3. An important set of facts which is almost entirely unknown is the volume of migration into Latin American countries.

4. The fact that few facts data has been available and widely disseminated has had unfortunate consequences. The most serious effect has been to lead to exaggerated ideas as to the number of migrants. Another effect has been to place discussions of migration in a rather theoretical light.

Finally the absence of sound data has naturally prompted various people to search for any facts which might provide information. Thus, in Mexico students of the supply and demand for physicians have thus for had to rely on the numbers tested for practice in the United States. The estimate was made as follows:

"Some 150 young physicians from Mexico are tested annually for settling and practicing in the United States; of these, 100 are graduates from the Medical School of the National University, and the remaining 50 are graduates from State medical schools; from 66% to 75% pass the first test successfully, and those who fail have the opportunity of passing tests in subsequent years; therefore, the number of physicians which Mexico loses per year is 100." 1/

Actually, the maximum annual number of migrating physicians from Mexico to the United States between 1961 and 1965 has been about 80 and the actual number has been closer to 60. In the absence of such precise data, the Mexican estimate was remarkably precise and provides an order of magnitude which is not misleading in terms of policy implications.

A more serious error was made in Argentina in earlier years. Upon the basis of no facts whatever, a statement that Argentina had lost 5,000 engineers to the United States. No source was specified and no

1/ Alarcón, Donata G., Director de la Facultad de Medicina de la U. N. A. M. Evaluación de la Necesidad de Médicos de la República Mexicana y Planeación de la Enseñanza Médica. 1965. p. 13

time period was given. The true figures indicated that a maximum of 700 engineers had migrated to the United States over the period 1951-1961.[1/] The true situation was serious enough since the number of migrants equalled 8 percent of the number of new engineers graduating over the period 1951-1961.

5. However, the major finding is not that lack of interest concern and action over the problem of migration is much more significant than the inadequacy of statistics.

1/ Horowitz, Morris A. La Emigración de profesionales y técnicos argentinos. Instituto Torcuato di Tella. Buenos Aires, Argentina 1962, p. 1

II CHARACTERISTICS OF MIGRANTS -

The Quality Factor

The migrants considered in this study are valuable to their native countries in several respects. First, they are valuable in the sense that they cost a great deal to produce. University education, particularly in such fields as medicine, is expensive, averaging perhaps $ 20,000 per person. University education is typically available to a very small proportion of the population in the relevant age group. Virtually all university graduates in Latin America - rich and poor - have had their education heavily subsudized through taxes.

University graduates are most valuable in another sense - the value of the services that they provide. Engineers, physicians and scientists are critically important,in different ways, to national development.

Engineers are required for all types of design, construction and production. The availability of well trained engineers becomes particularly important when countries begin to diversify and expand industrial production, and to enter fields involving modern technology. The capacity of countries to develop, operate and manage with their own nationals industries requiring the application of complicated technology depends heavily upon the availability of engineers with up to date training. Hence, the migration of engineers is a serious matter for the countries concerned. As is generally true the appropriate measures are not tied to the precise number of migrants. As long as the number of migrants is above the negligible level and below the catastropic level, the actions that governments might take are not affected by differences with the number of migrants.

THE LOSS OF TEACHERS

The loss of those qualified and working as teachers -- investigators is particularly important because these people are responsible for expanding the future supply of professionals.

The exceedingly small supply of teachers-investigators is illustrated by the situation in engineering. In all of Latin America, about 15,000 engineers devote some time to university teaching. But of these, only 2,000 are full time, even in the sense of spending a formal full work week at the university. Even fewer devote themselves completely to academic work. Only 600 to 700 engineers in all of Latin America devote themselves completely to academic teaching and research.[1/]

The same extremely small proportion of professionally trained persons in medicine devote themselves completely to university teaching and research. The proportion in science is higher, and of the same number of engineers and scientists who migrate a much larger number of teacher -investigators will be found among the scientists.

The better the scientist and the better the laboratory in which a scientist works, the more likely is he to be offered an opportunity to work in a loboratory in the United States. Even the outstanding laboratories in Latin America have difficulties at times in providing the resources which investigators consider essential to the optimum progress of their research. Graphic examples of this condition can be cited from laboratories with which members of this Committee are associated.

1/ UNESCO. CASTALA Conference. Personal Docente, Niveles, Grado de Especialización, y Condicion de Ingreso en Estudios de Ingenieria. p. 3

THE LOSS OF SPECIFIC INDIVIDUALS

Even more specific than the case of university professors in engineering science and medicine is the small number within these groups who are national leaders. In every country there exists a small number of persons who combine in themselves all of the attributes - unusually rare when found singly and extremely rare when found combined - necessary to the establishment, growth, productivity, vitality and stability of substantial institutions whether these institutions be ministries, professional parts of ministries, independent institutes, universities or parts of universities.

The loss of such people by migration can not be counted by statistics, for one person with such extraordinary gifts is uniquely valuable, and worth as much as 10 to 100 persons with a high degree of professional training but lacking the rare personal attributes of leaders.

Such persons are known by name. Informed persons virtually in every Latin American country can name persons of outstanding talent who have migrated to the United States. The numbers vary from country to country and at most the numbers are small. But their migration represents a serious blow to aspiration for development. On the whole, these losses seem to be more serious in medicine and science than in engineering.

This problem can not be assessed statistically, and there is no point in attempting to do so. The critical fact is that the dimension of quality must be borne explicitely borne in mind when statistics are examined.

Take the case of Dr. Biro, an immunologist in the Institute of Cardiology in Mexico City.

> "The difficulties were mainly in obtaining salaries for personnel or scholarships. It had become very difficult to obtain United States grants and in his selection of post-graduate co-workers he was dependent on the possibility of the candidate bringing his own fellowship. There were no probelms concerning the supply of adequate equipment. Personally, Dr. Biro is still partly supported by a Helen Hay Whitney Research Fellowship but he considers his total salary extremely low and though he wants very much to persist in his object of creating a good basic immunology unit in his country, he frankly told the consultant that he might be forced to go to the United States where he could obtain a research position either with Dr. Frank Dixon in La Jolla or with Dr. Francis Wood in the University of Pennsylvania."

Another example is provided by Dr. Martinez in the Institute of Experimental Biology and Medicine in Buenos Aires:

> "The immunological work in this Institute is limited to a rather small section in which, at the time of the Consultants' visit, Dr. Carlos E. Martinez had been working for about a year on extremely interesting problems concerning the importance of thymus to the immunological development of mice and the acquisition of immunological tolerance. Dr. Martinez is an immunologist of high repute who has worked for many years in the Physiology Department of the University of Minnesota and his return to Argentina would have been a considerable asset to immunological research in that country. Unfortunately, Dr. Martinez has had many difficulties in pursuing his work in the manner that would satisfy him and he is planning to return to Minnesota and even to take one of the most gifted young immunologists (Dr. O. Stutman) with him.

(Note: The two quotations above are from consultants' notes for the PAHO study of research in immunology in Latin America. In the final draft the names of the individuals will be dropped. Should the names of the laboratories also be dropped,or not?)

III. Causes of Migration

The causes of migration may be usefully separated into four components. (Ignoring the purely personal factors, such as attraction to or repulsion from a lady, or ladies). The first group of causes consist of those which tend to push people out of their native countries. This group consists of two sub-groups -- deliberate and unintentional.

A. Deliberate Push from the Native Country

Few countries have ever wished to push highly trained people out to other countries. Occasionally, however, this happens, as when a change of political regime forces -- or makes it highly desirable -- for some highly trained people to migrate. Even in this case, the fact that a person is highly trained is incidental, and his political views or affiliations are paramount.

B. Unintentional Push from the Native Country

A major cause of migration to the United States from Latin America is the low level of opportunity in professional and in economic terms in the home country. In this connection, two points need emphasis. First, the opportunities available at home need not equal the opportunities available in the United States if people are to remain at home. Most physicians, scientists, and engineers, as is true of people generally, prefer to remain home. This is where their families are, where their roots are. They know their own people, their own customs, their own language, their own food. Therefore, people do not generally move from one country to another solely to obtain a slight economic or professional advantage. The difference must

be large enough to overcome a strong preference to remain at home.

The second important point is that the direction of movement, as well as the absolute level, is important. If it appears that the political situation is becoming more stable, that the prospects for economic growth are good, that career opportunities are improving, then migration will decrease even though a large gap may still exist between conditions in the home country and conditions in the United States. This general statement can be verified concretely by examining the trends of migration over a period of years in such countries as Venezuela, Argentina and Mexico. In Venezuela, salaries and professional opportunities are not as favorable as in the United States. But they are favorable enough to forestall all but a small amount of migration. In Argentina, the fluctuations in the prospects for political stability and economic growth are reflected -- with a six month to a year long -- in the migration figures.

In short, people can be pushed out of their native countries -- in spite of the very strong human forces that lead them to remain at home -- if conditions are so unsatisfactory that they feel that they must leave. The unsatisfactory conditions can be those that force all citizens -- general political unrest and uncertainty as to the future, politics in universities, low incomes, general lack of hope for the future, inflation, and difficulty in securing recognition of individual merit by those without political and family influence.

They can also be conditions that face professional persons - difficulty in utilizing advanced training, the part-time system and poor remuneration for university teachers, problems in maintaining contact with the world community in their profession.

Migratinn and Balanced National Development

One important source of unintentional push from the home country is inbalance in national development. The idea of balance is a notion as complicated and as fundamental to the evolution of countries in the earlier stages of development as it is to countries at the higher stages of development. A number of factors would ideally remain in balance in the course of development. These include the rate of economic growth of the country, the rate of development of culture of the country generally, the development of the educational system at all levels, the institutional forms for education system at all levels, the institutional forms for education at all levels, and the output of people in numbers and kinds well adjusted to the evolving needs of the nation. Such an ideal is virtually impossible to attain, and its value as a matter of fact is its existence as an ideal, rather than as a goal to be achieved and sustained. Progress does not in the affairs of nations occur with such balanced rhythm. Rather progress comes about through spurts in various sectors. These spurts leave imbalances which nations must them try to remedy. This process of seeking to achieve the balance is the essence of progress. In this process, dislocations are inherent. The dislocations are a means of adjusting to the unevenness of the development process. If they are not too severe, the adjustments are productive and a normal price to be paid for the development itself. Migration is one of the evidences of lack of balance in the development process. Migration is therefore not a unique kind of imbalance but simply one of a number of kinds of dislocation that are inevitable in a highly complex dynamic process.

To be specific about imbalance in development, it is virtually impossible to produce highly-trained people -- such as scientists and engineers -- at the precise rate required for and by the development of national economies. One primary reason for this is the length of training period. For example, deliberate efforts to expand the advanced training of chemists, as has been done in Argentina rest upon the assumption that very special types of industries will develop 5 to 10 years in the future. Not all such estimates will be accurate in all countries. Another type of imbalance can occur in training persons for employment by the state. The training of nurses, for example, depends on the development of medical and related services. In addition, the training of academic scientists often rests on the assumption that career opportunities which do not exist at the time of training will be available when the training is completed. Sometimes these expectations are not fulfilled, often because they depend upon drastic changes in laws customs and administrative structures of universities.

Political Instability as a Cause of Migration

Taking Latin America as a whole, political instability is a major unintentional force tending to push highly trained people to other countries. Generally, highly educated people in Latin America are not politically neutral in their beliefs. They tend philosophically to be in the center, or to the right or left. These political inclinations are expressed in varied ways. Attitudes towards the structure of universities, attitudes towards the structure of government for science, attitudes towards the acceptance of outside assistance for research, attitudes towards scientific relationships with the western countries or the eastern countries, as well as direct political activity, tend to establish the position of individual

scientists on the political spectrum. With changes of government resulting in a change in the prevailing political philosophy, those who find themselves out of sympathy with the government, find it impossible to remain productively at work. The pressures on individuals range from mild harrassment to physical force. A substantial part of the migration of scientists from Latin America is therefore traceable to the basic problem of political instability. This is noticeable, for example, in Argentina and Brazil. The case of Cuba need not be elaborated.

(How to write about the problem of political instability as a factor in migration in a PAHO document is extremely delicate, and good advice on the phrasing of this section is needed.)

C. Unintentional Pull to the United States

Unintentional pull to the United States is the strongest force affecting migration to that country from Latin America. Latin American physicians, scientists and engineers are drawn to the United States by the relatively high incomes and relatively good professional opportunities which they see there. The attractions exist not by reason of an intentional effort by individuals or by the government to attract persons from other countries, but by reason of the nature of the culture and the economy.

Many policies of the United States since World War II have tended to increase the unintentional pull to that country. High stable levels of employment have expanded the general demand for professional as well as other workers. Sharp increases in the demand for the services of physicians have not been matched by the production of new physicians. Large research and development expenditures have created heavy demands for scientists and engineers. University policies have made it possible to establish thousands

of new academic positions at all levels.

In general, the policies that have been considered appropriate to the United States for its own internal development have been the policies which have simultaneously attracted people from other countries. Conversely, the policies which would be best designed to discourage the movement of talented people to the United States are those which would be domestically unacceptable because they would lead to a stagnant economy and to restricted professional and economic opportunities. Some other internal policies which would have reduced the unintentional pull to the United States might have been acceptable. An intensive effort at an earlier date to increase sharply the number of physicians educated in the United States might have reduced the demand for physicians from other countries. Higher rates of production of Ph.D.'s in the sciences would have had the same effect.

D. Intentional Pull to the United States

Intentional pull to the United States has been non-existant on the part of government. The formal actions of government specifically related to migration have been in the direction of restraining migration, as through the requirement that persons with an exchange visitors visa spend two years outside the United States. However, the United States Government has not taken strong direct steps to discourage the migration of high level talent from Latin America through such devices as the imposition of quotas on the admission of such people.

On the other hand, some private employers in the United States have deliberately offered positions to Latin Americans. In some university and industrial research laboratories, highly capable investigators are offered positions which are attractive in terms of income, and professional opportunities measured by such things as equipment, space, facilities, assistants

and professional associations.

A large proportion of the migrants to the United States from Latin America not not sought out in Latin America by employers in the United States. The more common pattern among highly trained persons is to visit the United States as a student, as a tourist, as an employee or as a self-employed person. Then, after a period assessment the decision to migrate is made. It is during or after this period that professional opportunities are offered in the United States. Accordingly, it is difficult to assess in the case of many individuals the ofrces which "push" from those which "pull", and the extent to which the forces are intentional or unintentional.

E. A Suggestion for Measuring the "Push" and "Pull" Forces

Data from Argentina can be used to illustrate an exploratory means of quantifying the "push" and "pull" forces. The essential suggestion is that when there are wide fluctuations in migration over time, the minimum level represents the "pull" of the United States and all migration above the minimum represent the "push" from the Latin American country. Data illustrating this approach for migration of physicians from Argentina are presented below .

Over the fifteen-year period from 1951 through 1965, a total of 1,065 physicians from Argentina were admitted as immigrants to the United States. The movement by five-year periods was as follows:

1951-1955	94
1956-1960	396
1961-1965	575
Total	1,065

Since the more recent years are of particular interest, figures for the 1961-1965 are as follows:

1961	74
1962	94
1963	116
1964	151
1965	140

Variations in the number of migrants from year to year are significant. More than twice as many physicians migrated in 1964 as in 1961. Emigration of physicians in 1964 and 1965 was higher than in any year since 1950. These rapid and large changes are attributable to differences in conditions in Argentina rather than to difference in conditions in the United States. This is one means of showing that physicians are "pushed from" Argentina by adverse circumstances as well as "pulled to" the United States by relatively good circumstances. Indeed, one can estimate roughly how much migratory is attributable to the two factors by accepting the hypothesis that the years of minimum migration over the past decade represent the "pull to" the United States. These minimum years were 70 in 1959 and 74 in 1961. Assume that 70 migrants per year are "drawn" to the United States, and that the remainder of the migrants are "pushed from" Argentina. Then over the past decade 700 migrants were "drawn to" the United States, and 271 migrants were "pushed from" Argentina (i.e., 971 total migrants from 1956 through 1965, minus 700). In short, about 70 percent of the migrants were previously attracted by the United States and 30 percent were primarily repelled by conditions in Argentina. This rough hypothesis may also provide a useful guide to the volume of migration which may be expected to continue even if conditions in Argentina in the future are quite good and stable. It would appear reasonable to assume that a minimum of 70 to 80 physicians

per year will continue to migrate under the best of circumstances in Argentina.

There is a cler tendency for the number of physicians who migrate to rise.

The absolute number of migrants need to be assessed in the light of the total number of physicians in Argentina and the number of new physicians produced each year. There were about 35,000 physicians in Argentina in 1965, and the number has increased from about 32,000 in 1962[1/]. There are about 1,800 new graduates in each year. Argentina has about 150 physicians per 100,000 population, approximately the ratio that obtains in the United States. Measured against this base, the number of migratory physicians does not seem severe. The 575 physicians who migrated between 1961 and 1965 represent only about 1.5 percent of the number of physicians in Argentina [2/]. However, the loss is more serious when examined from other viewpoints. The loss of 100 to 150 physicians per year to the United States means that the number migrating each year is equal to one out of every 12 of the 1,800 new graduates each year from the medical schools of Argentina. This annual volume of

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1/ OEA. Departamento de Asuntos Científicos. Estudios de Recursos Humanos en el Contexto de la Planificación y la Metodología en America Latina. (Paper prepared for the CASTALA Conference 1965, Table 35. The number of physicians in 1962 approximated 32,000 - WHO World Directory of Medical Schools. Third Edition, 1964).

2/ Oteiza has estimated that the total number of physicians who migrated over the period 1950 to 1964 was equal to 2.9 percent of the number of physicians in Argentina in 1964. (La Emigración de Ingenieros dentro del Contexto de las Migraciones Internacionales en la Argentina, un Caso de "Brain Drain" Latinoamericano. Paper prepared for the CASTALA Conference, Santiago, Chile, September 1965). Of course, the longer the period over which migration is measured, the larger the percentage which this figure represents of the total manpower pool.

migration is equal to the output of a large medical school in the United States.

E. Assessment of the Forces Affecting Migration

1) It is clear that the unintentional forces in Latin America and in the United States are much more important than the intentional forces. The governments of Latin American countries do not intend to force highly talented persons to leave. The government of the United States does not intend to draw talented people from Latin America. Yet both of them, by unintended effects of general policies -- or lack of policies -- generate forces which lend to extensive migrations.

2) Part of the migration of highly skilled people from Latin America to the United States results from differences in economic and professional opportunities which will not disappear. For example, among professional migrants from Chile, only 50 percent had income of $150 per month or more before leaving Chile, but 75 percent of them are earning $400 or more per month in the United States.[1/] A realistic approach to the problem of migration must rest on the assumption that there will be a continuing flow of professional people from Latin America to the United States. Only if Latin American countries, or the United States, or both, were to place unthinkable limitations on the rights of individuals could migration be halted.

3) The fact that rates of migration vary widely from country to country, and from year to year in the same country, indicates that changing conditions in Latin American countries have an important effect on migration. This is an important finding, because it leads to the conclusion that deliberate efforts to improve conditions in Latin American countries can affect migration.

1/ Gutiérrez, S. and Requelme, J. La Emigración de Recursos Humanos de Alto Nivel y el Caso de Chile, P. 31.

4) A substantial proportion of the migration of highly trained people from Latin America to the United States could be avoided by the adoption of policies which Latin American countries can afford.

The primary obstacles to the adoption and execution of effective policies are not economic, but are rather institutional, cultural and political. Lack of understanding by those officials who could institute the requisite measures is important. The absence of a point of official responsibility in governments.

Only Argentina has taken measures designed specifically to encourage highly qualified persons who have migrated to return. These measures include 1) organized efforts to secure continuing research support in Argentina for those scientists who wish to return, 2) offers of career support in universities for highly qualified scientists, and 3) waiving of duty on automobiles and household effects for returning scientists.

5) The degree of awareness of the problem of migration in various countries has depended more upon the initiative of a few individuals than upon the seriousness of the problem. For example, excellent and adequately publicized studies in Chile and Argentina, have directed public attention sharply to the migration question. In contrast, the more serious migration from Colombia has been virtually unnoticed in that country.

Draft Recommendations of the
PAHO Committee on Migration

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Draft Recommendations of the
PAHO Committee on Migration*

A. The Intractable Basics and the Feasible

The fundamental causes of migration of highly trained people from Latin America to the United States are the consequence of factors which would not be affected by recommendations. These fundamental matters in Latin America include such things as low levels of income, inflation, political instability, absence of opportunities to use and develop professional skills effectively, archaic university structures, and political influence over professional appointments and promotions. Changes in such matters as these typically come about slowly, and are the consequence of the processes of development themselves. So far as the United States is concerned, there are also many basic factors giving rise to migration which are not amenable to change through recommendations. The dynamism of the economy which gives rise to insatiable demands for persons with highly developed skills and professional training, the rapid growth of research in universities and the extreme shortage of physicians all result from forces so fundamental that recommendations will do little if anything to modify them.

However, the process of change is affected by many factors, and expressions of views from informed sources and presentation of new, significant and little known facts can contribute to the multitude of factors which bring about fundamental changes. This report, therefore, takes note of many basic causes of migration which are not amenable to quick change.

*These recommendations are a second draft which takes into account the comments made by the Committee on Migration at a symposium and meeting held in Rio de Janeiro, Brazil, during the first week of May, 1966. This section will be revised in accordance with further discussion at the June meeting of the PAHO Advisory Committee on Medical Research.

Short of the fundamental economic, social and political considerations, there are important contributory factors which can be modified by specific actions which are within the economic capacity of every nation.

This report concentrates upon such actions. If adopted in total, they would not stop all migration. However, the abolition of migration is not only impracticable, but would also be undesirable. Movement of people from one nation to another is generally helpful to individuals and to countries. The purpose of these recommendations is to prevent the normal from becoming pathological, abnormal and harmful.

B. The Problem of Migration of Scientists, Engineers and Physicians Differentiated.

In this connection, the migration of scientists can be treated in a different manner than the migration of other highly trained groups. The measures that are required to retain professional people such as engineers and practicing physicians are, by and large, the basic economic, political and social changes required for national development. There are a few measures that can be specifically designed for these groups in order to reduce migration. Even if such measures could be devised, there are so many engineers and physicians that the cost would be excessive. However, the case of scientists is a special one. In absolute numbers, few of them migrate but the loss per scientist is very high to the countries concerned. The movement of one scientist can, and has, meant that an entire university department is ruined and that a field research is closed. Those scientists who work in their own countries are teachers and leaders, as well as investigators. Hence, the gain to

countries from keeping scientists at home, or repatriating them, is very high per scientist. The total number of scientists in any country is small in relation to the number of practicing engineers and physicians. Accordingly, the total investment required to moderate the movement of scientists is relatively small and the return is extraordinarily high.

C. Observations Relating to the Responsibilities of Individuals.

While recommendations to individuals are not particularly appropriate, observations on the responsibilities of individuals are relevant. This matter has been presented directly and persuasively by Professor Houssay:*

> "Yo afirmo que si bien la ciencia no tiene patria, el hombre de ciencia sí la tiene; la tierra donde nació, se educó y formó, la cual lo sostuvo, le permitió vivir, educarse y adelantar. Allí tiene sus amistades y su familia, factores de tan profunda influencia en los latinoamericanos.
>
> Hay un pacto tácito, no firmado, de que todo hombre debe ayudar a su patria. Pudo estudiar merced al trabajo de todo un pueblo: campesinos, obreros, intelectuales, que produjeron los recursos que lo mantuvieron y cuyo esfuerzo sostuvo las escuelas y universidades. Debe retribuir a ese trabajando al máximo para el adelanto de su país."

The Committee fully endorses this philosophy.

D. Latin American Countries

The primary responsibility for taking steps to moderate the movement of highly trained people to the United States from Latin America rests with Latin American countries. The differentials

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*Houssay, B. La Emigración de Científicos, Profesionales y Técnicos de la Argentina. 1966, p.12.

in terms of professional opportunity, income and stability that give rise to migration should be reduced by raising rather than by lowering professional and economic opportunities. This means that the basic actions must be taken by the Latin American countries.

The nature of the actions relating to migration that are appropriate and feasible differ widely among Latin American countries. Nevertheless, the recommendations are stated as if Latin America were a single unit. This is done with the full knowledge of the widest diversity, but with the central assumption that the proposals will stimulate leaders to select, choose, adapt, delete and add measures suited to the specific needs and capabilities of their countries.

1. General Measures to Strengthen Science in Latin America

The actions required to reduce migration of scientists from Latin America are precisely those required to establish stronger science and technology. As has been uniformly recommended by numerous national and international study groups a number of steps to strengthen science are indicated:

a) Raise the Total Level of Investment in Science and Science Education

An urgent need exists for expanded and stable general support for science and science education, and this can be achieved in most countries only with external assistance. However, the constant objective must be the strengthening of indigenous science and education, and for this the nations involved have a responsibility that they have not yet adequately met.

It is reasonable to set as a goal the investment in research of .5 to 1 per cent of the gross national product, depending on the relative wealth of the nation. Research is an investment, not an expenditure.

Carefully planned investments in research and higher education are among the most profitable that a country can make, and most Latin American countries do not invest enough in these fields.

More fundamental than the division between scientific fields or between science and technology is an increase in the total investment in research development and technology. The most fundamental problem confronting the development of science - including biomedical science - in Latin America relates not to any specific deficiency but to a complex of social attitudes that result in a nonscientific or an antiscientific attitude on the part of the population generally and often on the part of political leaders. Leaders of science in Latin America bear a heavy responsibility to change these attitudes.

More intensive and effective applied research and development is a general goal of high priority, which should be sought by building applied research without lessening efforts in basic research.

b) Strengthen Existing Centers

High priority should be given to strengthening those strong points of research and education which already exist, including engineering, science and medicine. These are organizations in being, with strong leadership, facilities, equipment and students. In general, investments in selected existing centers of high quality will yield a higher return, in terms of the training of people and in terms of the quality of research, than investment in new centers.

In general, and as long range objective, emphasis should be on strengthening points of excellence - departments, faculties, research groups, institutes or whatever they may be - which have a strong eduational

component. This generally, but not always, means points of excellence associated with universities. Some universities are so archaic, poorly organized and staffed that they fall far short of the ideal institution combining teaching and research, and in such cases it is necessary to consider strengthening non-university points of excellence.

No solution or specific recommendations are offered for the deeply rooted problems of most Latin American universities. Certainly, those who are working toward the needed fundamental changes deserve every encouragement. As a general principle, assistance should be directed so far as possible to strengthening the position of those who are undertaking to modernize the outlook and structure of universities, as against supporting those who oppose modernization.

C. Link Centers of Strength - Domestic and International - An Intellectual Common Market.

The existing efforts to link points of strength within each country to form stronger total national systems are commendable and should be encouraged. Such efforts are being exerted in Argentina, Brazil, Colombia, Chile and Venezuela. This recommendation is relevant to the question of migration because a stronger national system tends to permit people to be trained to higher levels within their own countries. The higher the level of training at home, the less the probability of migration.

With respect to international linking of points of strength, no nation can wisely pursue a policy of autarchy in science. The smaller the country, the more the difficulties in establishing a strong structure for science and the greater the need for strong links to world science. A degree of isolation can be useful to scientists as a protection against unproductive conformity, but such isolation can be productive only under special circumstances.

The fundamental need for communication establishes a particularly strong case in Latin America for more widespread efforts to establish free and easy collaboration within countries, an increased flow of scientific information and people among nations, and a stronger network of international activities. Accordingly, the central idea of an economic common market for Latin America should be extended to the creation of a wider intellectual common market, building upon the excellent steps already taken.

Specifically, active leadership, staff assistance and funds should be provided by international organizations for the organization of advanced training - to the Ph.D. level in some cases - using existing centers of excellence wherever they may be found in Latin America. Full exploitation of existing capability and extension of the capacity of Latin America to offer advanced scientific training of higher quality to more students is a major means of preventing undersirable migration. Precedents for such action exist, particularly in the pattern being set by the Latin American Physiological Society, which has selected 12 centers after screening a much larger number on the basis of objective creteria. The Pan American Federation of Associations of Medical Schools offers a useful instrument for developing such arrangments.

More fellowships should be available for study by Latin Americans in other Latin American countries. Steps in this direction have been taken by the Ford and Guggenheim Foundations, and by the Organization of American States. AID is financing the study of a substantial number of Latin American Students in Mexico. From the viewpoint of the Latin American countries, expansion of this so-called "third country" training would be highly desirable even if financed by reducing the number of fellowships for study in the United States.

d) Improve the Organization of Science - Establish Strong National Research Bodies.

The absence of a means by which all factors affecting research can be considered in their relation to each other is a major disability for most countries, and a major reason for establishing national bodies competent to deal with such problems. Indeed, the entire complex of training, migration of highly trained persons, support of research, university structure, full-time jobs, and all the other factors vitally affecting a country's capacity to conduct a vigorous research effort must be considered together. A characteristic of research that is both prevalent and deleterious is inadequate organization and coherence. There are obvious dangers in over-organization, but Latin American science suffers from ineffective organization. The individuality of each person, the fragmentation of the university, the lack of coherence in science at the national level, and the weakness of international collaboration are all evidence - at different levels - of inadequate organization.

Every Latin American country with multiple centers of research that does not now have a formal national structure for science policy should establish such a group; every country with emerging points of scientific strength should consider establishing such a group.

The establishment of a national research body should not be considered desirable simply because it is the fashion to set up such organizations. There are real and important tasks to be performed for science. One of these is essentially political - the decisions made in all countries on investments in science as contrasted with other fields. These are generally and quite properly made by political authorities. Often these authorities have little comprehension of the power of science and technology in relation to economic

and cultural development. A national science body can be a vital link between the scientific and technological communities and political authorities.

A second reason is scientific, and relates to the problem of choice. Every nation has a science policy, which consists of de facto decisions. The real question is how these decisions are made, or whether they are made in a context that reveals the possible consequences of choices before they are made, permits an examination of alternative choices, and exposes for prior study the general relationships between use of resources for research and higher education and their use for other important goals - such as investment in public works, secondary education, or defense. If such choices are to be made with a reasonably high degree of rationality, and if governments are to be guided toward intelligent choices, deliberate attention must be paid to these matters at the national level. In this respect, a national research body can be invaluable.

National research bodies can also serve for securing and analyzing data on resources for science and technology, for improving communication among scientists in other countries, and for providing a link to international bodies and sources of scientific collaboration and support in other countries.

Finally, national research bodies are the natural instrument for viewing the question of migration of highly trained people in the total context of national affairs, and for securing effective action.

e) Plan Opportunities for Study Abroad

Study abroad continues to be an essential part of the education of many highly trained persons in Latin America. Much of this training is secured in the United States.

However, well known and continuing deficiencies in the planning of training opportunities decrease the utility of the process. For example, inadequate planning tends to increase migration.

As noted above, training opportunities should be expanded in Latin America in part to minimize reliance upon training elsewhere. Training in Latin America tends to be related more to domestic needs and capacities, it is much less expensive, and it tends to decrease both incentive and opportunities to migrate.

Those who do study abroad should first exhaust all training opportunities of adequate quality in Latin America. For one thing, the older the students when they go abroad for study, the more likely are they to be married and the less likely are they to stay abroad.

The nature of training abroad should be related to needs and opportunities at home. To the greatest possible degree positions relevant to the advanced training should be reasonably assured before individuals go abroad for training. There is an urgent need in many countries to consider, before people are trained, how many the country can absorb in advanced specialties. This is one aspect of general manpower planning. In specific terms related to migration, serious questions have been raised about the productivity of providing more fellowships before the issue of jobs and careers is resolved.

These recommendations are not new. They are reiterated here because they are important, and because deficiencies in the training process continue to appear.

Many individuals go abroad for advanced training on their own initiative and not under official auspices. They have a right to do so, but those who advise them have a responsibility to help them choose the nature of their foreign training.

2. Specific Measures to Repatriate Highly Trained Persons

a) Stimulate Studies of Migration

Each country should stimulate, perhaps through subsidizing the necessary research, studies of the extent, characteristics and causes of migration of highly trained people. The investigations sponsored by the National Academy of Science of Brazil, the studies of health manpower in Colombia, the scholarly investigations of the subject by di Tella Foundation in Argentina, and the investigation by Sr. Gutiérrez of migration from Chile (see Bibliography), indicate the varied practical approaches which different countries might take. A prime requirement is interest by an influential person and the availability of at least one competent scholar. The governments, research councils, professional societies and similar groups have a responsibility to promote such research, to publicize the results and to consider their implications for positive action.

b) Institute Official Inquiries

National governments should institute official inquiries into the migration question, with these inquiries conducted by appropriate persons or groups. The investigations should be aimed at discovering the nature and extent of migration, and of making realistic recommendations. The investigation undertaken by official order in Argentina can serve as a model (see Appendix).

c) Improve Statistics on Migration

The major statistical gap in information relating to migration is the absence of data on the number and characteristics of persons who return to their home countries after various periods abroad. The utility of the

extensive data on the number and characteristics of persons entering the United States with immigrant visas is substantially reduced by the fact that little is known about the number who return. The sole exception to this is physicians, since the number of foreign physicians practicing in the United States is known.

The second gap in statistics on migration is migration of foreigners to Latin American countries. Only in Argentina has this subject been studied (see Bibliography).

The Organization of American States should add to its statistical program a technical review of migration statistics with the aim of strengthening the data available.

d) Adopt a Repatriation Program

Each country should consider deliberately a program to repatriate highly trained personnel. This program should be the responsibility of a person highly placed in an influential organization in or linked to government. The measures that should be considered include:

1) Organized efforts, through government and professional societies, to keep track of all highly trained people who migrate; organized efforts to secure names and addresses of highly trained persons in the United States.

2) Provision of special inducements for those willing to return. The primary inducements are general rather than specifics in that the most powerful inducements are generally good political, economic and social conditions with adequate opportunities for professional work. However, special inducements in such forms as guaranteed housing accomodations at a reasonable price, importation of household goods, and an automobile,

without payment of import taxes, assured support for research, and assured career opportunities may be offered. Specifically which inducements might be offered to specific groups will differ from country to country. In general, it would appear most feasible and productive to offer special inducements to those who will be associated full time with institutions engaged in research and advanced training. This group is relatively small and of special importance to natinnal development.

E. Recommendations Relating to the United States*

Since the primary responsibility for moderating migration rests with Latin American countries, the recommendations relating to the United States are relatively brief - particularly because some measures have already been taken to moderate migration. For example, the provision that persons with exchange visitor and student visas be prohibited from securing immigrant visas until they have been outside the United States for at least two years is sound, and constitutes a wise and helpful curb on migration of highly trained people from Latin America to the United States.

In addition the training of about 9,000 citizens of Latin America per year in the United States is an important factor in the total education scheme of Latin American countries, and it offers important advantages to the United States. However, greater care should be exercised to keep this training program from becoming the first stage of migration to the United States.

Finally, the existing system of examination for foreign physicians administred by the Educational Council for Foreign Medical Graduates (ECFMG)

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* A strong theme of the Rio meeting was that the resolution of the migration problem rests primarily with Latin America. Does this draft underplay the measures that the U.S. might take, and the U.S. responsibilities?

is sound. It operates to the advantage of the Latin American countries, to the United States, to physicians and to patients. The existing examination is merely evidence that those who pass it possess a medical education equal to the minimum expected of physicians in the United States. The ECMFG examination should be design to select physicians from Latin America with at least average as compared with minimum qualifications. This would tend to lower the number of migrating physicians, to increase the average qualifications of those who migrate, and to lead to better status and positions of those who migrate.

Nevertheless, further steps by the United States would moderate migration without infringing unduly on the rights of individuals. These include matters decided privately and through government.

1. Consideration of Special Assistance to the Development of Latin American Universities

The greatest contribution which could be made by the United States to effective moderation of all academic persons - scientists, engineers, physicians, and others - to the United States would be the establishment of a general plan of assistance to Latin American universities. This assistance should have as its objective the strengthening of Latin American universities to meet the requirements of the Latin American countries for cultural, scientific and economic development. The assistance should not be directed in a specific and limited way towards projects, but rather towards the development of high competence in broad areas of teaching and research.

Highest priority, and perhaps under some circumstances sole priority, should be given to provision of professors of highest quality as contrasted with provision of money. Most Latin American countries need people more than they need money from outside sources to develop universities. A

carefully considered plan designed to induce leaders of American science to spend substantial periods in Latin America would pay tremendous dividends in terms of invigorating fields of science, establishing an enduring scientific base, creating a tradition of advanced study in Latin America, and producing new generations of Latin American scientific leaders.

Ernest consideration by the United States of a general plan for development of Latin American universities, and particularly for provision of outstanding professors is by far the most significant recommendation to the United States of this report.

2. Maintainance of U.S. Support for Science in Latin America

The agencies of the United States government support research in Latin America to attain limited objectives - furtherance of the defined goals of the agencies which support the research. However, an unintended but vitally important consequence of this support from the viewpoint of the Latin American countries is to sustain the vitality of many of the most important Latin American research institutions. The most important actions taken by the United States to forestall migration of scientists and to repatriate scientists have been the support of scientific research. Withdrawal of this support would, in turn, have as unintended but certain consequence the collapse of many laboratories and the migration of a substantial portion of the scientific talent of Latin America to the United States.

To the extent that the policy of the United States includes strengthening of science in Latin America and the strengthening of universities in Latin America, the trend of research support should be viewed in a wider context than the specific, limited objectives of the separate agencies of the United States government.

3. Coordination of Existing Research Support

The United States should accept the principle that its actions with respect to support of research in Latin America are related to and strongly influence broader aspects of policy. The nature and level of U.S. support for research in Latin America determines the level of effectiveness of most major research centers, including their capacity to train advanced students. To the extent that the strengthening of higher education in the sciences and the moderation of rates of migration from Latin America are of concern to the United States, some means of using research support more effectively to achieve these wider objectives would be valuable. It would be helpful if the total effects of all U.S. support of research in a given country could be considered, insofar as possible, as a whole in relation to the development of the country.

4. "Third Country" Training

To the extent that the United States Government invests its funds in training Latin Americans for service in Latin America, a marked increase in support for training in Latin American institutions would be valued by the Latin American countries. This increase would be particularly wellcome if it involved no decrease in training opportunities in the United States. However, it is advocated strongly even if the price to be paid were a decrease in training opportunities in the United States. The reason for this recommendation are stated above.

4. Ethical Responsibilities in Recruitment

Research leaders under whom younger Latin American scientists work, learn and teach in the United States have an ethical responsibility to assist in selecting visitors in a manner which will ensure that the maximum number will return to their home countries.

Individuals and organizations who seek employees or professional associates in Latin America have an ethical responsibility to pay serious attention to the contribution which individuals are making to their communities and their nations.

6. Improved Statistics

The data available from the United States Immigration and Naturalization Service are the most significant single source of information on migration from Latin America to the United States. However, these statistics could be improved to good advantage. First, it would be helpful if data on each type of professional, technical and kindred workers were tabulated every year and made available in printed form. Second, it would be helpful if the occupational classification of persons were made more reliable. How to do this is a technical matter not within the province of this report. Perhaps a joint U.S.-Latin American conference of experts could work out a practical approach to resolution of this problem.

F. Recommendations Relating to International Agencies*

1. United Nations

The manpower aspects of national development, including migration of highly trained persons, should be more strongly emphasized by the Committee on Science and Technology of ECOSOC.

UNESCO should sponsor studies of the movement of highly skilled persons from less to more developed countries, concentrating upon investigations of areas where such studies of emigration and immigration have not been undertaken.

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*This section needs careful criticism and perhaps expansion.

2. Organization of American States

The manpower studies of the OAS should be expanded to include current studies of migration, as well as the establishment of long range basic statistical series.

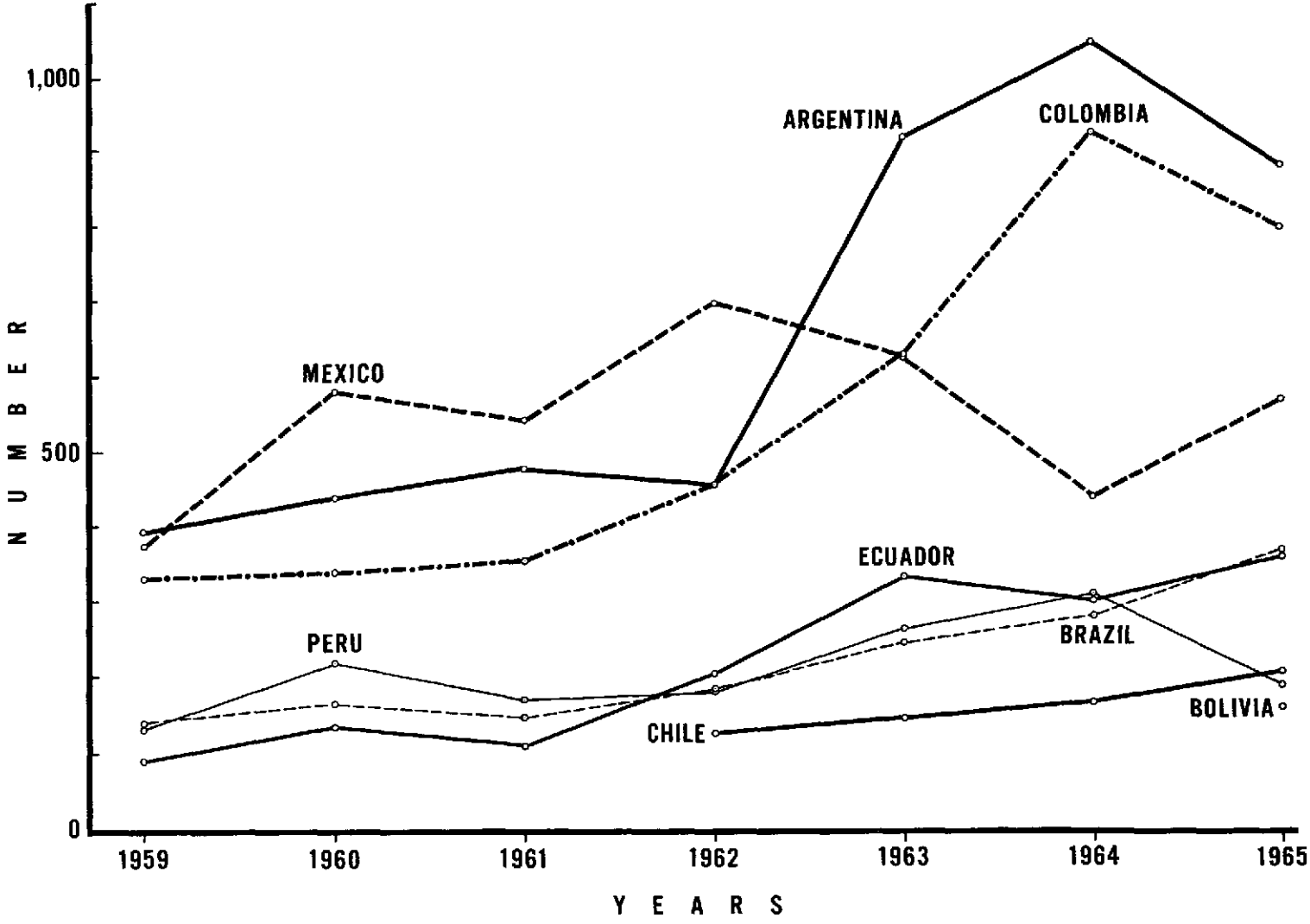
3. World Health Organization and Pan American Health Organization

The World Health Organization should analyze the international migration of physicians on a world-wide basis, implications of this migration, and advocate appropriate action.

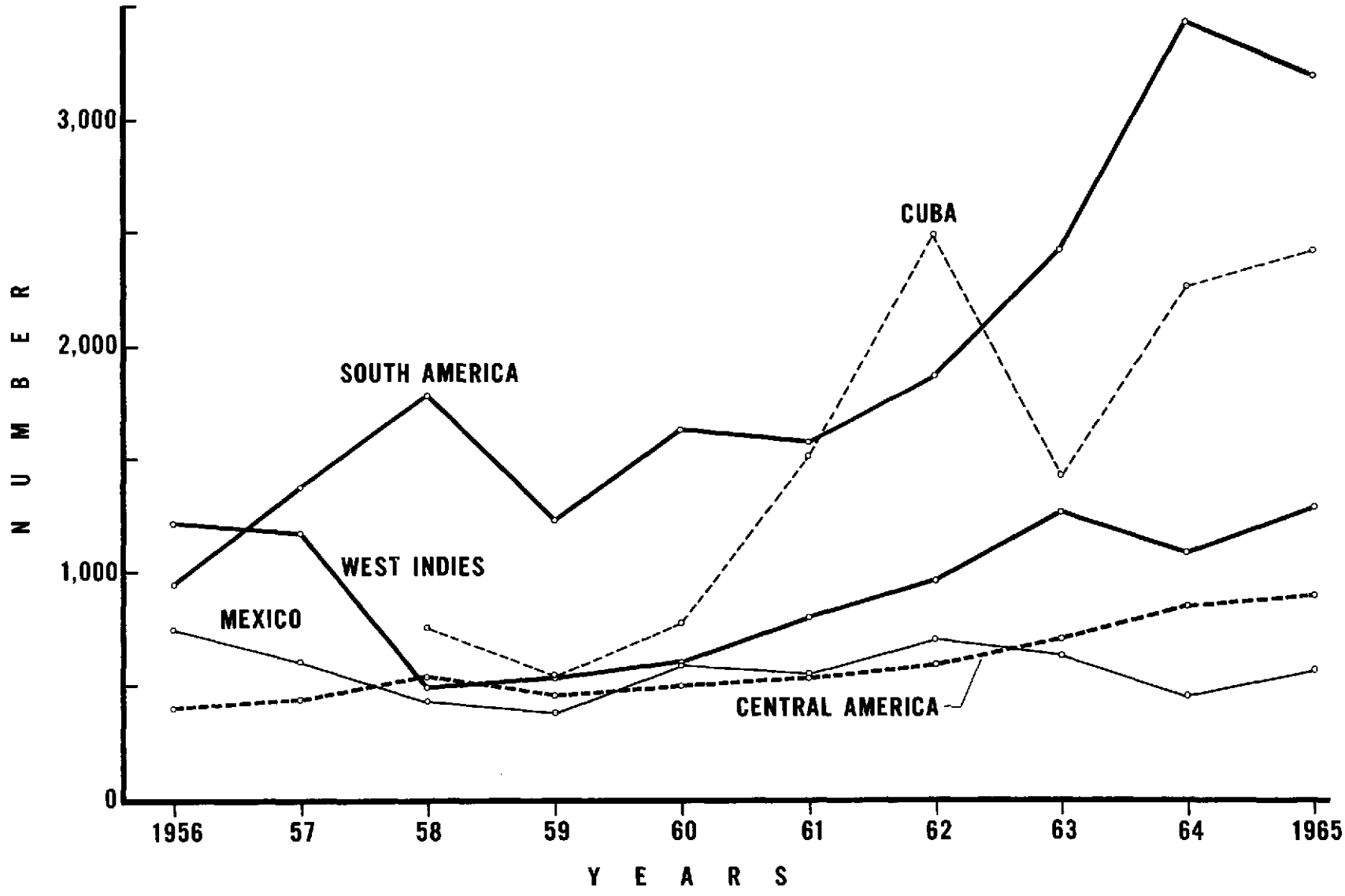
The Pan American Health Organization should use this report, supplemented by other sources of information and judgment, as the basis for an appropriate statement of policy regarding migration of health personnel to, from and among Latin American countries. This report and a PAHO policy statement should be widely distributed in all countries of the Western Hemisphere.

The Pan American Health Organization should extend its total fellowship program, and in such an expansion place greater stress upon the training of biomedical scientists.

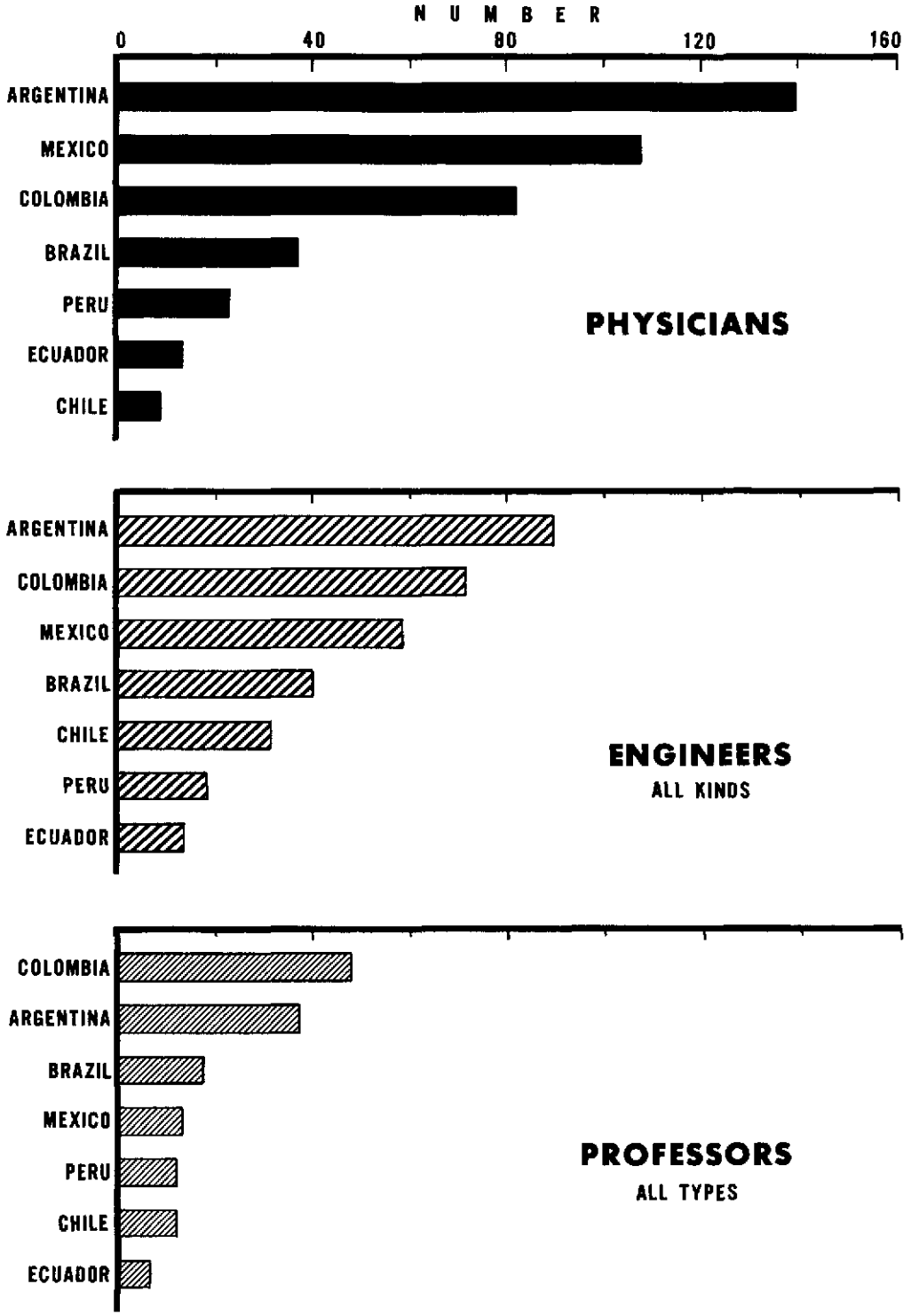
NUMBER OF PROFESSIONAL, TECHNICAL AND KINDRED WORKERS ADMITTED AS IMMIGRANTS TO THE UNITED STATES FROM SELECTED COUNTRIES OF THE AMERICAS, 1959-1965



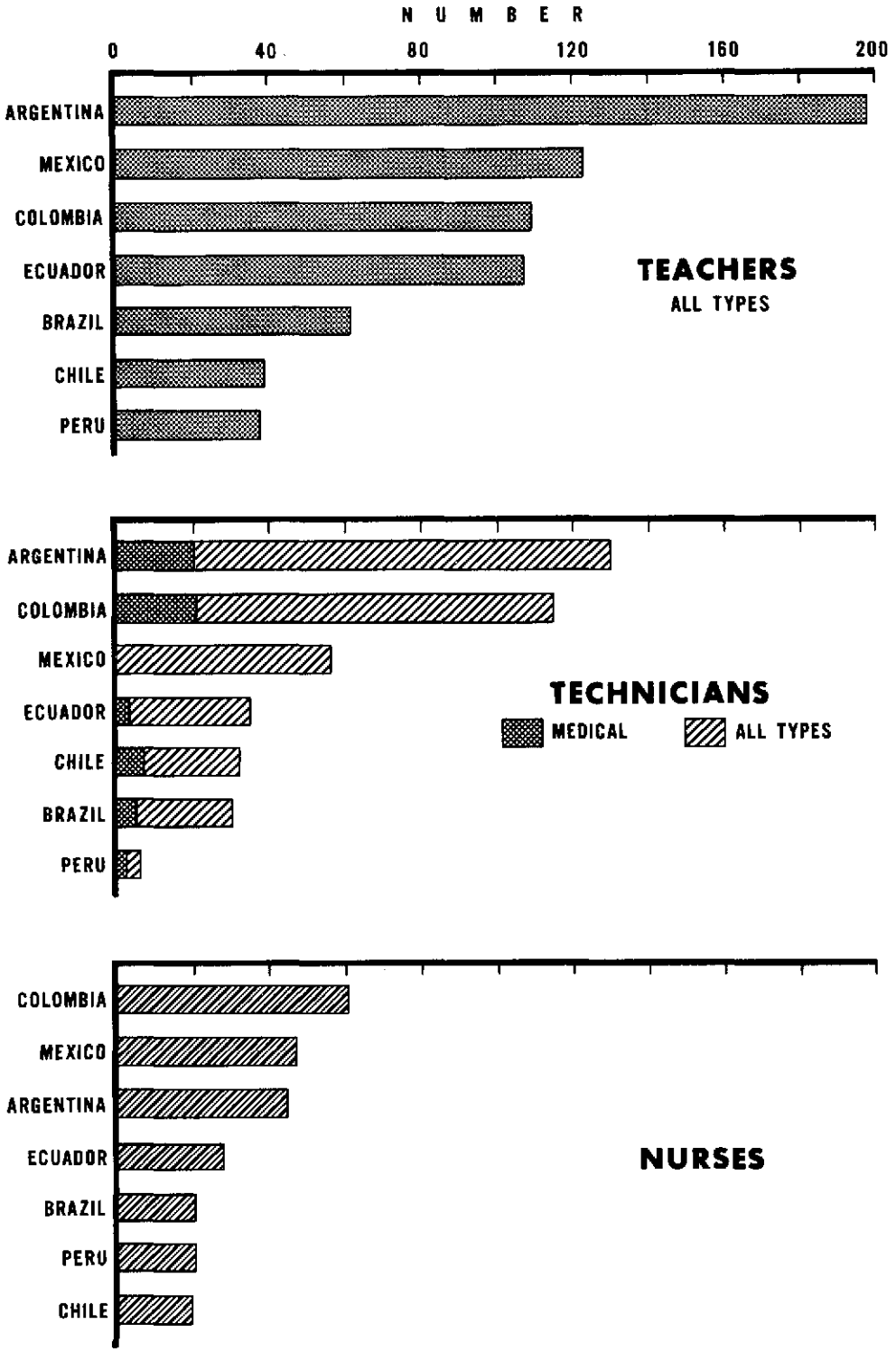
NUMBER OF PROFESSIONAL, TECHNICAL AND KINDRED WORKERS ADMITTED AS IMMIGRANTS TO THE UNITED STATES, FROM SELECTED AREAS IN THE AMERICAS, 1956-1965



PERSONS ADMITTED TO THE UNITED STATES WITH IMMIGRANT VISAS, 1965, FROM LATIN AMERICA, SELECTED COUNTRIES AND OCCUPATION

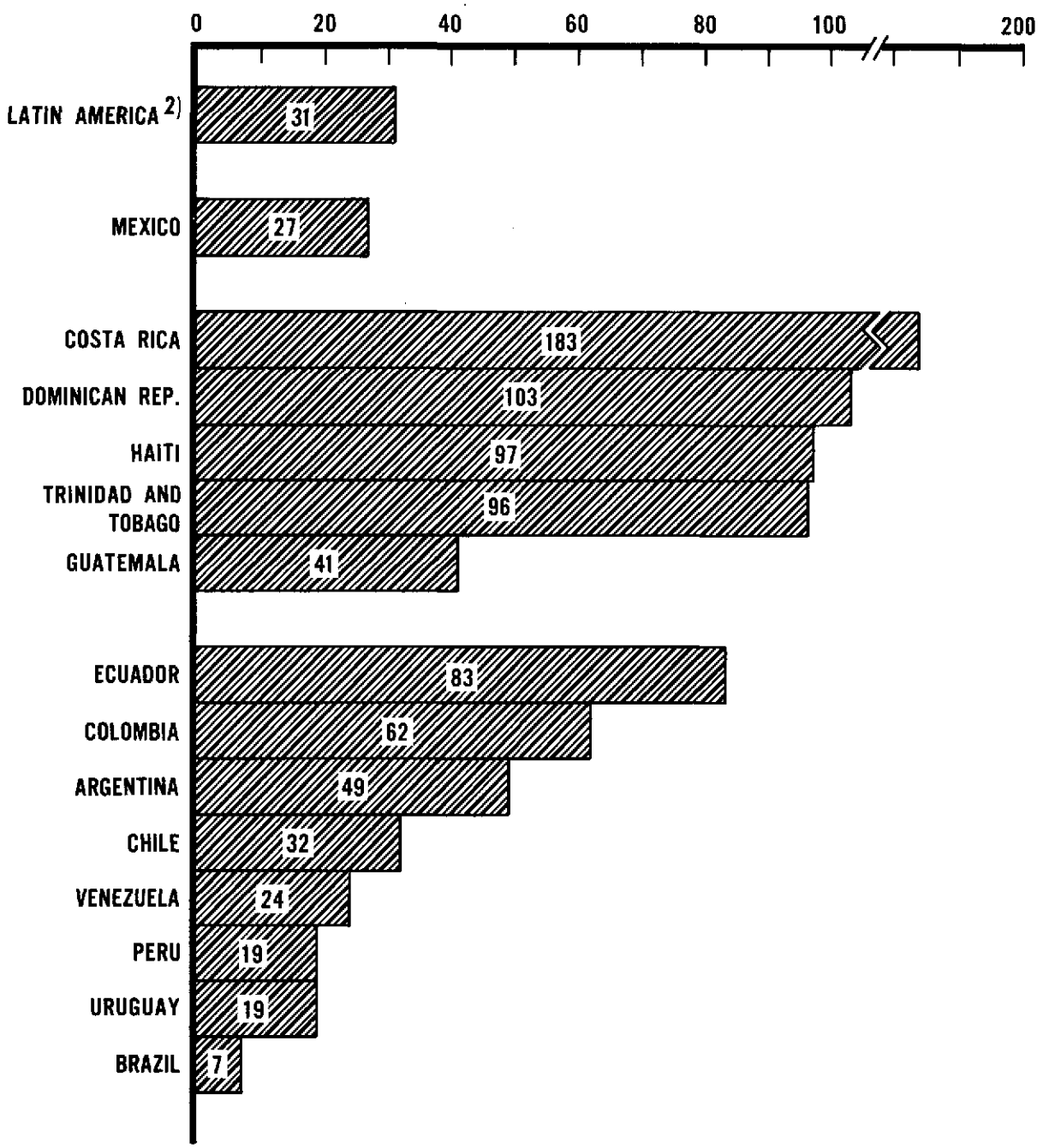


PERSONS ADMITTED TO THE UNITED STATES WITH IMMIGRANT VISAS, 1965, FROM LATIN AMERICA, SELECTED COUNTRIES AND OCCUPATION



POTENTIAL [1] LOSS OF PROFESSIONAL AND TECHNICAL WORKERS BY COUNTRY, LATIN AMERICA

(IMMIGRANT VISAS TO USA PER MILLION POPULATION IN 1965)

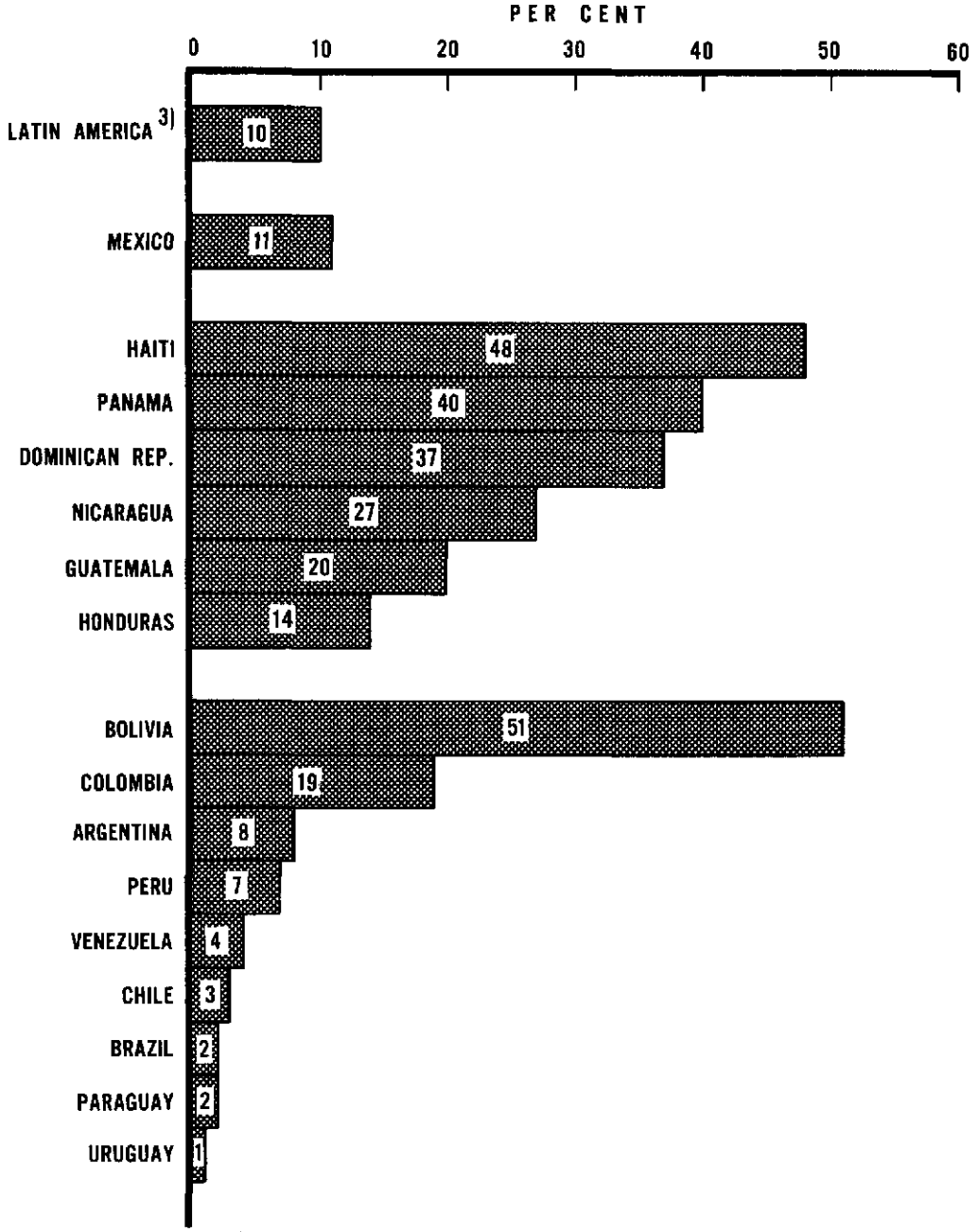


1) A substantial percentage of those who obtain immigrant visas will return

2) Excluding Cuba. Visas per million population for Cuba were 223

POTENTIAL [1] LOSS OF PHYSICIANS BY COUNTRY IMMIGRATION VISAS (TO USA) IN 1965 [2]

(EXPRESSED AS % OF ANNUAL OUTPUT)

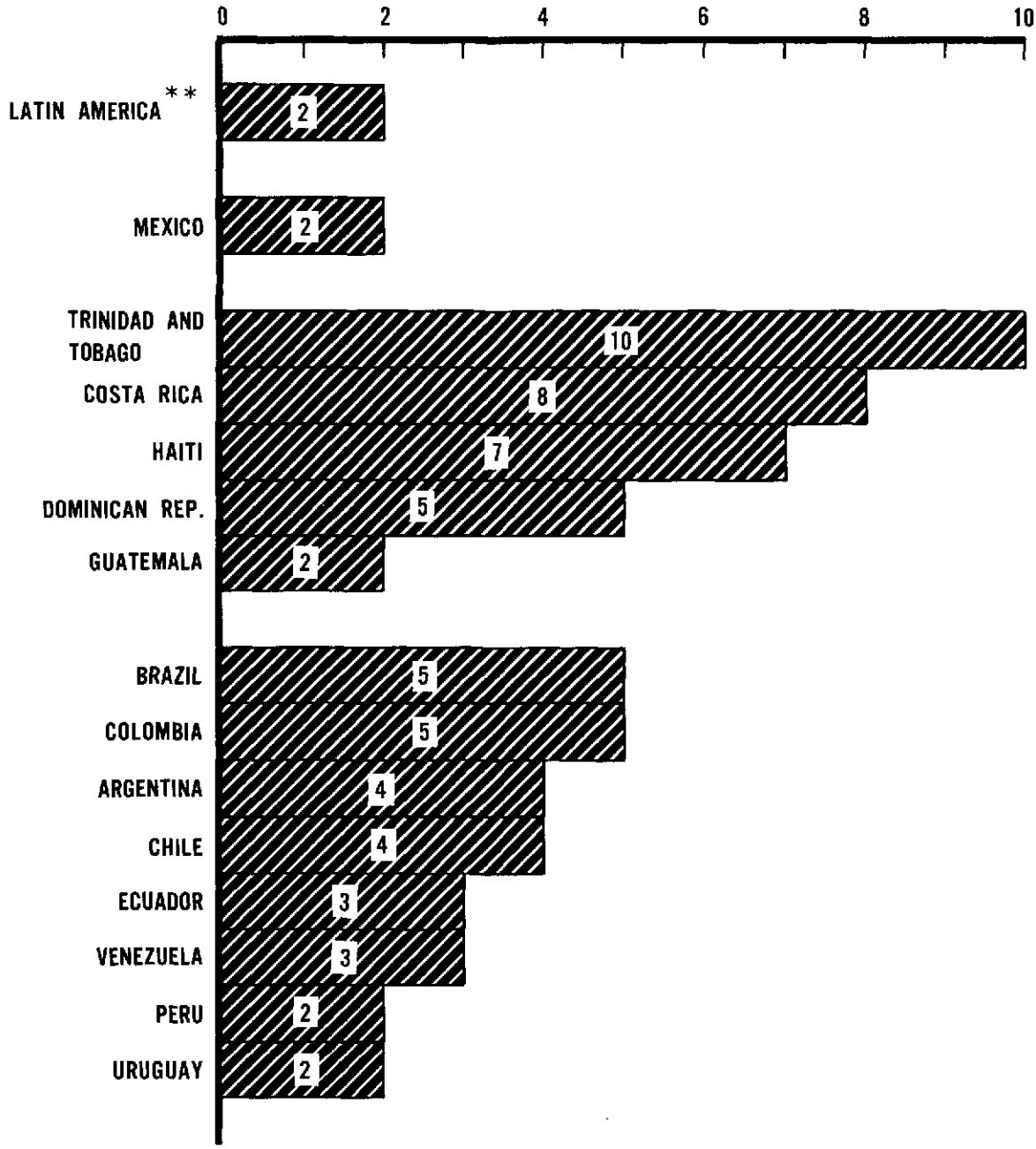


1) It is expected that only about 50% of those who obtain immigrant visas will immigrate.This varies from country to country

2) Year ending June 30, 1965

3) Excluding Cuba. Rate for Cuba was 50%

POTENTIAL LOSS OF ENGINEERS BY COUNTRY, LATIN AMERICA
IMMIGRATION VISAS (TO USA) IN 1965*
PER MILLION POPULATION



* 12 months ending June 30, 1965

** Excluding Cuba. Rate for Cuba was 18