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Gabino Barreda and the Positivist Reforms in Mexican Education: The Law of Public Instruction, 1867 and Its Reform, 1869

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GABINO BARREDA AND THE POSITIVIST REFORMS IN
MEXICAN EDUCATION: THE LAW OF PUBLIC INSTRUCTION,
1867 AND ITS REFORM, 1869

by
Josephine H. Schulte

A Dissertation Submitted to the Faculty of the Graduate School
of Loyola University in Partial Fulfillment of
the Requirements for the Degree of
Doctor of Philosophy

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1969
The dissertation herewith presented has been read by the members of the Graduate Committee of Josephine Helen Schulte and is considered worthy of approval in partial fulfillment of the requirements for the degree Doctor of Philosophy in History.

Department of History

June, 1969
Loyola University, Chicago
VITA

Josephine Helen Schulte was born May 9, 1929, in Foley, Alabama. She attended the public elementary school in Foley from 1935 to 1941; St. Benedict's Academy in Elberta, Alabama, from 1941 to 1943; Elberta Junior High School, from 1943 to 1944; and Bishop Toolen Catholic High School for Girls, Mobile, Alabama, from 1944 to 1947. In 1949 she received an Associate of Arts degree from Sacred Heart Junior College, Cullman, Alabama; in 1957 a Bachelor of Science degree from Spring Hill College, Mobile; and in 1961 a Master of Arts degree in History with a Minor in English Literature from the University of Southern Mississippi, Hattiesburg. In the summer of 1950 she attended a seminar on "Inter-American Relations" at the University of Havana, Cuba. From September 1962 until January 1966 she was a Teaching Fellow in the History Department of Loyola University, Chicago. From February 1966 until February 1967, and from June 1967 until October 1967, she was enrolled at the El Colegio de México, México, D. F., through an Organization of American States grant.

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INTRODUCTION

The purpose of this study is to analyze the ideas of Gabino Barreda, a well-known nineteenth century Mexican intellectual. The strand that will weave together this study is positivism as Barreda learned it under Comte and which he introduced into Mexico through the Law of Public Instruction, December 2, 1867. In order to disseminate his ideas, he founded the National Preparatory School.

At the beginning of the nineteenth century, the political, economic, and social conditions, which resulted from the French Revolution, were a constant preoccupation of contemporary thinkers. Both leftists and rightists aimed at replacing the state of "crisis" with a state of "order," and political upheaval and schism by stability and unity. Intellectuals were convinced that their task was to recreate a society based on an ordered intellectual system.¹

Broadly considered, nineteenth century positivism was an attempt to apply science and the scientific method to every phase of existence, whereby the world of both human and physical phenomena would be seen as one whole and complete picture. This conception of unity underlay the masterly synthesis of Comte and

¹D. C. Charlton, Positivist Thought in France During the Second Empire, 1852-1870 (Oxford, 1959), p. 35.
impelled him to organize the sciences, to seek to recognize the forces that control human history, and to apply his social theory to all phases of human life.\(^2\)

Traditional metaphysical speculation decreased in proportion to the increasing concern for science, which was practical, exact, and objective. Comte said that the aim of knowledge was not knowledge in itself, but that it should embrace the real world. His slogan, "to know in order to foresee and provide," contained the philosophy of science and hence positivism. This meant that one should use his knowledge as a useful guide to control the forces of nature for the common good. The immediate expression of this ideal of practical knowledge was applied to the field of human relationships where science could achieve efficiency and order.\(^3\)

Positivism looked back on three centuries of scientific progress in the natural sciences, but not until the nineteenth century did Comte make positivism a definite system. In his philosophy Comte tried to reconcile the traditionalist and the liberal spirit, the conservative and the revolutionary spirit. He was also influenced by the Socialists, especially Saint


\(^3\)de Ruggiero, *op. cit.*, pp. 260-261.
Simon, to whom he was both secretary and disciple. In addition, his positivism was a reaction to the idealism of Hegel and the post-Kantians, who had alienated themselves from scientific knowledge. 4

The purpose of his own thinking was to discover laws that would govern social reorganization, not just truth for its own sake. His motto was: "love as a principle; order as a base; progress as an end." A new positive society, fully compatible with progress, would direct politics, while the cult of humanity would establish religious unity among the citizens. 5

A "scientific" public education would serve to disseminate the idea of progress and the advancement of the positivist philosophy. This education—the only way to establish order and a total reform of society by means of slow and definite evolution—should consist of a systematic ordering of human knowledge, practical as well as speculative. 6

Comte organized the development of human thought on the basis of his well-known "Three Stages." These were: the Theological, the Metaphysical, and the Positive. The first was the necessary point of departure of the human understanding and the

4 Ibid., pp. 261-264.
5 Charlton, op. cit., p. 35.
third was its final and definite stage. The second was merely a
dstage of transition. In the theological stage, the corresponding
structure was archaic; in the metaphysical, feudal; and in the
positive, industrial. In the theological stage the human mind
sought to know the first and final causes (the origins and pur-
pose) of all effects, that is, absolute knowledge. Phenomena
were explained through the intervention of supernatural spirits.
In the metaphysical stage, there was the same search for absolute
knowledge, but the supernatural agents were replaced by abrac-
tions which served as explanatory principles. Reason acquired an
importance, which prepared the way for science. The positive
stage, on the other hand, renounced the possibility of knowing
the essence of things. Scientific laws, discovered through
observation and experience, governed reality. 7

The Catholic Church perpetuated and sustained the theo-
logical stage. Its ideas became retrograde because they refused
to give way to the evolution necessary to admit the scientific
spirit. With the discovery of physical laws, supernatural ex-
planations began to be challenged and science and theology entar-
ed into a struggle. The French Revolution corresponded to the
metaphysical stage. It was characterized by disorder and

7Auguste Comte, The Positive Philosophy of Auguste Comte,
anarchy. Thus, the positive stage, through a scientific, encyclopedic and popular education, was the only one capable of bringing about order and progress.\textsuperscript{8}

With respect to knowledge, the mind could not traverse the theological, metaphysical and positive stages simultaneously, but rather one at a time, in a definite order, the order of diminishing generality of the concepts of the respective sciences and the increasing complexity of their subject matter. He considered this order to be mathematics, astronomy, physics, chemistry, biology, and sociology. No one science could be effectually pursued without the preparation of a competent knowledge of the anterior sciences on which it depended. Our intellectual system could not be renovated till the natural sciences were studied in their proper order. He considered this theory to be the key to the other generalizations, all of which were more or less dependent on it.\textsuperscript{9}

The first characteristic of the positivist philosophy was that one could know only phenomena, and this knowledge of phenomena was relative, not absolute. All phenomena were subjected to invariable natural laws, which helped one know the future by means of the past. Thus his motto: "to know in order

\textsuperscript{8}Ibid., pp. 50-51.

\textsuperscript{9}Comte, A General View of Positivism, p. 36. Comte claims no originality for his conception of human knowledge, but he has made the doctrine his own by the manner in which he treated it.
to foresee." The positivist mode of thought was not necessarily a denial of the supernatural; it merely admitted that the direct determining cause of every phenomenon was natural, not supernatural, and that this "intelligent governor adhered to fixed laws." Positivism did not investigate the origin and final destiny of things since spiritual knowledge was inaccessible to human reason. According to Comte, knowledge was real, that is, what you can weigh, measure, or count.  

Sociology was the science of humanity. There were three things that positive sociology had to avoid: it would have to reject "absolute ideas" and restrict itself to coordinating observed facts and perfecting new techniques of investigation. It would have to confine itself to the relative. Lastly—and most important for Comte—positive sociology had to accurately define the limits and nature of political action.

Comte believed in a social and altruistic morality which moved one towards love of neighbor. This type of morality assured continued progress. The public good was what produced individual happiness. Therefore, positivism exalted the myth of the Great Being of Humanity. The basis of Christian morality, according to Comte, was individual perfection, which developed

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10 Ibid., pp. 50-51.

11 Ibid., pp. 29-31.
in man an excess of egoism. 12

Family life, according to Comte, was the basis of all morality and social ties. Thanks to it, man was elevated from egoism to altruism. In the sacred formula of positivism, "love as a principle, order as a basis, and progress as an end," love was explained as a feeling of unity, of benevolence, and of kindness, which had its origin in family life: love of the wife, veneration of the mother and kindness to the children. 13 Comte gave the woman a privileged position because of her influence on morality. He counted on the woman to support positivism because she, like the proletariat, had not been perverted by politics and metaphysics. 14

The positive religion was another creation of Comte. One was to render veneration to the Great Being, which is Humanity. The rites were to be adapted from the Catholic religion. Christian saints would be saints of positivism. Moral instruction would teach the youth the lives of great men as models of imitation. 15

Comte took the idea of liberty from liberalism, but

12 Ibid., pp. 101-104.
13 Ibid., pp. 282-283.
14 Ibid., p. 360.
15 Ibid., pp. 112-113.
modified it. Positive liberty was an ordered liberty. In place of equality, there was to be a social hierarchy.\(^{16}\)

The diffusion of positivism was left to the disciples of Comte. Among them we can mention the writer, Emilio Littre, who kept up a friendship with the Mexican positivists. The latter were disciples of Barreda, and were separated from Comte by a modified version of his ideas. Pedro Laffitte, orthodox positivist, was chosen by Comte to succeed him. He also carried on a friendship with the Mexican positivists.\(^{17}\)


CHAPTER I

BIOGRAPHICAL DATA

Gabino Eleuterio Juan Nepomuceno Barreda was born in Puebla de los Ángeles, February 19, 1818, and christened the following day, according to Catholic custom, by Father Mariano Goya, an assistant pastor in the Cathedral of that same city. The baptismal certificate of Barreda gives his godparents as Licenciado Don José María Barreda and Doña María Josefa Flores Alatorre. Don J. Francisco Díaz served in their absence.¹

Both parents were Spanish. The father, don Antonio Barreda de Beltrán, descended from an old Castilian family. He bore the title Tendiente de Dragones de España.² His mother, Doña María Flores Alatorre, was born, and lived until her marriage, in Aguascalientes.³ The family probably moved from Guanajuato to Puebla because of the devastation caused by the Hidalgo Revolt.⁴

¹Baptismal Book No. 101, p. 65, located in the Cathedral of Puebla de los Ángeles, Puebla, México. Various mistaken dates have been given for the birth of Barreda.

²Ibid.


⁴Guadalupe Muriel, Las Reformas Educativas de Gabino Barreda (México, 1963), p. 1. Muriel states that Barreda's father was born in Guanajuato.
We know very little about the boyhood of Barreda. Valverde y Téllez states that he did all of his preparatory studies in Puebla. Most writers, however, say that he went to San Ildefonso in Mexico.\(^5\)

After receiving his bachillerato in the humanities, Barreda continued his studies in jurisprudence at San Ildefonso.\(^6\) His thirst for a knowledge of the natural sciences turned him toward the old Mining School to study chemistry.\(^7\) Though well advanced in the juridical profession, Barreda began to lose interest in law. Lawyers, he thought, were not concerned with studying facts. They were only interested in conventional laws which society had dictated to direct its customs. Besides, these laws did not deal exclusively with Mexican customs, but with the customs of other nations, some-

\(^5\) Ibid., p. 2; Emeterio Valverde Téllez, Bibliografía Filosófica Mexicana (León, Guanajuato, 1913), p. 9; Manuel Flores, Dr. Gabino Barreda, Propesorador del Positivismo en México y Fundador de la Escuela Nacional Preparatoria (México, 1880, p. 3). This short biography was written before Barreda died by one of his followers. If Barreda went to San Ildefonso, and if he began his preparatory studies in 1833, the year that Valentín Gómez Farías suppressed the University, he entered the edifice of the Hospital de Jesús where they were being taught. If Barreda began his preparatory studies in 1834, under the Santa Anna regime, he entered the Colegio de San Ildefonso which until 1767 had been known as the Colegio de San Ildefonso de la Compañía de Jesús.


\(^7\) Fuentes Mares, loc. cit.; Gabino Barreda, "Instrucción Pública," La Revista Positiva, I (México, 1903), 337.
times very remote. Nevertheless, the education which Barreda acquired at this time prepared him to better understand the logic of Comte, which was most useful later in his educational reforms. ³

Barreda came to regard medicine, unlike law, as based on the knowledge of the phenomena of real life. At the urging of his professors, he decided to switch to medicine. Thus, in October, 1843, at the age of twenty-four, he registered in the Medical School, where he studied until 1847, with one more year to go.⁹

At the beginning of the war with the United States Barreda joined the National Guard. Distressed by the way that the National Guard turned against its own countrymen, he enlisted in the Medical Corps as a surgeon, June 11, 1847. He remained in this position until the end of the war. He was attached to the garrison of the capital without a salary as he himself had requested. The services which he rendered were of such importance that the Ministry of War bestowed upon him a decoration, April 18, 1878.¹⁰ He and Doctor Juan Navarro

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⁹ Aragón, loc. cit.; Hernández, loc. cit.; Libro Segundo de Inscripciones de los alumnos del Establecimiento de Ciencias de 1843-1844, p. 103. This document is located in the library of the Medical School at the National University of Mexico.

¹⁰ Aragón, op. cit., p. 9.
attended the wounded in the Battle of Podierna, August, 1847, at a house called "Risco" located in the Plaza de San Jacinto in San Angel. Since Barreda had gained experience in the National Guard, he was selected to train the Medical School regiment, which had been organized for the defense of the country. Some of his former instructors became his students.

A few months after the war was over Barreda set out for Paris to complete his medical career. Mexican scientists admired France because their texts had come from there for a long time. One day a Mexican doctor, Pedro Contreras Elizalde, invited Barreda to the Palais Royal to hear the Sunday lectures of Comte on the general history of humanity. He began these lectures March 11, 1849, and repeated them in 1850 and again in 1851. Comte was at this time developing the religious phase of his system. His ideas were new and not in harmony with the generally accepted thinking of the time. Even though Barreda could not accept the positivist religion, he did become profoundly interested in its morality. The impact of Comte on both Contreras Elizalde and Barreda was decisive. But in spite of Barreda's outstanding intellectual faculties, he did not

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11 Francisco Fernández del Castillo, "El Positivismo de Gabino Barreda y su influencia en los Médicos Mexicanos durante el siglo XIX," Historia de la Medicina, I (July, 1960), 57.

12 Aragón, op. cit., p. 10.
yet have the scientific background to understand Comte. Nevertheless, he was so fascinated by the new doctrine that when he returned to Mexico in 1851, six volumes of Comte occupied a preferential place in his library. The course that Barreda received in positive philosophy from Comte established the basis for the thought that was prevalent in Mexico in the work realized by the government of Juárez: the educational reform.\textsuperscript{13}

Upon his return from Paris, September, 1851, Barreda passed his general examinations for the doctor of medicine (medical-surgeon) degree by unanimous assent. Throughout his five years of medical studies he received the class award for making the highest grades. In his second and fourth years he received the award for practical exercises in anatomy.\textsuperscript{14} and

\textsuperscript{13}Flores, \textit{op. cit.}, pp. 3-4; Moisés González Navarro, "Las Positivistas Mexicanas en Francia," \textit{Historia Mexicana}, IX (México, 1959), 119. González Navarro holds that the relationship between Comte and Barreda was simply confined to Barreda's attending Comte's lectures. Aragón says that it is possible that there was a personal relationship between them. Aragón, \textit{op. cit.}, pp. 10-12. Contreras Elizalde was the first Mexican positivist. He studied medicine in Cádiz and later in Paris. He attended the classes of Robin and Sagond, both disciples of Comte, who probably got him in contact with Comte. He joined the Positivist Society in 1848. In 1853 a Spaniard, M. J. S. Flores, who became a positivist through Contreras Elizalde, founded a periodical, \textit{El Eco Hispano-Americano}. Financially unable to continue his medical studies, Contreras Elizalde traveled through Mexico and Venezuela as agent for this newspaper. After his last trip to Paris in 1855, he returned to Mexico permanently. At the end of this year he met Juárez, with whom he was henceforth associated and was later married to his daughter.

\textsuperscript{14}Libro Segundo de Inscripciones de los alumnos del Establecimiento de Ciencias Médicas, \textit{loc. cit.}
During the years 1846 and 1847 he served as assistant lecturer of that subject. From the time that he received his medical degree until 1863, Barreda, in addition to holding a professorship in Mexico City, practiced medicine.

Throughout the decade of the fifties, Barreda re-educated himself under the inspiration of Comte. He began with mathematics and, in conformity with Comte's hierarchy of the sciences, he terminated his studies with morality. Thus, by meditating on the combined works of Comte and the authors of the Bibliothèque Positiviste he assimilated positivism, aided by a well-disciplined and brilliant mind.

At the inaugural session of the Academy of Medicine, November 30, 1851, Barreda was elected Secretary, an office which he held off and on until 1858. He became vice-president in 1871. The publication, La Unión Médica de México, edited by Barreda, was the official organ of the Academy. In the acts of its sessions, it is interesting to note the reflections of Barreda on topics that he had studied in Europe which were then of great novelty and interest: the use and danger of chloroform

15 Aragón, op. cit., p. 9.
16 Fuentes Mares, op. cit., p. x.
17 Flores, op. cit., p. 4; Aragón, op. cit., p. 12.
18 Manuel S. Soriano, "En los Funerales del Ilustre Doctor Gabino Barreda, por la Academia de Medicina de México," Gaceta Médica de México, XVI (Mexico, March 15, 1881), 101-102.
as an anesthetic, the application of the microscope in the diagnosis of cancer and mammary tumors, lung diagnosis in children, amputation in cases of dry gangrene, the extraction of fishhooks, the nature of ozone and the use of certain vermifuge and other therapeutic agents. In 1864 the Medical Section of the Scientific Committee of Mexico noticed that the water of the Irapuato River communicated to plants, especially cereals, poisonous qualities which caused serious diseases in men and animals. Since Barreda was in nearby Guanajuato, the Commission asked him for data about this evil, which he submitted November 9, 1864. The following September he sent the Commission an analysis of his observations, from which he concluded that the disease was caused by infected corn and not from flood waters.

In 1854, by unanimous consent, Barreda was nominated for the chair of physics in the School of Medicine, and a year later for that of natural history (including zoology, botany, mineralogy, geology, and other subjects dealing with animal, vegetable, and mineral world), which he occupied until 1868. At the same time, he taught anatomy in the same school.

Whether as a practicing physician or as a professor of

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19 Ibid.
20 Ibid.
22 Fuentes Mares, loc. cit.
natural history, Barreda little by little propagated positivism, its method, and its fundamental principles. Opposed to the contemporary theology and metaphysics then being taught, positivism was carefully disseminated in the classroom by Barreda, who never made an offensive allusion to the religious or political beliefs of the students. He scientifically expounded positivist principles by demonstrating their exactitude and utility. He never condemned the past, but sought and justified it like a true positivist. In this way he impressed upon the minds of his students what he considered real truths and useful means for the investigation of truth. Nevertheless, because of the complete lack of scientific preparation required to understand positivism, there was never a large number of converts among the students of the natural history class. Probably the most eminent was Doctor Adrian Segura, who replaced Barreda in the School of Medicine in 1876. 23 The same methods that Barreda used to propagandize positivism in the classroom served to disseminate it through scientific periodicals. In this way many intellectuals became indoctrinated. 24

Although we do not know the political activities of Barreda in detail during the period 1851-1863, it is certain that he leaned toward the liberal party and the Constitution of

23 Flores, op. cit., pp. 4-5; Aragón, loc. cit.; Fernández del Castillo, op. cit., p. 59.
24 Flores, ibid.
In spite of the fact that he was a positivist and differed basically with the liberals, he sympathized with those who formed the Liberal party as proven by his hostility toward the Imperial Conservatives and his later cooperation with Juárez in furnishing Mexico a new law of public instruction.  

On May 3, 1862, at the age of forty-four, Barreda married Adela Díaz Covarrubias of Jalapa, Veracruz. Mrs. Barreda came from a family of distinguished minds. Francisco, the oldest of six, was a famous Mexican astronomer and mathematician. He founded the Humboldt Society and the Astronomical Observatory at Chapultepec. José was a notable jurist and statesman. Juan was a poet, known as the "poet martyr," because he was shot in Tacubaya at the order of Mier. The success of Barreda in converting Francisco and José to positivism was of considerable advantage in helping him circulate the positivist doctrine through their works. In 1875 José published Instrucción Pública en México, which was based on the ideas of Comte. As Minister of Education for four years (1872-1876) under Sebastián Lerdo de Tejada, he openly espoused positivism. In 1873 Francisco wrote a treatise entitled Tratado Elemental de Topografía, Geodesía y Astronomía Practica, inspired by the philosophy of Comte.  

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25Gabino Barreda, "Oración Cívica," pronunciada en Guanajuato el 16 de septiembre del año de 1867, Opúsculas, discusiones, y discursos (México, 1877), 81-105.
also wrote *Viaje a Japón*, where he had gone in 1874 to make some astronomical observations. 26

In 1861 Barreda wrote a treatise entitled "La homeopatía o juicio crítico sobre este nuevo sistema," to which he applied the positivist method. The treatise put Barreda in the limelight, although there were only two or three persons in Mexico who knew anything about positivism at that time. Many medical societies deemed it an honor to have Barreda nominated a member and almost all the scientific societies invited him to join. 27

In 1863 Barreda published a short treatise entitled "De la educación moral," which attracted the attention of the public. In this brief, but complete, exposition, Barreda put forth the basis of positivist morality, clearly based on the philosophy of Comte. 28 Barreda attempted to separate religion from morality. Human beings should be the creators of their own values, which should be rooted in science. He pointed out that religion assumed various forms in time and space, but that the basis of morality has great universal acceptance. Morality derives from intelligence; religion from superstition based on faith. Since

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it is the obligation of the state to educate its people, morality must of necessity be of concern to the state rather than to the church. 29

During the years 1863-1867, the period of the French Intervention, Barreda settled in Guanajuato. There he practiced medicine and, at the same time, he read and meditated on the works of Comte, bringing his scientific and philosophical education to completion. During this period he published two short articles, which have already been mentioned, concerning an epidemic. They were remarkable for the precision of their method. The popularity of Barreda was beginning to stand out by the fact that the French tried to attract him to their cause. In 1864 he refused to accept from the Intervention government an appointment to the Mexican Scientific Commission, in spite of the laudatory note signed by Victor Durry, Minister of Public Instruction in France, which accompanied the offer. 30

On September 16, 1867, Barreda delivered a "Civic Oration" in Guanajuato, wherein he outlined the history of Mexico from a positivist point of view. On the strength of this speech he was placed on a Commission to reorganize the Mexican educational

29 Barreda, ibid.

system, which resulted in the Organic Law of Public Instruction of December 2, 1867. The Preparatory School, created by a law of January 24, 1868, was opened by Barreda February 1, 1868, to replace the old Colegio Nacional de San Ildefonso. It was established for the purpose of disseminating positivism. 31

Logic, the most important chair in the Preparatory School, was given to Barreda. He was also nominated to the chair of general pathology in the School of Medicine. 32 In 1876, when a new law prescribed that a professor could not hold a chair in different establishments, Barreda relinquished the chair of pathology. 33 However, on Sundays, during the period 1872-1875, he gave free courses in biology at the Medical School. 34

The notes that the disciples of Barreda took at his lectures of general pathology were highly valued and year after year they were used by the students. In 1903 Doctor José Ramírez (son of the Nigromante and disciple of Barreda) published the lectures which Barreda gave in 1876. Judging from the "Lessons," Barreda treated the themes as a child of his times, and he trusted more in dialectics than in observation and observation and

31 Aragón, op. cit., pp. 15-16; Fernández del Castillo, op. cit., p. 58.
32 Flores, op. cit., pp. 6-7; Aragón, op. cit., p. 16.
33 Gazeta Médica, XII (México, 1877), 59.
34 Aragón, loc. cit.
experimentation. Much of what he said in his "Lessons" has gone out of date, but there is much also that is still of interest. His "Lessons" are of great use for the study of the evolution of medical thought in Mexico.35

His ten years as director of the Preparatory (1868-1878) left Barreda almost no leisure. It was during this time that he wrote almost all of his works, which included the most diverse themes, such as: mathematics, medicine, philosophy, and ethics.36 The most important was his "Examen del Cálculo Infinitesimal." His chief object was to correct the error made by Comte, who, using the method of Leibniz, followed the deductive method of reasoning. Barreda said that one should use the inductive method. He said that although the procedure used in mathematics was deductive, the fundamentals of mathematics were inductive, that is, the elementary notions and the axioms of mathematics were only vast generalizations of experience; and, consequently, one should use inductive, not deductive, logic. In fact, Barreda tried to demonstrate that the inductive method was the basis of infinitesimal calculus.37

35Fernández del Castillo, "El Positivismo de Gabino Barreda y su Influencia en los Médicos Mexicanos," II, 63; Gabino Barreda, Lecciones de Pathología General, publicadas por el Doctor José Ramirez (México, 1903).

36Aragón, loc. cit.

37Ibid., p. 17. Barreda's brother-in-law, Francisco Díaz Covarrubias, adopted his capital ideas in his own work which was mentioned on page 17.
In 1868 Barreda delivered an official report to the Junta Directiva de Estudios against the adoption of *El Catecismo de Moral* as a textbook in the Preparatory School. In this report he, like Comte, attacked the liberal idea of unlimited individual freedom. He defended religion and the Catholic clergy against the assaults of the author, Nicolás Pizarro. Differing from Comte, he defended private property against state intervention. *El Seminario Ilustrado* attempted to refute his statements, but Barreda justified himself in a letter addressed to the Director, D. Jesús Fuentes y Muñiz, October 21, 1868. He took the position that the state should not attack wealth for this would stifle initiative and hence progress. What the state should do is to "humanize the rich" through a system of positive education.38

To honor their patron, the members of the Humboldt Society invited Barreda to deliver a speech, September 14, 1869. In this eulogy Barreda referred to Alexander von Humboldt as "one of the saints of science and progress," who "dedicated his life to the service of humanity."39

In a celebrated letter which he addressed to Mariano Riva

38 Barreda, "Informe presentado a la Junta Directiva de Estudios sobre el Libro que a continuación se expresa," *Opúsculas*, pp. 119-131; "Carta dirigida al editor del Seminario Ilustrado," *Opúsculas*, pp. 133-142. Only with regards to education did Barreda believe in state interference in the lives of its citizens.

39 Barreda, "En honor del Baron de Humboldt. Discurso pronunciado el 14 de septiembre de 1869," *Opúsculas*, pp. 143-147.
Palacio, the governor of the state of Mexico, October 10, 1870, in reply to the governor's request, Barreda outlined the system of education which was inaugurated by the Law of December 2, 1867. The letter contained the synthesis of Barreda's ideas concerning public instruction. He gave a complete and well thought-out exposition of the purpose of the Preparatory School, the different subjects, and the order in which they should be taught. Opposed to an education exempt of method and unity, Barreda proposed a human formation inspired by reason and science. In 1872 he wrote an article entitled "Instrucción Pública," which was first published in the official organ of the government, the Diario Oficial. In this article, which we will later take up in more detail, he criticized the educational reform projected by the liberals in Congress, who attempted to abolish his own plan.

In 1873 Barreda wrote "Mahoma y Robespierre (cuatro palabras al Justo Sierra)," in answer to an attack by Justo Sierra, in which Barreda denounced the extreme liberals as representing a doctrine of violence and disorder. Only positivism can bring about order. He stated, in effect, that the will

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40 Barreda, "Carta dirigida al Mariano Riva Palacio, gobernador del estado de México, ... en la cual se tocan varios puntos relativos a la instrucción pública," Opúsculas, pp. 23-65.

of the social order was expressed in the laws of the state which all must obey. The state should be supreme. He presented Robespierre as an example of Jacobin or metaphysical intolerance—a symbol of the men who made force an instrument of conviction. 42

In 1874 Barreda gave a lecture at the National Preparatory School, honoring the artist, Juan Cordero (who had earlier that year made a painting of Barreda himself) with a public testimony of gratitude and admiration for the mural which he painted for the Preparatory. The mural, done at the request of Barreda, symbolized the positivist triumph of science and work over envy and ignorance. The purpose of art, according to Barreda, was to make beauty "useful." "The glorification of art he stated, in Comtian fashion, "is a frank and loyal recognition of the superiority of the heart over intelligence, a noble voluntary subordination of science to love, an immense moral progress. . ." 43

On August 15, 1875, he sent a report to a committee


interested in advancing enlightenment, to which he himself belonged, in which he incorporated his ideas on primary education. In an article to the Revista Universal, Miguel Rendón Peniche accused Barreda of maintaining that utilitarian acts were the movers of human conduct. Defending himself in an article published by that same newspaper, December 10, 1875, Barreda stated that what he meant by "utilitarianism" was "common interests and general well-being," not "individual selfishness" and "sensual pleasures."45

On January 14, 1876, he published in El Federalista an article entitled "Rectificaciones Históricas" wherein he refuted an article published by Justo Sierra in that same newspaper, December 28, 1875. Sierra had attacked Barreda for comparing Mohammed and Robespierre rather than Mohammed and Napoleon and for violating positivist principles by substituting "authority" for "conviction." Sierra said that Barreda did not use Napoleon as a comparison because Napoleon was a sceptic, because he

44 Barreda, Algunas Ideas respecto de Instrucción Primaria presentadas en forma de dictamen por Cabino Barreda, a la Comisión que fue nombrada en una junta de amigos reunidos con el objeto de promover lo que pudiese ser útil para difundir la ilustración en Mexico aprobado por dicha Comisión tanto en lo relativo a la parte resolutiva con que termina (Mexico, 1875), pp. 5-18. This article is also included in the Opúsculas, pp. 159-168.

45 Barreda, "Carta dirigida a los redactores de la Revista Universal y en la cual se contestan las impugnaciones del señor Miguel Rendón Peniche al folleto titulado 'Algunas ideas acerca de instrucción primaria,'" Opúsculas, pp. 191-198.
abhorred theology, and because he had a scientific education. "But how," said Barreda, "can Mr. Sierra accept me as a positivist and then accuse me of being a partisan of the greatest tyrant who ever lived?" The fact that he [Barreda] was a partisan of Napoleon because Napoleon was a sceptic, Barreda refuted, because "positivism," he said, "neither accepts nor exalts scepticism, but was its greatest enemy because it [scepticism] substitutes shaky beliefs for solid convictions." "Besides," said Barreda, "Napoleon was not a sceptic; he was a fanatic who believed everything imbued in him since infancy. . . . Furthermore, neither Napoleon nor positivism were opposed to theology." "The positivist school," said Barreda, "was the only one known to recognize the great services rendered to humanity by theology. Regarding Sierra's third criticism, Barreda held that Napoleon did not have a scientific education in the positivist sense. 46

The funeral oration which Barreda delivered in memory of his friend and colleague, Miguel Jiménez, a professor in the Medical School who had dedicated his life to "humanity," "progress," and "science" was published in the Gaceta Médica de México and in El Federalista, May 1876. 47

On May 1, 1877, Barreda addressed the professors of the


47 Barreda, Gaceta Médica de México, XI (México, 1876), pp. 241-244.
national schools regarding the intellectual, moral, and material elevation of the teaching profession. In this address he encouraged the establishment of an organization for teachers through which they could demand better salaries to allow them financial independence to dedicate themselves solely to teaching.\textsuperscript{48}

On September 8, 1877, he delivered a speech for the occasion of the distribution of scholarly awards at the National Preparatory. In this address he spoke of liberalism as the incarnation of anarchy and the negative spirit.\textsuperscript{49}

In addition Barreda delivered a funeral oration on the death of Leopoldo Río de la Loza, director of the Medical School. He also wrote numerous treatises and polemics that were published by the "Asociación Metodófila," which will be mentioned later.\textsuperscript{50}

In 1877 Barreda established a confraternity called the "Sociedad Metodófila Gabino Barreda," which proposed to apply the inflexible criteria of logic to all problems. The method of the studies of its members, who met on Sunday morning from 10 to 12, was criticized by Barreda himself. In addition the Society published a bi-weekly paper in which appeared a great number of

\textsuperscript{48}Barreda, "Invitación a los ciudadanos profesores de las Escuelas Nacionales," \textit{Opúsculas}, pp. 241-244.

\textsuperscript{49}Barreda, "Discurso leído en la distribución de recompensas escolares acordada por la Junta de Profesores de la Escuela N. Preparatoria y verificada el 8 de septiembre de 1877," \textit{Opúsculas}, pp. 245-248.

\textsuperscript{50}\textit{Anales de la Asociación Metodófila Gabino Barreda}, 2 volumes (México, 1877).
scientific articles. At the end of a year it published a two-volume book, one volume containing the lectures of the various members and one containing those of Barreda himself.\textsuperscript{51}

It is interesting to note that in the list of founding members there stood out a number of future doctors: Luis E. Ruiz, secretary of the society, was then a student of medicine and later became one of the first Mexican sanitarians and author of a textbook on hygiene treatment; Manuel Gómez Portugal, second secretary; Manuel Flores, later director of the Preparatory School, pro-secretary; Adrián Segura, later director of the Hospital Juárez; Ángel Caviño, one of the founders of the study of microbiology in Mexico; Regino González, well-known doctor and man of science; Porfirio Parra, later director of the Preparatory, president of the Academy of Medicine, and professor of physiology; José Manuel Ramos, well-known ophthalmologist and president of the Academy of Medicine.\textsuperscript{52}

\textsuperscript{51}Ibid., I, p. 11.

\textsuperscript{52}Ibid., p. 12. There were also less known members who were then students of medicine: Alberto Escobar, Carlos Esparza, Demetrio Molinar, Daniel Muñoz, Pedro Mercado, Pedro Noriega, Carlos Orozco, Joaquin Rivero, L. Herrera, Joaquin Pobles, Bernardo Sánchez, Aurelio Valdivieso, Eduardo Vargas and Agustín Vergara. In other fields there stood out Andrés Almaraz, a student of pharmacy; Andrés Aldasoro, a student of engineering; Salvador Castellot, a student of jurisprudence; and Miguel Macedo, also a student of jurisprudence. Many years later, Macedo became one of the prominent figures in the administration of General Porfirio Díaz and one of the most important members of the Partido Científico, a group that kept Díaz in power. Among the important works of the Society were: Las Causas Primeras, by
Among the followers and disciples of Barreda were:

Agustín Aragón, whose written works are numerous. He was editor of the Revista Positiva, 1900-1914, the period of its existence, and a staunch defender of positivism against the members of the "Ateneo de la Juventud," an organization founded in 1909 for the sole purpose of breaking with positivism; Horacio Barreda Díaz Covarrubias, son of Barreda, who was the most distinguished and intelligent defender of the educational reforms of his father as he demonstrated in an article which appeared in the Revista Positiva, Volume VIII (1909), entitled, "La Escuela Nacional Preparatoria"; Alfonso L. Herrera, distinguished biologist, successor of Barreda as director of the Preparatory School, and head of the Parasitology Commission created at the beginning of the

Portuario Farra, in which he concluded that all research on first causes was worthless; Consideraciones sobre la teoría de Darwin, by Pedro Narciso, which was criticized by Barreda because it was supported by a priori knowledge; Essayo Sobre los deberes recíprocos de los superiores a los inferiores, by Miguel Macedo, regarding the relations between commanding and obeying; Adelantos de la Química, by Andrés Almaraz, who was professor of this subject when the group attended the Preparatory; Influencia de las Sociedades secretas en la civilización, by Salvador Castellot; La Naturaleza es un Modelo de Perfección?, by Manuel Flores, in which he arrived at a negative conclusion; Estudio de las relaciones entre la Sociología y la Biología, by Manuel Ramos, in which he affirmed that the Darwinian idea of the survival of the fittest should apply to social problems; Como la Corrección de las fuerzas del Organismo es una comprobación del axioma de la persistencia de la fuerza, by Joaquín Rivero y Heras; Examen de las teorías médico-homeopáticas bajo el punto de vista lógico, by Daniel Muñoz; Ligero estudio sobre el Dente, by Manuel Gómez Portugal; Examen del juego, by Demetrio Molinar.
century; Enrique O. Aragón, exponent of experimental psychology and professor in the faculty of medicine; Ezequiel Chávez y Lavista, professor of psychology and other subjects in the Preparatory School, holder of various important educational posts and author of important works concerning logic and psychology, the most important of which was *La Educación Pública*. The thinking of Chávez evolved until it departed radically from positivism. 53

In 1878 Barreda turned over the direction of the Preparatory School to Alonzo Herrera. The official reason was his appointment as Minister Plenipotentiary of Mexico in Germany. However, Fernández del Castillo states that he was probably

53Martín Luis Guzmán, "El doctor D. Gabino Barreda," *Escuelas Laicas, Textos y Documentos* (México, 1948), pp. 188-191; Aragón, op. cit., pp. 40-46. Other disciples of Barreda were: Eduardo Prados, who, although a positivist, criticized the Preparatory School in a letter addressed to Musto Sierra in 1905; Juan B. Garza, professor at the Literary Institute in Toluca; Fortunato Hernández, evolutionist doctor; Julio S. Hernández, pedagog; Telésforo García, a Spaniard who wrote Don Gabino Barreda y la integración de la nacionalidad mexicana; Alberto Escobedo, who published, among other works, a study on Galileo which was read before the "Asociación Metodófila"; Enrique H. de Zayas, author of *Sociología General*, which was a text book in the Preparatory School; and Alejandro Sánchez de Tagle, who also published a work on the same theme; Francisco Bulnes, historian who wrote a controversial book on Juárez; Luis E. Ruiz, author of a number of text books on pedagogy, who occupied important posts in the Porfirian era; Ignacio Manuel Altamirano, distinguished writer, poet and politician; Ignacio Ramírez, a positivist of the pure kind; Manuel Flores, director of the National Preparatory and a well-known political and educational writer; Genaro García, an anti-Spanish writer and an outstanding jurisconsult; Adalberto Esteva, author of a manual on constitutional law; and Jorge Hammken y Mejía, an active positivist.
released from his post at the Preparatory School for political reasons, since the regime of Sebastián Lerdo de Tejada had fallen and the presidential regime of Porfirio Díaz had begun.\textsuperscript{54}

During his stay in Berlin Barreda was designated by the Mexican government to represent Mexico at the International Postal Convention in Paris, May 15-June 14, 1878. He presented the results of the Convention in a report that he submitted to his government.\textsuperscript{55} It was during his stay in Germany that Barreda obtained a prize for having demonstrated the way to perform a difficult surgical operation.\textsuperscript{56}

If Barreda was torn away from his main work by diplomatic functions, which he filled until 1880, he owed to these circumstances the satisfaction of returning to Paris at the beginning of 1881 with his son Horace to visit Pierre Laffitte, director of the Positivist Society. Aragón says that when

\textsuperscript{54}Fernández del Castillo, \textit{op. cit.}, I. p. 60.

\textsuperscript{55}Aragón, \textit{op. cit.}, p. 18; Secretaría de Relaciones Exteriores, México, 1878, Sección de Europa, Suecia y Noruega, Gabino Barreda representante de México en el Congreso penitenciario de Stockolmo, No. 4; Secretaría de Relaciones Exteriores México, Sección de Archivo General, 1878, Gabino Barreda, Su expediente personal, Sección de Europa, Legación de México en el Imperio Alemán, No. 39, Classificación No. H/131/7603, Topográfica L-E 1207; Tratados y Convenciones, 1878, Expediente No. 2, Unión Postal, Invitación del Gobierno Frances para que el de México mande un representante al Congreso Postal que se reunirá en Paris. Misión de D. Gabino Barreda, Caja No. 22 (Primera Parte) H-341.9(44) "878"-1.

\textsuperscript{56}Aragón, \textit{op. cit.}, p. 18.
Barreda returned to Mexico he dedicated himself to the propagation of the religion of Humanity through a series of conferences, especially for women. Up to this time Barreda had ignored the religious phase of positivism because he felt that the time was not yet ripe for a positivist religion in Mexico.57

The death of Barreda occurred March 10, 1881, at 6:15 A. M., at his residence in Tacubaya, due to a malady of the digestive system. The following day his body was taken to the library of the National Preparatory School. There Justo Sierra delivered the funeral oration exalting him as a thinker and the founder of the National Preparatory. The next day his body was taken to the chapel of San Ildefonso. At the foot of his coffin was placed an open volume of Comte, surrounded by elegant funeral wreathes. In the back of the room was a canvas painting of the illustrious teacher, and on the picture was written in big gold letters the motto, "Father of Positive Philosophy, Order and Progress." Below the painting was a clock with stopped hands marking the hour of Barreda's death. Surrounding the coffin were props holding scientific apparatus, the acoustics of Koenig, the electric machine of Ramsden, various small skeleton booksellers holding

57Aragón, ibid.; Moisés González Navarro, op. cit., p. 121. If what Aragón says is true, stated Moisés González Navarro in an article entitled, "Las Positivistas Mexicanas en Francia," Historia Mexicana, IX, then it would contradict the thesis of Zea which holds that Barreda did not intend to establish a positivist church in Mexico.
the works that were constantly read by Barreda, the hydro-electric machine of Armstrong, and a big Gregory telescope. Anatomical preparations, different-sized physics, chemistry, and other apparatus were arranged in columns with alternating tubes of alcohol emitting a green flame. Six tapers fastened to the floor lighted up the body of Barreda with the sacred fire of science. On the wall were the names of all the societies Barreda organized or to which he belonged. In this position the body of Barreda lay exposed in the chapel of San Ildefonso until March 14, the day on which the inhumation took place. At 3 P. M., March 14, the body was taken to Dolores Cemetery where he was buried among the illustrious men. By request of the President, the Mexican nation met the expenses of the funeral. In 1903 Puebla, the city of his birth, declared Barreda benemérito of the state of Puebla and erected a bronze statue in his honor on the

58 Gaceta Médica de México, XVI, pp. 13, 98-101; Justo Sierra, Obras Completas del Maestro Justo Sierra. Discurso. Edición preparada por Manuel Mestre Ghigliazza, revisada y ordenada por Agustín Yáñez, Volume V (México, 1948), pp. 51-54. The Scientific Societies which Barreda organized were numerous. Among them were: Academia de Medicina; La Sociedad Médica; Pedro Escobedo; El Instituto Fetalógico Nacional; La Sociedad de Cirugía; La Sociedad de Medicina Interna; El Instituto Médico Nacional; La Sociedad Farmaceutica, and La Sociedad Metodófila Gabino Barreda. Besides the organizations which he established, Barreda was a member of other scientific societies, including: Geografía y Estadística; Historia Natural; Liceo Hidalgo; Sociedad Filiástica; Asociación Larrey; and Andrés del Río.
In 1905, upon the request of the "Ateneo Guanajuatense," Barreda was declared benemérito of the state of Guanajuato. The Positive Society of Mexico, under the leadership of Aragón, twice a year visited the tomb of Barreda, February 19, the day of his birth, and March 10, the day of his death.

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59 Agustín Aragón, "La inauguración de la Estatua del Dr. Barreda en la ciudad de Puebla," Revista Positiva, III (México, 1903), 279-286.

60 Luis P. Bustamante, "Homenaje a Don Gabino Barreda," Revista Positiva, V (México, 1905), 271.

61 Agustín Aragón, "El S. Dr. Don Gabino Barreda," Revista Positiva, VII (México, 1907), 287.
CHAPTER II

"ORACION CIVICA": THE HISTORY OF MEXICO FROM A POSITIVE VIEWPOINT

On September 16, 1867, the anniversary of the proclamation of Mexican Independence, Barreda pronounced in Guanajuato a "Civic Oration." The purpose of his speech was to present the interpretation of the history of Mexico from a positivist point of view. The first person to formally attempt to adapt the system of Comte to Mexican reality of his day, Barreda divided the history of Mexico by using the three well-known positivist stages of social evolution: 1) the theological; 2) the metaphysical; 3) the positive. The first he took to be represented by the colonial period, the second by the revolt from Spain, and the last by the reform that took place in Mexico the second third of the nineteenth century.¹

The theological period was characterized by clerical and military controls and, in the interpretation of Barreda, they were a retarding or negative influence. Although the origins of the positivist spirit came to Mexico with the Catholic religion, the clergy, according to Barreda, destroyed it, preparing the way for the metaphysical stage in the positivist evolution of history. "The chief disintegrating element, which was growing

¹Patrick Romanell, Making of the Mexican Mind. A Study in Recent Mexican Thought (Lincoln, Nebraska, 1952), p. 43.
here [Mexico] as it was everywhere else," said Barreda, "came with its founders, who constructed in Mexico an edifice upon decadent principles." 2 In charge of universal education, the clergy controlled all avenues of thought and thus prevented any penetration by the enemy. 3 In Mexico, according to Barreda, the clergy checked the scientific course which its European predecessors could not contain. 4 During the colonial period nothing could penetrate from the outside and no new idea could spontaneously germinate without having first passed through the sieve of the secular and regular clergy, a clergy entirely consecrated to the service of the Mother Country. Spain in turn granted the clergy numerous immunities and privileges, elevating it over the rest of the population, especially the Creoles. 5 The Divine Right of Kings and the privileges of the clergy and the army, which were incompatible with popular sovereignty and social equality, ideas which Barreda borrowed from the liberals, were the two political principles which furnished the basis for the social edifice of Spain. 6 For three centuries education.


3 Ibid., p. 83.

4 Ibid., p. 87.

5 Ibid., p. 83.

6 Ibid., pp. 88-89.
religious beliefs, politics, and administration were all directed
towards the same, well-determined end, that is, the indefinite
prolongation of Spanish domination and exploitation.7

At the time of the conquest the emancipation of science
from theology was already in an advanced state in Europe.
Although no positive or mathematical explanation could be given
for the double movement of the earth until the seventeenth
century, the condemned hypothesis could satisfactorily be ex­
plained according to the laws of physics or mechanics and uni­
versally accepted in spite of the Council, the Bible, and the
Inquisition. Furthermore, the Bible was soon interpreted so
that it was not incompatible with science.8

Positive science was developing, passing from the most
simple to the most complicated, but the clergy, according to
Barreda, did not wish to recognize the fact that science was
destroying the edifice which they had constructed at a great
cost. They refused to admit the need for mental emancipation.
They did not wish to recognize that natural laws were supplanting
supernatural explanations. They could not understand:

the intimate and necessary relationship be­
tween human progress and the human mind, a
relationship whose participation is equal,
whose parts progress simultaneously, though
with unequal velocity, according to the

7 Ibid., p. 83.
8 Ibid., pp. 86-87.
degree of increasing complexity of corresponding knowledge.\textsuperscript{9}

It was in the field of physics where the clergy first lost their capacity to explain satisfactorily the phenomena of nature. But they did not yet recognize the fact that their role in history had ended. They continued to dominate society politically without realizing the fact that the same light that penetrated physics could also penetrate politics. "It is impossible to have politics without the support of science just as science cannot be understood without politics."\textsuperscript{10} Barreda asked:

Why prevent the light that emanates from the inferior sciences from penetrating the superior sciences? Just as the most surprising astronomical phenomena are explained as a law of nature, that is, with the enunciation of a general fact, which is no other than an inseparable property of matter, could one not introduce this same spirit of positive explanations into the other sciences and consequently into politics?\textsuperscript{11}

Mexico as well as all America appeared in history at the very moment "... when the Catholic Church lost its capacity to explain satisfactorily the phenomena of nature." The gradual decadence of old doctrines and the progressive substitution of new ones ultimately resulted in a complete transformation before one could hardly realize any progress.\textsuperscript{12} "In this period," said

\textsuperscript{9} Ibid., p. 85.
\textsuperscript{10} Ibid., pp. 84-85.
\textsuperscript{11} Ibid., p. 84.
\textsuperscript{12} Ibid., p. 84.
Barreda, "the principal ideas of the modern era were in full efervescence in the Old World and the conquistadors, already impregnated with them, introduced them, in spite of everything, into the New World..."\textsuperscript{13}

Not only in reference to science did the conquistadors bring a decadent doctrine incapable of establishing a respectable government without the use of force. But the Protestant Revolt had just divided Europe, which broke the unity and veneration towards spiritual superiors, and demolished the work which was begun by Saint Paul and slowly elaborated in the Middle Ages. This schism, whose motto was the appeal to one's own reason, was born just at the time when the conquistadors went out to make their seizures. The famous treaties of the Regalists in Spain were no more than a protest against the authority of the Pope. And the brutal way in which Charles V, in spite of his fanaticism, treated the Roman Pontiff when he wanted to oppose his will proves that one authority had already fallen.\textsuperscript{14}

It was impossible that Mexico and the rest of Spanish America not see the fire of emancipation which burned everywhere. In politics it was no different than in religion. Spain herself

\textsuperscript{13}Ibid., p. 85.
\textsuperscript{14}Ibid., pp. 87-88.
had given the noble example by expelling the Moors who for seven centuries had done in Spain what Spain tried to do in America.  

The success of Spain in America gave her the opportunity to extend her power throughout much of Europe. But the religious, political and military liberty desired by the European states subject to the Crown of Spain caused her to lose the Low Countries and later on her colonies in the New World.

According to Barreda, the political dogma of popular sovereignty was not, in fact, formulated explicitly and precisely until the war of independence which Holland heroically sustained against Spanish tyranny. The important dogma which later became the political creed of all civilized countries was invoked by an oppressed people. England, France and all the monarchies, perhaps in hatred of Spain, supported it. Universal domination, based on the Divine Right of Kings, disappeared.

During the English revolutions there appeared a new political tenet of modern republicanism—the equality before the law. According to Barreda:

"Its practical application was premature at that time. . . . But notwithstanding its failure the English who left for America had it engraved on their hearts and both dogmas [liberty and equality before the law] served

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15 Ibid., p. 85.
16 Ibid., pp. 88-89.
17 Ibid., p. 89.
as a seed and preparation for the development of the Colossus which today is called the United States... It has demonstrated a vigor and vitality which has frightened its enemies and amazed its most ardent admirers.¹⁸

The ingredients for a general explosion in Mexico were accumulated. "Now only a spark was needed," said Barreda. This spark was applied the night of September 15-16, 1810. No one could contain the fire.¹⁹ An obscure village priest without arms, organization, clothes or resources, faced a valiant and disciplined army and carried off the victory.²⁰ Barreda regarded Hidalgo as a man of genius with a big heart: the genius to choose the right moment to start the revolution, and the heart to sacrifice his life. According to Barreda, Hidalgo was the first of a long list of martyrs to bring about the redemption, liberty and greatness of Mexico. After much suffering there would appear an "era of peace, liberty, order and greatness of Mexico." After eleven years of warfare, Guerrero and Iturbide finally broke the chain by which Spain enslaved Mexico for three centuries. However, because of the errors committed by the new public officials and because of the powerful elements of anarchy and division, conditions remained as they were under the old regime.²¹

¹⁸Ibid., p. 89.
¹⁹Ibid., p. 90.
²⁰Ibid., p. 83.
²¹Ibid., pp. 90-91.
That which could have been a natural evolution was transformed into a revolution, but the effect of the revolution was only transitory. 22

Independence from Spain was followed by intermittent war between two political groups, the Conservatives and the Liberals. In his speech at Guanajuato, Barreda interpreted the history of Mexico as the struggle between two great forces: the progressive (liberals) and the retrogressive (conservatives), or the positive and the negative. 23

Barreda described the Conservative party as opposing mental emancipation—scientific, religious and political. Differing from Comte, Barreda said that the Liberal party represented the dynamic order or the positive forces of society. It defended mental emancipation. Unfortunately, the liberal, or positive, spirit was not immediately triumphant. The conservative, or negative, spirit wanted to plant a regime similar to the one that had been overthrown. It never understood order and progress. 24

In spite of its violence, the revolution ultimately fulfilled its objective. The Mexican revolution which began in 1810 and ended in 1867, was a struggle of the positive spirit against

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22 Ibid., p. 90.
23 Ibid., p. 92.
24 Ibid., p. 92.
the enemies of progress--the clergy--which opposed the Mexican government by provoking revolts and foreign interventions. 25

Zea interpreted Barreda's metaphysical period as the initial or combative phase which was necessary to destroy the common enemy of progress--the clergy and the army--and replace them with a new order, the positive order. With the combative phase at an end, it was necessary to create a new ideology for this new order. Positivism would represent the constructive stage once the combative role had been terminated. 26

Liberty would be guaranteed by material order. The state has the right to intervene in the field of education, and only in the field of education, to create the type of individuals who might make this order possible. But before arriving at this stage, Barreda said that the Mexican mind had to be completely emancipated from Catholic theology and metaphysics. This would be done through education. Describing freedom of conscience, Barreda said:

... that in the future a complete liberty of conscience, an absolute freedom of expression and discussion, giving room to all ideas and inspirations, would permit light to spread in every quarter and make unnecessary and impossible all commotion which was not purely spiritual, every revolution which was not purely intellectual. 27

25 Ibid., pp. 92-93.

26 Romanell, op. cit., pp. 43-44. Barreda chose the terms theological, metaphysical, and positive because they were used by Comte as a vehicle for his ideas.

Although presented by some people as an exception in the progressive evolution of humanity, Barreda said that:

The Reform, if examined in the light of reason and philosophy appears as a great drama which concludes with the sublime glorification of the courage of 1810, through the successive line of heroes from Hidalgo and Morelos to Guerrero and Iturbide, from Zaragoza and Ocampo to Salazar and Arteaga, to the conquerors of the hyena of Tacubaya and the adventurer of Miramar.

Without this progressive struggle of the positive spirit (the liberals) against the negative spirit (the clergy and the army) one cannot explain the history of Mexico. 28

In the end the liberal (or positive) spirit triumphed. Liberals ideas were embodied in the Constitution of 1857. The men who headed the constitutional reform in Mexico were imbued with the positive spirit. The conquest of the century was the deprivation of the privileged classes of their fueros (special privileges). By separating church and state, the liberals hoped to render impotent a power that was opposed to progress. They considered Catholicism dangerous because the clergy used it as a political arm. 29  The liberals did not deny the fact that the clergy had spiritual power. Barreda expressed this idea in the "Civic Creation" when he stated that the spiritual weapons of the clergy were not touched by the Reform Laws; on the contrary, they

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28 Ibid., p. 82.
29 Ibid., p. 93.
were strengthened. The liberals, although anti-clerical, did not give up their Catholicism. Juárez knew that to decatholicize Mexico by force would incite continuous revolts, which would signify the continuation of anarchy and disorder. The new government needed to establish order. The desired order was simply material, an order that did not want to invade the spiritual field of the Catholic Church.

The Constitution of 1857 provoked the War of Reform. In this Three Years' War the Conservative faction in Mexican politics was severely weakened, but not entirely destroyed. The Conservatives were willing to gamble with a monarchy set up in Mexico with foreign aid. "Perhaps the Conservatives did not realize," said Barreda, "that they were delivering to Napoleon a nationality, an independence, and institutions which had cost rivers of blood and a half century of war and sacrifice. The French invasion of Mexico, according to Barreda, was "the intervention of the negative spirit which succeeded in hindering progress and the positive spirit." Apparently at this point, the Liberal party won the bitter struggle which had begun with Independence.

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30 Ibid., pp. 93-94.
32 Barreda, op. cit., p. 105.
33 Ibid., p. 94.
34 Ibid., pp. 95-96.
According to Barreda, the struggle against the troops of Napoleon III was not simply a struggle for the independence of Mexico, but the struggle for the independence of all humanity. May 5, 1862, was a victory that Mexico obtained in the name of the progress of humanity. Zaragoza, the commander of the small handful of heroes, will forever be linked to the idea of "independence, civilization, liberty and progress." Barreda said that

The soldiers of the Republic in Puebla saved, like the Greeks in Salamis, the future of the world by saving the chief republican principle, that is, the modern standard of humanity in the struggle with the champion of negativism, Napoleon III. . . . In this conflict between European retrogression and American civilization, in this struggle of the monarchical principle against the republican, in this ultimate effort of fanaticism against emancipation, the republicans of Mexico stand alone against the entire world.35

Those nations that did not openly support the French at least gave them their moral support. Because of its own civil war, the United States was forced to maintain neutrality, and even at times to lend its services to the invader. Finally the United States asked France to withdraw from Mexico. The fear of an unsustainable war against the United States, the precarious position of the French forces in Mexico, and the unpopularity of the French mission in France itself, finally made Napoleon decide to withdraw his army from Mexico.36

35Ibid., pp. 95-96.
36Ibid., pp. 96-97.
Mexico, according to Barreda, owed a great debt to the United States, without doubt, but the help of the United States should in no way diminish the merit of the heroic defense of Mexico. Mexico was criticized for asking the United States for help, because the United States, it was said, wanted to maintain a government in Mexico which would permit it to end European influence in America and increase its own.37 But Mexico, said Barreda, had the right to call on foreign help without compromising its autonomy and dignity. After all, he said, Holland called on England for help to emancipate herself from Spanish tyranny; the United States accepted the services of France to gain its independence; Spain asked for help from England against France. These countries did not compromise their autonomy, nor did foreign aid obscure their heroic deed.38

That the Mexican government did not pardon Maximilian was in the eyes of Barreda a splendid triumph. From now on every new throne erected in Mexico would find no willing occupant. Barreda said that:

No doubt the Mexicans could have pardoned Maximilian, but when the autonomy, future and independence of a nation are in question, when the time has come to erect the cornerstone of that delicate structure which has been gradually elaborated over a period of 57 years, every idea that does not conduce

37 Ibid., pp. 98-99.
38 Ibid., p. 99.
to the desired end should be abandoned, every movement of the heart that diverts us from our path and interrupts our point of view, should be stilled.  

Had Maximilian been exiled to Europe, according to Barreda, he would have been the banner of the discontented, a constant threat to public tranquility, the pablum to nourish the secret call of rebellion, and at the first opportunity he would start anew the civil war.  

Had Maximilian been pardoned he would never have admitted that he owed his life to the generosity of Mexico, but to the fear of Francis Joseph or to the pressure of the United States. Had Maximilian been pardoned Mexico would have forever lived under the tutelage of other nations. Had Maximilian been pardoned at the time of the North American Intervention, when national sentiment was at its peak, it would have undoubtedly provoked...a cry of universal condemnation. And neither would Mexico have been conquered nor would the country have been pacified.

The privileged classes were finally persuaded of their impotence. The old army which had been defeated by new soldiers and unforeseen generals lost its prestige. The clergy accepted their loss of prestige after they unsuccessfully resorted to their spiritual arms--the only thing that remained--to defend what they believed to possess by Divine Right.  

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39 Ibid., pp. 103-104.  
40 Ibid., pp. 103-104.  
41 Ibid., pp. 103-104.  
42 Ibid., p. 93.
power from the pressure of temporal power, Mexico made the most advanced step that any nation had been known to make towards true civilization and moral progress. \(^{43}\)

Barreda transformed positivism into a neutral doctrine. This meant that positivism did not attack any idea be it Catholic or liberal, but the individual was to be a good citizen. Whatever he believed, he was to sacrifice his individual ends for the good of society, or, better yet, he could not hinder the free movement of society through his ideas. Barreda changed the Comtian motto: "love, order and progress," to "liberty, order and progress," liberty as a means, order as a base, and progress as and end. The ideology of the Mexican liberals remained summarized in the adopted motto of Barreda. \(^{44}\)

In turning to the above concept, Liberals and Positivists opposed each other. Both groups looked at positivism not only as a social doctrine for the support of order, but as a sectarian doctrine for the support of a determined social group. The Mexican Jacobins held the concept of individual liberty against the interpretation of the positivists. \(^{45}\) Comtian positivism, which subordinated the individual to society, did not allow them freedom without restrictions. According to the Jacobins,

\(^{43}\) Ibid., p. 94.
\(^{44}\) Ibid., p. 105.
\(^{45}\) Zea, \textit{op. cit.}, p. 77.
the individual should be restricted in no way whatsoever, other than his own ability. 46

Positivism, according to Barreda, was to be a doctrine of social order. Differing from Comte, Barreda eliminated the religion of humanity. In Mexico, unlike other American countries such as Chile and Brazil, the ecclesiastical rites which Comte added to his philosophy were not implanted. According to Leopoldo Zea, Barreda did not try to establish a new church because he felt it would merely cause new upheavals and disorders.

The "Civic Creation" was made in predetermined historical circumstances: the triumph of the Mexican liberal revolution. This revolution brought an urgent need for order. The positivism of Barreda furnished the ideology for this order which was necessary to transform Mexico into a strong and respectable nation. From the positivist point of view, 1867 was a special year in the history of Mexico. The French army retired; the Austrian emperor was executed; the Reform movement and liberal ideas saw their final triumph; a new order would take the place of the old colonial order. 48

47 Ibid., p. 76. See footnote 57, page 32.
Barreda presented the whole series of historical events as a compact and homogeneous whole which, according to positivism, was necessary for progress. "In the dominion of intelligence and in the field of true philosophy, nothing is heterogeneous. Everything is homogeneous." Order, said Barreda, must begin with ideas, that is, "a truly universal doctrine must issue in a common fund of truths." 49

For Barreda history was a science and, like the other sciences, it was subject to unchangeable laws. 50 He said that:

History is not a conjunct of incoherent and strange acts. ... Neither is it subject to the caprice of Providence, nor to unforeseen accidents. It is subject to science. ... It is subject to laws which make it possible to explain the future through what has taken place in the past. ... If an important event such as the revolution would not have been prepared beforehand by a series of slow, though real and powerful, influences, it would be unexplainable. ... 51 Furthermore, it would not have been a heroic act, but a miracle and, as a miracle, it would not be concerned with the true philosophical sciences, whose end is always foresight and therefore opposed to supernatural influences. Supernatural influence is not subject to invariable laws and therefore it is not the object or the basis for any type of explanation or rational foresight. 52

In the "Civic Oration" Barreda examined the steps to-

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49 Barreda, op. cit., pp. 82-83.
50 Ibid., pp. 81-82.
51 Ibid., pp. 83-84.
52 Ibid., p. 84.
wards the emancipation of Mexico. Although the Progressive or Liberal party seemed to navigate without a compass, it nevertheless was able to weather the storm through stubborn persistence. Two generations sacrificed themselves to the reconstruction of Mexico. All the elements of social reconstruction—moral, intellectual, and political—became united; all obstacles were overcome. The foundation for the reconstruction of Mexico was established. The Reform laws put Mexico on the road towards an advanced civilization. The new Mexican constitution led the way towards innovation based on evolutionary rather than revolutionary measures. Barreda showed how positivism was not the result of curiosity or caprice. He presented the historical circumstances that prevailed in the era in which he made known the doctrine learned directly from Auguste Comte. Forecasting the constructive phase of Mexican positivism, Barreda closed his speech with the optimistic remark that "all the elements of social reconstruction are so well assembled that the current peace and order, if maintained for sometime, would accomplish by themselves alone all that remains to be done." 53

With an understanding of the history of Mexico as Barreda conceived it, one can better understand the ideas of the Mexican intellectual which were contained in the law of public instruction of 1867. In the following chapters Barreda's plan of education will be discussed.

53 Ibid., pp. 103-105.
CHAPTER III

THE LAW OF PUBLIC INSTRUCTION OF 1867 AND ITS REFORM OF 1869:

PRIMARY EDUCATION

Shortly after Barreda delivered the "Civic Oration," and partly on the strength of it, Juárez invited him to be on a commission to reorganize the entire system of Mexican education from primary to professional in accordance with positivist aims. Other members of the commission included Pedro Contreras Elizalde, Francisco and José Díaz Covarrubias (brothers-in-law of Barreda), Ignacio Alvarado and Eulalio María Ortega. Barreda was the intellectual spokesman of the commission and his recommendations were immediately embodied in the Law of Public Instruction, December 2, 1867, which contained important novelties and which gave education a distinctive course. In addition to outlining the whole system of primary, secondary, and professional education, this law created the National Preparatory School, which will be discussed in the next chapter of this study. Although this law was enforced only in the Federal District and in the national territories, its influence was decisive throughout the Republic.¹

The law of 1867 had a precedent in several educational laws passed in Mexico in the nineteenth century. The Law of Public Instruction of 1853 took education out of the hands of the church, an important characteristic of the Law of 1867. José María Luis Mora, the driving force behind the Law of 1853, anticipated a scientific education based on facts when he said:

Positivists were called to execute reforms, especially educational, because the old education falsified and destroyed at the roots all the convictions that constituted a positive man.3

It is interesting to note that the law of education passed by the Provisional Government of Santa Anna also contained some of the chief characteristics of the Law of 1867, that is, that primary education was to be obligatory and free. There was to be freedom of instruction but the professors would have to be approved by the Board of Primary Education.4

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Juárez made known his position on public education when he took over the reins of government on January 20, 1861:

... The government will adopt measures to promote public education, to improve the professional schools, and to give necessary attention to the schools of medicine, agriculture, arts and crafts, mining and commerce, and the Academy of Fine Arts.

At his inauguration, June 15, 1861, Juárez officially endorsed public support of education in the following statement:

I profoundly hope that the national representatives will give the proper attention to public education, to commerce, to industry, and to progress in general, moral as well as material.

The two characteristics of the Law of 1861 were secularism and emphasis on the training of good citizens.

Maximilian promulgated a law of education December 27, 1865. In a letter addressed to his Minister, Manuel Siliceo, he explained the basis of his plan. It is of interest to note that this letter, with the exception of religious instruction in

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6 Ibid., p. 13.
70 Gorman, op. cit., pp. 167-168; Manuel Dublán and José María Lozano. Legislación Mexicana o Colección Completa de las Disposiciones Legislativas expedidas desde la Independencia de la República, IX, pp. 150-158, 85-86. On February 18, 1861, Juárez decreed that public instruction was to be handled by the Secretary of Justice and Public Instruction.
primary and secondary schools, contained the fundamental ideas that the liberals defended in the era of Porfirio Díaz. Maximilian said that everyone should receive a public education. Primary education should be free and obligatory. As a good liberal, he said that religion should be left up to the conscience of the individual. The state was not to interfere in religious questions, but neither was the Church, which was obligated to impart religious instruction, to interfere in politics. Maximilian's law of education, which was to be imparted by the municipalities, was reduced to reading, writing, grammar, religion, and good manners. Everyone, except the poor, had to pay one peso a month. The plan was later criticized because of the disorderly arrangement of the subjects which, according to Chávez, "was bound to form absurd pedants and ridiculous encyclopedists." It was not carried into effect because of the early collapse of the Empire.

By special presidential decree, Juárez promulgated the Law of Public Instruction of 1867. The passage of the law was condemned in the press and in Congress. The members of Congress asked that the law be abolished because the deputies were not given a chance to study it before it was promulgated. Deputy Peña y Ramírez said that it was "progressive in essence, but

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8 O'Gorman, ibid., pp. 169-170.
9 Chávez, op. cit., p. 516.
vicious in form. . .," because it prescribed so many subjects that it would take a child fifteen or twenty years to learn them. However, the deputies realized that if the law were abolished it would mean having to accept the law of 1865, which they felt was even more defective. Thus, after a few minor changes, the law was put into effect in January 1868. 10

The educational law which Juárez promulgated in 1867 was intended to be a pattern for thought and action in revamping the whole system of instruction and, ultimately, of society. It not only attempted to outline the whole system of education from the primary level to the preparatory, but it also tried to provide a comprehensive education by offering a wide variety of subjects. Realizing the necessity of creating an enlightened progressive society, science and practicality served as the basis for the subject matter. Finally, it fixed the responsibility of the state in matters of education. Francisco Larroyo noted that:

... the law did not expressly state that education would be secular; but as one can see, religion was eliminated as one of the courses. Thus elementary education in Mexico acquired the three characteristics of modern public education: obligatory, free and secular. 11

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10 Pantelecio Tovar, editor. Historia Parlamentaria del Cuatro Congreso Constitucional, I (México, 1972), pp. 104-105; González y González, op. cit., pp. 662-667; Dubían, op. cit., X pp. 192-205, 224, 242-254. Article three was changed. A few subjects in the doctor of medicine program were eliminated. Also, Article ninety-one, which required students who lived in Mexico City to board, was abolished.

The more important points of the Law of 1867 with reference to primary education were to create within the Federal District, with general funds, four primary schools, one of them for girls. Thereafter, there were to be established as many schools as necessary for the Federal District.\textsuperscript{12}

As subjects of primary instruction, the law enumerated reading, penmanship, Castilian grammar, letter-writing, arithmetic, the decimal system, rudiments of physics, chemistry, practical mechanics, lineal drawing, morals, good manners, notions of constitutional rights, and rudiments of history and geography, especially of Mexico. The program for girls was similar to that of boys, except that letter-writing and the physical sciences (physics, chemistry and practical mechanics) were omitted and practical hygiene, befitting to a woman, was added.\textsuperscript{13}

Absent were courses in physical education. Not until 1874 did the government provide for physical education in primary schools of both sexes.\textsuperscript{14}

The law issued January 24, 1868, the enabling act of the Law of Public Instruction of December 2, 1867, ordered the establishment of a school in each village in the Federal District

\textsuperscript{12}DUBLÁN, X., \textit{op. cit.}, p. 193.

\textsuperscript{13}Ibid.

\textsuperscript{14}José Díaz Covarrubias, \textit{La Instrucción Pública en México} (México, 1875), pp. xxxi-xxxviii.
that had more than five hundred inhabitants; in those villages exceeding two thousand there would be one for each sex and each two thousand inhabitants. The municipalities were to appeal to the hacendados of their municipality to create and support a primary school on their fincas. In addition the government ordered the municipalities of the capital to support twelve schools for girls and twelve for boys, which should be located in convenient places. The enabling act of 1868 eliminated some subjects (chemistry, physics, mechanics, and drawing), which were considered too difficult for elementary school children.15

The tendency to broaden primary instruction was encouraged by the rapid progress of the sciences. The old idea of primary education was limited to what was indispensable to constituting man a truly social and rational being, arousing his intellectual faculties, and cultivating his affective inclinations. Language, reading, writing, the basic rudiments of numbers and the idea of morality and social organization contained the knowledge that prepared man for the environment in which he lived.16

By the end of 1868, Ignacio Mariscal, the Minister of Public Instruction, at the request of members of the Chamber, asked for authorization to recast the Law of December 2, 1867.

16 Díaz Covarrubias, op. cit., pp. xix-xx.
which had been made effective by the enabling act of January 24, 1868. Barreda, who at that time was the president of the Commission of Public Instruction in the Chamber, took advantage of his official position to delay the course of action and to undertake a series of conferences with Mariscal, which convinced the latter that no more than a modification of the present law was necessary. On January 13, 1869, Congress decreed the following basis for the revision of the Law of 1867: 1) to allow freedom of instruction; 2) to see that as many children as possible receive a primary and public education; 3) to teach the exact sciences; 4) to improve secondary education by the introduction of special schools; 5) to combine the schools of commerce and administration; 6) to see that necessary expenses do not exceed the budget. The new law which was passed May 15, 1869, did no more than sanction the one of December 2, 1867, introducing a few new changes. Thus, the new law was a triumph for positivism.

The Law of Public Instruction of May 15, 1869, and the enabling act of November 9, 1869, gave more attention to primary education than the law of 1867. The Lancasterian Society (Sociedad Lancasteriana) and other private schools were to continue

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18 Dublán, X. op. cit., p. 515.
despite the fact that the government ordered the Secretary of Justice and Public Instruction to organize four model schools for girls and four for boys, as well as one for male and one for female adults, which were to be night schools. Furthermore, the National Treasury would continue to aid, and, if necessary, supply books and indispensable writing materials to the fourteen schools which depended on the Beneficence Society (Sociedad Beneficencia). The subjects taught in the two primary schools for adults were to be the same as those taught in those for boys and girls, respectively, in addition to the following: lineal drawing; the federal constitution; rudiments of chronology and history, especially of Mexico; and, in addition, for men rudiments of physics and chemistry. The law reiterated that primary education was to be "free for the poor."  

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19 Dublán, X., op. cit., p. 591; González y González, op. cit., pp. 646-647, 681. The Sociedad Lancasteriana was the most important private educational institution in Mexico. It was introduced into Mexico in 1822 by Manuel Codorniu, Agustín Buenrostro, Eulalio Villarrutia, Manuel Fernández y Aguado and Eduardo Torreau who followed the "Mutual System" of education established in England by Joseph Lancaster. This system was used because of the scarcity of teachers. One person taught a number of grades at one time. The teacher instructed the more advanced students to aid him, while he maintained discipline. Sometimes this meant no more than the "blind leading the blind." The Sociedad de Beneficencia was founded in 1846 by Vidal Alcocer for the education and protection of destitute children. It was supported by alms. In 1853 the government decided to contribute 25 per cent of the tax on spirits for its support in the Federal District. By 1858 there were 33 of these schools in Mexico City and the outlying areas.

It is interesting to note that Comte said nothing about primary education. He felt that the education of a young child (theological period) should not be formal or systematic and scientific, but that it should include such subjects as literature, drawing, music and foreign languages. Barreda, on the other hand, thought that the child in the primary school should be initiated in the scientific method. 21

The ideas of Barreda on primary education were incorporated in a report which he delivered to a committee in 1875 of which he, Ignacio Ramírez, Rafael de la Torre, Guillermo Prieto, and Roberto Estava were members. This group shared the same views on education. In this report, Barreda stated that it was well understood that the greatest obstacle to the progress of Mexico was illiteracy; that the lack of education among the people is what makes them passive and unconscious instruments of exploitation. 22

According to statistics there was an intimate relationship between illiteracy and criminality and misery. And, if important functions such as serving as electors and on juries


22 Gabino Barreda, Algunas Ideas respecto de Instrucción Primaria Presentadas en forma de Dictamen por Gabino Barreda, a la Comisión que fue nombrada en una junta de Amigos reunidos con el objeto de promover lo que pudiese ser útil para difundir la Ilustración en México Aprobado por dicha Comisión tanto en lo general como en lo relativo a la parte resolutiva con que termina (México, 1875), p. 5.
were to be performed by the illiterate masses, a national catastrophe could take place. Public opinion is not worthy of its role if the people are not educated. The only solution to this problem is public and obligatory primary education.\(^{23}\)

Barreda reiterated that "positive utility was the true touchstone in legislation as in any other matter." He defended obligatory public instruction on the basis of "convenience," "progress," and "social stability," even if it is a "restriction of individual and even domestic liberty." "If we admit that it is useful and convenient we should not worry as to whether or not such an obligation seems contrary to the principles of liberty." Barreda answered the doctrinaire liberals who claimed that obligatory, primary education was irreconcilable with personal liberty, the independence of the family, and the rights of man, by saying that the rights of society were more important than the rights of the individual. He defended his thesis on the basis of the previous acceptance of many acts that originated from eternal principles of justice and moral and natural law, even though they limited liberty. The Ten Commandments, stated Barreda, "are conditions of order and stability for any society, because they guarantee the existence and security of the individual and the family." When the social state demanded positive obligations for stability never did it vacillate in preserving them even if it

\(^{23}\)Díaz Covarrubias, op. cit., p. xv.
meant fighting for one's country, endangering life and property, or the risk of falling into slavery. Social interests, said Barreda, always predominated. "The individual liberty of the citizen has decreased in proportion to the obligations imposed upon him; however, he has gained in pleasure, security and guarantees." Science has demonstrated that primary education has contributed not only towards the development of civilizations, but it is a necessary assurance for the existence and progress of present-day societies. The conclusion is, then, according to Barreda, that the government is obligated to impose primary education on everyone. "That which does not progress through necessity will regress. This regression will mean national as well as individual suicide. Can Mexico commit suicide in the name of the principle of liberty?" For the North Americans, the most practical people in the world, illiteracy is death. Therefore, they are daily more satisfied in having overcome all scruples against compulsory education. Barreda quotes Edouard René Lefebvre de Laboulaye, a French historian, who in his Instruction publique et le suffrage universel asserted that an "illiterate democracy is a condemned democracy." In objective and practical education, said Barreda, lies the remedy for "true regeneration" because in it all the faculties are exercised and benefitted.²⁴

²⁴Barreda, op. cit., pp. 6-18.
Unfortunately, the Law of 1867 said nothing with regards to method. However, part two of the "Report on Primary Education" which Barreda delivered in 1875 dealt with this aspect of education. For Barreda method was of utmost importance. The problem of education cannot be solved by merely increasing the schools, modifying the program and increasing or eliminating certain courses. The general method of instruction in the primary schools of the Mexican republic was the Lancastrian, also known as the mutual and simultaneous, system, which was predominant in all civilized countries. By this method the abler students, known as monitors, were taught each lesson by the master and they in turn taught the same lesson to groups of other students. A large number of students could receive simultaneous instruction in one room. The child was stimulated by the fact that he was serving as both a teacher and a student.

Barreda said that:

... the best method is the one that best advances the education of the rising generation which will form a society of men and not of machines, or persons capable of seeing things as they are and not as they want them to be.

He was opposed to a method based on faith, whereby force, threat, and punishment, rather than conviction, obligated others to one's opinions. The old method concentrated on memory. It was merely

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an accumulation of previously formulated abstract principles and conceptions, presented to the child to memorize by way of definitions, axioms, or rules. The child was taught ideas and abstract rules before examples, axioms before experiences, and definitions before concrete examples. This purely mechanical method weakened the intellect of the child. He searched constantly for authorities rather than for proofs, texts, and facts. Barreda attacked purely deductive logic which he said did no more than teach one to interpret formulated propositions without manifesting the truths clearly implicit in them. Thus, the scientific evolution in education, differing from the old metaphysical approach which consisted of starting out with a general principle, consisted in observation, followed by abstraction and generalization. The demands of the modern world—the world of work, industry, and of the definitive influence of the positive sciences—were the basis for the changes taking place in the primary education. 26

The theory of Barreda was that the teacher should, after having sufficiently awakened the curiosity of the child, allow the child full liberty to make his own observations instead of doing it for him. He insisted that explanations be tempered to the student's capacity, and "strictly sustained by facts." He granted, curiously enough (because it contradicts his whole system of philosophy), that while some of the beliefs of the

pupil may be transformed into convictions, the student should be made to see that other beliefs must be taken on faith from those who know more than he.27

In the art of education, Bareda said that two points should be kept in view: 1) the end; and 2) how to obtain that end. Education should be well-rounded. It can have one of two objectives: to develop all the faculties and talents of the individual; or, to thoroughly develop one at the expense of others. Our moral existence is composed of two classes of inclination, some recognized as good and advantageous for everyone; others as bad and harmful. One's objective should be to strengthen the first and weaken or eliminate the second.28

According to Bareda, this is not the case with intellectual growth, which demands that all the faculties be strengthened, stimulated, exercised and guided because they are all indispensable. To observe, analyze, generalize, denominate or name, describe, define, classify, and finally, to reduce and deduce, are activities required in our practical and speculative life. Without induction and deduction, that is, without inference based on antecedents, there is no foresight and without foresight not even the most trivial matter can be accomplished. But neither are induction and deduction possible without a combina-

tion of the other mental operations. It is necessary that the cultivation of the mind be complete and universal.\textsuperscript{29}

It is not necessary, said Barreda, to make philosophers out of everyone, but it is necessary to form a generation of logical, practical men, who know the natural connection of facts to themselves, and to their relations with the world about them. This inflexible logic, this invariable connection between the real antecedents and their effects, is what primary education tries to inculcate. The child should be made to feel the real harmony which has satisfied his imagination up to the present. Objective and practical education is the only remedy. During the period of mental cultivation one should employ all his faculties and not just one. This retards fatigue, permitting the prolongation of each lesson without cerebral exhaustion. Before a lesson becomes uninteresting for a student, he should abandon it if it does not cause irreparable damage. The spontaneous tendencies of the activities of a child are those which should be aided and encouraged. Children, said Barreda, have as much of an affection for examining material objects as they have a repugnance for purely ideal conceptions. Every lesson should be opened with the presentation of material objects. It should be interesting as well as useful for the child. After each abstract synthesis, one should return to the completely objective method. It

\textsuperscript{29}Ibid., pp. 28-29.
is common knowledge that those children who arrive at a notion of the anterior world through a single sense are never satisfied. They need to use as many senses as possible and only then can they concentrate their attention for any length of time. This irresistible tendency, once considered as a defect by the old pedantic pedagogs, has received full approval through the progress of modern physiology. Children should begin their education with things and not with signs or words.  

In Mexico, as elsewhere, the chief difficulty in introducing the Comtian system was the lack of capable teachers. Intelligence, prudence, and a solid education were requirements to fulfill such an important social mission. It was not necessary to be an intellectual in order to be a primary school teacher, but it was impossible for a primary school teacher to fulfill his obligations without a solid education in each one of the sciences. A preparatory school education was sufficient provided that the person had a year of teaching experience based on scientific principles. The teacher should be capable of developing the faculties of the child, making the child analyze in order to arrive at generalizations, making the child describe these generalizations by comparing them to other known objects, define them, etc. In other words, the teacher should do no more

\[30\] Ibid., pp. 32-37.
than help the student, not do the work for him.\textsuperscript{31}

Martínez de Castro, Minister of Justice and Public Instruction under Juárez, maintained that the success of the new law depended upon capable teachers. There were more than eight thousand primary school teachers in the Mexican Republic in 1874 (there should have been, according to Díaz Covarrubias, eighteen thousand), of which one-fourth were women. Probably, said Díaz Covarrubias, not more than two thousand of these teachers had degrees or even the most essential qualifications for a primary school teacher. Good teachers should be paid a salary to satisfy the necessities of their profession and, while the law fore-saw this, it was impossible to enforce it because of a bankrupt government. In many places teachers were being paid less than seven pesos a month. The maximum salary (which was exceptional) was eighty pesos a month. In addition there were not enough training schools for teachers. Only six states had establishments that came close to a normal school: namely, Durango (one for men), Guanajuato (one for men and one for women), Nuevo León (one for men), San Luis Potosí (one for men and one for women), Sonora (one school for both sexes), and one for the Federal District. Díaz Covarrubias criticized these normal schools for their lack of method and scientific courses.\textsuperscript{32}

\textsuperscript{31}\textit{Ibid.}, p. 40.

\textsuperscript{32}Díaz Covarrubias, op. cit., pp. lviii, cv-cxxii. Salaries of primary school teachers in the United States ranged from $25 to $150 (dollars) a month.
Certified teachers were divided into three classes. A class one certificate required a primary and secondary education, a theoretical-practical examination on teaching methods, and that the applicant be a person of good habits and manners. A class two certificate required the applicant to withstand an examination to prove that he was sufficiently qualified in reading, writing, Castilian grammar, arithmetic, including the metric system, physical and political geography, and national history, that he have good habits and manners, and that he have at least six months teaching experience. To possess a class three certificate, one was required to possess the same qualifications as for a class two certificate. The examining jury was to decide as to whether or not a class two or a class three certificate should be issued. No school receiving public funds could be directed by a non-certified teacher.33

The states little by little followed the direction of the Federal District. But they too lacked sufficient schools, money and personnel. During the reorganization period, 1867-1875, more than half of the states of the Mexican Republic had established obligatory, primary education by law. Those where it was established included: Aguascalientes, Chiapas, Coahuila, Campeche, Guanajuato, Guerrero, Jalisco, Michoacán, Morelos.

33 Barreda, op. cit., parte tercera, p. 48. Apparently certification was not required before 1867. There is no mention of it in the Law of Education of 1861.
Nuevo León, Oaxaca, Puebla, Sinaloa, San Luis Potosí, Sonora, Tlaxcala, Veracruz, Distrito Federal, and Baja California. It was only a matter of time before primary education would be established in all the states.\textsuperscript{34}

The great problem in trying to effect primary, compulsory education was due to the fact that a large number of people was scattered a distance from the centers of population and did not have a school to go to. When Díaz Covarrubias was Minister of Justice and Public Instruction he urged the implementation of the Law of January 24, 1868, whereby the hacendados were made responsible for educating their people and the municipalities were responsible for the towns of minor importance. Each municipal association was to obtain the necessary funds through local taxes. This, according to Díaz Covarrubias, was the secret of the 125,000 primary schools in the United States.\textsuperscript{35}

Díaz Covarrubias in 1873 asked the state governors of the Republic to collect statistical information concerning public education during the period of the Restoration. Although the data were not complete, it did present an idea of the educational conditions of the period. It was published in 1875 in a book entitled \textit{La Instrucción Pública en México}.\textsuperscript{36}

\begin{itemize}
\item \textsuperscript{34} Díaz Covarrubias, \textit{op. cit.}, pp. 11-111.
\item \textsuperscript{35} Ibid., p. vii. See Appendix C, p. 167.
\item \textsuperscript{36} Ibid.
\end{itemize}
Primary education in Mexico was mainly in the hands of the municipalities. State governments directly supported and administered few schools. Also, the number of schools supported by the clergy and religious orders was small. The Catholic clergy, according to Díaz Covarrubias, preferred to dedicate itself to secondary education, because it probably felt that it could obtain more benefits in this way; the child could receive religious training in a private school where tuition was paid; and the fact that many Catholics of the educated class were lukewarm while many members of the lower class were indifferent towards religion. All religions were free to open schools in Mexico, but since Protestantism had not had a great response in the midst of a strong Catholic tradition, there existed only ten Protestant schools.37

Considering the illiteracy which could not appreciate the benefits of an education and progress, the Law of January 24, 1868, tried to stimulate primary education with sanctions. Small awards were given to children who attended school punctually. The parents who could not prove that their children had received or were receiving a primary education were not eligible for

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Some states established penalties of arrest and small fines. The states of Aguascalientes, Chiapas, Campeche, Michoacán, Jalisco, Morelos, Nuevo León, Oaxaca, Sinaloa, Veracruz, San Luis Potosí, and Guerrero imposed monetary fines or arrest on parents, tutors, or other responsible persons who denied the child a primary education. Puebla and Coahuila considered this violation as a crime to be punished by police fines. In Sonora, as in the Federal District and the territory of Baja California, the laws established certain inducements through awards to children who attended school punctually or penalties which prevented parents from taking public employment if they could not prove that their children were receiving a primary education. Since this last plan was not effective, the government asked Congress to replace it with fines and arrest. Although Mexico did not have the problem of many of the industrial nations where manufacturing employed a great number of the children between the ages of eight and fifteen, the lower classes, according to Díaz Covarrubias, nevertheless needed some type of compulsion to educate their children. The Organic Law was for the first time supported by the strength of public power. Díaz Covarrubias stated that the "principle of obligatory primary education, which aroused such great opposition in Mexico and other civilized

countries, has finally triumphed. "39

In conclusion, the general recommendations of Barreda included the following: compulsory education for everyone in the Republic between the ages of five and thirteen; the imposition of monetary and other penalties for the violation of the above law; opportunity for part-time attendance for those employed; the maintenance by the municipality of at least one school for every five hundred inhabitants; a supervising Junta to administer the funds; a statement every seven years by the political authority of the ministry of instruction, which must always consist of at least reading, writing, arithmetic, elements of natural history, and gymnastics; classification of teachers based on preparation; and the selection of certified teachers only for schools sustained by public funds.40

In order to appraise the achievements of Barreda in primary education, it is necessary to bear in mind his positivist goal, which did not stress the development of a "population of wise men and philosophers," but rather a "generation of logical, practical men. . . ." It was the purpose of the Law of Public Instruction of 1867 to encourage education in order to strengthen the nation.41

39 Díaz Covarrubias, op. cit., pp. xi-xiii. Apparently an honest effort was made to enforce these laws, since the number of schools increased from 5,000 in 1871 to 8,103 in 1875.


41 Barreda, op. cit., parte segunda, p. 29.
CHAPTER IV

THE LAW OF PUBLIC INSTRUCTION OF 1867 AND ITS REFORM OF 1869:
THE NATIONAL PREPARATORY AND PROFESSIONAL SCHOOLS

The Law of Education of 1833 set a pattern for the preparatory and the professional schools created by the Law of 1867-1868. The idea behind the 1833 plan was to unify the courses in a hierarchical order. The university, described as "useless," was suppressed and in its place were created six schools of specialization, including a preparatory school in the Hospital de Jesús; a school of philosophy and letters in the Convent of Camilio; a school of physical and mathematical sciences in the Mining School; a school of medical science; a school of jurisprudence in San Ildefonso; and a school of ecclesiastical sciences in the Colegio of San Juan de Letrán. Also, the Law of 1833 decreed the establishment of two normal schools, one for men and one for women. Although this law did not legally stay in effect longer than July 31, 1834, its ideas were not forgotten. Numerous attempts were made to imitate it, but of no avail.\(^1\)

In 1834, when the Centralist government of Santa Anna

again took over the government, a new law of education was promulgated. Santa Anna said that the law of 1833 was not progressive enough. He also criticized the liberal attack on property. The new law reestablished the Colegios of San Ildefonso, San Juan de Letrán, San Gregorio, the Mining School, and the University. The students of the Colegios (not including those from the Mining School) went to the University to complete their studies, because only the University could issue the degrees of bachiller, licenciado, and doctor. The law of 1834 differed from the previous one in that it eliminated history and the natural sciences. There were, however, chairs of the history of law, the history of medicine, and the history of the church. In addition, zoology was taught in the University and botany was taught in the Colegio of Medicine. Furthermore, the philosophy course which was taught in the Colegios also showed some signs of the "scientific spirit." The following courses were taught in the order listed: logic, the principles of mathematics, general and special physics, metaphysics, and ethics. Thus, generally the objectives of the law of 1834 were the same as those of the previous one. Only the methods and organization were different.²

The Enabling Act of December 1842, which made effective

²Edmundo O'Gorman, "Justo Sierra y los orígenes de la Universidad de México, 1910," Seis Estudios Históricos de Tema Mexicano (Jalapa, 1960), pp. 153-155. A colegio was a school founded by the Jesuits where they educated people for university level work.
the Centralist (Conservative) Law revising primary education, contained another idea that the Liberals called their own. There was to be freedom of instruction in the Normal School providing that this freedom did not oppose religion, good habits, the present political institutions, and the laws in force.\(^3\)

In 1843 a new Centralist government promulgated another law of education. It contained two characteristics that will be taken over by the Law of 1867: uniformity of preparatory studies for the four careers of law, church, medicine and natural sciences; and the teaching of scientific courses (mathematics, physics, chemistry and biology), alongside of metaphysics, theology and philosophy, which the positivists will eliminate in 1867. The law did not require a student to enroll in the University to take his advanced courses (which he was to do on his own); however, the University did reserve the right to issue the degrees of \textit{bachiller, licenciado} and \textit{doctor} after the student had taken the corresponding examinations.\(^4\)

This same law also created the School of Agriculture and the School of Arts and Crafts. In 1853 the Centralists established a practical School of Mining and Veterinary which, combined with the School of Agriculture, resulted in the National \textit{Colegio}

\(^3\)Ibid., p. 153.

\(^4\)Ibid., pp. 158-160. The Preparatory studies were taken in the \textit{Colegios} of San Ildefonso, San Gregorio, San Juan de Letrán, the School of Medicine and the School of Mining. The University existed in name, but that was about all.
of Agriculture. In January 1854 the School of Commerce was established. 5

In December 1854 the Centralists promulgated their last law of education, which was to replace the one of 1843. The preparatory studies, which were to be taken over a period of six years, served as a basis for advanced studies. Preparatory studies were divided into the three-year periods. The first was called "Latin and Humanities." It included Latin grammar, Castilian, Church history, world history, with emphasis on the history of Mexico, and literature. The second period was called "Fundamental Studies of Philosophy." It included psychology, logic, metaphysics, religion, moral philosophy, mathematics, experimental physics, notions of chemistry, notions of cosmography, geography, French and English. This law also outlined higher education for the four faculties of philosophy, medicine, jurisprudence, and theology. It is interesting to note that the conservatives (Centralists), who had always been accused of having an antiquated educational system, insisted upon the study of the positive and exact sciences alongside the humanities and religion.

In 1856 a Liberal regime was again imposed upon the country. The president, Ignacio Comonfort, promulgated several

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5 Ibid., p. 160.
6 Ibid., pp. 161-164.
laws orientating education towards the new regime. For example, on April 3, 1856, there was established a Colegio of Secondary Education for Girls, which included in its courses a chair of religion and Christian and social morality. It specifically avoided using the word "Catholic." Special emphasis was placed on practical courses such as arts and crafts, agriculture and mining. History was becoming more nationalistic; in the Normal School there was a course entitled "History of Heroes" and in the Secondary School for Girls there was a course entitled "Fundamental Principles of the Republican Democratic System." The University was again suppressed because it was considered a stronghold of clerical and conservative influence.7

Juárez, not being able to conform with some of the acts of the Puros (doctrinaire liberals) reopened the University in January 1861. In April 1861, Juárez promulgated the second liberal plan of education. This law provided for the secondary or preparatory and the special schools of Jurisprudence, Medicine, Mining, Arts and Crafts (which included the Conservatory of Music and Voice), Agriculture, Fine Arts, and Commerce. There was no great change in the special schools. But, it is interesting to note that in the Preparatory, besides the ordinary subjects of languages, mathematics, physics, economics, world history and Mexican history, there appeared philosophy, which included every

7Ibid., p. 166.
branch of ideology, logic, morals, and metaphysics (Barreda will eliminate some of these philosophy courses from the Preparatory). Periodical circulars strengthened the secular idea. For example, in March 1863, the Directors of the various schools were warned not to obligate any student to practice religion and neither was any religion to be opposed. Everyone was to have the full liberty to follow the dictates of his conscience. 8

Under Maximilian (1864-1867), the University was again closed. This time it did not open until 1910. Also a law of public instruction was passed in 1865. According to this law, secondary and preparatory education had two important objectives: it aimed at educating the middle class and it was to be a preparation for professional or special schools. This plan consisted of the humanities; the letters; and the sciences: the first, because the humanities train the intellect; the second because languages are indispensable in a country which desires to participate in world affairs; and the third because the modern era seeks reality and the sciences teach man to know that reality. Special attention was given to philosophy, a science which Maximilian felt was little known in Mexico. He said that philosophy was necessary as an intellectual exercise. It teaches man to know himself and by knowing himself he is able to know his obligations towards society, an idea very similar to what the

positivists held. The law of 1865 disposed that secondary education should be imparted during seven or eight years in some establishments of less importance called lyceums and in others of higher rank called colegios. Courses included the Castilian, Latin and Greek languages and their respective literatures, history and geography, natural history, physics, mathematics, philosophy, morals, French, English, drawing, caligraphy, tachigraphy, general history, literature, technology and bookkeeping.

Finally, the enabling act of January 24, 1868, effectuating the law of Public Instruction of December 2, 1867, created the National Preparatory as an independent school. It replaced the Colegio Nacional de San Ildefonso, which, in spite of its serious deficiencies, was one of the chief centers of secondary or preparatory education in the country in the first half of the nineteenth century.

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9Ibid., pp. 169-170.
10Chávez, op. cit., p. 516.
11Manuel Dublán y José María Lozano, "Reglamento de la Ley Orgánica de la Instrucción Pública en el Distrito Federal, Enero 24 de 1868," Legislación Mexicana o Colección Completa de las Disposiciones Legislativas expedidas desde la Independencia de la República, X (México, 1878), pp. 242-254; Agustín Aragón, "El Sr. Dr. D. Gabino Barreda," Revista Positiva, III (México, 1903), 153-154. According to Aragón, Barreda had planned the Preparatory School long before it was actually created. On December 15, 1859, the director of the School of Medicine said in his annual report: "Mr. Gabino Barreda, professor of natural history, made it clear in his speech four days ago... the necessity for a change in preparatory studies." The Preparatory School was located in the same building as the old Colegio de San Ildefonso.
The Preparatory School was the educational center of Mexican positivism for more than forty years. Its purpose was to teach useful, necessary, solid, and positive knowledge, that is, to prepare its students for a "real and effective life" by "developing the whole personality, endowing it with all the talents required of the modern man." The humanities, which had been taught during the colonial period, were disregarded in favor of the experimental sciences. The school was designed as a center of general knowledge, not as a center of specialist or professional training. Two mottos guided instruction in the Preparatory School: "To know in order to foresee, to foresee in order to work" and "liberty, order, and progress," liberty as a principle, order as a means and progress as an end. Through the Preparatory School, the triumphant liberals would establish the order necessary for progress. 12

Anarchy was destroying all the expected accomplishments of the Reform. Barreda attempted to demonstrate how a positive attitude would make anarchy almost impossible. If by means of a uniform preparatory education the Mexican mind could be oriented toward positivism, social order might be achieved. Barreda

The edifice was constructed in 1749 by the Jesuits who were expelled in 1767 by Charles III. Sebastián Lerdo de Tejada, President of the Mexican Republic (1872-1876), was one of the last rectors.

stated that:

... the only way to consolidate liberty, order and progress is through an education which omits no important branch of the natural sciences. ... an education which studies all the phenomena of nature, from the most simple to the most complicated. ... an education which studies fundamentals and successively analyzes them from a theoretical as well as from a practical point of view. ... an education which cultivates both our mind and our feelings. ... an education which does not force upon us certain opinions, political beliefs, or religious dogmas. ... an education which will permit us to escape the fear of contradicting some authority. ... an education that seeks real truth and not what we think truth should be. ... Such an education will be the surest prelude to peace and social order, for it will place all citizens in a position to appraise all the facts in the same way, and therefore all opinions will be uniform as far as possible. ... 13

The reasons just mentioned, continued Barreda, "are not the only ones that justify the same type of preparatory education for everyone; there are also logical and practical reasons, which are important from a social as well as from an individual point of view." 14

"The intellect of man," said Barreda, "is and always will be the mover of all his acts." Positivism would teach the Mexicans how to establish order--mental and social--order in their own minds being an indispensable presupposition of the direly needed social order. Barreda, like other positivists,

14 Ibid., p. 31.
believed that differences of opinions stemmed from appeals to contradictory ultimate standards. If everyone were taught to accept the same criterion of truth (in this case what is empirically demonstrable), a unanimity of ideas would result that would be the basis of a real social order.\textsuperscript{15} Basing his reforms on this principle, Barrada sought to universalize the curriculum for all students and to minimize such specialization as would yield differences of criteria. He cast the school in the mould of Conte's schematization of the sciences. The special bachelor's degrees were abolished and the preparatory for all professions was made uniform. All students, irrespective of the profession upon which they were to embark, took the same courses and were provided the same methods of instruction because "all tend toward the same end which is social well-being." Under the old system preparatory studies for each career varied. Students had a great deal of freedom in choosing the courses that they wanted to study. This system introduced much disorder into the establishment. According to Barreda there should be a "perfect harmony and homogeneity with respect to the subjects taught as well as to the methods and procedures of examination."\textsuperscript{16}

He stated that:

\textsuperscript{15}Ibid., pp. 26-28.

\textsuperscript{16}Ibid., pp. 26-28.
... it is necessary that there be a common body of truths to serve as a point of departure, more or less deliberate, but constant so that practical conduct, inasmuch as it is possible, may be sufficiently harmonious with the real necessities of society. This body of truths, which must serve as a point of departure, should be general [the same for everyone] and encyclopedic [comprehensive], that is, learned by taking courses in a hierarchical order because some courses are requirements for other courses in nature so that nothing of importance may be inculcated on our minds without first having been submitted to a discussion, though superficial, sufficient to permit us to know its fundamental truths.17

The plan of education of the Society of Jesus, said Barreda, was a failure because it was not encyclopedic. The Jesuits omitted much practical knowledge because it either conflicted with the dogmas and doctrines of the church or because of their lack of scientific understanding. Their system of education therefore never resulted in "unity of doctrine and homogeneity of opinions."18

Disordered education, said Barreda, had such bad results that:

... persons of equal intelligence and capable of reasoning with equal precision arrive at conclusions diametrically opposed and likewise they come out with opposite practical results. Thus, one can explain the diverse religious and political beliefs. Thus, one can explain, finally, the complete anarchy which presently

17 Ibid., p. 23.
18 Ibid., pp. 28-30.
reigns in minds and in ideas and which is being incessantly felt in the practical conduct of everybody.\textsuperscript{19}

Barreda felt that education should do more than impose determined ideas or dogmas: it should destroy prejudices. "By educating all Mexicans in the same way, all race and class distinctions will soon be eradicated and bonds of intimate fraternity will be promoted."\textsuperscript{20} He stated that:

\textit{... this permanent perspective of being able to transform pure science into conviction, into a faith in demonstration, is not a living and incessant stimulus for learning, but also it becomes the best defense against tyrannical intolerance. He who is certain of being able to convince will never be tempted to impose a belief by force; he will be able to sympathize with him who does not have the aptitude to understand demonstration, but he will never persecute him; he will be more or less inclined to instruct him, but not to exterminate him.}\textsuperscript{21}

Barreda's claim that the longing of the positivist in face of opposition would be to "instruct" rather than to "persecute" might explain why positivism entered Mexico by way of education.

Prior to the Law of 1867, one was familiar only with what was intimately connected with his profession. For example, a doctor might be well versed in the natural sciences, but he knew nothing of man's moral life; a lawyer might be well versed

\textsuperscript{19}Ibid., pp. 27-28.

\textsuperscript{20}Ibid., p. 65.

\textsuperscript{21}Ibid., p. 183.
in moral matters, but knew nothing of man's physical nature. Barreda attempted to develop the intelligence of the students. He did not want to prepare uncultivated professionals. Therefore he proposed a general preparatory plan of education whose end was not meant to be immediately applicable. The Preparatory School was to teach the different scientific theories, inasmuch as they were general, in order to prepare the students for professional and special schools. According to Barreda it was preferable that society have few, good lawyers, doctors and architects than many bad ones and although a student did not finish his career, well performed preparatory studies would be of great use in his life.

The philosophy of Comte was to be realized through the creation of a public and free establishment in which were taught all the laws of phenomena of the exterior world, as well as of man, considered from a triple point of view--biological, sociological and moral--according to their increasing complication and decreasing generality. Positivism was the complete and systematic expression of the peculiar evolution of humanity. The positive system of education was characterized by the general coordination of all the abstract truths, embracing all that is real from mathematics to morality, and all that one needs to know

22Ibid., p. 28.
23Ibid., pp. 46-47.
about the world, about society, and about man.24

Barreda announced that he hoped to achieve:

... the substitution of those five years badly spent in that purely Scholastic and empty education by another five years also, but employed fruitfully. ... in making of ourselves practical men, in the true meaning of the word, and not political dreamers. ... 25

Barreda's educational plan also attempted to form morally good citizens. "Besides his political duties," he remarked, "the citizen has others more important to fulfill—the duties of the moral order, and it is the obligation of the government to train him to fulfill his moral duties even more so than to others." Positivism, for Barreda, was the scientific coordination of sociology and morality. Since man is the element of all society, society demands a corresponding perfection of man. Lacking this perfection, society would have a precarious existence and would soon dissolve. This is why Barreda judged morality, the climax of the scientific evolution, indispensable to the study of man. Man was considered not as an animal of the biological order, but as an element of society, developed by it and through it. For Barreda morality had no connection with religion or philosophy. Man was good or bad regardless of his religious or philosophical beliefs. According to the positive

24Ibid., pp. 23-65.
laws of the biological and physical sciences, Barreda concluded that man by nature possessed good and evil instincts which are exercised through their respective faculties. To attain moral perfection man should develop the faculties that are inclined toward goodness. Those faculties which tend toward evil will gradually subside if they are not utilized. As an example, he cited physical education, which strengthens the muscles that are exercised. With reference to the state's function in training good moral citizens, Barreda had to reconcile liberalism and positivism. He therefore explained what was meant by true liberty. He said that man was not free to do what he wanted as the liberals held, because this would make order impossible. To support his statement, he gave an example from the law of physics.

"When one speaks of a body that falls freely, one is speaking of a body that follows the laws of gravity. . . . Likewise, man follows freely his moral impulses which conduce him toward good or toward evil." Through education the state should try to develop man's good instincts and, consequently, his freedom, through what Comte would call his "altruistic impulses," that is, those instincts which incline man to love his neighbor. To do what one wants, as the liberals believed, was an obstacle to the free development of one's altruistic impulses. Immorality was an obstacle to liberty in a positive sense, because it hindered the free and natural development of the altruistic or positive
feelings which caused humanity to progress. In the Preparatory School, morality, which was to be taught as social ethics, substituted religion in the secular state. The lives of great men were to be imitated. 26

In the letter to Mariano Riva Palacio, referred to on page twenty-three, Barreda explained the course of study in the Preparatory School. "Mathematics," he said, "should be the basis for preparatory studies." The importance of mathematics lies in the method—the deductive method—which they employ. Therefore, mathematics are "true intellectual exercises which are bound to strengthen and develop our various faculties." It is simpler to count and measure, because one counts beings and phenomena without bothering to find out how they are made, what they are, and why they produce certain phenomena. In the dominion of measurable quantities and related unities, one studies arithmetic; for the relationship between concepts of quality in terms of formulas and equations, algebra; measurements, plane descriptive or analytical geometry and plane and spheric trigonometry; quantity in terms of the undefinably small, calculus; quantity in terms of extension and force, rational mechanics. 27

The scientific series continues with the natural sciences.


27 Barreda, "Carta dirigida al Mariano Riva Palacio," op. cit., pp. 31-33.
(cosmography, physics, geography, chemistry and natural history, which is divided into botany and zoology). Mathematics is followed by cosmography or elementary astronomy. Cosmography is the study of the earth as a physical and celestial body, that is, its movements around itself and around the sun, the seasons, the eclipses and the distances and relations of the earth to the other luminous bodies. With the exception of mechanics, this course deals with the most simple phenomena of nature. One employs both the inductive and the deductive method, with the help of mathematics, to draw universal conclusions.  

After cosmography comes physics. Physics deals with the most complicated properties of the body. It is the study of bodily conditions of substances such as gravity, color, light, sound, electricity, magnetism, and atmospheric phenomena, whose composition it does not alter. In addition to observation, one must make experiments, whereby the student uses the inductive method. He also employs the deductive method in the principle discoveries by the use of calculus.  

After physics comes chemistry, which studies the phenomena that alters the nature of bodies. Here the bodily properties are far more numerous and complicated than in the previous course; thus ideas become more complicated and methods more

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28 Ibid., p. 33.
29 Ibid., pp. 33-34.
complex. Here the experimental method is more highly developed and therefore induction is the predominate logical procedure.\(^{30}\)

After chemistry one studies natural history, which relates to the phenomena of living beings (botany and zoology). To examine this phenomena implies a knowledge of the aforementioned sciences. The properties which one analyzes are infinitely and numerically more complicated. Here observation, experimentation, and comparison are necessary to obtain the knowledge which these sciences offer. To train the mental faculties, the school should teach not only the use of the first two methods of investigation, but also comparison, which has barely been touched up to this time.\(^{31}\)

Classification, the most important logical art, is exercised and cultivated by the study of natural history, especially zoology. No other study supplies the necessary conditions, that is, the great variety and the profound and multiple analogies of beings. Because of the complex methods and doctrines which characterize the study of living beings, and the necessity of the aforementioned sciences to comprehend them, natural history has been placed after mathematics, astronomy, the physical sciences and chemistry. In this way one can study the most rational application, the most fruitful results, and another important

\(^{30}\text{Ibid.}, \text{pp. 34-35.}\)

\(^{31}\text{Ibid.}, \text{p. 35.}\)
logical art—the hypothesis.  

Thus, Barreda proceeds from what he considers the most deductive science to the most inductive. In astronomy one uses the sense of sight; in physics the sense of sight, touch, and hearing; in chemistry the sense of sight, touch, smell and taste, almost completely excluding the sense of hearing; and in natural history all the senses simultaneously. Each proven fact becomes valid support for each hypothesis which is successively posited. The method involves a graduated sequence of mental activities. From a deductive operation, as in mathematics, we proceed to observation as in astronomy, to observation and experimentation, as in chemistry; and finally to observation, experimentation, and comparison as in natural history. This method leads naturally from the particular to the general, from practice to theory. Only after observing the workability of an idea should generalizations or theories be formulated. Thus courses are arranged to lead from the most practical to the most theoretical. Given the same situation, all students, by employing sane methods of inductive reasoning should arrive at conclusions fundamentally similar. The method was designed to discover truth of general universal validity and, what was just as important, to permit the application of these to the social order.  

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32 Ibid., p. 35.
33 Ibid., pp. 34-35.
34 Ibid., pp. 36-38.
The aforementioned sciences will permit the student to form a notion of the universe, to observe and experiment in particular cases, to form the concept of a law by generalization, and to learn to reason inductively and deductively. The graduation of scientific knowledge, from the simple to the complex, will prepare the student to know his surroundings so that he can take advantage of the products of commerce and industry. By the study of society the student can better understand his origin, and, in view of the ethnic knowledge of the races, he can aim toward improvement. With the self-confidence and skill demanded by stability and progress, he will be sufficiently prepared to fulfill his respective social functions.\(^{35}\)

The study of history and geography were left for the third and fourth years. To understand geography one needs a knowledge of cosmography; otherwise all the notions about poles, parallels, meridians and climates are entirely premature. History is placed after geography, or concurrent with it, because then the study of both will be easier and more interesting.\(^{36}\)

The greatest novelty of the Barreda plan was that of requiring students to take logic the last year of their preparatory studies whereas previously it was an introductory course. According to the old system students learned to draw universal

\(^{35}\)Ibid., p. 36.

\(^{36}\)Ibid., pp. 35-36.
conclusions through abstract rules of the syllogism. But, when they began to study the positive sciences and the phenomena of nature, they discovered, said Barreda, that the syllogism had taught them no fundamental truths. The deductive method repeats what is already known; the inductive method looks for new propositions. Deduction, said Barreda, supposes what our forefathers prophesized through revelation or intuition; induction observes, experiments, and generalizes in order to advance the sciences through general truths of which our forefathers never dreamed. The natural sciences establish and perfect the inductive method by research and discovery. Only through a conveniently linked unit of studies can one duly conciliate theory and practice, the abstract and the concrete.\(^{37}\)

To over-emphasize observation and experimentation is also a mental sickness. Its chief symptom lies in judging scientific questions which one does not understand. The study of the sciences is the best way to gradually eliminate both the abuses of inductive generalization and exaggerated deductive rationalism. The preparatory is therefore designed to train the student to use the inductive-deductive method to discover truth and formulate concepts, which are demanded by theoretical as well as practical necessities. Deduction and induction are collaborators, not rivals; complements, not contradictions. Logic, then, is

\(^{37}\)Ibid., pp. 36-41.
the coronation of all that has been successfully executed through scientific research. As the text for this course, Barreda chose the logic of John Stuart Mill, because it fulfilled the necessary condition of including the abstract and complete exposition of all the methods of logic.38

Like logic, ideology was also to be taught after the sciences. As the study of the most elevated and complicated faculties of man, ideology and psychology cannot be understood without an understanding of the sciences. Metaphysics, stated in the law of 1867 as the history of metaphysics, was only required of lawyers. The positive sciences replaced the chair of metaphysics, which would not again enjoy an academic right in Mexico until the opening of the National University in 1910.39

Other subjects were finally added to facilitate the diffusion of ideas. Everyone had to study French and Spanish grammar; English, with the exception of architects and notaries; Latin, with the exception of engineers; lawyers, doctors and engineers studied Greek; agronomists, doctors, and engineers studied German; architects and sculptors studied Italian.40

Languages were to be taught in the manner in which they were needed. Latin, which was previously studied in the begin-

38 Ibid., pp. 41-42.
39 Ibid., p. 42.
ning, was now required the last two years. Scientific and other important works were no longer written in that language and the student was less apt to forget it and even be more interested in it if he studied it at the end of the course. The modern languages, especially French and English, were important because many text books were written in those languages. Spanish grammar, which everyone had to study, was to be taught the third year rather than the first in order to give the student a more profound and rational knowledge of his idiom. In studying languages, Barreda reasoned that the intelligence of the student should be mature enough to comprehend their usefulness. Because of the analytical character of grammar, its study demands the development of the faculty of abstraction to avoid mere memorization. Since the faculty of abstraction is a gradual development, the delayed study of grammar was justified. 41

The Preparatory School partly filled the gap that had existed between primary and professional education. Previously, secondary or preparatory education was merely a preparation for a profession. The student often wasted precious time by changing majors, because he was not yet qualified to choose a profession in conformity with his capacities and inclinations. But according to Barreda's plan, by the time he finished the Preparatory he would be familiar with all the methods and doctrines that con-

stituted the vast field of science.\textsuperscript{42}

It could not be denied that the knowledge of the fundamental sciences was indispensable for modern intellectual preparation; therefore, the Law of 1867 decreed as preparatory material the study of the thirty-four most indispensable subjects to be taught over a period of five years, grouping them in the most logical order.\textsuperscript{43}

The plan considerably raised the intellectual level of the woman. The Secondary School for Women was a new addition to the Mexican educational system. The studies were arranged for a period of five years and they were the maximum knowledge that a woman could aspire to at that time. Ethics and civic education were replaced by subjects that were obligatory for women, such as arts and crafts, notions of horticulture and gardening, methods of comparative education, duties of the woman in society, and duties of the mother to the family and to the state. Here Barreda followed the positivist thinking of Comte who placed much emphasis on the mother, wife, and daughter.\textsuperscript{44}

The Law of 1867 also planned special and professional

\begin{itemize}
\item \textsuperscript{42} Ibid., pp. 53-56; José Díaz Covarrubias, \textit{La Instrucción Pública en México} (México, 1875), p. cxcix.
\item \textsuperscript{43} Dublán, X. \textit{op. cit.}, p. 194. See Appendix H, p. 172.
\item \textsuperscript{44} Dublán, \textit{Ibid.}; Díaz Covarrubias, \textit{op. cit.}, pp. cxcii-cxcii. The only professional careers chosen by women were those of elementary school teachers and obstetrics. Degrees were offered in both, but often these professions were practiced without degrees.
\end{itemize}
and/or university education. In this field it did not really create anything new, since all the schools had previously existed, but it decreed, organized, and detailed the years of study and the subjects that should be taught each year. It imposed new methods of practical education. This was important because an education well organized and logically oriented would be more useful.\textsuperscript{45}

The School of Jurisprudence, which was located in the ex-convent of Encarnación from 1869 to 1908, offered every branch of law—natural, Roman, civil, penal, constitutional, maritime and international.\textsuperscript{46} The School of Medicine, which was located on the site of the old Inquisition building, offered such courses as botany, pharmaceutical legislation, anatomy, pathology, therapeutics, obstetrics, legal medicine, and the study of medicinal plants.\textsuperscript{47} The School of Engineering, which was located in the old Mining School building, was divided into specialized branches such as: mining, mechanical, civil, topographical, geographical and hydrographic.\textsuperscript{48} The School of Fine Arts, which was located in the old San Carlos Academy building, was also divided into specialized branches: sculptors, painters, engravers and archi-

\textsuperscript{45} Dublán, X., \textit{op. cit.}, pp. 245-251. See Appendix J, pp. 174-178.

\textsuperscript{46} Ibid., p. 245. See Appendix J, p. 174.

\textsuperscript{47} Ibid., pp. 245-246. See Appendix J, p. 174.

\textsuperscript{48} Ibid., pp. 246-248. See Appendix J, pp. 175-176.
tects, with some general and some specialized courses. 49

The Organic Law of Public Instruction created "The National Academy of Science and Literature." It had the following objectives: 1) to encourage the cultivation and advancement of science and literature; 2) to serve as a consulting body for the government; 3) to collect objects and books of national scientists and literary men; 4) to arrange for lectures and give corresponding awards; 5) to publish useful scientific, artistic, and literary information, especially on Mexico. In addition, the Academy was to keep in touch with similar organizations in the states and in foreign countries. The Society of Geography and Statistics was to be part of the Academy. 50

Certified secondary teachers, like certified primary teachers, were divided into three classes. For women to receive a class one certificate from the Secondary School for Women (the equivalent of the Preparatory, which was for men), they were required to withstand an examination in all primary school subjects as well as in all secondary school subjects. 51 A class two

49Ibid., p. 251. See Appendix J, pp. 176-178.

50Ibid., p. 201.

51Dublán, X., op. cit., pp. 197. See footnote 44, page 101 of this study. The Secondary School subjects in which women were examined for a class one certificate were: Castilian grammar; French; Italian; basic algebra; geometry and cosmography; physical and political geography; bookkeeping; medicine, hygiene and domestic economics; duties of the woman in society; duties of the mother in the family and in the State; lineal, figure and ornate
certificate required practically the same as a class one certificate except that the applicant did not have to withstand an examination in Italian and cosmography. A class three certificate reduced the number of courses in which the applicant was to be examined considerably. She did not have to pass an examination in French, Italian, chronology, general and Mexican history, geometry, algebra, physical and political geography, bookkeeping and comparative education. The Law also listed the various subjects which a student had to pass in order to get various types of degrees from the Preparatory School, which was for men the equivalent of the Secondary School for Women.52

Professional degrees were issued by the federal government or by the states. The liberals argued that the individual was denied complete freedom of education if a degree was demanded to practice a certain profession. They gave as an example a carpenter or a plumber whose ability was judged not on the basis of a degree but on the basis of his work. The positivists, on the other hand, argued that if the state did not guide the instruction, examination, and awarding of degrees, one's education would often be incomplete and the practice of the professions could be disastrous.53

drawing: notions of horticulture and gardening; and methods of comparative education.

52 Ibid., p. 198.

In May, 1869, the Law of Public Instruction of December 2, 1867, was changed. The new law eliminated the School of Music and Speech, the Normal School, and the School of Natural Sciences. Instead, there would be a choral teacher in each secondary school and students who wished to go for lessons could do so voluntarily. The Normal School was replaced by a Chair of Methods of Instruction for those who wanted to be public school teachers.\textsuperscript{54} It added a Museum of History and a Library.\textsuperscript{55}

The reform law of 1869 also reduced the number of subjects in the Preparatory School, which was a limited concession to those who desired to reintroduce only those courses leading to the various professions. To simplify the plan, the history of metaphysics, mechanics, descriptive geometry, paleography, shorthand, and bookkeeping were eliminated from all courses. Literature was to be taught without elocution, poetry, and declamation. Universal and national history were combined into a single course. Note that with the absence of metaphysics the Preparatory School contained no more subjects reminiscent of the Scholastic education of the past.\textsuperscript{56}

\textsuperscript{54}Duñlán, X., op. cit., pp. 251, 561-563, 592.

\textsuperscript{55}Ibid., p. 592. Francisco Larroyo, \textit{Historia Comparada de la Educación en México} (7th ed., México, 1964), p. 240. By a decree of November 30, 1867, the National Library was reorganized. It was to be located in the old San Agustín Church. In addition to the books which belonged to the library through previous laws those of old convents and the Cathedral Library would also go to it. The National Library was first established in 1833.

\textsuperscript{56}Duñlán, X., ibid., pp. 591-601. See Appendix I, p. 173.
The Law of 1869 added a year of geometry and eliminated one year of Latin to the preparatory legal course. The two Latin courses were now taught the fourth and fifth years. From the preparatory curriculum of notaries, literature and paleography were eliminated. To the preparatory course for those who wanted to be pharmacists, geometry was added. Latin was reduced to only two courses, and German and trigonometry were eliminated. Preparatory agronomy students no longer studied German, literature, chronology, history and geometry. Preparatory architect students no longer had to study Italian. Five years instead of four were assigned for the preparatory studies of engineers. German, a second year of which was added to the engineering course, was taken the last two years of the preparatory.  

By distributing the courses on an annual basis, and by cutting down the number of courses so that students of limited resources would not be held up too long, the preparatory students were obligated to take simultaneously a number of courses which should have been taken successively. For example, the study of cosmography, physics, and mechanics were prescribed for the third year; however, it would have been preferable to study mechanics first and then cosmography, followed by physics, in their hierarchical order.

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In special and professional and/or university education there were not many changes worthy of mention in the new law of 1869. In the School of Jurisprudence, political economy was to be taught as a separate course and canon law was to be eliminated. 59 The School of Agriculture discontinued zoology. Also, it was no longer necessary for a student in the School of Agriculture to work his fourth year on an hacienda in the Tierra Caliente. A few courses, such as geology, arboriculture and notions of gardening were added. 60 The School of Engineering eliminated botany, zoology, and hydraulics. Architectural engineers now took part of their courses in the School of Engineering and part of them in the School of Fine Arts, whereas according to the Law of 1867, all courses had to be taken in the latter. Architecture was no longer part of the School of Sculpture, Painting and Engraving. 61 The School of Arts and Crafts, located in the old Convent of San Lorenzo, added a fifth year. French and English were eliminated, but descriptive geometry and machine drawing, plus a second year of algebra were added. Practical shop experience in industrial inventions and work with arts and crafts was prescribed annually, while in the previous law shop experience was left to the discretion of the director of the

59 Dublán, op. cit., p. 561. See Appendix K, p. 179.
60 Dublán, ibid., pp. 246-247, 562, 757. See Appendix K, p. 179.
In the School of Commerce, now called the School of Commerce and Administration, which was located west of the Mining School in the Terceros Hospital building, a course on general principles of law on judicial and administrative procedures was replaced by a course in administrative law wherein the student would learn the present legislation of the Secretaría de Hacienda and the Secretaría de Guerra. Besides, French, English and German would be taught and a practical course in commerce was anticipated with the opening of a new Museum of Commerce. It is interesting to note that while religion was no longer part of the plan of education, students in the School of Deaf Mutes, which was located in the former Corpus Cristi Convent, had to take a course in catechism and religious principles. The changes made by the Law of 1869 did not really contradict the plan of Barreda; in fact, the Law of 1869 confirmed the positivist plan by eliminating metaphysics and canon law from the preparatory course. Yet, Barreda was not satisfied with the law. In his letter to Mariano Riva Palacio, he stated:

... In that law [May 15, 1869] and in the Enabling Act of November 9, 1869, there is still a distinction in the preparatory studies for each career. This distinction I want to do away with....

62 Ibid., pp. 250, 759. See Appendix K, p. 182.
63 Ibid., pp. 198, 562-563.
64 Ibid., pp. 196, 594.
For ten years (1868-1878) Barreda directed the Preparatory School in the face of much opposition. Before the Law of May 15, 1869, was hardly approved, it was attacked and criticized. The new reform could be seen by many as a dangerous utopia. Except for the young under-secretary of state, José Díaz Covarrubias, who was director of the Ministry of Public Instruction for many months, the rest of the Cabinet of Lerdo de Tejada opposed the positivist reform in education. The President who for many years had been in charge of the Colegio de San Ildefonso under an exclusively clerical regime, had a traditional education. He was ill-disposed toward the new law of education as well as toward a program which had abolished religious instruction. 66

In the following chapter we shall take up the various criticisms against positivism in general and against the Preparatory School in particular.

CHAPTER V

CRITICISMS OF THE PREPARATORY SCHOOL AND OF POSITIVISM

Toward the end of 1870 a new Congress asked that the Law of Public Instruction be abolished, alleging that the results of both the Law of Public Instruction of December 2, 1867, and the one of May 15, 1869, were unsatisfactory. It was suggested that Mexico return to the educational law of 1843, which generally conserved the institution created by the Law of 1833, with the exception of the preparatory studies. The present plan of studies, said Deputy Valente Baz, resembles the one of Maximilian, that is, it is a plan of studies for which only a few privileged people have a capacity, since "kings want the people to be ignorant so that they might maintain their power."¹

Besides the Conservatives, who found in Barreda a personal enemy, the Liberals, led by Guillermo Prieto, were also trying to free themselves from the Positivists. Deputy Charles Pacheco proposed the suppression of the Preparatory School, because he felt that it was administratively and financially im-

possible to establish the agencies necessary for its dissemination. Finally, it was agreed that either the Executive or the Chamber should formulate a project, which would be discussed by the Chamber.²

In his letter to Mariano Riva Palacio, Barreda answered the charges against the Preparatory School by demonstrating the great improvements made by the students. He defended himself against the charge that his plan was similar to the Lyceum of Maximilian when he said:

... order and logical succession form a manifest contrast to that 'Spanish stew' which was called a plan of studies during the time of the intervention. Only bad faith or haste could confuse such contradictory plans. ... Never in any establishment in our country has there been a course of studies presenting the physical and natural sciences as complete and as practical as has the Preparatory School during the three years of its existence. Each year more importance is attached to it in spite of the notorious shortage in the treasury. Positivism is applied to all studies, producing in the students an enthusiasm for the laboratory, broadening their tastes for the study of nature. ... Chemical analysis and experiments of all types form one of the most important elements of progress and diversion of the students in this school.

The study of mathematics, according to Barreda, has been notable. The Academies of Science have perfected their studies on the basis of mathematics so that future engineers will have a more

complete preparation in their fields.\(^3\)

In October, 1872, there appeared a new reform initiated by Juárez himself. The new plan was formulated by a group of liberal ideologists whose idea of education differed from that of Barreda. In an article entitled, "Instrucción Pública," Barreda criticized point by point the educational reform that attempted to annul his own plan of education:\(^4\)

1. The new plan of education said that the law was "to guarantee liberty of instruction prescribed by Article three of the Constitution by requiring no more than an examination to prove one's knowledge and aptitude to practice a profession which requires a degree." This point sustained the concept of absolute freedom of instruction. Implicitly it manifested that the plan of Barreda was doctrinaire and, therefore, a violation of the Constitution which declared that instruction should be secular.

The Liberals who opposed Barreda's plan of education held that a person should study whatever he felt necessary for his career; he should not have to take courses such as Barreda's plan called for that will make him think in a certain way (the Preparatory School was designed to make everyone think alike so that order would be established in Mexico. Order in one's mind was a prerequisite

\(^3\) Gabino Barreda, "Carta dirigida al Mariano Riva Palacio," \textit{Opúsculos, Discusiones y Discursoas} (México, 1877), pp. 53-54.

for external order). Thus the Liberals were undermining the educational control which the Positivists wanted for themselves. Freedom of the student to choose the course which he wants, in the conception of the Liberals, was absolute; in the conception of the Positivists it was subordinate to order. According to Zee:

We know now how Barreda understands liberty when he says that instruction in the Preparatory is free. He means that all the sciences that are taught there can be demonstrated. Since everything taught in the Preparatory School is demonstrable, it is accepted freely. No one can deny the truth whose demonstration leaves no room for doubt. Here liberty is not understood in a negative sense. This is what is done in the Preparatory School; they teach the positive, that which can be demonstrated. There is no freedom to deny, only to affirm.

Nevertheless, Barreda defended himself by sustaining that:

... the law in force anticipates, fulfills and has scrupulously carried out what the Liberals demand in point one since its promulgation. No proof that the student has taken the respective course is demanded, other than an examination in the subject in conformity with the law of public instruction. Every year the examinations are given to an increasing number of students who request them in the different subjects.

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5Ibid., p. 260; González y González, op. cit., pp. 671-672.
By secular was meant that the school should be neutral in religious matters. The state should not impose a certain ideology on the Mexicans.


2. "Division of general preparatory studies for all careers, and special preparatories for each professional science. The first can be accomplished in the National Preparatory School and the second in the respective establishments." The second point of the 1872 reform proposed that those pursuing a profession should not be obligated to study the sciences which are seldom used in their work. Thus the student would immediately begin his professional studies without any previous knowledge of the sciences. This proposal opposed the encyclopedic character of instruction which was established to give the students a common basis for truth. It opposed the thesis of Barreda in which he maintained that all students should know all the positive sciences regardless of what career they pursue. He considered that if this proposal was accepted, which, in fact, it was, that the existence of the Preparatory School would be useless. Barreda felt that the Preparatory School had a greater mission than to prepare professionals, and that mission was to prepare Mexicans to live together as citizens. 8 According to Zea:

... Only this living together will make national order possible. Social order is possible through the unity of criteria that is obtained through encyclopedic and organic instruction. If it attacks this type of instruction, the Preparatory School loses its right to exist. 9

9 Zea, op. cit., p. 147.
3. Increase the special schools. This proposal would call for specialized preparatory courses. Barreda considered it as an attack against order, for, to establish special schools so that each Mexican understands only his field of specialization would, according to Barreda, foment discordance among the Mexicans. Barreda asked:

... What is the advantage in increasing the schools and later the number of professors and other employees? What is the advantage in having two, three, or more schools of jurisprudence, medicine, agriculture, deaf and dumb, blind, etc. ...?  

4. This proposal referred to the abolition of special students. Barreda did not understand what the authors meant in posing this reform. If by "special students" was meant "boarding students," Barreda was all in favor of the reform. This implied that the parents were the ones who, in the home should cement the morality, character, and sentiment of their children. Barreda had tried to abolish boarding schools in 1867, but was only able to decrease the number of students by limiting them to children whose parents lived outside of Mexico City. In 1868 Congress abolished this decree and reestablished the traditional boarding school.  


11Barreda, "Instrucción Pública," op. cit., p. 264. Under the old system of education, the student was required to go to an internado or boarding school. Barreda criticized the Jesuits for wanting to direct the cultivation of the mind as well as to educate the heart, form the character, and to direct the
5. "Secondary instruction was to be free and primary instruction was to be free and obligatory." Barreda defended rather than opposed this point. In fact, it was not really a new proposal. However, he felt that an empty treasury would render free and obligatory education impossible in Mexico.  

6. "The Directive Junta of Public Instruction was to be composed of persons who did not belong to the Board of Practicing Professors." "This disposition," commented Barreda, "signified the loss of all the members of the Directive Junta, because all of them are practicing professors." "They [the authors of the reform] felt," said Barreda, "that any person on the street was better qualified to select texts than those who had consecrated their lives to the honorable profession of teaching and to the study and continued meditation that it demands." This sixth measure was obviously taken because the reform would not be possible if the Junta which was composed of a group of professors devoted to Barreda continued, because this group wanted to conserve the existing order. A good example is the reform of 1869.  

According to Zee:

...inclinations of the children under their care in the boarding schools. See Barreda, "Carta dirigida al Mariano Riva Palacio," op. cit., pp. 59-60.


13Ibid., pp. 268-269.
... the reform of the Liberals proposed to destroy a competing power. The Liberals knew that by eliminating the professors from the 'Directive Junta of Public Instruction' they could destroy the basis of a possible spiritual power which was opposed to theirs. 14

The reform proposals were not published until 1875. After the death of Juárez in 1872, the reform was shelved by Lerdo de Tejada. The Law containing the reform proposals was not passed until 1877, under the regime of Porfirio Díaz and his Minister of Justice and Public Instruction, Ignacio Ramírez. 15

Meanwhile, in October 1873, Congress passed a law which struck a sharp blow at the original plan of preparatory studies. Trigonometry, spacial geometry, analytical and infinitesimal calculus, chemistry, and the biological sciences were no longer required in the preparatory course for future law, medicine and pharmacy students. This law specialized the bachelor's degree, that is, the preparatory school would no longer be the same for everyone. 16 In 1877 Ignacio Ramírez, Minister of Justice and Public Instruction, modified the Law of 1873 when he restored plane trigonometry as an obligatory preparatory course for law, medicine, and pharmacy students and chemistry and zoology for law students. Philosophy was limited to the history of metaphysics.

14 Zea, op. cit., pp. 149-150.
16 Ibid., p. 539.
The professors were to point out the influence of the sceptical schools on experimental and positive methods. The Law of 1877 rendered the laws of public instruction of 1867 and 1869 completely ineffectual.\footnote{Ibid., p. 539; Dublán, XIII, pp. 147-148.}

On January 31, 1877, in order to encourage the study of fine arts, the Ministry of Ramírez adjusted the preparatory program for architects, painters, engravers, and sculptors. Normally one studied four years in the preparatory and six years in the Academy of Fine Arts. All the mathematical sciences in preparation for engineering were listed as preparatory courses, in addition to physics, chemistry, zoology, and botany for painters and lineal drawing, French and English for sculptors. According to the new law, future architects were no longer obligated to study Castilian grammar, botany, zoology, logic and morals in the preparatory, but in the Academy of Fine Arts new courses were added in geometry, mineralogy, and mechanics.\footnote{Ibid., p. 539; Dublán, XIII, \textit{op. cit.}, pp. 152-153.}

In October, 1878, the new Minister, Protasio Tagle, rearranged the mathematics courses in the National Preparatory in view of the difficulty for students to learn them in their present order. He placed them as follows: first year: mathematics; second year: plane and spacial geometry and trigonometry; third year: application of algebra to geometry, spherical trigonometry
and analytical geometry; fourth year: infinitesimal calculus.
The study of mathematics in the third and fourth years was for engineers only.\(^{19}\)

In the latter part of 1878 the agricultural courses were rearranged. These studies had been greatly neglected through the obligatory preparatory studies of Barreda. According to the new plan, the preparatory courses would be the same as those for engineers, excluding cosmography, logic, morals, history, Spanish and literature. The agronomy students were again allowed to study preparatory and professional courses simultaneously, which discontinued the gathering of students in one establishment.\(^{20}\)

The reforms executed during the ministries of Ramírez and Tagle undermined the basic edifice of a successively linked chain. The order of studies was complicated and the bachelor's degree became specialized. Nothing remained of the Preparatory School in its original plan. Nevertheless, Barreda, who taught logic in the Preparatory School until the spring of 1878, was still optimistic about the future progress of the school in view of the results that had been realized in the face of so much opposition. He presented the following report which shows the number of students enrolled in the Preparatory School, the number who took examinations, and the number who passed and failed

\(^{19}\)Dublán, op. cit., XIII, p. 543.

\(^{20}\)Chávez, op. cit., pp. 539-540.
them. Barreda apparently submitted these "notas" while he was
director of the Preparatory School (1868-1878), because he added
a note saying "that the data referring to examinations for 1877
is missing, because it was only received today, December 23,
[1877]." At the end of the "notas" he added information, probably
upon his return from Germany, for the years 1877-1880, inclusive:

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<th>Year</th>
<th>Students Enrolled</th>
<th>Examinations</th>
<th>Passed</th>
<th>Failed</th>
<th>Percentage Failed</th>
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Additional information included later:

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<td>1878</td>
<td>810</td>
<td>1,476</td>
<td>1,278</td>
<td>198</td>
<td>13-1/3</td>
</tr>
<tr>
<td>1879</td>
<td>722</td>
<td>1,154</td>
<td>1,024</td>
<td>130</td>
<td>11-1/5</td>
</tr>
<tr>
<td>1880</td>
<td>880</td>
<td>1,165</td>
<td>996</td>
<td>169</td>
<td>14-1/2</td>
</tr>
</tbody>
</table>

The decrease in the number of students for the year 1879, according
to Barreda, was due to the small number of scholarships that
were assigned to the Preparatory School by a decree of January 1,
1879. At the same time, a large number of scholarships were as­
signed to the School of Agriculture which resulted in many stu­
dents enrolling in that school.22 The considerable increase in

21 Barreda, "Notas," Opúsculas, pp. 78-79. "Notas" was
attached to Barreda's letter to Mariano Rivas Palacio (1870) with
no explanation of any kind whatsoever.

22 Ibid., pp. 78-79. See information covered by footnote
20, p. 117.
the number of those who were examined resulted from a decree issued by the Secretary of Justice and Public Instruction, January 31, 1878, which stated that no student could take an examination in any course without having first passed examinations in the courses that preceded them in the hierarchical plan. This also included students in the professional schools. The increasing number of failures for 1878 and 1879 was due to a decree passed January 28, 1879, which modified some of the articles in the Law of Public Instruction. The modification consisted in increasing the number of questions and in extending the length of time of the examinations for those who had a certain number of absences during the school term. 23

Barreda was removed from his post as director of the Preparatory School in the spring of 1878 when the government of Porfirio Díaz sent him to Berlin as resident minister. Thus he was separated from his school and from the teaching profession. 24

On October 14, 1880, the logic texts of John Stuart Mill and Alexander Bain were replaced by the text of the spiritualist, Karl Krause, which contained the eclectic logic of G. Tiberghien and Paul Janet. The attack against the logic of Mill came from the Conservatives as well as from the Liberals. Both united

23 Ibid., pp. 78-79.

against the text which they said impeded freedom of thought. By reducing the possibility of knowing matter, it implicitly attacked the Catholic religion. Besides, it occasioned a moral relaxation.25

On January 21, 1881, the preparatory studies for lawyers were reorganized. All subjects pertaining to the natural mathematical sciences were eliminated. At the same time future lawyers were required to take three years of Latin instead of two. On November 28, 1881, the School of Engineering and Agriculture became dependent on the Secretary of Public Works and Instruction. Thus the Junta of Public Instruction no longer had control of all the educational centers. As the Preparatory School developed, it became more and more an institution for preparing for the professions and less and less one for reconstructing the social order.26

In April, 1881, the Minister of Public Instruction, Ezequiel Montes, published a Law of Public Instruction which was intended to change the fundamental orientation of the Law of Barreda.27 In that same month, for the purpose of maintaining

25Patrick Romáñez, Making of the Mexican Mind (Lincoln, Nebraska, 1952), pp. 54-55. José M. Vigil y Rafael Ángel de la Peña, DisCURSOS pronunciados en las juntas catedráticos celebradas en la Escuela Nacional Preparatoria (México, 1885), pp. 63-64.

26Chávez, op. cit., p. 540.

positivism in the school curriculum, Justo Sierra proposed to the Chamber the reopening of the University, which had been closed in 1865 by order of Maximilian. According to Sierra, the University itself should direct, orient, and arrange the courses and select the texts. The state should intervene only in administrative affairs. This signified that the positivist groups would return to acquire spiritual power, independent of state control, which was what Barreda had desired. At this time, Sierra was a faithful follower of positivism. It was not until many years later that his project was realized. Ezequiel Montes, the humanist minister, and the majority in the Chamber opposed him. Montes was of the opinion that positivism produced men without morals; he considered a positivist education incomplete and fought for the law which imposed philosophical chairs. He felt that

28 Francisco Lerroyo, Historia Comparada de la Educación en México (7th ed., México, 1964), pp. 222, 322-323. The University of Mexico was closed in the years 1833, 1857, 1861, and 1865. From the time that the University of Mexico was established by Charles V in 1551, until its final abolition by Maximilian in 1865, the only university organization existing in Mexico was under the direct control of the Catholic Church. According to the plans of 1833 and 1867, different institutions were opened to replace the "decadent" university. This form of organization proved unsatisfactory. The necessity for closer coordination of university instruction became so pressing that the government finally decided to correlate the work of the several independent faculties. Under the law of May 26, 1910, the existing schools of law, medicine, engineering, and architecture were made integral parts of the new National University of Mexico. To this a graduate school was added. The National Preparatory School in Mexico City was also made an integral part of the new university organization.
philosophy gave unity and coordination to scientific studies. Montes, however, did not fight to bring back metaphysics into the school curriculum; he fought only for his preparatory plan—philosophy, ethics and logic—without a positive basis. Sierra rejected the ideas of Montes and defended the Preparatory School, saying that his object was to form men, rather than things, who are not foreign to modern progress. Montes, who was more hostile to positivism than any other minister, definitively ended the Preparatory School of Barreda.  

Even Justo Sierra, the Minister of Public Instruction and Fine Arts, who had been a staunch positivist, began to criticize positivism. On March 22, 1908, he delivered a speech in honor of Barreda in which he portrayed a certain disillusionment for the positive doctrine for which he had always fought. The world, he said, has been transformed into another world, which has caused the loss of faith in the doctrines which were previously accepted.

In addition to the governmental decrees against positivism, the doctrine was opposed by the Mexican press. In 1880 a Mexican edition of a translation by Guthlin, Las doctrinas positivistas en Francia, and also La Negación Positiva y su valor científico, by Father Félix, were published by two different


houses, one in Mexico and one in Zacatecas. Disparaging articles appeared in such newspapers as El Discusión, La Centanela Católica, La Voz de México, La Universal, El Tiempo, El País, La Bandera Mexicana, and El Progreso Cristiano. They undermined the educational policy of Barreda with their "negative" spirit of individualism. Although Barreda was willing to admit that they did a good job defeating the clergy and the military, he nevertheless felt that it was time to do something "positive." For Barreda, those "anarchists" were a "negative" force in the reconstruction of the social order.31

In 1873 only ten years after extolling the virtues and acclaiming the rights of all Liberals, he denounced the extreme Liberals. He stated, in effect, that the will of the social order is expressed in the laws of the state, which all must obey. The state is supreme. In this he approached Comte's positivism, namely, that of positing order as a weapon against both the Conservatives and the extreme Liberals.32 As soon as Barreda returned to Comte's unsympathetic attitude toward the individualistic conception of freedom, the Liberal party split into factions: radical and moderate. With this split--the radicals adhering to the old revolutionary principles and the moderates going the new way of positivism--there emerged the old problem of

how to reconcile order and liberty. The Liberals attacked the positive methodology in every way. Science, they said, which in positivism is the absolute means, was not a free science. What pretended to be an inductive philosophy, ended up being a deductive one. In being adapted to the desired social, economic and political order, science became more the slave than the servant. Ultimately, positivism developed into a revolution against evolution itself. The Liberals were not long in realizing that behind the positivist ideas of freedom and order there was a new dogmatism, a dogmatism as dangerous as the clerical for, like the latter, it attempted to impose certain definite ideas by means of education. In attacking the authority of the Church, positivism posited another form of authority almost as absolute as the one it attempted to eradicate. Such procedure was contrary to the freedom of conscience that the Liberals had fought for. Positive philosophy did not justify the freedom that most interested the middle classes: the freedom to get rich without any limitations other than the ability of each individual. In his effort to reconcile liberalism and positivism, Barreda said:

Freedom is commonly thought of as the right to do anything or to want anything without any regard for the law or the force which directs it. If such freedom did exist, it would be as immoral as it would be absurd, for it would

33 Barreda, "Carta dirigida al editor del Seminario Ilustrado, October 21, 1868," Opusculas, pp. 133-142.
make any discipline, and consequently all order impossible. . . . True freedom is not incompatible with order; it consists in unreserved submission to the law of order. A thing is free when it follows its normal and natural course and encounters no obstacles alienating it from its own law and peculiar order.

"Man is limited by his environment, from which he receives his laws, and his freedom consists in obeying them." In the philosophy of Comte individuals were subordinated to society in all material respects. 34

Parents protested against the Preparatory School because they felt that unless their children had superior ability, the Preparatory would be too difficult. Besides, they were interested only in their children receiving a professional degree. In a letter to Riva Palacio, Barreda said:

... The reasons in favor of different courses for different careers, which should, they say, be limited to courses strictly indispensable for the practice of a certain profession in the Preparatory School is nonsense. Many people have not had the occasion to meditate on those subjects. The irrational obligation that many parents and students have of obtaining a professional degree as quickly as possible, even though they are fully conscious that they do not merit it, does not justify them sacrificing important courses, even though these courses will delay them in receiving their degrees. Their reason for wanting to receive a degree quickly is merely personal. They desire no more than an elevated social position and the pleasures that go with it through the least possible effort. 35

34 Barreda, "De la Educación Moral," op. cit., p. 113.
35 Barreda, "Carta dirigida al Mariano Riva Palacio, op. cit. pp. 43-44."
Others argued that the Preparatory School would permit the students to acquire only a superficial and inadequate education because of the excessive number of subjects to study. These demands, they said, could only produce a generation of people who talk about everything and know nothing about anything. Barreda defended himself on the basis that:

... never have the physical and natural sciences been studied so completely and so practically in our country as they have been studied in the Preparatory School during its three years of existence. Every year new improvements are introduced. The positive character of each course makes it appear more important and more necessary. It arouses in the students an enthusiasm for the laboratory. It arouses their interest for nature; the examination and classification of every kind of being; every class of chemical analysis and experiments of the most important elements.36

He continued that time will show that those who do not have a scientific education will lose public confidence. The new system of preparatory education will greatly aid the majority of the people to judge the real value of certain purely official degrees, the true degree of education which one possesses, and the way he has obtained it. "The old system," said Barreda, "can only promise one a position without a salary; the new system will assure one his well-being and a way to make a fortune honorably." Barreda did not expect any plan of studies to save the situation immediately. The real hope of education lay in a better one for

36 Ibid., p. 53.
The clergy too immediately directed its forces against the Preparatory. Not realizing the great breach that had been made in their forces, they hoped that the new reform, like the previous ones, would soon collapse and that metaphysics (the study of fundamental causes) would again be restored to the curriculum. Metaphysics was the basis of the old Catholic-oriented Scholastic education. Although the clergy no longer had the support which they previously found in the Executive, Lerdo de Tejada, nor did they possess the political power of censure in their press, La Cruz, and others, they still found support in the Chamber. José María Vigil (1829-1909), an untiring enemy of positivism and partisan of a spiritual philosophy, argued that the teaching of “positivist religion” in the national schools was a violation of the law. The Constitution, which proclaimed the separation of Church and State, also imposed the obligation to respect the religious beliefs of all citizens. Positivism, instead of respecting religious beliefs, attacked the foundation upon which such beliefs rested, that is, the idea of God. In 1880 he defended metaphysics against the arguments of the positivists, Garay, Flores, Sierra, Gamboa and others. In 1882 he founded the Revista Filosofía for the purpose of combating

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37 Ibid., pp. 43-44.
positivism.\textsuperscript{38} Rafael Ángel de la Peña, a devout Catholic, vigorously attacked positivism by pointing out that the positivists could not agree amongst themselves.\textsuperscript{39} In 1885 José de Jesús Cuevas wrote a lengthy article in \textit{La Voz de México} entitled "El Positivismo en México," wherein he defended the Church against positivism.\textsuperscript{40} Emeterio Valverde Téllez, too, defended religion against positivism. He censured Barreda for putting Saint Paul before Christ.\textsuperscript{41}

Barreda's aim could not be carried out because of overemphasis upon scientific studies. His pupils, according to E. M. de los Ríos, "carried upon their brow the stigma of disapproval" and all regarded "the youth as incapable of every noble

\textsuperscript{38}José M. Vigil y Rafael Ángel de la Peña, "Junta de 1 de septiembre [1880], Discurso del Sr. Vigil," \textit{Discursos pronunciados en las juntas catedráticos celebradas en la Escuela Nacional Preparatoria} (México, 1885), pp. 33-61. Emeterio Valverde Téllez, \textit{Bibliografía Filosófica Mexicana} (México, 1907), p. 172. Vigil had been a Deputy several times. He also held the chairs of Castilian grammar, literature, logic and morals in the National Preparatory School and the chairs of history and geography in the National School for Girls. He had also been Director of the National Archives and of the National Library. Vigil was a liberal.

\textsuperscript{39}José M. Vigil y Rafael Ángel de la Peña," Junta del 31 de Agosto. Discurso del Sr. Peña," \textit{ibid.}, pp. 13-31. de la Peña was a professor of logic, mathematics, and Castilian grammar in the National Preparatory School.


\textsuperscript{41}Valverde Téllez, \textit{ibid.}, pp. 106-107.
and lofty sentiment, and unfit not only for representing the future worthily but also for sustaining duly the role of civilized man in the family and in society. 

Eduardo Prado, a positivist, one of the most famous sons of the National Preparatory School, and later one of its fiercest attackers, wrote an open letter to Justo Sierra, Minister of Public Instruction and Fine Arts, in 1905, as follows:

... I firmly believe that the Preparatory School as it is and has been organized, is not nor can it be a beneficial establishment. ... Its plan of studies absorbs too much of the sap of life, demanding prolonged and sterile intellectual forces. ... Mathematics, considered by an eminent French thinker [Comte] and by his eminent Mexican convert [Barreda], as the basis of all positive education are an instrument of mental torture which produce poor, worn-out students. ... I am firmly convinced that under the auspices of an encyclopedic education, no student can acquire a vast and solid education. ... Many sciences are in their formation stage, particularly those that most interest man. General psychology and biology are in their infancy; the social sciences exist only in the powerful and fecund imagination of the sociologists, and in their fantasy, these sciences take more and varied forms than those of Proteo. ... The majority of the students waste time studying logic and mathematics. ... The official school, as a neutral school, should be profoundly respectful of religious sentiment, where neither religion nor irreligion should be taught. ... Logic should be excluded from the plan. ... and since biology is in its infancy, it also should not be included in the plan of scientific studies such as is found in the Preparatory. ... Psychology, sociology, ethics

42 Wilson, op. cit., p. 234.
and moral philosophy should also be eliminated from the official plan of studies. . . . The teaching of all philosophy should be prohibited in the public schools. . . . Finally, scientific education should be excluded because the sciences cannot serve as a solid basis for any philosophical foundation. . . . Secondary education should be established on the basis of the modern languages, and scientific and classical education should be eliminated. . . . The preparatory studies should include the following subjects distributed over a period of three school years: French and English as obligatory; Italian and German as voluntary; Castilian grammar; universal and national history, rhetoric, literature and Spanish composition. . . .

The "Ateneo de la Juventud," (Athenaeum of Youth) formed in 1909 by a group of young students who later became distinguished intellectuals, made the severest attacks and criticisms against positivism during the first part of the twentieth century. The group was composed of Antonio Caso, Alfonso Reyes, Pedro Henríquez Ureña, José Vasconcelos, Jesús T. Acevedo, Alfonso Graviota, Julio Torri, Enrique González Martínez, Martín Luis Guzmán, Manuel Ponce, Julian Garrillo, Carlos González Peña, Federico Mariscal, Antonio Méndez Bilio, Roberto Montenegro and others. That group, according to Hernández Luna, was influenced by the antipositivist teaching of some eminent Porfirist teachers (José M. Vigil, Rafael Angel de la Peña, and others) as well as by the great number of books that were arriving from Europe. All the members had one idea: to break with positivism and to find a

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43 Valverde Téllez, op. cit., pp. 125-129.
new doctrine based on philosophy, literature and art. "If the reform has its own physiognomy," said García Maynez, "it is the asylum of a new era of thought in Mexico. . . . It is the first free center of culture born toward the end of the Porfirian dictatorship and the beginning of the Revolution of November 20."44

The men of the "Ateneo" valued the work of Barreda during its time, because it was sincere and positive. They criticized Porfirismo in which "capital and power were found only among certain groups." They said that the Científicos were decadent pseudo positivists, who had detained the evolution of the country. The generation of the "Ateneo" realized that the morality of Porfirismo had created a law without humanism, without Christianity, a concept of the state foreign to the struggle of the classes, education without free esthetics, without metaphysics, lack of enthusiasm for the redemption of the humble, and with a view always based on the European model. The real origin of morality for the members of the "Ateneo" was not physical and biological determinism, but a morality based on reason and free will. It is not to be debased by those who believe in constructing morality on a scientific basis, no matter how venerable or conscientious may be their ends. Science can only offer us relative results, never necessary norms of action. And only by virtue of necessary

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44 Antonio Caso, et. al., Conferencias de Ateneo de la Juventud (Juan Hernández Luna ed, México, 1962), prologue.
principles can one obligate beings of reason such as men. 45

This was a characteristic of the generation which followed the Científicos. It was intended to extinguish a philosophy which no longer seemed to apply to the real needs of Mexico. Thus, the "Ateneo de la Juventud" had an extremely unpolitical personality, and the Revolution of 1910, unlike the War of Reform, was without a definite philosophy. What it would eventually begin to profess would be a philosophy which was almost the negative image of positivism. 46

Antonio Caso was one of the most ardent opposers of Comte's doctrine. He criticized Mexican positivism insofar as it represented "an era of the abandonment of every true philosophical speculation," because "philosophy [positive] was conceived of as a synthesis of scientific knowledge." In his lecture, "Augusto Comte y los principios del positivismo," he examined Comte's doctrine and exposed its errors. The positive man lacks individuality. To be good consisted in acting for the good of society. He criticized the Preparatory School of Barreda as defective because it formed only the "intelligence and even that imperfectly, since the human understanding without metaphysical culture will always be a stunted understanding."

"Positive concepts, by which all knowledge

45José Vasconcelos, "El movimiento intelectual contemporáneo en México," Conferencias de Ateneo de la Juventud, p. 22.
46Lawrence Dorre, The Positive Philosophy in Mexico Between the Reform and the Revolution of 1910 (Mexico, 1953), p. 139.
is relative, by which all knowledge comes from experience." Caso considered of little value, because they eliminated the possibility of lifting themselves from phenomena to essence, from a transitory act to a contingent act, to the absolute principle, the region of ideas. For Caso supreme value does not reside in knowledge, but in the individual life directed toward the attainment of values and ideals. He stressed the need of the constant dependence of the human intellect on intuition which, in his opinion is the best philosophical method accessible to man. Based on intuition, a knowledge of metaphysics was possible, thus widening the aims of Comtian philosophy. 47

A more recent evaluation of the work of Barreda was that of José Vasconcelos, who represented a passionate return in Mexico to the products of the imagination. "The positivism of Comte and Spencer," he said, "could never satisfy our aspirations. He spoke of art and human intuition as previous aspects of the human character which were just as important as dry logic and scientific procedures in the discovery of truth. Vasconcelos gave Barreda credit for having a better system of education in Mexico than Scholasticism, and admitted that scientific fanaticism was more progressive and more in keeping with the times than

religious fanaticism. Vasconcelos stated that Barreda:

by making Mexicans acquainted with the free thought of Europe, he placed whole generations in readiness not only for assimilating European culture but also for developing their own speculative and moral inherent abilities upon the firm basis that an education of solid discipline affords. 48

In his lecture entitled "Gabino Barreda and Contemporary Ideas," Vasconcelos saw in a vision:

an epoch of criticism in which wise men checked the work of preceding generations, conserving the valuable and defending it from oblivion, regardless of how sterile it is. Humanity again and again feels it a necessity to listen to itself and then to interpret the revelations of a renewed life, a life enriched by the past, master of a field without limits, which was more and more extended with each new fission and with each new virtue. 49

But he quickly added that positivism failed to realize that "the poetic sense" is not just a premature stage of the human mind which the natural sciences have outgrown. Furthermore, Barreda was mistaken even on his own hallowed ground of science, inasmuch as his dogmatic attitude toward it prevented him from seeing what the best authorities in the field knew, namely, that scientific principles are "merely hypothesis." 50

It is not difficult to perceive in the exposition of

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48 José Vasconcelos, "Don Gabino Barreda y las ideas contemporáneas," Conferencias de Ateneo de la Juventud, pp. 193-213.
49 Ibid., pp. 97-98.
50 Ibid., pp. 98-100.
Barreda the causes for the reaction against his program. Leopoldo Zea, one of his severest critics, interpreted the positivism of Barreda as nothing less than a clever instrument for establishing and perpetuating a social group. The positivists desired the power that the Church once held. The Junta of Education, which Barreda tried to separate from politics, represented that power. It put Mexican education in the hands of the Positivists who would guide it in its morality. Zea points out that Mexico's experiment with the Comtian idea was a case in point of those difficulties and of an initial error in the philosophy itself. An attempt was made to administer the affairs of Mexico with this sociological concept of society as a basis. Barreda's education had been an effort to subject what was human in man to exact laws and scientifically regulated ways of thinking; by ordering man, Barreda had hoped to put society into order. "Nevertheless," added Zea, "this ideal positivism would have come into conflict with the very nature of man which cannot be submitted to limits, even if such is the proposal of man himself."\(^{51}\)

From the beginning Comte's thought had suffered from the almost inevitable tendency toward the mechanization of everything under a mere method. It has been noted to what extent the "Asociación Metodófila" had depended on the method: "They made

of mathematics," said Reyes, "the sum of human knowledge." Comte had feared this dissipation of the philosophy and had warned against it. He had noticed and stated frankly that that which appeared to be exact in mathematics gradually diminished in exactitude as his study passed on to astronomy, physics, chemistry and biology; his most provoking difficulties arose when in his new science of sociology, he tried to apply the scientific method to what was human. 52

Zea said that:

... the Barredians of Mexico did not want to accept anything which was not demonstrated by positive science. They did not want to work except with demonstrated realities; they did not want to idealize; all of that was fantasy which perturbed social order and welfare. 53

But, by so limiting human activity, Mexican positivists denied other realities. The young men of Vasconcelos' generation criticized the positivists for their neglect of the arts. The positivists were in fact acutely aware of this neglect. A world comprehended by science alone began to appear extremely stuffy and oppressive to the positivists themselves. Zee has the following theory on this:

... They [the positivists] looked for a means whereby they could give an outlet to


their sentiments, and this substitute was constituted by sentimental poetry and fantastic legends, the imagination injected into any happening. This is an epoch in which men will not bother themselves very much about their fellows of flesh and blood, but, on the other hand, they will suffer with protagonists of novels, and they will unload their imagination in common events, giving to them the quality of extraordinary happenings. . . .

It appeared that this tendency during the last ebbing years of positivism in action was not in accord with the philosophy, even in the sense in which Comte had recommended a certain exercise of the imagination in the process of scientific investigation. As Zea described it, this tendency was only symptomatic of the decadence of positivism in Mexico, because this kind of development in which the repressed passions of the positivists themselves overflowed into what was an extremely fantastic sort of art, represented a detached and abnormal reaction which clashed with the very essence of the positive philosophy. It was supposed that this tendency was not so much a deliberate and gradual adjustment to an inherent error, as it was an inevitable collapse because of the error. Mexican positivists soon became aware of some discrepancy, but apparently they did not know what it was and had no understanding of it; thus, they unwittingly committed drastic contradictions.

\[54\text{Ibid.}\]
CHAPTER VI

CONCLUSIONS: THE PORFIRIAN ERA

The Laws of Public Instruction of 1867 and 1869 were an attempt by Barreda to substitute the Comtian doctrine of positivism for Scholasticism and the knowledge and cultivation of the sciences for the humanities. The object of his new educational program was to bring order and progress to Mexico. To do this he would have to completely change the Mexican mentality by educating all Mexicans alike and by making them practical like the Anglo-Saxons. He felt that Mexicans would have to break away from their past. To accomplish this task Mexico needed a large middle class, commerce and industry, a complete separation of church and state, and a moderate liberal political structure. These were the objectives that Barreda aimed at when he and his collaborators wrote the Law of Public Instruction, promulgated December 2, 1867, and modified May 15, 1869.

The practical results of these laws can be seen in a report published by José Díaz Covarrubias in 1875, which contained a description of the state of primary, secondary, and professional education in the Mexican Republic. The findings of this report are useful to interpret the general attitude of the Mexicans toward education and the direction that the Laws of 1867
and 1869 took.¹

We might note that although education had not developed rapidly, by January 1875, 349,001 children were being educated by eight thousand primary school teachers (of which scarcely two thousand had degrees) in 8,103 primary schools in the Mexican Republic. This compares with 1,310 in 1843 and 4,500 in 1870. Since the total population was nine million, Díaz Covarrubias estimated that at least one-fifth or 1,800,000 children in the Republic were of school age and should have been in school. There should have been a school for every 1,500 children. In the United States, according to a Report of the United States Commission of Education, there was one for every 277. There were no exact statistics on the number of Mexicans who could not read or write, but Díaz Covarrubias estimated that it was more than half of the population. In the United States the number was about one-third. These 8,103 Mexican primary schools included those supported by the government and municipalities, free schools supported by corporations and private individuals, free schools supported by the church, and private schools in which one paid for his education. The cost of primary public education and free schools supported by organizations and individuals in the Republic (such as the Lancastrian School) was estimated at $1,632,436.

¹José Díaz Covarrubias, La Instrucción Pública en México (México, 1875), 218 pp.
pesos. About three-fifths or $1,042,000 of this money came from the municipalities, one-fourth or $417,000 pesos came from the federal and state governments, and one-sixteenth or $173,000 pesos came from gifts of private individuals. A much greater amount, namely, $1,188,168 pesos, was spent in the private and church elementary schools where one paid tuition.  

Fifty-four government colegios (excluding schools for women) offered preparatory and professional instruction to 9,336 students in the Republic, one-third of which were in the twelve schools of the Federal District. In addition, there were twenty-four seminaries, which educated 3,800 students for law and the priesthood. Díaz Civarrubias pointed out that during the period 1844-1875, when the Church was expected to lose its position in education, ecclesiastical colegios almost tripled.  

The cost of preparatory and professional education in the Republic was estimated at $1,100,000 pesos, which included about $200,000 pesos for 1,435 scholarships (840 to the Federal District) which the national government awarded to the various schools. The scholarships did not go to establishments for the

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2Ibid., pp. lviii-cxii. See Appendices A-F, pp. 165-170. Primary school teachers were paid an average of forty-five pesos a month.

3Ibid., pp. cxi-cxcxl. See Appendices L-M, pp. 183-184. Approximately seventy directors and six hundred professors were employed in preparatory and professional colegios in the states and Federal District.
higher education of women nor to church-controlled seminaries. 4

The great educational leaders during the Díaz era were Joaquín Baranda and Justo Sierra. They established important educational institutions, encouraged new pedagogical ideas, and organized conventions. Public education continued to have a positive orientation until 1910, when the inadaptibility of positivism to the preparatory schools forever destroyed Barreda's institution. 5

Through the encouragement of Joaquín Baranda, Minister of Education, a Normal School was established December 17, 1885, and was inaugurated February 27, 1887. The one which was created by the Law of 1867 had been eliminated by the Law of 1869 due to lack of funds. In addition, Baranda proposed and received from Congress the authority to convert the old Secondary School for Women, established by the Law of 1867, into a Normal School for Women. It opened in February 1890. 6

In 1888 a new law of primary education, which divided the primary school into the elementary and higher primary, was formulated by Justo Sierra, Julio Zárate, and Leonardo Portuño. The law like the one of 1867 prescribed that primary education be compulsory, gratuitous and secular. The federal government was

4Ibid. See Appendix G, p. 171.


6Ibid., pp. 550-552.
to subsidize primary schools in the poor municipalities. The law, which did not go into effect until March 21, 1891, continued the previous plan of education with modifications. 7

In the meantime two conventions concerning public education were held. The first met from 1889 to March 1890, and the second (a continuation of the first) met from December 1, 1890, to February 28, 1891. Directors of various educational establishments from all over the Republic met and discussed the problems of primary, secondary, and professional education. Special attention was given to the preparatory school. It prescribed an education which should be intellectual, physical, and moral. Generally, it followed Barreda's plan of studies, but a sixth year was to be added. The essence of the plan of studies consisted of mathematics, cosmography, physics, chemistry, the biological sciences, psychology, logic and the social sciences. Metaphysics, theology, Greek, and Latin were excluded. The courses were arranged according to Comte's hierarchy except that biology, morals, logic and psychology were taught the sixth year, and cosmography and mechanics were taught in an inverted order. Later Porfirio Díaz tried to reorganize Barreda's preparatory school, but the specialized bachelors, which Barreda tried to

7Manuel Dublán and José María Lozano, Legislación Mexicana o Colección Completa de las disposiciones Legislativas expedidas desde la Independencia de la República, XIX (México, 1876-1913), pp. 127-129; XXI, pp. 24-37.
eliminate, continued. Those conventions were of great importance because this was the first time in Mexico that there was an effort to coordinate public education throughout the entire Republic. The Lancasterian schools were nationalized in order to modernize their already outmoded pedagogical system. In order to enforce the decrees of the Convention, Baranda formed a directive body on education which was composed of professors and members of the Secretary of Education and of the municipalities.

The educational methods of Enrique Rébsamen, inspired by Johann Pestalozzi, notably influenced Mexican education at the time, especially the Normal School. Rébsamen had previously established the Normal School in Jalapa, Veracruz, and he had worked successfully in the model school in Orizaba, Veracruz. He also wrote various books on pedagogy and texts for primary and normal schools.

In 1896 Baranda reformed the national preparatory school. The project was turned over to Ezequiel Chávez, who was aided by Luis E. Ruiz, Miguel Ángel de la Peña, and Emilio G. Baz. The courses for all careers were unified, since this was the original goal of the preparatory school founded by Barreda. Upon the insistence of Justo Sierra courses were added in 1899. A chair of

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grammar and literature was created. Ethics and civil education placed emphasis on great figures such as patriots and philanthropists. The preparatory school created by Chávez followed the lines of extreme positivism since the Científicos (the Porfirist politicians) still followed the scientific hierarchy of Comte. And in this way the preparatory, with slight modifications, continued until 1910.  

On June 14, 1901, Justo Sierra was appointed Assistant Secretary of Public Instruction. From this moment until the end of the Porfirian era, his work as a minister of education was important. He modified the preparatory studies in 1906. They were again shortened to five years. Science and sociology courses were eliminated, and courses in Latin, modern languages and literature were added. In a report which he delivered in 1907, he spoke of the necessity of an upper Normal School, an Academy of Science, and a University which would coordinate the secondary schools and the schools of higher education. A School of higher education was created April 7, 1907. Its purpose was to teach classes in jurisprudence, medicine, fine arts, and engineering,

10 Chávez, op. cit., p. 577.

11 Larreyno, op. cit., pp. 310-315. In 1902 the Superior Council of Public Education was founded. The Secretary of Public Education and Fine Arts became independent of the Secretary of Justice in 1905.

12 Ibid., p. 321.
in order to perfect the preparatory studies, which would train professors and encourage research. By the law of primary education of August 18, 1808, the primary school was reformed. There continued to be seven years of primary: five of elementary primary and two of upper primary. The upper primary which consisted of practical courses was not obligatory.

When the National University opened in 1910 Justo Sierra pronounced the inaugural address: "... no, no it will not be the university where a person will take his eyes away from the microscope or the telescope. ... It would propose the means of nationalizing science, of Mexicanizing knowledge. ..." Concerning preparatory education, he said that secondary instruction would be organized along scientific as well as along literary lines. Sierra recognized the fact that modern science could not always be reconciled with positivism, and though he did not change the Comtian order, the humanities, including philosophy and metaphysics, were once again given a recognized place in the National University.

Politically and economically, the results of a positive education were felt immediately after the Laws of 1867 and 1869

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13 Ibid., p. 322.
14 Ibid., pp. 318-320.
were passed. Positivism became the ideological counterpart of Porfirismo (1876-1911). But the generation of leaders educated by Gabino Barreda felt restrained within the confines of Comtian positivism because Comte subordinated the individual to society. The liberals felt that their individual capacity was restricted (even though the state was not to interfere with private property a state-controlled education would of necessity incline the rich to use their wealth for the good of humanity), so they discovered that the doctrine of the English positivists, Herbert Spencer and John Stuart Mill and the theory of evolution of Charles Darwin better supported their interests. Spencer justified progress and evolution, Mill individual liberty, and Darwin the survival of the fittest. These thinkers, they thought, were the exponents of common sense so it appeared most appropriate to educate the Mexicans in their doctrines. The Spencerian positivists said that liberty was something that belonged to a future stage of evolution; the Comtian positivists said that liberty belonged to the past or to the metaphysical stage of evolution. The Spencerians said that there could be no political freedom without public order. Economic freedom or bread was more important than political freedom or the right to vote. Thus the Spencerian positivists justified a strong state that would establish the order necessary for the progress of Mexico and General Díaz began
to symbolize that order. 

In 1880 the "scientific era" in Mexican politics began when a number of positivists entered the Chamber of Deputies. Some of them were to become outstanding figures in the regime of Porfirio Díaz. These included Justo Sierra, Pablo Macedo, Rosendo Pineda, Francisco Bulnes, and others. In 1892 the Liberal Union Party, the party of the Mexican Spencerians, issued a manifesto supporting another re-election of Porfirio Díaz. It defended his regime on the basis of "science" learned in the schools which Barreda had established. As a result, the opposition dubbed it the Partido de Científicos.

The Científicos accomplished much, but all for the vested interests of the Mexican ruling class, which consisted of a small group of bourgeoisie. They justified their actions on the basis of Darwinism by affirming that they were the "fittest" to govern the country. Although the Paz Perfiriano had arrived, Mexicans, like all other oppressed peoples in the world, had to pay the usual price for the thirty-five-year peace guaranteed by force.


17 Ibid., p. 187.

18 Ibid., p. 187. The Union Liberal party, which consisted of conservative liberals, distinguished itself from the radical liberals (the Jacobins) and from the moderate liberals (the Juáristas).
What had happened was the opposite of what the positivists had anticipated. Positive education in Mexico had not produced a large middle class. It had merely become another instrument serving the desire of power and domination. Scientific absolutism had replaced religious absolutism. The new Mexican bourgeois, concerned only with its own gains, replaced the army and the clergy as the privileged class. The scientific methods which the positivists used lay beyond the reach of the great masses, who continued to be ruled with an iron hand. Social order was only a slogan used by the Científicos to defend their personal interests.

The material progress that might have created a large middle class such as existed in England and the United States was not achieved. Industry never materialized. Such industries as sprang up were due to the European and North American bourgeois who were not concerned with the progress of Mexico. With all their education, the generation who had been taught the positive sciences remained as impractical as ever. Reality soon revealed that thirty-five years of dictatorial rule failed to bring about the order so dear to the heart of the positivists. Instead of the orderly mind which Barreda foresaw, the Mexican mind built up discontent and disgust at a doctrine whose practical results were nil. The new generation of intellectuals rebelled against education based on a positive philosophy. The people rebelled against the Porfírist government. The permanent order that
Barreda hoped for was followed by the Revolution of 1910. The entire political machinery called *Perfílismo* collapsed and the philosophical doctrine that supported it was doomed to die. Positivism only continued as a dream of a few sincere individuals who remained detached from Mexican politics and were therefore impotent for all practical purposes of the philosophy. But the failure of positivism did not invalidate the role of science, which was left as a legacy to modern thinking.
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A. Primary Sources

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APPENDIX A. THE NUMBER OF PRIMARY SCHOOLS
IN EACH STATE OF THE MEXICAN REPUBLIC

<table>
<thead>
<tr>
<th>STATE</th>
<th>NUMBER OF SCHOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aguascalientes</td>
<td>66</td>
</tr>
<tr>
<td>Campeche</td>
<td>72</td>
</tr>
<tr>
<td>Coahuila</td>
<td>115</td>
</tr>
<tr>
<td>Colima</td>
<td>48</td>
</tr>
<tr>
<td>Chiapas</td>
<td>100</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>39</td>
</tr>
<tr>
<td>Durango</td>
<td>150</td>
</tr>
<tr>
<td>Guanajuato</td>
<td>403</td>
</tr>
<tr>
<td>Guerrero</td>
<td>455</td>
</tr>
<tr>
<td>Hidalgo</td>
<td>479</td>
</tr>
<tr>
<td>Jalisco</td>
<td>714</td>
</tr>
<tr>
<td>Mexico</td>
<td>821</td>
</tr>
<tr>
<td>Michoacán</td>
<td>233</td>
</tr>
<tr>
<td>Morelos</td>
<td>200</td>
</tr>
<tr>
<td>Nuevo León</td>
<td>278</td>
</tr>
<tr>
<td>Oaxaca</td>
<td>427</td>
</tr>
<tr>
<td>Puebla</td>
<td>1,008</td>
</tr>
<tr>
<td>Querétaro</td>
<td>98</td>
</tr>
<tr>
<td>San Luis Potosí</td>
<td>252</td>
</tr>
<tr>
<td>Sinaloa</td>
<td>281</td>
</tr>
<tr>
<td>Sonora</td>
<td>129</td>
</tr>
<tr>
<td>Tabasco</td>
<td>38</td>
</tr>
<tr>
<td>Tamaulipas</td>
<td>60</td>
</tr>
<tr>
<td>Tlaxcala</td>
<td>202</td>
</tr>
<tr>
<td>Veracruz</td>
<td>500</td>
</tr>
<tr>
<td>Yucatán</td>
<td>194</td>
</tr>
<tr>
<td>Zacatecas</td>
<td>382</td>
</tr>
<tr>
<td>Distrito Federal</td>
<td>354</td>
</tr>
<tr>
<td>Baja California</td>
<td>5</td>
</tr>
</tbody>
</table>

*For 1871

8,103

*José Díaz Covarrubias. *La Instrucción Pública en México* (México, 1875), pp. lviii, lv. The 8,103 primary schools in the Republic (January 1875) comprise those supported by the government and municipalities, free schools supported by corporations or private individuals, free schools supported by the clergy or religious associations and private schools in which one pays tuition.
### APPENDIX B. PRIMARY SCHOOLS IN THE MEXICAN REPUBLIC BY SEX

<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Schools for Male Children</td>
<td>5,567</td>
</tr>
<tr>
<td>Primary Schools for Female Children</td>
<td>1,594</td>
</tr>
<tr>
<td>Primary Mixed Schools</td>
<td>548</td>
</tr>
<tr>
<td>Primary Schools for Male Adults</td>
<td>124</td>
</tr>
<tr>
<td>Primary Schools for Female Adults</td>
<td>21</td>
</tr>
<tr>
<td>Without Classification</td>
<td>249</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,103</strong></td>
</tr>
</tbody>
</table>

*Díaz Covarrubias. La *Instrucción Pública*, p. lxxii.*
APPENDIX C. COMPARATIVE STATISTICS ON THE NUMBER OF PRIMARY SCHOOLS IN VARIOUS COUNTRIES

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>INHABITANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>1 School for each</td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td></td>
</tr>
<tr>
<td>Holland</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td></td>
</tr>
</tbody>
</table>

*Díaz Covarrubias, La Instrucción Pública, xliii.*
APPENDIX D. PRIMARY SCHOOLS IN THE REPUBLIC SUPPORTED BY
THE GOVERNMENT, CORPORATIONS, AND INDIVIDUALS

<table>
<thead>
<tr>
<th>Supported by</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>the Federal and State Governments</td>
<td>603</td>
</tr>
<tr>
<td>Municipalities</td>
<td>5,240</td>
</tr>
<tr>
<td>Corporations and Private Individuals</td>
<td>378</td>
</tr>
<tr>
<td>the Catholic Clergy and Other Religious Associations</td>
<td>117</td>
</tr>
<tr>
<td>Tuition (Private Schools)</td>
<td>1,581</td>
</tr>
<tr>
<td>Without Classification</td>
<td>184</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8,103</td>
</tr>
</tbody>
</table>

APPENDIX E. NUMBER OF STUDENTS THAT ATTEND PRIMARY SCHOOLS IN THE REPUBLIC

<table>
<thead>
<tr>
<th>STATE</th>
<th>NUMBER OF STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aguascalientes</td>
<td>5,663</td>
</tr>
<tr>
<td>Campeche</td>
<td>2,585</td>
</tr>
<tr>
<td>Coahuila</td>
<td>4,359</td>
</tr>
<tr>
<td>Colima</td>
<td>3,600</td>
</tr>
<tr>
<td>Chiapas</td>
<td>2,435</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>2,228</td>
</tr>
<tr>
<td>Durango</td>
<td>4,410</td>
</tr>
<tr>
<td>Guanajuato</td>
<td>20,641</td>
</tr>
<tr>
<td>Guerrero</td>
<td>9,670</td>
</tr>
<tr>
<td>Hidalgo</td>
<td>18,078</td>
</tr>
<tr>
<td>Jalisco</td>
<td>39,538</td>
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<tr>
<td>Michoacan</td>
<td>10,200</td>
</tr>
<tr>
<td>Morelos</td>
<td>7,271</td>
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<tr>
<td>Nuevo León</td>
<td>12,031</td>
</tr>
<tr>
<td>Oaxaca</td>
<td>18,000</td>
</tr>
<tr>
<td>Puebla</td>
<td>33,755</td>
</tr>
<tr>
<td>Querétaro</td>
<td>3,613</td>
</tr>
<tr>
<td>San Luis Potosi</td>
<td>13,019</td>
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<tr>
<td>Sinaloa</td>
<td>9,272</td>
</tr>
<tr>
<td>Sonora</td>
<td>3,840</td>
</tr>
<tr>
<td>Tabasco</td>
<td>2,184</td>
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<tr>
<td>Tamaulipas</td>
<td>3,600</td>
</tr>
<tr>
<td>Tlaxcala</td>
<td>8,868</td>
</tr>
<tr>
<td>Veracruz</td>
<td>17,062</td>
</tr>
<tr>
<td>Yucatán</td>
<td>9,263</td>
</tr>
<tr>
<td>Zacatecas</td>
<td>17,581</td>
</tr>
<tr>
<td>Distrito Federal</td>
<td>22,200</td>
</tr>
<tr>
<td>Baja California</td>
<td>300</td>
</tr>
</tbody>
</table>

349,001

*Probable for Chihuahua and Tamaulipas. For Tlaxcala it is for 1871.

*Díaz Covarrubias, La Instrucción Pública, p. lxxx.
APPENDIX F. AMOUNT SPENT ANNUALLY ON PRIMARY EDUCATION

<table>
<thead>
<tr>
<th>STATE</th>
<th>AMOUNT SPENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aguascalientes</td>
<td>$11,132</td>
</tr>
<tr>
<td>Campeche</td>
<td>14,356</td>
</tr>
<tr>
<td>Coahuila</td>
<td>26,322</td>
</tr>
<tr>
<td>Colima</td>
<td>14,500</td>
</tr>
<tr>
<td>Chiapas</td>
<td>13,941</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>9,590</td>
</tr>
<tr>
<td>Durango</td>
<td>21,724</td>
</tr>
<tr>
<td>Guanajuato</td>
<td>82,500</td>
</tr>
<tr>
<td>Guerrero</td>
<td>68,340</td>
</tr>
<tr>
<td>Hidalgo</td>
<td>77,879</td>
</tr>
<tr>
<td>Jalisco</td>
<td>100,538</td>
</tr>
<tr>
<td>México</td>
<td>163,499</td>
</tr>
<tr>
<td>Michoacán</td>
<td>52,756</td>
</tr>
<tr>
<td>Morelos</td>
<td>41,538</td>
</tr>
<tr>
<td>Nuevo León</td>
<td>70,400</td>
</tr>
<tr>
<td>Oaxaca</td>
<td>69,500</td>
</tr>
<tr>
<td>Puebla</td>
<td>151,140</td>
</tr>
<tr>
<td>Querétaro</td>
<td>15,660</td>
</tr>
<tr>
<td>San Luis Potosí</td>
<td>91,400</td>
</tr>
<tr>
<td>Sinaloa</td>
<td>59,640</td>
</tr>
<tr>
<td>Sonora</td>
<td>43,900</td>
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<td>Tabasco</td>
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</tr>
<tr>
<td>Tamaulipas</td>
<td>10,000</td>
</tr>
<tr>
<td>Tlaxcala</td>
<td>21,307</td>
</tr>
<tr>
<td>Veracruz</td>
<td>75,000</td>
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<tr>
<td>Yucatán</td>
<td>49,444</td>
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<tr>
<td>Zacatecas</td>
<td>72,878</td>
</tr>
<tr>
<td>Distrito Federal</td>
<td>67,176</td>
</tr>
<tr>
<td>Baja California</td>
<td>15,400</td>
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**$1,632,436**

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*Díaz Covarrubias, La Instrucción Pública, p. xciii.*
APPENDIX G. ANNUAL EXPENSES FOR PUBLIC EDUCATION

<table>
<thead>
<tr>
<th>Position</th>
<th>Salary</th>
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<tbody>
<tr>
<td>Administrator</td>
<td>$2,000</td>
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<tr>
<td>Bookkeeper</td>
<td>$1,000</td>
</tr>
<tr>
<td>Treasurer</td>
<td>$1,500</td>
</tr>
<tr>
<td>Tax-Collector</td>
<td>$1,200</td>
</tr>
<tr>
<td>Official</td>
<td>$800</td>
</tr>
<tr>
<td>Four Clerks with a Salary of $600 each</td>
<td>$2,400</td>
</tr>
<tr>
<td>Porter</td>
<td>$400</td>
</tr>
<tr>
<td>Payment for two Ordinances</td>
<td>$120</td>
</tr>
<tr>
<td>Official Expenses</td>
<td>$480</td>
</tr>
<tr>
<td>Lawyer</td>
<td>$1,800</td>
</tr>
<tr>
<td>Primary School Teachers with a First Class Certificate</td>
<td>$1,000</td>
</tr>
<tr>
<td>Primary School Teachers with a Second Class Certificate</td>
<td>$800</td>
</tr>
<tr>
<td>Primary School Teachers with a Third Class Certificate</td>
<td>$600</td>
</tr>
<tr>
<td>Primary School Assistant Teachers</td>
<td>$360</td>
</tr>
<tr>
<td>Secondary School Teachers</td>
<td>$1,000</td>
</tr>
<tr>
<td>Secondary School Assistant Teachers</td>
<td>$360</td>
</tr>
<tr>
<td>Modern Language, Shorthand and Bookkeeping Teachers</td>
<td>$700</td>
</tr>
<tr>
<td>Prefects</td>
<td>$600</td>
</tr>
<tr>
<td>Classical Language Teachers</td>
<td>$800</td>
</tr>
<tr>
<td>Physics, Chemistry and Natural History Teachers</td>
<td>$800</td>
</tr>
<tr>
<td>Professional and Preparatory School Directors (no less than 1,500 and no more than 3,000)</td>
<td></td>
</tr>
<tr>
<td>Science Teachers (no less than 1,200 and no more than 2,400)</td>
<td></td>
</tr>
<tr>
<td>Arts and Crafts Teachers (no less than 360 and no more than 600)</td>
<td></td>
</tr>
<tr>
<td>Music Teachers (no less than 360 and no more than 800)</td>
<td></td>
</tr>
<tr>
<td>Members of the Academy of Science (no less than 360, and as high as 560 if public funds permit)</td>
<td></td>
</tr>
<tr>
<td>The position as director of the Academy of Fine Arts and the School of Music is purely honorary</td>
<td></td>
</tr>
</tbody>
</table>

Funds for public education will come from the following sources:

1. Inheritance Taxes Within the Federal District and National Territories
2. Vacant Property (Property with no known owner) in the Federal District and National Territories
3. Property that Actually Belongs to the Government for Public Education
4. The Amount of One Real (an ounce of silver) for every eleven díneros (Stear'd of silver) imposed on all Mints throughout the Republic
5. Tuition paid in the Schools

*Duñlán, X., op. cit., pp. 203-204, 601. The above expenses are set forth in the Law of Public Instruction, December 2, 1867. The salaries in the Law of Nov. 9, 1869, are the same.
<table>
<thead>
<tr>
<th>First Year:</th>
<th>Pharmacy</th>
<th>Veterinary</th>
<th>Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Arithmetic</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Algebra</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Geometry</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4. Spanish Grammar</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5. French</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6. Shorthand</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7. Algebra and Geometry</td>
<td>-</td>
<td>-</td>
<td>X</td>
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</table>

<table>
<thead>
<tr>
<th>Second Year:</th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Trigonometry</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>9. Infinitesimal Calculus</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>10. Rational Mechanics</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>11. Cosmography</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>12. Creek Roots</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>13. First Year Latin</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>14. First Year English</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>15. Geography</td>
<td>-</td>
<td>-</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>Third Year:</th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Physics</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>17. Geography</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>18. Second Year Latin</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>19. Second Year English</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>20. Chronology and History</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>21. Literature</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>22. Bookkeeping</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>23. First Year German</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth Year:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24. Chemistry</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>25. History</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>26. Chronology</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>27. Third Year Latin</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>28. Bookkeeping</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>29. First Year German</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>30. Natural History</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>31. Logic</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>32. Ideology</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>33. Morals</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>34. General Grammar</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>35. Second Year German</td>
<td>-</td>
<td>-</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>Fifth Year:</th>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>36. Natural History</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>37. Logic</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>38. Ideology</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>39. Morals</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>40. General Grammar</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>41. History of Metaphysics</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>42. Literature</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>43. Second Year German</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>44. Figure, Landscape and Lineal Drawing</td>
<td>required by all at a time convenient for both professor and student</td>
<td></td>
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</tbody>
</table>
### APPENDIX I

**The Preparatory School, November 9, 1869**

<table>
<thead>
<tr>
<th>First Year</th>
<th>Pharmacy</th>
<th>Veterinary</th>
<th>Assaying</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Arithmetic</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Algebra</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Plane Geometry</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4. French</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tbody>
</table>

<table>
<thead>
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<th>Second Year</th>
<th>Pharmacy</th>
<th>Veterinary</th>
<th>Assaying</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Spacial and General Geometry</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6. Trigonometry</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7. Infinitesimal Calculus</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8. English</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Pharmacy</th>
<th>Veterinary</th>
<th>Assaying</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Physics</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>10. Cosmography</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>11. Spanish Grammar</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>12. Greek Roots</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>13. English</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>14. Rational Mechanics</td>
<td>-</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th>Pharmacy</th>
<th>Veterinary</th>
<th>Assaying</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Chemistry</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>16. Geography</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>17. General and National History</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>18. Chronology</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>19. First Year Latin</td>
<td>X</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>20. German for Mining Engineers, or, better yet, for all engineers if the government demands it</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fifth Year</th>
<th>Pharmacy</th>
<th>Veterinary</th>
<th>Assaying</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Natural History</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>22. Logic</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>23. Ideology</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>24. General Grammar</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>25. Morals</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>26. Second Year Latin</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>27. Literature</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>28. German for Mining Engineers, or, better yet, for all engineers if the government demands it</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>29. Figure, Landscape and Lineal Drawing required by all at a time convenient for both professor and student</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX J. PROFESSIONAL SCHOOLS, January 24, 1868

I. SCHOOL OF JURISPRUDENCE
First Year:
1. Natural Law
2. First Year Roman Law
Second Year:
3. Second Year Roman Law
4. First Year National Law
Third Year:
5. Second Year National Law
6. Ecclesiastical Law
Fourth Year:
7. Constitutional and Administrative Law
8. International Law
9. Maritime Law
Fifth Year:
10. Civil Procedures
11. Principle of Legislation
12. Practice with a Lawyer or a Civil Judge
Sixth Year:
13. Criminal Procedures
14. Comparative Legislation
15. Second Year Theoretical-Practical Academy
16. Six Months Practice with a Lawyer or Civil Judge
17. Six Months Practice in a Criminal Tribunal

II. SCHOOL OF MEDICINE
First Year:
1. Descriptive Anatomy
2. Galenic Pharmacy
Second Year:
3. Physiology
4. External Pathology
5. General and Topographical Anatomy
6. External Clinic
Third Year:
7. Internal Pathology
8. Operations, Bandages and Instruments
9. Internal Clinic
Fourth Year:
10. General Pathology
11. Therapeutics
12. External Clinic
Fifth Year:
13. Public Hygiene
14. Obstetrics
15. Legal Medicine
16. Internal Clinic
17. Obstetrics Clinic
18. Applied Physics, Chemistry, Botany, and Zoology

III. SCHOOL OF PHARMACY
First Year:
1. Theoretical-Practical Pharmacy
2. Economics and Pharmaceutical Legislation
Second Year:
3. Natural History of Simple Drugs
Third Year:
4. Chemical Analysis
5. Four Years of Practice in a Public Pharmacy, beginning the last year of Preparatory School

IV. SCHOOL OF AGRICULTURE
First Year:
1. Applied Chemistry
2. Applied Botany
3. Applied Physics and Meteorology
Second Year:
4. Second Year Agriculture
5. Applied Zoology
6. Agricultural Bookkeeping
Third Year:
7. Rural Administration and Economy
8. Topography and Descriptive Geometry
Fourth Year:
9. Practice on an hacienda in the Tierra Caliente at Public Expense
V. SCHOOL OF VETERINARIANS
First Year:
1. Descriptive Anatomy
2. Comparative Physiology
Second Year:
3. Exterior of Domestic Animals
4. Comparative External Pathology
5. Comparative External Clinic
6. Operations
Third Year:
7. Comparative Internal Pathology
8. Comparative Internal Clinic
9. Comparative Therapeutics
Fourth Year:
10. General Pathology, preceded by Elements of General Anatomy
11. Obstetrics
12. Hygiene
13. Veterinarians are to Study Physics, Botany, and Zoology in the School of Medicine and Pharmacy

VII. SCHOOL OF METAL ASSAYERS
First Year:
1. Analytical Geometry
2. Advanced Algebra
3. Infinitesimal Calculus
4. Chemical Analysis
Second Year:
5. Chemical Analysis
6. Mineralogy
7. When possible, practical and theoretical courses will be taken together, according to the laws of the school

IX. SCHOOL OF MECHANICAL ENGINEERS
First Year:
1. Analytical Geometry
2. Descriptive Geometry
3. Advanced Algebra
4. Infinitesimal Calculus
5. Machine Drawing
Second Year:
6. Analytical and Applied Mechanics
7. Machine Drawing

VI. SCHOOL OF MINING ENGINEERS
First Year:
1. Analytical Geometry
2. Advanced Algebra
3. Infinitesimal Calculus
4. Descriptive Geometry
5. Topography
6. Topographical Drawing
Second Year:
7. Practical Astronomy
8. Machine Drawing
Third Year:
9. Applied Chemistry
10. Chemical Analysis, including Assaying, Botany and Applied Zoology
Fourth Year:
11. Mineralogy
12. Geology and Paleontology
13. Artisan Wells

VIII. SCHOOL OF METAL IMPROVERS
First Year:
1. Analytical Geometry
2. Advanced Algebra
3. Infinitesimal Calculus
4. Descriptive Geometry
Second Year:
5. Analytical and Applied Mechanics
Third Year:
7. Chemical Analysis
8. Mineralogy
9. Metallurgy and Practical Courses will be taken in the School of Mining Engineers
Continued from page 175

X. SCHOOL OF CIVIL ENGINEERS
First Year:
1. Advanced Mathematics, including analytical geometry, descriptive geometry, advanced algebra, infinitesimal calculus, topography, hydraulics, topographical drawing, theoretical and practical

Second Year:
2. Analytical and Applied Mechanics
3. Knowledge of Construction Materials and Areas where Civil Engineers are to work
4. Architectural Drawings

Third Year:
5. Construction Mechanics
6. Carpentry
7. Construction of Roads and Highways

Fourth Year:
8. Bridges, Canals and Port Works
9. Composition and History of their Construction

XI. SCHOOL OF TOPOGRAPHICAL ENGINEERS
First Year:
1. Advanced course in Mathematics, including analytical geometry, advanced algebra, descriptive geometry, infinitesimal calculus, topography, hydraulics, theoretical and practical topographical drawing

Second Year:
2. Analytical Mechanics
3. Geodesy
4. Elements of Practical Astronomy
5. Topographical Drawing

XII. SCHOOL OF GEOGRAPHICAL AND HYDROGRAPHICAL ENGINEERS
First Year:
1. Descriptive Geometry
2. Advanced Algebra
3. Infinitesimal Calculus
4. Topography
5. Hydraulics
6. Theory and Practice of Topographical Drawing

Second Year:
7. Analytical Mechanics
8. Calculus applied to the Sciences of Observation, Geodesy, Topographical Drawing and Geography

Third Year:
9. Theoretical-Practical Astronomy
10. Hydrography and Global Physics
11. Geographical Drawing
12. Practical Astronomy will be done in the Astronomical Observatory

SCHOOL OF FINE ARTS
(First Part) These courses are to be taken exclusively in the School of Fine Arts

First Year:
1. Arithmetic
2. Geometrical Drawing copied from the Design

Second Year:
3. Design from Plaster of Paris
4. Ornate Design

Third Year:
5. Designs from Classical Architecture with a detailed study of the various parts

Fourth Year:
6. Design copying from Byzantine, Venetian, Florentine, Lombard, Gothic and Renaissance monuments

XIII. SCHOOL OF FINE ARTS
(Second part) These courses are to be taken exclusively in the School of Fine Arts
SCHOOL OF FINE ARTS—continued

First Year:
1. Analytical Geometry
2. Descriptive Geometry
3. Advanced Algebra
4. Infinitesimal Calculus
5. The application of descriptive geometry to the study of shades and perspective
6. Natural history applied to construction materials
7. Design copying from Roman, Greek, Renaissance, and Contemporary Greek Monuments

Second Year:
8. Applied Analytical Mechanics
9. Descriptive Geometry applied to Stonecutting
10. History of Fine Arts, especially of Architecture
11. Composition and Combination of the Different Parts of Buildings

Third Year:
12. Practical Art of Construction
13. Art of Building Projection and Combination of every type of building

Fourth Year:
14. Composition of Monuments, commemorative, triumphal, etc.
15. Restoration Projects
16. Meetings on Architectural Projects
17. Legal Architecture
18. How to make Estimates
19. Notions of Topography and the Application of Topographical Instruments
20. Practical Construction Work

XIV. PROFESSOR OF FINE ARTS

First Year:
1. Arithmetic
2. Geometrical Drawing
3. Elements of Geometry
4. Free-hand Drawing

Second Year:
5. Practical Construction, including a knowledge of construction materials and how to make mixtures and mortars
6. General rules of Frames, Scaffolds, Tools and Machinery and Instructions for their use

The courses for Professor of Arts are to be taught at the School of Fine Arts every night for two hours

XV. MUSIC

First Year:
1. Music theory
2. Melodious singing
3. Principles of all Instruments

Second Year:
4. Melodious Singing
5. Study of Instruments
6. Vocalization and Singing
7. Principles of Harmony

Third Year:
8. Vocalization and Singing
9. Study of Instruments
10. Harmony—Theory and Practice

Fourth Year:
11. Vocalization and Singing
12. Study of Instruments
13. Pantomime and Declamation
14. Study of Apparel and Costumes
Continued from page 177

MUSIC—Continued

Fifth Year:
15. Vocalization and Singing
16. Study of Instruments
17. Composition and Instrumentation
18. History of Music
19. Biography of well-known musicians

Sixth Year:
20. Study of instruments
21. Composition and instrumentation
22. Anatomy
23. Physiology and Hygiene of the Voice and Ear
24. Philosophy and Aesthetics of Music

XVI. SCHOOL OF ARTS AND
CRAFTS

First Year:
1. Spanish
2. First Year French
3. Arithmetic
4. Design, Create and Natural Drawing

Second Year:
5. French
6. English
7. Algebra
8. Geometry
9. Trigonometry
10. Modulation

Third Year:
11. English
12. Physics
13. Notions of Mechanics
14. Linear Drawing
15. Machine Drawing

Fourth Year:
17. The Economy and Industrial Inventions which will be taught by the Directors of the shops and their respective arts and crafts
I. SCHOOL OF JURISPRUDENCE

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Natural Law</td>
<td>7. International and Maritime Law</td>
</tr>
<tr>
<td>2. First Year Roman Law</td>
<td>8. Constitutional and Administrative Law</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Fifth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Second Year Roman Law</td>
<td>9. Civil Procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Sixth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Second Year National Law</td>
<td>11. Criminal Procedures</td>
</tr>
</tbody>
</table>

II. SCHOOL OF MEDICINE

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Descriptive Anatomy</td>
<td>10. General Pathology</td>
</tr>
<tr>
<td>2. Galenio Pharmacy</td>
<td>11. Operations, Bandages and Instruments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Fifth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Physiology</td>
<td>12. Therapeutics</td>
</tr>
<tr>
<td>4. External Pathology</td>
<td>13. External Clinic</td>
</tr>
<tr>
<td>5. Internal Pathology</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Sixth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Internal Pathology</td>
<td>15. Medical Meteorology</td>
</tr>
<tr>
<td>9. Internal Clinic</td>
<td>17. Legal Medicine</td>
</tr>
</tbody>
</table>

III. SCHOOL OF AGRICULTURE

<table>
<thead>
<tr>
<th>First Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agronomy</td>
<td>8. Botany applied to Agriculture</td>
</tr>
<tr>
<td>3. Applied Physics</td>
<td></td>
</tr>
<tr>
<td>4. Chemistry and Meteorology applied to Agriculture</td>
<td>10. Theoretical-Practical Topography</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Third Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Agricultural Art</td>
<td>10. Economics and Agricultural Administration</td>
</tr>
<tr>
<td>6. Arboriculture</td>
<td>11. Rural Constructions</td>
</tr>
</tbody>
</table>

| Fourth Year | |
|-------------| |

IV. SCHOOL OF VETERINARY

<table>
<thead>
<tr>
<th>First Year</th>
<th>Third Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Descriptive Anatomy</td>
<td>6. Operations</td>
</tr>
<tr>
<td>2. Compared Physiology</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Exterior of Domestic Animals</td>
<td>7. Comparative Internal Pathology</td>
</tr>
<tr>
<td>4. Comparative External Pathology</td>
<td>8. Comparative Internal Clinic</td>
</tr>
<tr>
<td>5. Comparative External Clinic</td>
<td>9. Therapeutics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Operations</td>
<td>7. Comparative Internal Pathology</td>
</tr>
<tr>
<td>7. Comparative Internal Clinic</td>
<td>8. Comparative Internal Clinic</td>
</tr>
<tr>
<td>9. Therapeutics</td>
<td>10. General Pathology, preceded by Elements of General Anatomy</td>
</tr>
<tr>
<td>11. Obstetrics</td>
<td></td>
</tr>
<tr>
<td>12. Zootecnic applied to Hygiene</td>
<td></td>
</tr>
</tbody>
</table>
Continued from page 179

V. SCHOOL OF PHARMACY

First Year:
1. Theoretical-Practical Pharmacy
2. Economic and Pharmaceutical Legislation

Second Year:
3. Natural History of Simple Drugs
   Third Year:
4. Chemical Analysis

VI. SCHOOL OF MINING ENGINEERS

First Year:
1. Analytical Geometry
2. Advanced Algebra
3. Infinitesimal Calculus
4. Descriptive Geometry
5. Topography
6. Topographical Drawing

Second Year:
7. Analytical and Applied Mechanics
8. Geodesy

Third Year:
10. Applied Chemistry
11. Chemical Analysis
12. Practical Astronomy

Fourth Year:
13. Mineralogy
14. Geology
15. Paleontology
16. Mine Working, Mining Ordinances, and Metallurgy in the practical school

VII. SCHOOL OF TOPOGRAPHICAL ENGINEERS

First Year:
1. Advanced Mathematics
2. Descriptive Geometry
3. Topography
4. Topographical Drawing

Second Year:
5. Analytical Mechanics
6. Geodesy
7. Elementary Practical Astronomy
8. Topographical Drawing

VIII. SCHOOL OF GEOGRAPHICAL AND HYDROGRAPHICAL ENGINEERS

First Year:
1. Advanced Mathematics
2. Descriptive Geometry
3. Topography
4. Topographical Drawing

Third Year:
7. Topographical and Geographical Drawing
8. Theoretical-Practical Astronomy
9. Hydrography and Global Physics
10. Geographical Drawing

IX. SCHOOL OF ARCHITECTURAL ENGINEERS

First Year:
1. Advanced Algebra
2. Infinitesimal Calculus
3. Analytical Geometry
4. Descriptive Geometry
5. Second Course of Monument copying in the School of Fine Arts

Second Year:
6. Analytical and Applied Mechanics
7. Topography, Topographical Drawing
8. The History of Fine Arts
9. First Year Composition in the School of Fine Arts
10. Study of Construction Materials and of the areas where Architectural Engineers will work (in the School of Engineering)
Continued from page 180

<table>
<thead>
<tr>
<th>Course</th>
<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Second Year of Composition in the School of Fine Arts</td>
<td>13. Third Year of Composition in the School of Fine Arts</td>
</tr>
<tr>
<td>12. Construction Mechanics and building carpentry in the School of</td>
<td>14. Legal Architecture</td>
</tr>
<tr>
<td>Engineering</td>
<td>15. Formation of Estimates</td>
</tr>
</tbody>
</table>

### X. SCHOOL OF METAL ASSAYERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>1. Advanced Mathematics</td>
</tr>
<tr>
<td></td>
<td>2. Chemistry and Chemical Analysis</td>
</tr>
<tr>
<td>Second Year</td>
<td>3. Practical Assaying and Elements of Mineralogy to be studied</td>
</tr>
<tr>
<td></td>
<td>simultaneously</td>
</tr>
</tbody>
</table>

### XI. SCHOOL OF MECHANICAL ENGINEERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>1. Advanced Mathematics</td>
</tr>
<tr>
<td></td>
<td>2. Descriptive Geometry</td>
</tr>
<tr>
<td></td>
<td>4. Analytical and Applied Mechanics</td>
</tr>
<tr>
<td></td>
<td>5. Machine Drawing</td>
</tr>
<tr>
<td>Second Year</td>
<td>6. Construction Mechanics</td>
</tr>
<tr>
<td></td>
<td>9. Building Carpentry and Road Construction</td>
</tr>
<tr>
<td></td>
<td>10. Study of Construction Materials and of areas in which Civil</td>
</tr>
<tr>
<td></td>
<td>Engineers will work</td>
</tr>
<tr>
<td></td>
<td>11. Bridges, Canals and Port Works</td>
</tr>
<tr>
<td></td>
<td>12. Stereometry</td>
</tr>
<tr>
<td></td>
<td>13. Architectural Drawing</td>
</tr>
</tbody>
</table>

### XII. SCHOOL OF CIVIL ENGINEERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>1. Advanced Mathematics</td>
</tr>
<tr>
<td></td>
<td>2. Descriptive Geometry</td>
</tr>
<tr>
<td></td>
<td>3. Topography</td>
</tr>
<tr>
<td></td>
<td>4. Topographical Drawing</td>
</tr>
<tr>
<td></td>
<td>5. Analytical and Applied Mechanics</td>
</tr>
<tr>
<td></td>
<td>6. Stereometry</td>
</tr>
<tr>
<td></td>
<td>7. Architectural Drawing</td>
</tr>
<tr>
<td></td>
<td>8. Construction Mechanics</td>
</tr>
<tr>
<td></td>
<td>9. Building Carpentry and Road Construction</td>
</tr>
<tr>
<td></td>
<td>10. Study of Construction Materials and of areas in which Civil</td>
</tr>
<tr>
<td></td>
<td>Engineers will work</td>
</tr>
<tr>
<td></td>
<td>11. Bridges, Canals and Port Works</td>
</tr>
<tr>
<td></td>
<td>12. Stereometry</td>
</tr>
<tr>
<td></td>
<td>13. Architectural Drawing</td>
</tr>
<tr>
<td>Third Year</td>
<td>6. Practicall construction, including the knowledge of construction</td>
</tr>
<tr>
<td></td>
<td>materials, the formation of mixtures and mortars, general rules of</td>
</tr>
<tr>
<td></td>
<td>Stereometry, Frames, Scaffolds, Apparatus, and Construction Machines</td>
</tr>
<tr>
<td></td>
<td>and Instruments</td>
</tr>
</tbody>
</table>

### XIII. SCHOOL OF FINE ARTS: SCULPTORS, PAINTERS AND ENGRAVERS

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>1. Arithmetic</td>
</tr>
<tr>
<td></td>
<td>2. Geometrical Drawings copied from the first sketch</td>
</tr>
<tr>
<td>Second Year</td>
<td>3. Geometry</td>
</tr>
<tr>
<td></td>
<td>4. Free-hand Drawing of clear dark contour, outline copied from the</td>
</tr>
<tr>
<td></td>
<td>first sketch</td>
</tr>
<tr>
<td>Third Year</td>
<td>5. Practical construction, including the knowledge of construction</td>
</tr>
<tr>
<td></td>
<td>materials, the formation of mixtures and mortars, general rules of</td>
</tr>
<tr>
<td></td>
<td>Stereometry, Frames, Scaffolds, Apparatus, and Construction Machines</td>
</tr>
<tr>
<td></td>
<td>and Instruments</td>
</tr>
</tbody>
</table>
Continued from page 181

XIV. SCHOOL OF ARTS AND CRAFTS

<table>
<thead>
<tr>
<th>First Year:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Arithmetic</td>
<td>15. Practical Arts and Crafts in Shops</td>
</tr>
<tr>
<td>3. Algebra</td>
<td>Fourth Year:</td>
</tr>
<tr>
<td>4. First sketch and ornate Drawing</td>
<td></td>
</tr>
<tr>
<td>5. Industrial Inventions and Practical Arts and Crafts</td>
<td></td>
</tr>
</tbody>
</table>

Second Year:

| 6. Algebra | 16. General Chemistry |
| 8. Rectilinear Trigonometry | 18. Inventions and Industrial Economy and Practical Arts and Crafts |
| 9. Natural Drawing and Modulation | Fifth Year: |
| 12. Lineal Drawing | 21. Invention and Industrial Economy |

The following shops and practical crafts will be established:
Ceramic arts (pottery, porcelain, glass, enamels, gilding, etc.); Carpentry applied to the construction of musical instruments, and cabinet work; all branches of locksmithing; use of the lathe with solid bone; metal, ebony and horn button-making; metal foundations for adornments, especially statues and every class of image; every kind of tannery, dying of hides, textiles and feathers; elastic materials.

XV. SCHOOL OF DEAF MUTES

It depends on what one studies
### APPENDIX L. THE NUMBER OF COLEGIOS IN EACH STATE AND THE SCIENCES TAUGHT IN EACH

<table>
<thead>
<tr>
<th>STATE</th>
<th>COLEGIOS</th>
<th>SCIENCES TAUGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aguascalientes</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Engineering</td>
</tr>
<tr>
<td>Campeche</td>
<td>2</td>
<td>Preparatory, Jurisprudence, Medicine, Pharmacy, Land Surveying, Navigation</td>
</tr>
<tr>
<td>Coahuila</td>
<td>1</td>
<td>Preparatory, Jurisprudence</td>
</tr>
<tr>
<td>Colima</td>
<td>1</td>
<td>Preparatory</td>
</tr>
<tr>
<td>Chiapas</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Medicine, Land Surveying</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Medicine, Land Surveying</td>
</tr>
<tr>
<td>Durango</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Medicine, Land Surveying, and Metal Assaying</td>
</tr>
<tr>
<td>Guanajuato</td>
<td>3</td>
<td>Preparatory, Jurisprudence, Medicine, Pharmacy, and Engineering</td>
</tr>
<tr>
<td>Guerrero</td>
<td>1</td>
<td>Preparatory</td>
</tr>
<tr>
<td>Hidalgo</td>
<td>1</td>
<td>Preparatory</td>
</tr>
<tr>
<td>Jalisco</td>
<td>4</td>
<td>Preparatory, Jurisprudence, Engineering, and Agriculture</td>
</tr>
<tr>
<td>México</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Engineering</td>
</tr>
<tr>
<td>Michoacán</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Medicine, Pharmacy</td>
</tr>
<tr>
<td>Morelos</td>
<td>1</td>
<td>Preparatory</td>
</tr>
<tr>
<td>Nuevo León</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Medicine, Pharmacy, and Land Surveying</td>
</tr>
<tr>
<td>Oaxaca</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Medicine, Pharmacy, and Engineering</td>
</tr>
<tr>
<td>Puebla</td>
<td>3</td>
<td>Preparatory, Jurisprudence, Medicine, Pharmacy</td>
</tr>
<tr>
<td>Querétaro</td>
<td>1</td>
<td>Preparatory, Jurisprudence (for Lawyers and Notaries), Pharmacy</td>
</tr>
<tr>
<td>San Luis Potosí</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Engineering, and Commerce</td>
</tr>
<tr>
<td>Sinaloa</td>
<td>3</td>
<td>Preparatory, Navigation</td>
</tr>
<tr>
<td>Sonora</td>
<td>1</td>
<td>Preparatory</td>
</tr>
<tr>
<td>Tabasco</td>
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<td></td>
</tr>
<tr>
<td>Tamaulipas</td>
<td>1</td>
<td>Preparatory</td>
</tr>
<tr>
<td>Tlaxcala</td>
<td>0</td>
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</tr>
<tr>
<td>Veracruz</td>
<td>5</td>
<td>Preparatory, Jurisprudence, and Commerce</td>
</tr>
<tr>
<td>Yucatán</td>
<td>4</td>
<td>Preparatory, Jurisprudence, Medicine, and Conservatory of Music</td>
</tr>
<tr>
<td>Zacatecas</td>
<td>1</td>
<td>Preparatory, Jurisprudence, Medicine, and Engineering</td>
</tr>
<tr>
<td>Distrito Federal</td>
<td>12</td>
<td>Preparatory, Jurisprudence (for Lawyers, notaries and business agents), medicine, obstetrics, pharmacy, engineering (surveying, civil, mechanical, architectural, mining, geographical, and hydrographical), Assayers and Metal Improvers, Trade Teachers, Agriculture Veterinary, Arts and Crafts, Commerce, Fine Arts, Military Art, Conservatory of Music, Instruction of the Blind and Deaf-Mutes</td>
</tr>
</tbody>
</table>

| Baja California | 0 | *Díaz Covarrubias, In Instruction or Liv. |
APPENDIX M. SEMINARIES IN THE MEXICAN REPUBLIC

<table>
<thead>
<tr>
<th>STATE</th>
<th>NUMBER OF SEMINARIES</th>
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<tbody>
<tr>
<td>Aguascalientes</td>
<td>2</td>
</tr>
<tr>
<td>Colima</td>
<td>1</td>
</tr>
<tr>
<td>Coahuila</td>
<td>1</td>
</tr>
<tr>
<td>Chiapas</td>
<td>1</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>1</td>
</tr>
<tr>
<td>Durango</td>
<td>1</td>
</tr>
<tr>
<td>Guanajuato</td>
<td>1</td>
</tr>
<tr>
<td>Guerrero</td>
<td>1</td>
</tr>
<tr>
<td>Hidalgo</td>
<td>1</td>
</tr>
<tr>
<td>Jalisco</td>
<td>2</td>
</tr>
<tr>
<td>Michoacán</td>
<td>2</td>
</tr>
<tr>
<td>Nuevo León</td>
<td>1</td>
</tr>
<tr>
<td>Oaxaca</td>
<td>2</td>
</tr>
<tr>
<td>Puebla</td>
<td>1</td>
</tr>
<tr>
<td>Querétero</td>
<td>1</td>
</tr>
<tr>
<td>San Luis Potosi</td>
<td>1</td>
</tr>
<tr>
<td>Sinaloa</td>
<td>1</td>
</tr>
<tr>
<td>Veracruz</td>
<td>1</td>
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<tr>
<td>Zacatecas</td>
<td>1</td>
</tr>
<tr>
<td>Distrito Federal</td>
<td>1</td>
</tr>
</tbody>
</table>

24

*Díaz Covarrubias, La Instrucción Pública, p. clxxviii.*
APPENDIX N. THE NUMBER OF COLEGIOS IN WHICH ONE CAN STUDY FOR THE PROFESSIONS

<table>
<thead>
<tr>
<th>PROFESSIONS</th>
<th>NUMBER OF COLEGIOS</th>
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</thead>
<tbody>
<tr>
<td>Jurisprudence (19 state and 14 seminaries)</td>
<td>33</td>
</tr>
<tr>
<td>Medicine</td>
<td>11</td>
</tr>
<tr>
<td>Engineering (chiefly surveying)</td>
<td>10</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>9</td>
</tr>
<tr>
<td>Commerce</td>
<td>3</td>
</tr>
<tr>
<td>Arts and Crafts</td>
<td>3</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2</td>
</tr>
<tr>
<td>Navigation</td>
<td>2</td>
</tr>
<tr>
<td>Music Conservatories</td>
<td>2</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>1</td>
</tr>
<tr>
<td>Military Art</td>
<td>1</td>
</tr>
<tr>
<td>Ecclesiastical Careers (Seminaries)</td>
<td>24</td>
</tr>
</tbody>
</table>

APPROVAL SHEET

The dissertation submitted by Josephine Helen Schulte has been read and approved by members of the Department of History.

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Date: June 15, 1969

Signature of Advisor: [Signature]