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CONCERNING THE BADIANUS MANUSCRIPT, AN AZTEC HERBAL, "CODEX BARBERINI, LATIN 241" (VATICAN LIBRARY)

(With Four Plates)

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FOREWORD

The present pamphlet is published to make known the discovery of the Badianus Manuscript in the Vatican Library and to give an idea of the value and interest of this unique Aztec herbal. It is believed to be the earliest herbal produced on this side of the Atlantic, and from this consideration alone it deserves all the notice that it will undoubtedly receive. It is a matter of regret to the Smithsonian Institution that funds are not available to publish a facsimile of the full manuscript with its 91 color sketches of plants. Such a publication, in the usual edition issued by the Institution and with 91 color plates, would involve a considerable sum, but the text with black and white illustrations and a few color plates could be published for a comparatively moderate amount. If there are those who would be sufficiently interested to contribute toward the publication of this valuable manuscript as a whole or in such modified form, I should be glad to have them communicate with the Institution.

C. G. Abbot,
Secretary, Smithsonian Institution.

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The Badianus manuscript is a sixteenth century Mexican Herbal composed in the year 1552 in the famous College of Santa Cruz at Tlaltelolco, Mexico City. This beautiful manuscript has long been in the possession of the Vatican Library, where its real identity has been obscured by the title "Codex Barberini, Latin 241". Except for a few scholars,[1-2] it was practically unknown until 5 years ago, when,

[1] In a personal communication (Mar. 16, 1930) to Dr. C. U. Clark, Mrs. Zelia Nuttall suggests that "Codex Barberini, Latin 241" might be the "small book" sent by Muñoz Camargo to King Philip. It contained a "demonstración, pro pinturas y colores de sus formas y hechuras y propriedades" of the flowers esteemed by the Indians (Muñoz Camargo, Historia de Tlazcala, edition issued in Tlazcala, Imprento de Gobierno, 1870).

[2] Thorndyke, Lynn, Vatican Latin Manuscripts in the History of Science and Medicine. Isis, vol. 13, 1929-30.

"This sixteenth century manuscript is a work on medicinal herbs of the Indias which an Indian physician of the College of Holy Cross composed, taught by no reasons, but by experience only, in the year 1552.

"There is a dedication by Martin de la Cruz to Francisco de Mendoza, and the work closes with a letter of John Badianus, the Latin translator, to the reader.

"Barberini 241, paper, 63 fols., Libellus de Medicinalibus Indorum Herbis quem quidam Indus Collegii Sanctae Crucis medicus composuit, nullis rationibus doctus, sed solis experimentis edoctus Anne Domini Servatoris 1552."

In a personal communication from Dr. C. U. Clark, the author is informed that Dr. Gabrieli, of the Corsini Library in Rome, discovered a copy of the Badianus manuscript, in Italian hand, in the Royal Library at Windsor Castle. Gabrieli, G., Due codici iconografici di piante miniate nella Biblioteca Reale di Windsor. A proposito di Cimeli Lincei. Rend. Acc. Lincei, ser. 6, vol. 10, 2 sem., fasc. 10, November 1929.

through the generosity of Ambassador Charles G. Dawes, the Smithsonian Institution sent Dr. Charles U. Clark to Europe in search of early Latin American texts. Through the courtesy of the Vatican Library, Dr. Clark was able to obtain photographs of the original manuscript, and it is from these that the present translation has been made. The manuscript is a complete herbal consisting of 63 folios approximately 6 by 8¼ inches in size, clearly written in Latin and Aztec. It is divided into 13 chapters, each representing an attempt to group maladies of either similar type or similar location of the body. The first eight chapters follow the latter arrangement, beginning with the head and continuing to the feet; in the last five chapters an attempt has been made to group them according to subject matter. The text is exquisitely illustrated with pictures of 204 herbs and trees, and these illustrations still today retain their brilliancy of color. Through the kindness of Dr. Charles G. Abbot, of the Smithsonian Institution, the original water-color sketches for the colored plates, made by Mrs. Missonnier, niece of Mgr. Eugene Tisserant, Pro-Prefect, Vatican Library, have been obtained, and it is hoped that it will be possible at a later time to publish the herbal in colored facsimile with a translation.

The herbal is the work of two Aztecs who were educated at the College of Santa Cruz. It was first written in Aztec and then, with the exception of the names of the plants, stones, and animals, translated into Latin within the same year. The exact title reads as follows:

> A book of Indian Medical Herbs composed by a certain Indian physician of the College of Santa Cruz, who is not theoretically learned, but is taught only by experience. In the year of our Lord Saviour 1552. [Pl. 1.]

There seems little doubt that the principal author of the manuscript is one Martin de la Cruz, whose name appears in the first line of the dedication; the second author is Juannes Badianus, the translator, whose signature appears in the postscript at the end of the last chapter. Both of these men were natives taught in the first college erected for the Indians, the College of Santa Cruz.

The manuscript is fittingly dedicated to Don Francisco de Mendoza, son of Don Antonio de Mendoza, the first viceroy to New Spain. Although the dedication is addressed to Don Francisco de Mendoza, it is none the less a tribute to the first viceroy. That it is not addressed directly to the viceroy may be explained by the fact that Don Antonio de Mendoza had been transferred to Peru 2 years before. Since history records his death on July 21, 1552, the day before

the completion of the translation, it is certain that he was not aware of the well-deserved tribute which reads as follows:

For the most eminent Don Francisco de Mendoza, most excellent son of Don Antonio de Mendoza, first viceroy of this India, his unworthy slave, Martin de la Cruz, prays for the greatest health and prosperity.[3]

Since in you the graces and adornments of every excellence, and the accomplishments of the good, which are desired by everyone, shine forth O most magnificent Master, I do not know, indeed, what quality of yours to praise especially. Indeed, I do not see by what praises I may extol your remarkable love, by what words I may express gratitude for your unsurpassable kindness. For I cannot express in words how your father, a man at once most christian and most devoted, has been above all others my benefactor, for whatever I am, whatever I possess, and whatever renown I have, I owe to him. I can find nothing equal to, nothing worthy of his benefits. I can give great thanks, indeed, to my Maecenas, but little repayment. On that account, I offer, dedicate, and consecrate myself, whatever I am, to be your property. Not in truth to him alone, but also to you my most eminent master, as a most supplicant token and testimony of my singular devotion.

The herbal was written at the request of Don Francisco de Mendoza and was intended as a gift to "His Holy Caesarian Royal Catholic Majesty"—Charles V. It is evident that Don Francisco, who followed in his famous father's footsteps in fostering the protection and education of the Indians, wished to commend the work of the Indians and to enlist His Majesty's support of the College of Santa Cruz.

The latter part of the dedication reads as follows:

Indeed I suspect that you demand this little book of herbs and medicaments so strongly for no other reason than to commend us Indians, even though unworthy, to his Holy Caesarian Catholic Royal Majesty. Would that we Indians could make a book worthy of the king's sight, for this certainly is most unworthy to come before the sight of so much majesty. But you will recollect that we poor unhappy Indians are inferior to all mortals, and for that reason our poverty and weakness implanted in us by nature merit your indulgence. Now accordingly, I beg that you will take this book, which by every right I ought to inscribe with your name, most magnificent Master, in the spirit in which it is offered, or, what would not surprise me, that you cast it out whither it deserves. Farewell. Tlatilulci. In the year of our Lord Saviour 1552.

Your Excellency's most humble servant.

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[3] In the space between this item and the following appears "Exlibris didaci Cortavila." The handwriting is entirely different from that of the manuscript, so we can surmise that the book was once in the possession of someone by the name of Cortavila.

Whether this beautiful little manuscript ever came into the hands of Charles V is not known, but Mendieta[4] records the fact that His Majesty contributed to the support of the College:

> His Majesty gave to the College of Santa Cruz, where they were taught Latin a thousand pesos for each year for certain years. To those who taught in the Chapel of Santa Jose to read, write and sing and play instruments of the church, three hundred ducats was given for some years. To illuminate the Holy Sacrament he commanded to give to each monastery six measures in each year, one half measure for each month. For celebration of mass in the monastery he commanded wine.

and in addition we read—

> for the hospitals of St. Francis of Mexico and convent of Los Angeles 100 pesos per year. And in order that the sick Indians should not remain untreated, he ordered to be built a royal hospital near Saint Francis of Mexico where they were cared for.

Entirely apart from wishing to enlist His Majesty's support of the college which, after the early prosperous period, was always in need of funds, Don Francisco undoubtedly had a keen interest in the herbs and medical knowledge of New Spain. Verification of Don Francisco's personal interest in herbs is to be found in the quotation from the Frampton translation of Monardes:[5]

> Don Frauncis De Mendosa, Sonne unto the vise Roye, Don Antony de Mendosa did sowe in the new Spaine Cloaves, Pepper, Ginger, and other spices, of those whiche are brought from the Orientall Indias, and that whiche by hym was begonne was loste, by reason of his death, onely the Ginger did remain, for it did growe verie well in those partes, and so thei bryng it greene from newe Spain and other partes of our Indias, and some they bring drie, after the maner of that of the East India.

Besides the personal interest of Don Francisco in herbs and his desire to foster the education of the Indians, a third and more forceful influence gave impetus to the writing of this herbal; namely, the demand on the part of Europeans for herbs and medicaments.

The expansion of the West had been stimulated by a desire to find a shorter trade route to the spice-producing countries of the East. The tales and accounts of voyages of Columbus (1492-1502), Vespucci (1499-1503), Balboa (1512-13) and Magellan (1519-22) and others had already awakened Europeans to the value of spices and herbs from

[4] Icazbalceta, Joaquin Garcia, 1870.

Mendieta, Fray Gerónimo de Mendieta-Historia Eclesiástica Indiana. Publ. Mexico, 1870. Antiqua Libreria, portal de Augustinos no. 3, 1870.

[5] Frampton, John, 1577—Joyfull Newes of the Newe Founde Worlde . . . . tr. of Monardes, Nicholas, vol. 2, p. 5, Introduction by Stephen Gaselee, Constable and Co., Ltd. London, 1925.

the New World. With the coming of Cortez and the fall of Tenochitlan in 1521, news of the medical knowledge of the Aztecs drifted back to Europe. In a letter to Charles V concerning the district of Tlaltelolco, the marketplace of Tenochitlan, Cortez mentions especially a street of "herb sellers where there are all manner of roots and medicinal plants that are found in the land. There are houses as it were of apothecaries where they sell medicines made from these herbs both for drinking and for use as ointments and salves."[6]

These letters, accounts of ship captains and explorers, even at this early date carried news to Europe of a knowledge of the use of herbs and medicaments which appeared to rival that of the Old World. This interest is reflected in accounts of later historians and travelers, and in the works of some of the great European herbalists of the sixteenth century.

Of the translator Juannes Badianus, we have brief but precise data in the last two pages of the volume (pl. 2), where he adds a word of explanation to the reader which is self explanatory:

JUANNES BADIANUS, THE TRANSLATOR, TO THE GENTLE READER

I beg again and again, most excellent reader, that you consider that I have well employed the labor that went into the translation, such as it is, of this little book of herbs. For my part, I preferred to have that labor go for nothing than to undergo your most exacting judgment. Further be sure that I put so many spare hours on this edition, not to show off my own talent, which is almost nothing, but only because of the obedience which I very rightly owe to the priest of this Monastery of St. Jacob, the apostle of the Spaniards and my most excellent patron, and very much to his superior the reverend Franciscan father, brother Jacobo de Grado, who laid this task upon my shoulders. Farewell in Christ the Saviour. At Tlatilulci in College of the Holy Cross, on the feast day of Saint Mary Magdalene during the Holy Holidays, A.D. 1552.

End of the Book of Herbs, which Juannes Badianus by nation an Indian of the Xuchimilcanus country, reader of the same college, translated into Latin.

Glory be ever to him by whose gift I translated this Book which you perceive, Good friend Reader.

Badianus was apparently a native Indian from the district of Xochimilco, and he was undoubtedly among those first students who attended the college after it opened in 1535. It is most fitting that the translator was a native of the district of the floating gardens of Xochimilco, which had long been the gardens of the Aztec kings and princes. Centuries before the conquest the Aztecs had brought flowers and herbs from the lowlands and had developed a truly botanical gar-

[6] Cortes, Hernando, Five letters, 1519-1526. Translated by F. Bayard Morris, Robert M. McBride & Co., New York, 1929. Second letter, p. 87.

den of plants from many districts in Mexico. The historian Juan de Torquemada,[7] who was for a time a member of the faculty of Santa Cruz, tells us that "Montezuma kept a garden of medicinal herbs and that the court physicians experimented with them and attended the nobility. But the common people came rarely to these doctors for medical aid, not only because a fee was charged for their services, but also because the medicinal value of herbs was common knowledge and they could concoct remedies from their own gardens." These gardens were undoubtedly flourishing in good condition at the time the manuscript was written, and even today they furnish all the flowers and vegetables for Mexico City. It is quite within reason that both Martinus de la Cruz and Juannes Badianus were familiar with the flora of this district from early childhood.

Of "the Reverend Franciscan father, Brother Jacobo de Grado", no other historical reference has as yet been found—a most singular fact since he held the position of superior at the convent at a time when both the historians Fray Bernardino de Sahagun and Fray Torquemada were in Mexico, the former Fray Bernardino de Sahagun being a member of the Governing Board of the Order of Franciscans at the time of the completion of this manuscript.

As to the origin of the famous College of Santa Cruz of Tlaltelolco (Tlatilulci), both the modern writers Bourne[8] and Merriman[9] accredit its founding to Bishop Zumarraga in the year 1535. Bourne adds: "Besides the elementary branches, instruction was offered in Latin, philosophy, music, *Mexican medicine*, and the native languages. Among the faculty were graduates of the University of Paris and such eminent scholars as Bernardino de Sahagun, the founder of American anthropology, and Juan de Torquemada, himself a product of Mexican education, whose Monarquia Indiana is a great storehouse of knowledge of Mexican antiquities and history. Many of the graduates of this college became alcaldes and governors in the Indian towns."

[7] Torquemada, Juan de, Monarg. Ind., lib. 14, chap. 14: "El emperador Moctezuma tenia jardines de yerbas medicinales, y mandaba á sus médicos que hiciesen experiencias con ellas, y curasen á los señores de su corte. La gente común occurria rara vez a los medicos, por excusarse de pagarles, y porque era general el conocimiento de varios remedios, con los cuales se curaban, como podian, de sus enfermedades."

[8] Bourne, E. G., The American Nation—a history, vol. 3, p. 309, Harper & Brothers, New York, 1904.

[9] Merriman, R. B., The rise of the Spanish Empire, vol. 3, p. 663, Macmillan Co., New York, 1925.

If we return to the sixteenth century work of the historian Mendieta, who went to Mexico 19 years after the founding of the college, a more intimate picture may be obtained. Before the opening of the College of Santa Cruz in 1536,[9a] the Indians were taught in the convent of S. Francisco of Mexico in the chapel of S. Jose. Here " the good father and guide Fr. Pedro de Gante " instructed them in " Christian doctrine and in all the arts and exercises ". " The first teacher in grammar was Fr. Arnaldo de Bassacio, a Frenchman and a great linguist of Indian language, with whom they made such progress that the first viceroy Antonio de Mendoza, true father of the Indians, noting their progress gave the order that they should build a college in the principal suburb of Mexico a quarter of a league from S. Francisco (where we, the lesser friars have a second convent of the name of the apostle Santiago, in the suburb which is called Tlaltelolco). [Pl. 4.] In order that the guardian of that convent should have in his charge the administration of the college, and that this work should not burden the brothers of the principal convent, the viceroy Don Antonio himself built the college at his own expense and gave certain estates and farms which he had, in order that the rent of them might sustain the Indian college."

The students at the tender age of 10 to 12 years were carefully selected from the " sons of gentlemen " of the principal towns and larger provinces of this New Spain. " The priests of their native town selected only those who appeared most able, and thus were gathered together about a hundred children and young men." The ceremonies of the dedication of the college were impressive. Among those present were the viceroy, Antonio de Mendoza, Bishop of Mexico, Don Fr. Juan Zumarraga, the Bishop of S. Domingo, D. Sebastin Ramirez and " with them all the city ". The ceremonies began with a sermon preached by Dr. Cervantes at the convent of S. Francisco of Mexico. Then a great procession marched to the Convent of Santiago, where a second sermon was preached by Fr. Alonso de Herrera and a third and last by Fr. Pedro de Rivero in the refectory of the Friars of the Convent of Santiago—where, adds Mendieta, " The gentlemen ate at the cost of the good Bishop Zumarraga."

Mendieta also gives us the names of the teachers who taught during those early prosperous years and who quite probably were the instructors of the two authors of our herbal. Fr. Arnaldo de Bassacio, who first taught Latin, was followed by Fr. Bernardino de Sahagun and

[9a] Mendieta gives the year of the founding of the college one year later than that given by Bourne and Merriman.

Fr. Andres de Olmos. All three of these were gifted scholars of the Aztec language, and undoubtedly gave instruction in the writing of Aztec. (The Nahuatl grammar of Olmos is still today the background for all recent studies of the language.) Fr. Juan de Gaona also taught rhetoric, logic, and philosophy. And in addition we read "For a short time they taught also Medicine to the Indians, which they still use in their knowledge of herbs and roots and other things which they apply in their illnesses."

The fame of the college grew and flourished to such an extent that by the time of the second viceroy D. Luis de Velasco (1550-64), the rents of the college were not sufficient to sustain so many students. Through the intercession of the viceroy, the Emperor, Philip II, aided each year with two to three hundred ducats.[10] But after his death, the college lost favor with both the church and the governors. For a while the Indians themselves made an attempt to support the college, and we read the following notes from Mendieta: "The convent of Santiago of Tlaltelolco (in the borough of Mexico) has sustained itself very abundantly with the alms of the Indians, having continuously a gathering of Indian guests." . . . . "Indian butchers brought meat to the convent of Tlaltelolco on Saturday as their offerings." But by the time Mendieta was completing this history, approximately in 1598, we find him writing: "But this all is finished, and now the college serves for little more than to teach the Indian children who gather there, who are from the town of Tlaltelolco itself, good manners and to read and write."

Of all those who taught in the College of Santa Cruz, Friar Bernardino de Sahagun was the most eminent. Of his long life in Mexico (1529-1590), a large part was spent at Tlaltelolco. He was the first of the Europeans to gather together data on native materia medica. For the most part this was assembled in books 10 and 11 of his "Historia General de las Cosas de Nueva España". In a note of especial interest attached to the end of book 6 (Codice Florentino, libro 6 lam. 17), he tells us that he obtained his knowledge of Aztec medicine from eight native physicians of the district of Tlaltelolco, Santiago, and includes their signatures as follows: Gaspar Mattias, Francisco Symon, Felipe Hernandez, Miguel Garcia, Pedro de Santiago, Miguel Damian, Pedro de Raquena, and Miguel Motolinia. Book 6 was assembled in the year 1547, one year after the great plague, but the major part of all his writings on native medicine was not compiled until after 1557, when Fray Francisco Toral, Provincial of the Franciscan Order, commanded him to put his vast amount of

[10] Icazbalceta (tr. of Mendieta), p. 415.

information into two volumes. To complete this work he was sent to the Pueblo of Tepeopulco, of the district of Texcoco, where with the assistance of 10 or 12 Indians who were former students, the work was completed in 1569.[11]

A review of the known dates of his life shows that he was teacher of Latin at the College of Santa Cruz between 1536 and 1540. Between 1540 and 1545 he was visiting commissioner to various Franciscan convents. In 1545 he returned to the Tlaltelolco and was there until 1546, the year of the great plague. While nursing his beloved Indians he acquired the infection and was himself removed to the mother convent in Mexico City proper. The next year he returned to Tlaltelolco. Between the years 1547 and 1552 his residence is not known, but since in 1552, as a member of the governing board of the Order, we find his signature affixed to a letter to the Emperor, this would seem to indicate that he was in all probability in or near Mexico City at the time. It is possible that he was in residence at the Convent of Xochimilco, since we know that he was superior in that convent about this time.

As might be expected, the medical writings of Sahagun and text of the Badianus manuscript are closely related in subject matter as well as in the etymology of the Aztec words. However, the former is written in the manner of a notebook while the latter is a completely organized treatise. Also the Badianus manuscript deals with many more plants than the Sahagun. The illustrations are superior to the Sahagun manuscript both in number and in anatomical detail.

The use of Aztec symbols to assist in the identification of plants is to be found in both manuscripts. In the Badianus manuscript the Aztec water symbol is sometimes drawn under the roots of plants to indicate that it grows by flowing water. Where the water is not flowing the background around the roots of aquatic plants is painted blue. The use of the stone symbol, which is also found in the Sahagun manuscript, becomes a highly developed art in the Badianus manuscript, where it occurs with various modifications of form and color. In all cases it is found beneath the roots of plants.

In attempting to identify the various infirmities under the Latin title it is necessary to keep in mind that the manuscript is a description of diseases and ailments of natives of Mexico; and in addition that it deals with the materia medica of a people who lived in a tropical country at an altitude of approximately 9,000 feet. Although it was written within 31 years of the Conquest, the subject matter reaches

[11] Bandelier, F. R., Ancient Mexico. Fisk University Press, 1932.

far back into pre-Conquest times. The Nahuatl or Aztec Empire drew from its conquered peoples, the Toltecs and the Mayas, for much of its cultural background. Of these two peoples only Mayan medical texts have come down to us. All of these were written long after the Spanish Conquest and are believed to post-date the writing of the present Aztec herbal. To gain an adequate idea of the significance of much of the data of this herbal it is necessary to reach back into Aztec times and at the same time turn to our most recent writings in the field of tropical medicine and botanical research.

For the most part the materia medica deals with methods of treatment empirically derived. There are no incantations and only a few references to charms. The first chapter deals with head ailments, such as heat and cold in the head, abscess of the head, scales or mange, scabes, falling hair, and fractured head. The second chapter includes a treatment for sore eyes, fever, blood shot eyes, cataract, eversion of the eyelid, swelling of the eye, insomnia and a remedy to repel drowsiness. The third chapter deals with ear infection.

As a typical example of the method of treatment of the text, chapter four, because of brevity, permits of publication here. It reads as follows:

Fourth Chapter

Concerning catarrh, medicine to be instilled in the nose, herb for the blood.

Catarrh

Below this title are depicted two herbs, the Tzonpilihuizxihuitl and the Atochietl. An etymological analysis of the former name gives us the usage of the plant. Tzonpilihuiz-xihuitl is a compound word derived from the Aztec verb Tzompiliui (Simeon, p. 666) [12] meaning "to have a cold in the head" and the suffix, -xihuitl (Simeon, p. 699) meaning "plant"; so we may refer to Tzonpilihuizxihuitl as "cold in the head plant," or briefly "catarrh plant". Jimenez [13] (book 1, chap. 3) refers also to the use of catarrh medicine (Tzompilihuitz-patli), and Hernandez [14] (p. 29) refers to Tzinpalihuiz-patlin and gives the variant name Texaxapotla, which he identifies as *Ptarmica indica*, but this does not agree with the picture in the Badianus manuscript. The extract of Tzonpilihuizxihuitl is also used as a vermifuge (Bad. Ms., p. 51).

[12] Simeon, Reni, Dictionnaire de la Langue Nahuatl. Paris, Imprimerie Nationale, 1885.

[13] Jimenez, F., Quatro Libros de la Naturaleza . . . . Mexico, 1615.

[14] Hernandez, Francisco, Rerum Medicarum Novae Hispaniae Thesaurus . . . . 1651.

For the Atochietl, the second plant shown on the same page, we have but a single reference in which it is described as an aromatic plant, the pennyroyal (Simeon, p. 37).

The text for the treatment of catarrh reads as follows:

GRAVEDO

Qui narium distillatione seu coriza infestatur herbas atochietl, et Tzompilihuizxihuitl olfaciet et ita gravedini subveniet. [Those troubled with a dripping nose or cold are to sniff the herbs Atochietl and Tzompilihuizxihuitl and help the cold thus.]

A second remedy in the fourth chapter is entitled "Medicine to be instilled into the nose." The following remedy for a headache reads, "The root of the herb Yztac pahtli [lit. "white-medicine"] is to be bruised in a little clear water and the liquor poured into the nostrils drop by drop for those suffering from a headache."

The herb depicted above the text is of the family Mimosaceae, belonging to the genus *Acacia farnesiana* Willd.[15] An ointment made from the flowers is used today in Mexico as a remedy for headache. In addition an infusion of the flowers is used for dyspepsia.

The chapter closes with a remedy to stop nose bleeding. The plant Atzitzicaztli, or water nettle, is used also for maladies of the neck (Simeon, p. 664).

The remedy reads as follows:

The juice of nettles ground with salt in urine and milk poured into the nostrils, stops bleeding.

Two of the most interesting plants used as a cure for pain are the Tolohuaxihuitl and the Nexehuac (pl. 3). Both of these are Daturas (Solanaceae). The first of these, Tolohuaxihuitl or Tolohua plant, is referred to by Hernandez as *D. stramonium*. Sahagun[16] and Clavigero[17] refer to it as Toloache. Both the white-flowered and purple-flowered forms of this species occur in Mexico as well as in the United States; the purple forms are usually called *D. tatula*. The white-flowered forms may bear either smooth or prickly capsules, the smooth variety being called *D. inermis*.[18] The adjacent plant, called

[15] Standley, P. C., Trees and shrubs of Mexico. Contr. U. S. Nat. Herb., vol. 23, pt. 2, p. 378, 1922.

[16] Sahagun, Historia General de las Cosas de Nueva España (1590). Publicase con fondes de la secretaria de instrucion publica y bellas artes de Mexico, por Francisco del Paso y Troncoso. Publ. Madrid Tototipia de Hauser y Menet, 1905-07.

[17] Clavigero, F. J., Historia Antigua de Mexico. London, 1826.

[18] Safford, W. E., Narcotic Daturas of the Old and New World. Ann. Rep. Smithsonian Inst. 1920, Publ. 2644, 1922.

Nexehuac (Nexeua—the rambler—Simeon, p. 307), is depicted as an erect, white-flowered form with purple, smooth-skinned fruit resembling this type. The flowers are drawn as erect, the fruits pendant, but since all the arborescent Daturas have unarmed fruits we may consider either the drawing or the etymological derivation misleading. Its smooth pods would probably place it as a variety of *D. stramonium* known as *D. inermis* Jacq.

Varieties of *Datura* have been used the world over for their narcotic properties, the effect being due to the presence of the drug atropine.

Besides these remedies just discussed in detail, there are others for dysentery, skin disease, gout, pain in joints, various helminth infections, and afflictions such as burned body, cracks in soles of feet, and wounds of various types, and a number of other items. It is worthy to be noted that fear, fatigue, and feeblemindedness are looked upon as diseases and treated as such.

In chapter 10 we find a reference to a charm for getting across the river safely; chapter 11 is devoted to afflictions of women; chapter 12 refers to remedies for children; and the book closes very fittingly with two pages entitled "Of certain signs of approaching death."

The identification of plants depends to a large extent upon the etymological analyses, which frequently give the usage, the place of habitat, or a description of the plant itself. A complete analysis of all the 313 Aztec or Nahuatl words has been made in the preparation of the text for publication of this manuscript.[19] About 40 percent of these are new words—that is, they do not occur in the early sources, Molina,[20] Sahagun, Hernandez, or in the standard Simeon Aztec-French dictionary. From Simeon however, the roots have been derived, so that it has been possible to give a translation based upon the etymological sources of the word.

This system of the Aztecs of building up a descriptive compound noun results in the grouping of plants as to their color or form or as aquatic plants, eatable plants, sweet or bitter plants, fragrant, spinous, or medicinal. Examples of these when divided into their respective roots are as follows: A-caca-pac-quilitl (an-agreeable-eatable-water plant), Aca-mallo-tetl (water-plant captive (in) stone),

[19] The writer acknowledges the assistance of Dr. John P. Harrington, ethnologist, of the Bureau of American Ethnology, in verifying the etymologies of the Aztec plant names.

[20] Molina, Fr. Alonso, Vocabulario de la Lengua Mexicana, compuesto porel P. Fr. Alonso de Molina. Publicado de nuevo por Julio Platzmann, Leipsig, 1880.

Caca-matlalin (blue-colored herb), Chichic-xihuitl (bitter herb), Colomecatl (trailing cord), Hahuiyac-xihuitl (fragrant plant).

The credit for this as a system of plant identification was first recognized by Francisco Flores,[21] eminent Mexican medical historian, who mentioned it in his "Historia de la Medicina en Mexico" (1888), but he does not give such an analysis. Instead he groups Aztec plant names according to usage, such as tonics, antispasmodics, stimulants, etc. Until the translation of the present volume, as far as is known, no complete analysis of Aztec plant names has been undertaken.

The recognition of the modern botanical classification is most difficult. Without an analysis of the Aztec nouns, the usages of each plant and the colored-plate identification would be impossible. In addition it has been necessary to cross-reference every Aztec plant name with sixteenth century Aztec-Latin botanical texts. Again, without Standley's important volumes on the trees and shrubs of Mexico and the flora of Yucatan, this would have been impossible.

Of the sixteenth century Aztec-Latin sources, only two are of the greatest importance. The first, volumes 10 and 11 of the Sahagun manuscript, is the most important, since the work is both contemporary with, and deals with plants of the same district as, the Badianus manuscript. The second is the great Hernandez volume, which was written in the latter half of the sixteenth century, and although not published until 150 years later, was one of the greatest herbals of the sixteenth century. The excellent illustrations of the Hernandez volume have been invaluable in checking the more primitive Aztec drawings in the Badianus manuscript.

Besides the use of plants, animals, stones, and various kinds of earth, salts and carbon were used in the concoction of Aztec medical formulas. Of the stones, pearls of various kinds, the eztetl (jasper), the tetlahuitl (precious ocre stone), and the tlahcalhuatzin are the most frequently used. Numerous references are found to the use of bezoar stones, which they obtained from 10 different species of birds. Earths of various kinds classified according to their color were used, as well as soda and salt. The latter was obtained in cakes from the salt lake of Texcoco and, in the Aztec Empire period, was one of the chief articles of trade. Animal charcoal was used then as it still is today—although in a purer form—in the preparation of bitter principles for infusions and tinctures.

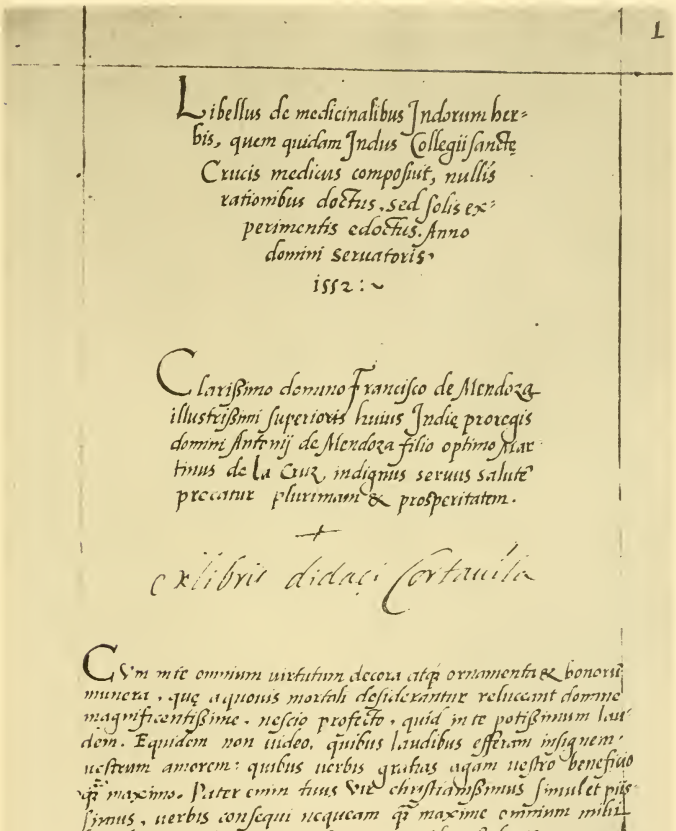
Of the animals used, the greater part were birds, although the stag, dog, fox, jaguar, monkey, and many other kinds were included.

[21] Flores, Francisco A., Historia de la Medicina en Mexico. Oficina Tip de la Secretaria de Fomento, vols. 1, 2, and 3, 1886.

Medicaments were either taken internally or used as lotions and unguents, and modes of treatments, intervals between dosages, and symptoms are also included. In many respects the treatments compare favorably with those of Europe. That Aztec medical knowledge was considered superior is obvious from the fact that it was taught at the College of Santa Cruz in preference to European medicine. It is especially significant that Philip II sent Dr. Francisco Hernandez, under the title of Protomedico of Spain, to New Spain with the commission to gather together the knowledge of native plants and their usage. Parts of his great work were collected by Dr. Nardo Antonio Recchi and published in one great volume by the Lyncean Society in 1651. The interest of Europeans in Aztec medicine is also reflected in the writings of Dr. Nicholas Monardes, whose work on the medical knowledge of the Occidental Indies was published in 1569 and translated into English in 1577 by John Frampton. The works of Carlos Clusius, Caesalpinus, and others all reflect the introduction of Aztec medical knowledge into Europe. The extent to which Aztec medical knowledge influenced the medical practices in Europe can only be judged by a careful examination of the later sixteenth and seventeenth century herbalists in whose work references to Mexican plants occur.

All these latter works of European authors present a picture of Aztec medical learning as it appeared when viewed through the eyes of Europeans. The Sahagun manuscripts alone show a close kinship to the Badianus manuscript. This would be expected because of both the time of writing and the source of material.

The Badianus manuscript holds the unique position of being the earliest written Aztec herbal as well as being the only one written by the Aztecs themselves. It marks the beginning of herbal literature on this side of the Atlantic. To the list of native Aztec students of the College of Santa Cruz who distinguished themselves in the field of letters, we add the names of Martin de la Cruz and Juannes Badianus. The volume is a lasting tribute to the teachings of Fr. Bernardino de Sahagun and the brothers of the Franciscan order who taught at Tlaltelolco during the first 50 years of its existence.


1

Libellus de medicinalibus Indorum herbis, quem quidam Indus Collegii sanctę Crucis medicus composuit, nullis rationibus doctus, sed solis experimentis edoctus. Anno domini seruatoris 1552.

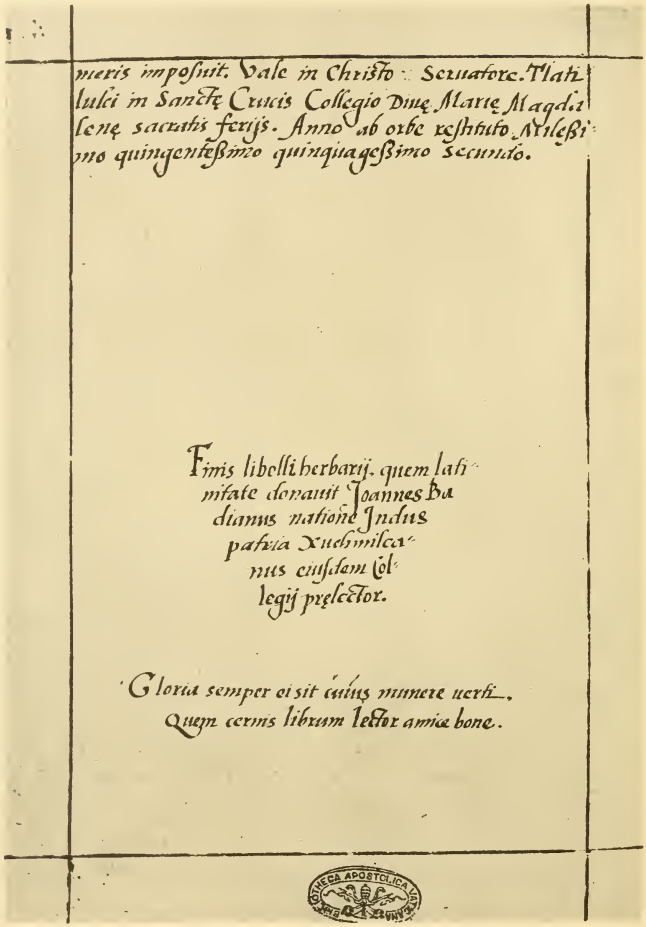
Clarissimo domino Francisco de Mendoza illustrissimi superioris huius Indię proregis domini Antonij de Mendoza filio optimo Martinus de la Cruz indignus seruus salutem precatur plurimam & prosperitatem.

Ex libris didaci Cortauila

Cum mihi omnium uirtutum decora atq; ornamenta & bonorum munera, quę a quouis mortali desiderantur relucent domine magnificentissime, nescio profecto, quid in te potissimum laudem. Equidem non iudeo, quibus laudibus efferam insignem, uestrum amorem: quibus uerbis gratias agam uestro beneficio q̃ maximo. Pater enim tuus uir christianissimus simulet pissimus, uerbis consequi nequeam q̃ maxime omnium mihi benefecerit. quicquid enim sum, quicquid possideo & quecunq; nominis habeo, illi debeo. Nihil par, nihil ne dignum inue-

mire

FACSIMILE OF THE FIRST PAGE OF THE BADIANUS MANUSCRIPT, "CODEX BARBERINI, LATIN 241" (VATICAN LIBRARY)



FACSIMILE OF THE LAST PAGE OF THE BADIANUS MANUSCRIPT

FACSIMILE OF PAGE 49 OF THE BADIANUS MANUSCRIPT

"Against pain in the side. The application of the herbs Tolohuaxihuitl and Nexehuac, ground in water takes away pains in the side."

Tolohuaxihuitl, *Datura stramonium;* Nexehuac, *Datura inermis.*

CHAPEL AND CONVENT OF TLALTELOLCO (COLLEGE OF SANTA CRUZ)

Redrawn from an old print, "Templo y Convento de Tlaltelolco—Estado actual", in "Historia de la Iglesia en Mexico", by M. P. Cuevas, Tomo 1, p. 387, 1928.