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MEDICINE AND HEALTH IN THE ALTA CALIFORNIA MISSIONS, 1769-1833 AS EXEMPLIFIED BY A STUDY OF MISSION SANTA CLARA DE ASIS

by

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Medicine and Health in the Alta California Missions, 1769-1833
as Exemplified by a Study of Mission Santa Clara de Asís
by Rosemary Keupper Valle, Ph. D.

This study of the medical and health situations at Mission Santa Clara de Asís revealed that the most common maladies among the Indians were venereal disease, dysenteries, fevers, tuberculosis and skin disorders. The epidemic disease which caused the greatest mortality was measles and not smallpox as had previously been supposed.

The Franciscan missionaries provided health care to the Indians, maintaining a hospital and pharmacy and carrying out preventive measures such as inoculations against smallpox.

The analysis of vital statistics showed that, while the Indian population was decreasing, the death rate which had been highest in the early years of the mission was declining and the rate of natural decrease (deaths over births) had shown a twenty-eight percent improvement between 1802 and 1833, indicating that the improved diet made possible by the agricultural success of the mission, better living conditions and health care were actually benefitting the Indians.

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Contents

Introduction

With the voluminous literature already in existence concerning the Alta California missions, it would seem at first glance that nothing more could be said. However, a survey of this literature reveals that little attention has been given to the medical and health situations at the missions. There are several articles which deal with smallpox (which never occurred) and mission population, and translations of Father Vicente Sarria's instructions for the performance of the cesarean operation and of Dr. Jose Maria Benites' 1804 medical report on seven of the missions. Also there is some mention of medicine and health in the missions in the longer works on California's medical history, but in general California's medical historians seem to have dwelled mostly upon the military surgeons at Monterey and, apparently from a lack of information, have given only the briefest of glances at the mission period (1769-1833).

A realization that further study of the medical and health situations in the missions was needed came with an investigation of the 1827-28 Alta California epidemic which, in the literature, had been attributed to both measles and smallpox. In an effort to determine which disease was responsible for the epidemic, it

soon became apparent that the contradictory information had not come from the original mission records. An epidemiological study of the epidemic, based on the actual available records and reported by the author in "James Ohio Pattie and the 1827-28 Alta California Measles Epidemic"[1] furnished unquestionable documentation for the presence of measles but none for smallpox. In addition to establishing that measles was the disease responsible for the 1827-28 epidemic, the study showed that the original records contained valuable information on both medicine and health. It also revealed that the missionaries were not only concerned with the health of the Indians, but also provided health care to the extent of their abilities. Much pertinent information was also found in the accounts of the many contemporary explorers and visitors to the missions which had also, for the most part, been overlooked.

Therefore, the present work was undertaken to provide information on the medical and health situations in the missions based chiefly on the evidence contained in the original mission records and documents. Many of the latter, such as the method for performing inoculations against smallpox (Metodo de Practicar la Ynoculacion de las Viruelas) prepared by Dr. Pablo Soler, the military surgeon at Monterey, in 1798 and the instructions issued in 1804 for performing the cesarean operation (Modo de hacer la operacion cesaria despues de muerta la Madre) not only have never

1. California Historical Quarterly, 1973, 52:28-36

appeared previously in print, but their existence was not even suspected. Likewise, the first hand accounts of the missionaries, early explorers and visitors have been reviewed for information about medicine and health in the missions.

On survey, it was found that investigation of the medical and health situations of all twenty-one missions would be a more extensive operation than was practical at the present time, thus it was considered advisable to select and study one mission as representative of all.

Mission Santa Clara de Asís was selected because having been founded in 1777 its life encompassed fifty-six years of the sixty-four years of the mission period. It also represented a relatively closed population in that its lands were bordered by those of Mission San Francisco de Asís on the north and of the pueblo of San Jose de Guadalupe and Mission San Jose on the south and west. Therefore, the mission would experience large influxes of wild Indians (gentiles) only in the early years and in the later years would have a stable population of Indian neophytes (Christian Indians) who had either been born, or grown up, in the mission. Also the mission records were complete, except for the Libro de Patentes which is missing, and were accessible in the Archives of Santa Clara University, Santa Clara, California.

The mission parochial books are among the prime sources of information. These are the Baptismal Register (Libro de Bautismos), the Marriage Register (Libro de Casamientos), Burial Register (Libro de Mortuos) and the Book of Patentes (Libro de Patentes) which is actually a file of the official correspondence and orders received by the missionaries. This last book for Mission Santa Clara de Asís is missing but its lack is compensated by the fact that the Libro de Patentes for Mission San Carlos Borromeo is in the Santa Clara University Archives and proved to be a valuable source of information. These books are approximately eight by twelve inches by two inches and are bound in calf tanned at the mission, and fastened with leather thongs. The paper is hand laid from various Italian sources and the ink was made by the missionaries from different types of oak galls. Judging from the differences in the amount of fading, some batches were better than others and while the books are legible for the most part, the ink on some pages is very faint.

Another prime source is the Informes, the biennial and annual reports which were furnished by each mission to the President of the missions at Monterey and which were copied and summarized and forwarded to the President of the College of San Fernando in Mexico. The earlier reports were in narrative form;

the later ones follow a standardized pattern and provide better statistics but are not as informative. There are copies of all the Informes for Mission Santa Clara de Asís, except those for 1797 and 1798 which are missing, in the Santa Clara University Archives. The originals are located as follows: for 1777, Mission Santa Barbara Archives, Old Mission, Santa Barbara, California; for 1778, Misiones de la Alta California, 2da Series, Tomo 2, No. 19, Archivo General de la Nacion, Mexico, D. F. (AGN); for 1779, No. 7, AGN; for 1780-84, Summary, No. 33, AGN; for 1785-86, No. 50, AGN; for 1787 (June 30), No. 55 and (December 31), No. 82, AGN; for 1788, (June 30), No. 89 and(December 31), 82, AGN; for 1789, No. 106, AGN; for 1790, No. 116, AGN; for 1791, No. 130, AGN; for 1792-93, No. 143, AGN; for 1794, No. 174, AGN; for 1795, No. 159, AGN; for 1796, No. 202, AGN; for 1799 to 1832 inclusive, Missions of California, Mission Santa Clara Informes, Santa Barbara Mission Archives.

An invaluable source of information is the scrapbook kept by Father Jose Viader who spent thirty-seven years, 1795-1833, at Mission Santa Clara de Asís. Only one volume still exists in the Santa Clara University Archives although the index indicates that there were originally two. The little book which is approximately eight by six inches by two inches is bound in brown suede. It has an index but no pagination and while most of the entries are in Father Viader's handwriting, there are many items written in other

hands. It contains a list of medicines in the mission pharmacy, treatments for various diseases, copies of important correspondence and documents, three formulae for making ink, recipes for meat sauces, clippings from the Gazeta de Mexico, changes in the liturgy of the church services, etc.

The Interrogatorio, a list of thirty-six questions sent out in 1813 by the Council of the Indies to all Spanish colonial possessions in an attempt to gain information about the new Spanish subjects in these areas, contains much information about the Indians both in the "wild" and in their Christian states. To those familiar with the Interrogatorios it is obvious that they have been the source of much of the anthropological information about the Indians even though this source has not been credited properly. The originals for all the nineteen missions in existence at the time are in the Santa Barbara Mission Archives.

Another source is the Taylor Papers now in the Archbishop's Archives at the Chancery of the Archdiocese of San Francisco. These consist of approximately six thousand original documents which were collected by Alexander S. Taylor and donated to Old St. Mary's library in 1850. It is believed that they were collected mostly at Mission Santa Barbara since Taylor was the son-in-law of Daniel Hill who was the lessee of that mission after secularization. The documents are numbered and there is an index, but it is not very detailed.

Some interesting letters were found listed as "ten pages of unimportant correspondence of Mission Santa Clara".

Santa Barbara Mission Archives in the Old Mission in Santa Barbara, California has a very large collection of original mission documents and the Rev. Dr. Maynard Geiger, OFM, the Archivist, has collected copies of items dealing with the missions from Spain and Mexico. The Serra Collection contains the largest number of items pertaining to Father Junipero Serra in existence.

Bancroft Library, University of California, Berkeley is another rich source of information about the missions. It contains many original documents, and transcripts of much of the material contained in the California State Papers which were stored in the Surveyor General's Office in San Francisco and which were destroyed in the fire which followed the 1906 earthquake. While the latter leave something to be desired in that many of the transcripts are incomplete summaries, obviously done in haste, they are all that remains of this lost source.

Other sources of original documents used in the preparation of this work are the Archivo General de la Nacion and the Biblioteca Nacional in Mexico, D.F., the Huntington Library, San Marino, California and Sutro Library, San Francisco, California.

Among published accounts of the early missionaries are

Father Francisco Palou's Noticias de la Nueva California and Relación Histórica de la Vida y Apostolicas Tareas del Venerable Padre Junipero Serra, both of which contain information pertaining to Mission Santa Clara de Asís. Father Palou was in charge of Mission San Francisco de Asís in 1777 and was very much involved in preparation for the founding of Mission Santa Clara de Asís. The diary of Father Pedro Font which is translated into English and which is a part of Anza's California Expeditions by Herbert E. Bolton, also contains much pertinent information.

Three Spaniards left interesting accounts of their activities in Alta California. Gaspar Portola's diary of his expedition to Alta California in 1769-70 has been translated into English by Donald E. Smith and Frederick Teggert. Miguel Constanzo, who accompanied Portola also kept a diary, "Diario Historico de los Viajes", the manuscript for which is in Sutro Library. The manuscript of the diary of Jose Longinos Martinez who came to Alta California in 1792 on a botanical expedition is in the Huntington Library and has been translated by Lesley B. Simpson as The Expedition of Jose Longinos Martinez.

The works of contemporary foreign visitors give a glimpse of the missions as seen by outsiders. The earliest of these in 1786 was Jean François de Galaup, Comte de LaPerouse whose comments appear in Voyage de LaPerouse autour du Monde.

Another early visitor was Captain George Vancouver in 1792 who left a detailed account of his stay at Mission Santa Clara de Asís in November 1793 in his A Voyage of Discovery to the North Pacific Ocean and Round the World. The next visitor of importance was Nikolai Petrovich Rezanov in 1806, but the best report of this sojourn is that by Dr. Georg H. Langsdorff. The Baron Otto von Kotzebue paid two visits to Alta California, that of 1816 is covered in his Entdeckungs-Reise in die Süd-See und nach der Berings-Strasse zur Erforschung einer nordöstlichen Durchfahrt, and that of 1824 in Neue Reise um die Welt, in den Jahren 1823,24, 25 und 26. Other contemporary reports of value are the Narrative of a Voyage to the Pacific and Beering's Strait by Frederick W. Beechey, Captain of the English ship Blossom who visited Mission Santa Clara de Asís in 1828 and Voyage Autour du Monde Principalement à la Californie et aux Iles Sandwich pendant les Années 1826, 1827, 1828 et 1829 by Auguste Bernard du Haut-Cilly commander of the French ship Le Hèros who was at the mission in 1827. The information contained in the popular Narrative of James O. Pattie of Kentucky by James Ohio Pattie, who was in Alta California in 1828 or 1829, makes interesting reading but has generally been discredited.

There are a number of physicians who left reports on the medical and health situations in Alta California. One of

these, M. Rollin, the surgeon who accompanied the LaPerouse expedition in 1786 gives a very detailed account in his "Memoire Physiologique et Pathologique sur les Americains". Archibald Menzies who was the surgeon with the Vancouver party in 1792 did not contribute much information on medicine in the missions and seemed particularly concerned with the collection of plant specimens. Dr. Jose Maria Benites, the Monterey surgeon from 1803 to 1807, visited Missions Nuestra Señora de la Soledad, San Antonio de Padua, San Miguel Arcangel, San Luis Obispo, San Carlos Borromeo, San Juan Bautista and San Francisco de Asís and reported his findings to Mexico in 1804. Georg H. Langsdorff, the German trained physician who was in California with the Rezanov expedition in 1806 gives some valuable information in his Bemerkungen auf einer Reise um die Welt in den Jahren 1803 bis 1807.

Information regarding medicine and health in the missions is also found in the Reise um die Welt... in den Jahren 1815-1818 by Adelbert Chamisso, botanist, and in Voyage Pittoresque autour du Monde by Louis Choris, artist, both of whom accompanied the Baron Otto von Kotzebue on his 1816 expedition to Alta California.

Dr. Cephas Bard who made a study of the medical situation in the missions while some of the mission Indians were still alive, presented some interesting observations in the address he gave to

the Southern California Medical Society in 1894 and which was published in Touring Topics in 1930. The well-known works of Sherburne F. Cook, George Lyman and Henry Harris were also consulted but these, except for the translations, since they are not based on the original mission records and contain a number of "ghosts" and errors, were found to be of limited value.

Last, but extremely important are the comprehensive works, The History of California and California Pastoral of Hubert H. Bancroft, and Father Zephyrin Engelhardt's Missions and Missionaries and histories of sixteen individual missions. Equally important are the extensive scholarly works of Dr. Herbert Eugene Bolton, Professor of History at the University of California in Berkeley and the numerous erudite contributions to mission history by Father Maynard Geiger, Archivist of the Santa Barbara Mission Archives.

The works consulted in this effort have been in the language in which they were written whenever possible and translations have been kept as literal as is consistent with making sense in order to preserve the flavor of the original.

While many works other than those mentioned were consulted and a vast amount of reading was carried out in gathering background material for this dissertation, there is no formal bibliography.

Extensive bibliographies already exist in the works of Bancroft, Engelhardt, Bolton and Geiger, thus for this work the copious notes at the end of each chapter serve dual purpose of bibliography and notes.

Chapter 1

Mission Santa Clara de Asís

Although this work is concerned chiefly with the medical and health situations at Mission Santa Clara de Asís, it might be well to review briefly the history of the mission and the mission movement in general as related to the colonization of Alta California.

Spanish colonial expansion was carried out under close cooperation between the civil government, the military and the clergy, and this combination had been used effectively for two-hundred and fifty years before the missionization of Alta California. While the missionaries considered the conversion of the Indians to the Catholic faith as their prime objective, they either intentionally or coincidentally acted as agents for the Spanish government in exploring the frontier, encouraging its settlement, teaching the Indians the Spanish language, disciplining them, instructing them in the rudiments of European crafts and agriculture, and even self-government.[1]

Under this system, even when the initial thrust into an area was military in nature, the clergy was either a part of the company or followed shortly thereafter. In areas where the indigenous inhabitants were considered docile, the missionaries often made the

first incursion with only a small military escort, as was the case in the movement into Alta California in 1769.

At this time the Spanish government had become aware of, and fearful of, the activities of the Russians along that part of the west coast of North America which now comprises the Province of British Columbia, and states of Washington, Oregon and California. The Spanish Ambassador to Russia, Francisco Antonio Lacy had informed the Spanish Secretary of State, the Marquis Jeronimo Grimaldi, of the Russian interest in this area in 1768. In turn Grimaldi wrote to the Viceroy of Mexico, Carlos Francisco de Croix, to advise him to be alert for any incursions by the Russians. The Viceroy forwarded this information to the King's Visitador General, José de Galvez, who was in New Spain on an inspection trip and who happened to be in San Blas in Baja California at the time.[2]

On receipt of the information concerning the Russian interest in the west coast of North America, Galvez made the decision to colonize and missionize Alta California. In planning this venture, he consulted directly with Father Junipero Serra[3] who was in San Blas, since the Franciscans of the College of San Fernando had taken over the Baja California missions on the expulsion of the Jesuits in 1767.

Visitador General Galvez issued the following instructions for the venture.

> The object is to establish the Catholic Faith, to extend the Spanish domain, to check the ambitious schemes of a foreign nation, and to carry out a plan formed by Felipe III, as early as 1606. Hence no pains can be spared without offence against God, the King and our Country.[4]

Perhaps the order in which the objectives of the venture are mentioned could be questioned, but its purpose is clearly stated. At this time Galvez authorized the use of money from the Pious Fund to pay the expense of the operation.[5]

The Franciscans were enthusiastic about entering this new field of endeavor. The missionaries from the College of San Fernando in Mexico City had had experience in the mission of Texas and the Sierra Gorda in Mexico. This college was one of the three missionary or apostolic colleges set up in New Spain by the Franciscans, as early as 1682, to train members of their order for work in the Indian missions. The first to be founded was Querétaro, the second Zacatecas and the last, San Fernando in 1734. The monks from this last college had been particularly successful in the missions of the Sierra Gorda, having requested

that these missions be secularized[6] after only twenty-six years, an achievement which merited congratulatory letters from the Viceroy, the Marquis de Croix, and the Archbishop of Mexico, Francisco Antonio de Lorenzana.[7] Perhaps the secret of their success is to be found in the Rules for the Spiritual and Temporal Government of the missions set forth by Father Pedro Perez de Mezquia, the first President of the college, which covered not only the Indians' conversion to the Catholic faith but also dealt with providing for their temporal well-being. These regulations so well state the purpose of the missions that a translation of them as they appear in Father Francisco Palou's Relacion Historica de la Vida y Apostolicas Tareas del Venerable Padre Fray Junipero Serra is presented.

Spiritual Government

> The missionary fathers are to try, first of all, to bring together each day at sunrise in the church at the sound of the bell all the adult Indians, male and female, the pagans and neophytes, without any exception. One of the fathers is to recite with them the prayers and text of Christian doctrine and to explain to them in Spanish the principal mysteries of religion. They are to do the same thing in the morning (after the adults have departed) and in the evening before sunset for the Indian boys and girls who are five years

old and over, without allowing anyone to be absent from this holy exercise. The catechumens [Indians being instructed in the Catholic faith but not yet baptized] and those who are to be married or who are to fulfill their Easter duty in the matter of confession are likewise to be present, morning and evening, so that they may be instructed before they receive these holy sacraments. The same is to be done with regard to those who may have forgotten their Christian doctrine despite this daily spiritual instruction.
On feast days the missionaries should see to it, with special vigilance, that no one is absent from the Mass for the people, or from the sermon which is to be given at the Mass, during which the gospel or the mysteries of our holy Faith are to be explained. With prudence and discretion they should try to accommodate themselves to the uncultivated state and needs of the Indians. When Mass is over, one of the missionaries is to call each Indian by name out of the mission register, and each Indian is to approach the missionary to kiss his hand. By this means he can detect if anyone is missing.
The missionaries should exhort the more capable and intelligent to frequent the holy sacraments, over and above the fulfillment of their Easter duty, especially on the greater feasts, and to hear Mass even on days not of obligation, always allowing them their freedom.
When the Indians are ill, the missionaries should try to visit them frequently, to restore them to health,

and to assist them as far as the circumstances permit. With even more care they will see they receive the holy sacraments they are capable of receiving, and will assist them in preparing for death; and will provide that at the burial, the people of the town are present. Likewise, they should give careful attention to composing the Indians' enmities and quarrels, teaching them to live in peace and Christian charity, without permitting scandals and bad example at the mission.

Temporal Government

In order to garner the spiritual fruit which is the purpose in view, the above-mentioned Father Mezquiá ordained that the temporal welfare of the Pame Indians [the tribe of the Sierra Gorda missions] be provided for. For if this were wanting, the Indians could not come to the town or the mission or assist at Mass and daily prayers, because they would have to live scattered, going about seeking food and clothing. To obviate this need, His Reverence ordered that the missionary fathers - on the basis of the annual stipend which his Majesty gives for the maintenance of the missions, plus the alms for the Masses to be said by them - should ask for implements and other things needed to carry out effectively the plantings. Moreover, they are to request cows, oxen and other cattle so that from these sources the Indians can maintain themselves, living in community

> as was practiced in the beginning in the Church. This being done, in time there will be an increase, harvests will be gathered and divided among the Indians, enabling them to live at the mission...[8]

Galvez and Father Serra immediately began to collect supplies for the new missions, articles for the church and livestock, seeds and agricultural equipment from the missions of Baja California.[9] The early Alta California missions, to which group Mission Santa Clara de Asís belonged, received some support from the Spanish government in the form of irregularly paid direct stipends. The missions also drew upon the Pious Fund which had been set up by the Jesuits to finance the missions of Baja California and when the Jesuits were expelled, the fund had been seized by the Government, but turned over to the Franciscans in 1770. However, the Spanish government never intended to support the missions indefinitely and planned for them not only to become self-supporting as soon as possible but also to be able to house and feed their troop (escolta) and furnish supplies for the presidios on a reimbursable basis. Actually, the Alta California missions were generally on their own by 1786, the establishment of new missions being supported by those already in existence.[10]

According to the original plan, Mission San Francisco de Asís and Santa Clara de Asís, the San Francisco Bay area

missions, were to have been founded in 1770, but due to a lack of soldiers, the former was not founded until 1776 and the latter until 1777.[11]

The suitability of the Santa Clara valley as a site for a mission was noted in the diary kept by Father Pedro Font who accompanied Juan Bautista de Anza on his march from Monterey to San Francisco in the spring of 1776. He remarks that the Indians were friendly and that the plain through which the river, named by him the Nuestra Señora de Guadalupe, flowed was a very good site for a mission.[12] Father Francisco Palou, who was the missionary in charge of Mission San Francisco de Asís from 1776 to 1785, states that the Indians of the Santa Clara valley observed the same customs as those of San Francisco and spoke the same language except for a slight variation in some words. These Indians belonged to the linguistic group called the Costanoans, which included those of the Monterey area and north to Bodega Bay and around the shores of the San Francisco Bay (Figure 1).[13]

In November of 1776, Father Tomas de la Peña and Captain Fernando Rivera y Moncada, commander of the Presidio of San Diego, passed through the Santa Clara valley enroute to the Presidio of San Francisco to prepare for the founding of Mission Santa Clara de Asís. The actual site of the mission was probably selected by

Lt. José Joaquin Moraga, commander of the Presidio of San Francisco and Father Tomas de la Peña when they went down from San Francisco with five soldiers and their families to found the mission the following January.[14]

The first Mass at Mission Santa Clara de Asís was said by Father Tomas de la Peña on January 12, 1777. Father Joseph Antonio Murguía, who was to be in charge of the mission was not present at its founding but marched up from Monterey with supplies and some of the livestock for the mission, arriving on January 22, 1777.

Father Murguía, who had had nineteen years experience in the Sierra Gorda missions,[15] and Father Tomas de la Peña got the mission off to a good start and the best description of the situation of Mission Santa Clara de Asís comes from the Informe for 1777, which they sent to Father Junipero Serra on December 31 of that year.

> In pursuance of your Reverence's direction that we should give a detailed account of the state of this mission, together with the inventory.... we report that this mission was founded with the title of Santa Clara, on the 12th day of January of this year of 1777, in the fertile lowlands of the river of Our Lady of Guadalupe, at a distance of about fourteen leagues [evidently the missionaries at Mission Santa

Clara de Asís were using a three mile league] to the southeast of the Port and Fort of our Holy Father San Francisco, and one league from the arm of the sea of the said port commonly called the Estuary of the Southeast. The Port of Monterey lies to the south about twenty-eight leagues distant. On the road to that port and about three-quarters of a league, or slightly less, from this mission there was founded by order of the Lord Governor in the month of November just passed, the new pueblo of San Jose and it is situated on the east bank near the source of the Guadalupe River. The site of the mission, which in the idiom of the natives is called Thamien (laurels) is a plain stretching more than three leagues in every direction, pleasant to behold, with lush land for cultivating crops and extensive areas for the raising of cattle. There is an abundance of ash, alders, white and red poplar, willow, laurel, black and live oaks. At a distance of four leagues to the west there is much so-called redwood, from which we have already obtained some lumber.

A large population of Gentiles [wild Indians] surround the site, such that we judge there are more than forty rancherias [Indian villages] within a radius of five leagues, of a people that we may call the Tares since this is the name they give themselves.

The Informe continues

> The buildings completed to date are as follows: First the Church with sacristy, twenty varas (yards) in length and six wide, of upright logs (palisada), chinked with clay, with a flat roof of earth; then a dwelling house adjoining the church, which is now being finished, twenty-two varas long and six wide with five living rooms; also another building thirty-one varas in length and five in width which serves at present as the actual dwelling of the Fathers, the servants, offices, toilets and a hen-coop, all of upright saplings with earthen roofs.
> There is also a corral, thirty varas square, ditched and with posts to enclose the cattle; and another of the same, twelve varas square, for the sheep and goats. There is also a bridge of timbers for passage over the river with a paving of earth.

This same Informe reports the following agricultural progress

> Likewise from the last of May and the beginning of June, one-half fanega [each fanega is approximately one and one-fourth English bushels] of beans was sown and five were harvested; also, in April one fanega of corn was planted and forty reaped; in December two and one-third fanegas of wheat were sown. There is land cultivated to sow as much more. So, too, for the development of the said land, a dam has been built with corresponding irrigation ditches.
> This Reverend Father President, is the state in which the mission finds itself; and we hope in God that He

will grant further increase both in spiritual and in temporal gains.

Regarding the spiritual gains mentioned, the missionaries reported in this Informe that they had heard that an epidemic was in progress among the children at a nearby rancheria and that they had visited the village and baptized thirteen sick children. The total baptisms for the year were sixty children and five adults. Twenty-four Christian burials were carried out.

From all that was accomplished in this one year, it is obvious that no time had been wasted and that the missionaries had devoted as much attention to the temporal as to the spiritual activities of the mission.

Throughout the life of the mission, the construction of new buildings and the maintenance of the old were carried on. George Vancouver, Captain of an English exploratory expedition, who visited Mission Santa Clara de Asís in 1792 remarks in the report of this visit that the missionaries were supervising the construction of dwellings for the neophytes, each of which had an enclosed area in the rear for the cultivation of a garden and the raising of poultry,[16] and Frederick W. Beechey, Captain of the British ship Blossom, who went to the mission in 1828 to purchase supplies for his vessel, comments on the five rows

of comfortable houses for the Indians.[17]

The agricultural activities of the mission were very extensive and successful. From the few fanegas of seed grain and the breeding stock (pie) brought from Baja California by Father Serra and from Mexico by the Anza expedition, the mission produced bountiful crops and large herds. Other visitors in addition to Vancouver commented upon the agricultural success of the mission. Two Russian visitors, M. N. Vasilyev,[18] Captain of the Discovery, in 1821 and the Baron Otto von Kotzebue[19] on a voyage around the world in 1824, state that the mission was very rich, producing much grain and fruits and vegetables. Captain Benjamin Morrell,[20] master of the American schooner Tartar, who was at Mission Santa Clara de Asís in 1825 says that it was the only place where he could obtain supplies for his ship. In 1826, Frederick W. Beechey, Captain of the British ship Blossom went to the mission to purchase supplies and comments on the excellent orchards and large herds of cattle, sheep and horses.[21] Captain Auguste Bernard de Haut-Cilly remarks in the report of his visit in 1827 that Mission Santa Clara de Asís was one of the prettiest and richest.[22]

While the production of food for the mission Indians, the presidio and the occasional victualing of ships was important

the products produced in large amounts for trade were hides and tallow. These were sold or traded, legally or clandestinely, to both the Spanish and the many foreign ships, especially American, which were coming to the California coast.[23] According to the report of Louis Choris who was in California in 1816 with the first Kotzebue expedition, two hundred and fifty American vessels were coming to the coast of California every year, half of them engaging in smuggling with enormous profit.[24]

During the fity-five years that Mission Santa Clara de Asís was under the care of the Fernandinos, approximately seven thousand seven hundred baptisms, six thousand eight hundred burials and two thousand three hundred marriages were performed. The last and largest mass baptism took place in 1794 and the mission population peaked at one thousand five hundred and forty-one Indians in the year 1795. According to the response of the missionaries to Question Two of the Interrogatorio[25] which was circulated through the missions in 1813, there were no more Indians in the area to convert.

However, the missionaries continued to be busy teaching the Indians and administering the mission. In their response to Question Thirty-one of the Interrogatorio, Fathers Catalá and Viader state that the Indians were being taught occupations

such as cowboys, shepherds, shoemakers, stonemasons, carpenters, blacksmiths, tanners, teamsters, etc. The boys are obliged to attend school. The women are given work considered appropriate to their sex, such as weaving, cooking, etc. In answer to Question Thirty-two, they state that the boys have learned music quite well; they sing and play on sixteen violins and three cellos. The reply to Question Eight says that the Christian Indians already speak and understand Spanish, due entirely to the efforts of the missionaries, the Indians' frequent intercourse with the Gente de Razon (Spanish) and the boys attendance at school. To Question Thirty-five, the priests answer that the Indians clothe themselves with coarse cloth, blankets or soft tanned leather, etc., all of which is made at the mission.

In the reply to Question Thirty of the Interrogatorio, regarding government, the missionaries state that the Indians recognized no superiority of any kind before their coming, had no respect for any regulation, and in disputes, the strongest always won. However, with the arrival of the missionaries, Captains (cabos) were selected from among the Christian Indians to supervise the work and to aid in governing, but the Indians were under the direction of the priests in all civil and political matters, and under the corporal of the guard

in criminal matters.

From the foregoing, it is apparent that the missionaries must have been devoted and diligent workers. Besides Father Murguía and de la Peña, who got the mission off to such a good start, three other missionaries who served for varying periods, were Father Diego de Naboa from 1783 to 1794, Father Francisco Miguel Sanchez from 1792 to 1797 and Father Manuel Fernandez from 1793 to 1795. However, the two priests who spent the longest periods at the mission were Father Magin Catalá and Father Jose Viader, the former from 1794 to 1830 and the latter from 1796 to 1833. Father Catalá was actually in charge of the mission but the burden of its administration fell upon Father Viader because the former was ill much of the time. After Catalá's death in 1830, Father Viader was alone at the mission until his departure in March of 1833.

In general the visitors' comments about the missionaries are favorable. For example, Captain George Vancouver who visited Mission Santa Clara de Asís in 1792 when Fathers Tomas de la Peña and Francisco Miguel Sanchez were the missionaries, says that their hospitality and solicitude indicated the nobility of their characters.[26] Auguste Bernard du Haut-Cilly who was there in 1828, during the time of Fathers Catalá and Viader, states

that these missionaries were well educated and very concerned for the welfare of their charges.[27] Hubert H. Bancroft described Father Viader as a large man who was very interested in the temporal welfare of the Indians and who had very little respect for the revenue laws.[28]

The scrapbook kept by Father José Viader is the source of much of the information about the medical situation in the mission. The index indicates that there were originally two volumes, only one of which remains in the Archives of the University of Santa Clara Library. The fifty-three pages devoted to lists of medicines in the mission pharmacy and treatments for various diseases not only indicates his interest in medicine but also that he was actively treating the Indians. The missionaries provided whatever medical care the Indians received because there was never more than one physician in the province at any time and that was the military surgeon assigned to the Presidio of Monterey. From the death of Dr. Manuel Quijano in 1824 until the arrival of Dr. J. Evan Perez de Leon in 1829 there was no physician in Alta California.[29]

In order to fulfill the obligation, to restore the Indians to health, put upon them by the Rules for the Spiritual and Temporal Government of the Missions, the missionaries would

have had some training in medicine at the College of San Fernando in Mexico City. The Franciscans had always been concerned about the health of their Indian students and the infirmaries operated at their schools in Mexico City became the foundation of the famous Real Hospital de los Indios.[30] In Alta California the missionaries had medical books in their libraries, medicines in their pharmacies for treating the illness of the Indians and built hospitals at all the missions.

The inventory of Mission Santa Clara de Asís for 1777, the year the mission was founded, lists the Florilegio Medicinal de Todas las Enfermedades Sacado de Varios y Clasicos Autores para bien de los Pobres y de los que TienenFalta de Medicos en Particular para las Provincias Remotas en donde Administran los R.R.P.P. Misioneros de la Compañia de Jesus, by Father Juan de Esteyneffer, S.J., published in Mexico by Juan J. Guillena Carrascoso in 1712. Listed on the mission inventory when it was secularized in 1836 were the following: Medicina Domestica o Tratado Completo del Metodo de Precaver y Curar las Enfermedades con el Regimen y Medicinas Simples y un Apendice que Contiene la Farmacopea Necesaria para el Uso de un Particular in three volumes by Dr. George Buchan and translated from English into Spanish by Col. D. Antonio de Alcedo, published in Madrid in 1798 by Ramon

Ruiz;[31] Tratado de las Enfermedades mas Frequentes de las Gentes del Campo in three volumes by M. Simon-André Tissot and translated from French into Spanish by Don Juan Galisteo y Xiorro, published in Madrid in 1781 by Pedro Marin;[32] and Tratado Theorico-Practico de Materia Medica, que Explica los Medicamentos Naturales or Simples, asi como Las Preparaciones Chimicas, y Galenicas, las mas Usuales in three volumes by Dr. Juan Rance, published in Barcelona in 1783 by Francisco Suría. It is obvious from the titles of these works that they were especially selected because they were written for use by non-professionals. It should be pointed out that the missionaries possibly had other personal medical texts since the books listed on the various inventories would have been those furnished by the College of San Fernando.

The mission pharmacy will be discussed in detail in the chapter on Materia Medica, but it should be mentioned that the missionaries were prepared to provide medical treatment to the Indians from the beginning of the mission. The inventory which accompanied the Informe of 1778 lists a chest of medicines valued at thirty pesos, and in the Informe of 1784, the missionaries state that a set of shelves had been built for the pharmacy to contain the various bottles and flasks

of oils, balsams, ointments and other medicines.

That the missionaries gave some attention to sanitation is evidenced in the Informe of 1777 which mentions the provision of toilet facilities (lugar comun) in the first building at Mission Santa Clara de Asís. Laundries (lavanderias) were built at all the missions, the remains of which can still be seen at Missions San Fernando, Santa Barbara and La Purisima Concepcion. Hygiene among the Indians consisted of the burning of their huts when these became too infested with vermin and it is likely that this practice was continued among those living outside the missions.[33] Also the Indians used the sweat bath (temescal) which was usually followed by a plunge into the sea or the nearest stream or river.[34] However, according to the visitors, cleanliness was not of much concern to either the mission or the wild Indians. Captain George Vancouver who visited Mission Santa Clara de Asís in 1792 remarks that the Indian huts and surroundings were filthy and verminous,[35] and Captain Frederick W. Beechey, who spent several days and nights at the mission in 1827, thirty-five years later, mentions that he had slept as well as the fleas had permitted.[36]

It is not known when the hospital at Mission Santa Clara de Asís was built. Dr. José Maria Benites, the Monterey surgeon

from 1803 to 1807, who made a medical survey of seven missions in 1803, did not visit this mission, but mentions that there was a hospital at Mission San Luis Obispo and recommends that all the missions be encouraged to follow this example.[37] There may or may not have been one at Mission Santa Clara de Asís at this time, but a letter written by Father Mariano Payeras to the President of the College of San Fernando on February 2, 1820 mentions that all of the missions had hospitals staffed with male nurses (enfermeros) trained by the missionaries.[38]

While Mission Santa Clara de Asís was not officially secularized until December 27, 1836,[39] Father Viader turned the mission over to the Zacatecan Franciscan, Father Francisco Garcia Diego y Moreno, on March 6, 1833, ending both the tenure of the Franciscans from the College of San Fernando and the missionary era at the mission.

EXTENT OF COSTANOAN LINGUISTIC GROUP

FIGURE 1

Notes

1. Bolton, Herbert E., "The Mission as a Frontier Institution in the Spanish-American Colonies", American Historical Review, 1917, 23:42-61
2. Chapman, Charles E., Catalogue of Material in the Archives of the Indies (Berkeley, University of California Press, 1919), Introduction, p. II. Lists items relating to California.
3. Palou, Francisco, Relacion Historica de la Vida y Apostolicas Tareas del Venerable Padre Fray Junipero Serra (Mexico, Zuñiga y Ontiveros, 1787), p. 56
4. California Archives, CA-24:28, Bancroft Library
5. When the Jesuits were authorized to missionize Baja California in 1697, it was with the understanding that they would receive only minimal support from the Spanish government. In order to finance the operation, they secured permission to set up the Pious Fund to which individuals and organizations could contribute money for the founding of the missions. The Jesuits then used this money to purchase farms in Mexico, the produce of which they sold to support the missions. When the Jesuits were expelled from Spain and its possessions in 1767 for supposedly starting a rumor that King Charles III was illegitimate and therefore had no rightful claim to the throne,

the government took over the fund until 1770 when it was turned over to the Franciscans. In 1821, after gaining independence from Spain, the Mexican government expropriated the holdings of the Pious Fund and allowed the missions interest of six percent.

6. From the beginning, it was planned that the missions would become secularized, or parishes for the Indian villages which would grow up around them when the Indians were sufficiently educated to manage their own affairs and hold their lands. In spite of several earlier attempts to secularize the Alta California missions, this did not take place until decreed by the Mexican government in 1833, and then it was not done for the benefit of the Indians. Most of the mission lands were never divided among the Indians, and those that were soon fell into the hands of the Mexican and American settlers.
7. Palou, Vida, pp. 38-39
8. California Archives, CA-1:28
9. Palou, Vida, p. 59
10. Engelhardt, Zephyrin, Missions and Missionaries (San Francisco, The Barry Co., 1913-1915), 3:341
11. Palou, Vida, p. 89
12. Font, Pedro, "Font's Complete Diary", translated by Herbert E. Bolton in Anzas California Expeditions (Berkeley, University

of California Press, 1930), 4:387-388

13. Palou, Vida, p. 218

14. Ibid., p. 54

15. Geiger, Maynard, Franciscan Missionaries in Hispanic California (San Marino, Ca., Huntington Library Publications, 1969), p. 162

16. Vancouver, George, A Voyage of Discovery to the North Pacific Ocean and Round the World (London, J. Stockdale, 1801), 2:37

17. Beechey, Frederick W., Narrative of a Voyage to the Pacific and Beering's Strait (London, H. Colburn & R. Bentley, 1831), 2:46

18. Shur, Leonid A. and Gibson, James R., "Russian Travel Notes and Journals as Sources for the History of California, 1800-1850", California Historical Quarterly, 1973, 52:43

19. Kotzebue, Otto von, Neue Reise um die Welt in den Jahren 1823, 24, 25 und 26 (Weimar, A. Hoffmann, 1830), 2:94 and 102

20. Morrell, Benjamin, A Narrative of Four Voyages to the South Sea, North and South Pacific Ocean, Ethiopic and Southern Atlantic Ocean, India and the Antarctic Ocean (New York, J. & J. Harper, 1832), p. 211

21. Beechey, Op. Cit., p. 49

22. Bernard du Haut-Cilly, Auguste, Voyage autour du Monde Principalement a la Californie et aux Iles Sandwich pendant les Années 1826,

1827 et 1828 (Paris, Bertrand, 1833), 2:87

23. Raimondo Carrillo wrote to Governor Arrillaga on May 4, 1804 about the extent of illegal trade. Taylor Papers, No. 644, Archbishop's Archives, San Francisco

24. Choris, Louis, Voyage Pittoresque autour du Monde (Paris, F. Didot, 1822), Part 3, p. 8

25. See Appendix

26. Vancouver, Op. Cit., p. 30

27. Bernard du Haut-Cilly, Op. Cit., p. 344

28. Bancroft, Hubert H., History of California (San Francisco, The History Co., 1886-1890), 3:726

29. Harris, Henry, California's Medical Story (San Francisco, J. W. Stacey, 1932), p. 40

30. Ocaranza, Fernando, Historia de la Medicina en Mexico (Mexico, Laboratorios Midy, 1934), p. 127

31. George Buchan was a member of the faculty of the University of Edinburgh Medical School.

32. Tissot's Avis au Peuple sur la Santé(1760), a tract on popular medicine ran through ten editions in less than six years.

33. LaPerouse, Jean François Galaup de, Voyage de LaPerouse autour du Monde (Paris, Imp. de la Republique, 1797), 2:295

34. The temescal was usually a hut built of reeds or a cave which

could be closed off and thoroughly heated. The Indians remained inside until sweating was profuse and then plunged into the nearest body of water. At first the missionaries prohibited its use because on occasion the Indians were badly burned and when resorted to in acute illnesses the results were sometimes fatal. However, its use was later permitted because it was found to be of help in preventing skin diseases.

35. Vancouver, Op. Cit., p. 35

36. Beechey, Op. Cit., p. 47

37. California Mission Docements, No. 671, Santa Barbara Mission Archives

38. Ibid., No. 1869

39. Spearman, Arthur D., The Five Franciscan Churches of Mission Santa Clara (Palo Alto, Ca., The National Press, 1963), p. 121

Chapter 2

Nutrition

Before the arrival of the missionaries, the Indians of the area of Mission Santa Clara de Asís foraged for their food. In the response to Question Four of the Interrogatorio,[1] the missionaries point out that in their pagan state the Indians knew nothing of agriculture and that they were satisfied to live on nuts, wild seeds, on the hunt and fishing. They further say that this food was usually plentiful and that the Indians employed their bows and arrows with dexterity and acumen.

Miguel Costanzo describes these skills in his report of the Portola expedition in 1776.[2] He states that the Indians are great hunters and gives a detailed description of their method, "In killing deer and antelopes they employ an admirable device. They preserve the skin of the head and part of the neck of one of these animals, removing it with care - with the horns left attached to the skin - and filling it with grass to maintain its shape. Wearing this mask on the head like a cap, they set out for the forest. When they see a deer or an antelope, they creep slowly along with the left hand on the ground, bearing the bow and four arrows in the right. They raise and lower it [the head] and turn it from side to side and imitate the animals so well that they

attract them easily. When these are within short range, they discharge their arrows with deadly aim."[3] Costanzo also says that fish were plentiful and that the Indians knew all the arts of fishing.[4] He states that the seeds they eat are first roasted by placing hot pebbles among them and then ground in stone mortars.[5] He mentions that there were walnuts, hazelnuts, cherries and blackberries in the woods,[6] oaks which bore good acorns and pine trees which yielded an abundance of pine nuts.[7] A. L. Kroeber states that acorn flour is nearly as tasteless as wheat flour, almost as nourishing but richer in starch and, when prepared from certain species, perceptibly oily.[8]

A gift of honey from the Indians is mentioned in Father Francisco Palou's "Noticias".[9] Father Pedro Font says in his diary that the Indians in the area where Mission Santa Clara de Asís was to be founded fished with nets and ate many mussels, and he remarks about the many large shell mounds in the estuary.[10]

From the foregoing, it can be assumed that the Indians' diet in the premission era was not necessarily a poor one. However, like most primitive peoples who depend on nature for sustenance and who do not plant crops or husband animals, they must have experienced hunger and even starvation whenever inclement weather or pestilence caused a decrease in the natural food supply.

With the coming of the missionaries, the Indians were

instructed in agriculture because, as has been previously stated, the Spanish government expected the missions not only to become self sufficient as soon as possible but also to be able to supply their own troops and those of the presidios on a reimbursable basis. Also the missionaries were well aware that the spiritual welfare and temporal welfare of the Indians were inseparable, thus feeding and clothing their charges was one of their priorities.

Evidence of this purpose is found in the Informe of 1777 which contains an inventory of all the items provided for the founding of Mission Santa Clara de Asís. Listed are two plowshares, three dozen hoes, one dozen digging sticks, two dozen axes, one dozen machetes for cutting brush, one dozen sickles, four plows with complete equipment and an assortment of seeds.

This same Informe states that the mission breeding stock which had been held in trust for them by the military commander had been delivered. Most of the cattle had been brought from Sonora by the Anza Expedition and the remainder of the animals had come from Baja California via Monterey.[11] There were two pairs of oxen broken to the yoke and two others which were unbroken; thirty-six cows for breeding purposes, thirty-six others which bore brands and twenty-eight unbranded; eighteen

pack and saddle mules, four of which were the gift of the King; two saddle horses and one old one; seven breeding mares, one jackass for breeding, two foals and three young mares; twenty sheep; seventeen goats; four pigs; twenty hens and three roosters.

In April 1777 one fanega (approximately one and one-fourth English bushels) of corn was planted and forty fanegas were harvested, and one-half fanega of beans were sown and five fanegas harvested. In December, two and one-third fanegas of wheat, a soft Spanish variety,[12] were planted which yielded seventy-six fanegas in August of 1778.

The Informe of 1778 mentions that a dam had been built and more than three thousand varas (yards) of irrigation ditches had been dug. In 1787 an additional six hundred varas of canal were opened. The Informe of 1788 records the completion of another three thousand varas of irrigation ditches and that of 1795 a further extension of one and one-half leagues (four miles). Such an extensive irrigation system indicates farming on a large scale, necessary since the mission population had already peaked at one thousand five hundred and forty-one persons.

The excellence of the soil around Mission Santa Clara de Asís is well known and crops and livestock would be expected to flourish. In addition this mission was especially fortunate in

having as one of its first priests, Father Joseph Antonio Murguía who had had nineteen years of experience in the Sierra Gordo missions in Mexico.[13] In the mission library were two works on agriculture, the "Agricultura General y Gobierno de la Casa de Campo" compiled by Jose Antonio Valcarcel and consisting of seven volumes which covered all phases of the cultivation of crops, fruit trees, vines and animal husbandry.[14] The other was the "Memorias Instructivas, y Curiosas sobre Agricultura, Comercio, Industria, Economica, Chymica, Botanica, Historia Natural, etc." by Miguel Geronymo Suarez in twelve volumes.[15]

Although the missionaries had many other duties, they supervised the planting of crops and carefully recorded the harvests. For example, the Informe of 1778 mentions that two types of seed corn were planted, one from the Rio Colorado and the other the ordinary yellow. The priests report that thirteen fanegas of the Rio Colorado were planted and one hundred and five harvested. The three fanegas of the yellow which were planted, yielded thirty fanegas. Equal attention was given to the livestock. The increase was noted and no females were killed until it was certain that it would not interfere with the growth of the herds.[16]

The Informe of 1787, ten years after the founding of the

missions, mentions that the harvest had consisted of eleven hundred fanegas of wheat and seven hundred of corn, besides appreciable quantities of beans, lentils, peas and garbanzos. The fruit trees, the seeds for which had been planted in 1778, were producing pears, apples, peaches, quinces and pomegranates. In addition to the mission cattle which numbered twelve-hundred and sixty-four head, there were five hundred and fifty sheep, three hundred and forty goats and twenty-one pigs.

The mission had so prospered that it was able to contribute one hundred cows, two bulls, one hundred sheep, four pairs of oxen and twenty-eight young oxes, four horses and three mules for the founding of Missions San Jose and San Juan Bautista in 1797. [17]

Excellent information about the actual diet of the Indians comes from the responses to the questions asked in the Interrogatorio which was sent out to the missions in 1813. In response to Question Seventeen, the missionaries state that three meals per day were prepared in the communal kitchen. The morning meal was atole[18] which consisted of roasted barley or other grain cooked in water to the consistency of porridge. At noon the meal was pozole[19], a sort of stew, which was a combination of beans, peas, corn and wheat with meat. The composition of the pozole varied, but always contained meat. In the evening the

Indians were given atole, as in the morning. In 1813, forty head of cattle were slaughtered every Saturday and the meat distributed to the Indians. This would have amounted to approximately eight pounds of beef per person per week.[20] Also between fifty and sixty fanegas of wheat were divided among them every week, approximately three and one-half pounds per person.[21] The answer to Question Eighteen states that the Indians at this mission had no fermented drink and that their only beverage was water. The missionaries' reply to Question Twenty-six indicates that the Indians were given time and seed and encouraged to plant for themselves. They were also permitted to hunt and fish and gather their customary food, thereby supplementing that provided at the communal meals. It is not possible to estimate the Indians' total daily caloric intake, but it would seem that their diet was adequate and certainly not deficient in protein.

Milk was given to the children. On March 13, 1773 Father Serra wrote to Viceroy Bucareli requesting that the cattle being held by the military be turned over to the missions so that they could be better tended and increase the milk supply.[22] Bucareli replied favorably on May 6, 1773 stating that the cattle were to be delivered to the missions so that the recently baptized children could have milk.[23] Father Pedro Font mentions

that the cows at Mission San Gabriel Arcangel gave rich milk and that good cheese and butter were made from it.[24]

In the early days of the mission, the grain was ground by hand and the Informe of 1777 lists six metates with their grinding stones as having been supplied for this purpose. Captain George Vancouver confirms this in the report of his visit to California in 1792 stating that the method of grinding corn was by hand and that the bread from this flour had a good taste but was heavy.[25] However, he mentions that there were plans for the construction of a grist mill at Mission Santa Clara de Asís and that he was shown a large black stone which was to be used in grinding the grain.[26] The construction of grist mills would be expected since the Spaniards had introduced this type of mill into the new world in the sixteenth century.[27]

As previously stated, it was the duty of the mission to provide housing and food for the soldiers assigned to it and food and other services to the presidios on a reimbursable basis and several Informes of Mission Santa Clara de Asís mention just what was supplied.[28] At times supplying the Presidio of San Francisco and occasionally that of Monterey was a strain on the mission and whenever these demands threatened hardship to the Indians, there can be no doubt that the interests of their charges came first with the missionaries. For example in a letter dated April 23, 1816 Father Jose Viader tells Governor Pablo Vicente

de Sola that the mission cannot supply auxilliaries to the troops because it is planting time and the Indians cannot be spared. In addition he cautions that if the planting is interfered with, the soldiers as well as the Indians will be hungry.[29] Again on May 3, 1820 when the troops wished to "borrow" the mission oxen, Father Viader writes that he is aware that they appear on the inventory but that they have become lost and he has no one to send to hunt for them.[30] Doubtless the fact that the military showed little inclination to return anything borrowed and paid their debts very slowly if at all eased any qualms the missionaries may have had over their lack of cooperation in such matters. On June 14, 1820 Fathers Viader and Catala wrote a joint letter to the President of the Missions, Father Mariano Payeras, stating that the Presidio of San Francisco owed the mission 3000 pesos and that of Monterey 220 pesos and that the mission had received no payment during the ten years between 1810 and 1820. They further pointed out that the sums outstanding were so large that they were seriously hampering the operation of the mission.[31]

While the Informes give the statistics of mission food production the comments of foreign visitors to the mission often furnish more detailed and interesting information on the subject.

One of the earliest of these to Alta California after the founding of the missions was Jean François Galaup de LaPerouse

who was the commander of a French scientific expedition on a voyage around the world. He came to California in 1786 and while he did not visit Mission Santa Clara de Asís his description of mission life at San Carlos de Borromeo could apply to all missions. He mentions the atole and pozole and adds that the atole of which the Indians were very fond, was seasoned with neither butter nor salt, and was a rather insipid mess.[32] He further states that the Indians had small gardens and a few fowls of their own and that they gave the eggs to their children.[33] He says that all the grain was ground by hand and that M. de Langle, Captain of the Astrolabe, presented the missionaries with his iron mill which enabled four women to do the work of a hundred.[34] His gardener is mentioned as having given the missionaries some potatoes from Chile and for this he has been credited with the introduction of the potato into Alta California.[35]

Another visitor was Captain George Vancouver, commander of a British expedition on a voyage of discovery. He visited Mission Santa Clara de Asís in November of 1792 and was very favorably impressed with its prosperity. He mentions in the report of his visit that, in addition to the well cultivated fields of grain, there was an abudance of vegetables and fruits. He adds figs, grapes and apricots to the fruits already listed as being grown at the mission.[36] He describes the slaughter of

twenty-two bullocks, each weighing from four to six hundred weight, in preparation for a fiesta in honor of their visit. He states that four of these were given to the mission Indians and soldiers and that these were in addition to the twenty-four which were killed every week for the whole community.[37] He also mentions that the missionaries were superintending the construction of houses for the neophytes, each of which had an enclosed space at the rear for the cultivation of vegetables and poultry.[38] He comments that the stream near the mission was well stocked with fish.[39] Captain Vancouver writes that in his opinion the Indians appeared totally insensible to the benefits with which they were provided, excepting in the article of food. He says that this they now find ready at hand without the labour of procuring it, or being first reduced by cold and hunger nearly to a state of famine, and then being obliged to expose themselves to great inconvenience in quest of a precarious, and often scanty means of subsistence.[40]

José Longinos Martinez who was in Alta California on a botanical expedition in 1792, mentions in his journal that all the Indians in the province have the custom of burning the brush for two purposes: one to facilitate rabbit hunting and the other so that with the first light rain or dew the green shoots which they call <u>pelillo</u> (little hair) will spring up, and upon which they feed like cattle.[41]

M. N. Vasilyev, commander of the Russian ship Discovery which was on a round the world voyage, spent four months, October 1820 to February, 1821, in the San Francisco Bay Area and travelled to Mission Santa Clara de Asís by longboat. He describes it as a rich mission. He says that the storehouses were filled with wheat, beans, peas, maize, onions, peppers, garlic and potatoes and that there were whole boulevards of apples and pears in the orchards.[42]

Another Russian, Baron Otto von Kotzebue reports on his visit to Mission Santa Clara de Asís in October of 1824 in his A New Voyage round the World in the Years 1823, 24, 25, and 26. He remarks that farming was on an extensive scale and that the harvest returns were forty-fold.[43] He states that although the gardens seemed to be carelessly cultivated, they produced abundantly and that he was able to purchase provisions of vegetables and fruits for his ship at a very fair price.[44] He notes that the melons were especially fine and that the peaches, grapes and figs were very good. He says that the apples were so magnificent that they have no equal in Europe.[45] He was not enthusiastic about the mission system as a whole and states that he thought that the Indians remained at the mission only because of the food provided them.[46]

An American visitor, Captain Benjamin Morrell, master of

the schooner Tartar was at Mission Santa Clara de Asís in May of 1825. In his A Narrative of Four Voyages to the South Sea, North and South Pacific Ocean... from the year 1822 to 1831... he is enthusiastic about the mission and found it very pleasant and prosperous stating that this was the only place where supplies for his ship could be found.[47]

In November 1826, Captain Frederick W. Beechey, Captain of the British ship Blossom visited Santa Clara de Asís. In his report of this visit to the mission he remarks on the five rows of comfortable dwellings for the neophytes. He also mentions the large herds of cattle, sheep, horses and flocks of geese. He made the trip to the mission to purchase supplies for his ship and comments on the excellent orchards and the abundance of apples, pears, olives and grapes.[48]

Auguste Bernard du Haut-Cilly, commander of the French ship Le Heros spent five days at Mission Santa Clara de Asís in July 1827. In his Voyage autour du Monde, 1826-1829 he states that in his opinion this mission was one of the prettiest and richest.[49] He reports that they had just harvested four thousand fanegas of wheat and that while this amount seemed enormous, the yield was actually decreasing because the ground was not being fertilized properly.[50] He describes the threshing floor as being sixty feet in diameter. He says that mares were used for trampling the grain because they were not ridden and

therefore there was no concern for the damage done to their hooves and legs.[51] He states that the mission had twelve thousand cattle and fifteen thousand sheep and that one hundred and fifty cattle were being killed weekly for tallow and hides. Some of the meat was dried and jerked but except for this and what the Indians ate, the remainder spoiled.[52]

While the reports of the visitors confirm the mission reports of an abundance of food, careful examination of the Informes reveals that the mission had some bad years when afflicted with floods, hurricanes, pests and drought.

The Informe of 1778 mentions that a frost occurred in October which reduced the corn crop considerably. That of 1786 states that a plague of field mice ate the grain which had been planted; reseeding was necessary but the harvest was not adversely affected.

In 1787, the Informe states that a hurricane had done extensive damage to the crops, especially to the legumes, but that in spite of this, there was hope for a reasonable crop.

In the years 1822, 1823 and 1824 there was a severe drought. This was especially bad in 1824 reducing the wheat crop to one hundred and thirty-five fanegas, however it appeared to have little effect on the corn and barley crops.[53] Father Viader wrote to Don Ignacio Martinez, commander of the Presidio of San Francisco

on April 9, 1825 stating that because of the bad harvest in 1824, Mission Santa Clara de Asís would for the first time be unable to fulfill its commitment to furnish grain to the Presidio.[54] He wrote again on May 16, 1825 to remind Don Ignacio that the Presidio owed the mission 1500 pesos which was needed to purchase supplies.[55]

Another factor which interfered with and complicated the agricultural progress of Mission Santa Clara de Asís was the proximity of the pueblo of San Jose de Guadalupe. This town was situated only two miles from the mission proper, contrary to the laws of the Indies which prohibited towns from being too close to the missions.[56] The mission had been founded on January 12, 1777 and the pueblo on November 29, 1777, thus the mission had prior claim to the land. In the Informe for 1784, which is really a summary for several years, 1780-1784, Fathers José Antonio Murguía and Tomas de la Peña wrote protesting the nearness of the pueblo and pointing out that its location was contrary to the law. They stated that already there were difficulties over drawing water from the Guadalupe River and that the settlers let their cattle trample the Indians' fields. Also the settlers' cattle mingled with those of the mission and when they were separated, the count was always short for the Indians. In the 1787 Informe, the missionaries report that the

settlers had cut down so many trees in the surrounding area that the Indians could not find enough wood for their cooking fires without going great distances. Also the cutting of trees and grazing herds had decreased the supply of seeds with which the Indians supplemented their diet. The dispute with the town of San Jose de Guadalupe ended in compromise in 1800 when the Guadalupe River was made the boundary of the town, and the mission was given joint use of the timber in the forest to the west.[57] Another encroachment on mission lands came in the later part of the mission era when private land grants and seizures greatly reduced the amount of pasture for the animals.

However, in spite of these difficulties all reports indicate that agriculture at the mission was a success. While admitting that the visitors may have been influenced in their glowing accounts of the agricultural success of the mission by their having been at sea for months and sometimes even years with very little fresh food, and also that they were for the most part on voyages of exploration, one of the purposes of which was to encourage future colonial ventures, their statements are borne out by the mission statistics. The Informe for 1832, the last year that Mission Santa Clara de Asís was administered by the Franciscans from the College of San Fernando, lists ten thousand head of cattle, nine thousand five hundred sheep, seven hundred

horses and a number of mules and lesser animals. It reports the harvest of three thousand fanegas of wheat, seven hundred of corn, one hundred and seventy-five of barley plus substantial amounts of lentils, beans, peas and garbanzos.

Evidently the production of food kept pace with the increase in population and the provision of a reliable supply of food and a varied diet certainly contributed importantly to the health and well-being of the Indians.

Notes

1. See Appendix
2. Costanso, Miguel, "Diario Historico de los Viajes del Mar, y Tierra hechos al Norte de la California de Orden del Excelentissimo Señor Marques de Croix, Virrey, Gobernador, y Capitan General de la Nueva España: y por Direccion del Ilustrissimo Señor Don José de Galvez, del Consejo y Camara de S. M. en el Supremo de Indias, Visitador General de Este Reyno. Ejecutados por la Tropa Destinada a dicho Objeto, al mando de Don Gaspar de Portola, Capitan de Dragones del Regimento, de España, y Gobernador en dicha Peninsula". Memorias de Viajes, 1769, pp. 212-233. The manuscript of this diary is in Sutro Library, San Francisco
3. Ibid., p. 226
4. Ibid., p. 225v
5. Ibid., p. 224
6. Ibid., p. 231v
7. Ibid., p. 232
8. Kroeber, A. L., Handbook of the Indians of California (Berkeley, California Book Co., 1967), p. 87
9. Palou, Francisco, Noticias de la Nueva California, edited by John T. Doyle (San Francisco, California Historical Society, 1874), 2:191
10. Font, Pedro, "Font's Complete Diary", translated by Herbert E. Bolton in Anzas California Expeditions (Berkeley, University of California

Press, 1930), 4:355

11. Ibid., p. 23. Most of the cattle came with the Anza Expedition but the mares and other animals came from Baja California. See Palou's Noticias, 4:64

12. Gade, Daniel, "Grist Milling with the Horizontal Waterwheel in the Central Andes", Technology and Culture, 1971, 12:48

13. Geiger, Maynard, Franciscan Missionaries in Hispanic California (San Marino, Ca., Huntington Library Publications, 1969), p. 162

14. Valcarcel, Joseph Antonio, Agricultura General y Gobierno de la Casa de Campo (Valencia, F. Bruguete, 1770-1778)

15. Suarez, Miguel G., Memorias Instructivas, y Curiosas sobre Agricultura, Comercio, Industria, Economia, Chymica, Botanica, Historia Natural, etc. (Madrid, P. Marin, 1778-1791)

16. Vancouver, George, A Voyage of Discovery to the North Pacific Ocean and Round the World (London, J. Stockdale, 1801), 2:40

17. Archivo de las Misiones, C-C-4-5:515, Bancroft Library

18. Robelo, Cecilio, Diccionario de Aztequismos o Sea Catalogo de las Palabras del Idioma Nahuatl, Azteca o Mexicano Introducidas al Idioma Castellano (Mexico, C. Robelo, 1904), p. 14

19. Ibid., p. 635

20. Vancouver reported that the cattle weighed between four hundred and six hundred pounds. Consultation with Hahn & Co. (Meat Packers), 550 7th St., San Francisco, provided the information that approximately fifty-five percent of the weight would dress out

as meat. If five hundred pounds is considered as the average weight, each cow would provide two hundred and seventy-five pounds of meat; forty cows would furnish eleven thousand pounds, or about eight pounds per person per week.

21. Since a fanega of wheat equals one and one-fourth bushels, and according to Webster's New World Dictionary, Second College Edition (New York, World Publishing Co., 1970), p. 1688, a bushel of wheat weighs sixty pounds, the total distributed would have weighed four thousand eight hundred and ninety-five pounds, or approximately three and one-half pounds of whole grain per person per week.

22. Junipero Serra Collection, No. 89, Santa Barbara Mission Archives

23. Ibid., No. 94

24. Font, "Complete Diary", 4:177

25. Vancouver, Op. Cit., p. 58

26. Ibid.

27. Mancebo Benfield, José, Las Lomas de Chapultepec (Mexico, Porrua, 1949), p. 59

28. For example, the Informe of 1786 states that the mission supplied the Presidio of San Francisco with thirty-six fanegas of corn and eleven of beans, valued at two hundred and eighty-five pesos; in 1787 they sent forty-nine fanegas of corn, fifteen of beans and three hundred pounds of tallow, valued at five hundred and twenty-five pesos.

29. Taylor Papers, No. 374, Archbishop's Archives, San Francisco

30. Ibid., No. 287

31. Ibid., No. 389

32. LaPerouse, Jean François Galaup de, Voyage de LaPerouse autour du Monde, edited by L. S. Milet-Mureau (Paris, Imp. de la Republique, 1798), 2:299

33. Ibid., p. 302

34. Ibid., p. 299

35. Ibid., p. 315. Edith B. Webb in Indian Life at the Old Missions (Los Angeles, W. F. Lewis, 1952), p. 85 so states. This is unlikely since the potato had long been known in Mexico. See Francesco S. Clavigero, Storia Antica del Messico (Cesena, Biasini, 1780), 1:58

36. Vancouver, Op. Cit., p. 34

37. Ibid., p. 39

38. Ibid., p. 37

39. Ibid., p. 42

40. Ibid., p. 35

41. Longinos, José Martinez, The Expedition of José Longinos Martinez, translated by Lesley B. Simpson (San Marino, Ca., Huntington Library Publications, 1938), p. 51

42. Shur, Leonid A. and Gibson, James R., "Russian Travel Notes and Journals as Sources for the History of California, 1800-1850", California Historical Quarterly, 1972, 52:43

43. Kotzebue, Otto von, Neue Reise um die Welt in den Jahren 1823, 24, 25 und 26 (Weimar, Hoffmann, 1830), 2:39

44. Ibid., p. 94

45. Ibid., p. 102

46. Ibid., p. 96

47. Morrell, Benjamin, A Narrative of Four Voyages to the South Sea, North and South Pacific Ocean, Ethiopic and Southern Atlantic Ocean, India and the Antarctic Ocean (New York, J. & J. Harper, 1832), p. 211

48. Beechey, Frederick W., Narrative of a Voyage to the Pacific and Beering's Strait (London, H. Colburn & R. Bentley, 1831), 2:46

49. Bernard du Haut-Cilly, Auguste, Voyage autour du Monde Principalement à la Californie et aux Iles Sandwich pendant les Années 1826, 1827 et 1829 (Paris, Bertrand, 1833), 2:87

50. Ibid., p. 89

51. Ibid., p. 88

52. Ibid., p. 90

53. Annual Report for the Province of Alta California dated August 10, 1825. The "Notes" of this summary mention that the drought of 1822, 1823 and 1824 had affected both crops and livestock but that the rains had begun in November and that they hoped for a good harvest in 1825. These Provincial Reports are in the Santa Barbara Mission Archives.

54. California Mission Documents, No. 684, Santa Barbara Mission Archives

55. Ibid., No. 426

56. Geiger, Maynard, The Life and Times of Fray Junipero Serra, OFM (Washington, D.C., Academy of American Franciscan History, 1959), 2:198. Law 20, Title 3, Book 6 of the Laws of the Indies states that estancias of cattle cannot be located within four and one-half Leagues, and those of sheep, goats and hogs within a league and a half of the Indian (mission) lands. The first of the laws which are known as the Laws of the Indies, were the Laws of Burgos handed down by Ferdinand the Catholic in 1512. These were amended during the reigns of Charles V and Phillip II (1516-1598) and also thereafter. They governed every phase of conquest, settlement and treatment of the Indians in the New World. Also see Lesley B. Simpson, "Studies in the Administration of the Indians in New Spain", Ibero-Americana, Parts I and II, 1934, Vol. 5, No. 7, pp. 1-130; Part III, 1938, Vol. 11, No. 13, pp. 1-162

57. Geiger, Op. Cit., p. 201

Chapter 3

Materia Medica

It has long been known that the New World was a rich source of materia medica. Dr. Diego Alvarez Chanca, the surgeon who accompanied Columbus on his second voyage in 1493 wrote a letter to the City Council of Seville which included some mention of drugs.[1] The Aztec physicians' knowledge of materia medica is remarked by Hernando Cortes in his letters to Charles V[2], and in the historical accounts of Gonzalo Fernando Oviedo y Valdez[3] and Bernal Diaz del Castillo[4]. The abundance of this materia medica is also documented in many other works, such as The Badianus Manuscript sometimes referred to as the Aztec Herbal which was compiled by Martin de la Cruz in Nahuatl and translated into Latin by Juan Badianus in 1552.[5] Nicolas Monardes, a physician of Seville who never visited the New World but who obviously was well informed, published the first part of his treatise on American drugs in 1545. The second part appeared in 1571 and the third part together with the first two as Primera y Segunda y Tercera Partes de la Historia Medicinal de las Cosas que se Traen de Nuestras Indias Occidentales que Sirven en Medicina in 1574.[6] This same year it was translated into Latin by Charles L'Ecluse[7] and in 1577 into English by John Frampton[8]. In 1570

Phillip II sent his personal physician, Francisco Hernandez, to Mexico to assess the commercial as well as the medicinal value of native remedies. His work was completed in 1577 but part of his seventeen volume manuscript which had been deposited in the Escorial was destroyed by fire. The remainder was assembled under the auspices of the Accademia die Lincei and published in 1651 under the title Nova Plantarum Animalium et Mineralium Mexicanorum Historia.[9] In 1582 Charles L'Ecluse published a small book Aliquot Notae in Garciae Aromatum Historia listing some of the plants which Sir Francis Drake had brought back from the New World.[10] One of the most important sources of information about the materia medica of New Spain is the Historia General de las Cosas de Nueva España which was compiled by the Franciscan monk, Bernardino de Sahagun.[11] This work was begun in 1536 but was not presented to King Phillip II until 1585.

Because of this general awareness of the scientific, humanitarian and commercial value of this materia medica, the crews of most of the early exploratory expeditions included physicians, botanists and naturalists whose duty was to collect such materials. On those which did not carry such professionals, this task usually fell to the Captain or one of the other officers. This was true for the early expeditions to Alta California as well

as for other parts of the world. M. Rollin, surgeon and M. Colignon, botanist and gardener accompanied Jean François Galaup de la Perouse who visited California in 1786.[12] Archibald Menzies was surgeon and botanist on the Vancouver expedition which was in California in 1792.[13] Two scientists, Adelbert von Chamisso, botanist, and Johann Frederick Eschscholtz, surgeon and entomologist, were with Captain von Kotzebue when he visited California in 1816.[14]

Two Spanish botanical expeditions visited Alta California during the mission period. One which originated in Spain in 1789 and ended in 1794 was headed by Alejandro Malaspina and two of the scientists on this expedition were Louis Neé and Tadeo Haenke.[15] They did most of their collecting in South America and Mexico and touched Alta California only at Monterey in 1791. Haenke identified more than two-hundred and fifty plants, a number of them of medicinal value.[16] The second expedition originated in Mexico and was under the command of Don Martin de Sessé. It was incorporated in 1787 and lasted until 1820 and was for the purpose of collecting specimens for the establishment of a botanical garden in connection with the inauguration of a course of Botany at the Royal Pontifical University of Mexico.[17] Of the several scientists assigned to this expedition only Jose Longinos Martinez visited Alta California. His sojourn was in 1792 and while his journal gives a good description

of Indian life, the only medicinal plants mentioned are the Indian root (Raiz del Indio) which is a species of Aristolochiae, the peony which he says the Indians did not use and another root called chuchupaste which he thought belonged to the Pentandria Digina and which was used as a diuretic and carminative.[18]

Dr. Cephas Bard[19] who made a study of the Indian use of herbs before the last neophytes had disappeared stated in a paper read to the Southern California Medical Society in 1894 "It has been reserved for the California Indian to furnish three of the most valuable vegetable additions which have been made to the pharmacopoeia during the last twenty years. One, the Eridyction glutinosum, growing profusely in our foothills, was used by them in the affections of the respiratory tract, and its worth was so appreciated by the missionaries as to be named Yerba Santa or Holy Plant. The second, the Rhamnus purshiana (the buckthorn) gathered now for the market in the upper portion of the state, is found scattered through the timbered mountains of southern California. It was used as a laxative, and on account of the constipating effect of the acorn diet, was doubtless in active demand. So highly was it esteemed by the followers of the Cross that it was christened Cascara Sagrada or Sacred bark. The third, Grindelia robusta (gum weed) was used in the treatment of pulmonary troubles, and externally in poisoning from Rhus

toxicodendron, or poison oak and in various skin diseases".

Dr. Bard also mentions the use of ants as medicine. For dysentery they were administered internally alive in an infusion. They were used externally for the same purpose, being applied to the bare abdomen and excited to bite. They were also used in the treatment of rheumatism. The soil surrounding the ant hills was mixed with water and given internally for the cure of diarrhea. Lice were also thought to have medicinal value. In chronic illnesses, cold infusions of living lice taken from the healthiest resident of the village were administered orally.

The temescal, or sweat bath, was in universal use. This was a reed hut built over an excavation in the earth or a cave which was thoroughly heated. The Indians remained inside until profuse sweating occurred. They then threw themselves into the nearest brook or stream, or the sea. It was used not only for the treatment of illnesses but also as sort of social hygiene and no doubt had some value. The missionaries at first objected to its use because occasionally the Indians were badly burned and when it was resorted to in fevers and serious illnesses, it frequently produced fatal results. However, they realized that it was helpful in the prevention of skin diseases and while not exactly encouraging its use, permitted it.[20] M. Rollin, in his discussion of the general use of the temescal, says that the Indians considered

it a panacea and that this excretion (sweat) was thought to be nature's favorite means of cleansing the blood.[21]

Father Zephryin Engelhardt in the Appendix of his book, Mission San Antonio de Padua lists fifty-eight medicinal herbs and home remedies which he states were given to him by the Rev. A. Garrigo of San Luis Obispo, who had received them from the last resident priest of the mission, Father Doroteo Ambris.[22]

The missionaries at Mission Santa Clara de Asís state in their response to Question Fifteen of the Interrogatorio[23] that there are no physicians among the Indians but that there are sorcerers. These scarify the flesh with a sharp stone and extract blood by sucking. They employ a charm which they hide in their mouths, and which is a thorn, a pebble or little tuft of feathers or some other item. They do not employ blood-letting nor do they use purgatives or emetics. The only herb we have seen them use is a very bitter root with a strong piquant taste. Since they used it until dysentery developed, the missionaries had prohibited its use. They further state that the Indians had learned from them and the Spaniards to employ blood-letting, though rarely, and also purgatives, injections, emetics and other items such as boiled barley, boiled chamomile, etc., for internal ailments. For external afflictions, they use salves, poultices, etc.

The missionaries came prepared to provide health care to the Indians. Father Junipero Serra in a letter dated March 13, 1773 to Viceroy Bucareli, states that they badly need a physician in the province of Alta California. He says that the ship had carried a large supply of medicines for use both by the Spaniards and the missions and that the physician was supposed to furnish instructions to the missionaries on their use. However, since Dr. Pratt had become insane, these instructions had not been written.[24]

From the very founding of Mission Santa Clara de Asís the missionaries had a supply of medicines for the treatment of themselves and the Indians. The Informe of 1778 reports that they had in their inventory a medicine chest with various medicines which had cost thirty pesos (Un botiquin con varios medicamentos, que importa como treinta pesos). In the Informe dated December 31, 1784 the missionaries state that a set of shelves had been built for the pharmacy to contain the various bottles and flasks of oils, balsams, ointments and other medicines.

In the scrapbook kept by Father Jose Viader, there are two lists of medications which he states were in the mission pharmacy.[25] They bear no dates. The first is just a list of fifty-one medicines (Remedios que hay en esta mision). The

second which contains twenty-three medicines, among them many already on the first list, also notes their uses. There is also a list of forty-three remedies which came from Dr. Manuel Quijano, the military surgeon at Monterey. Since so many of the medicines on this list appear on the first, it suggests that either Father Viader had sought advice from Dr. Quijano on their use or that the physician was following the rules about furnishing such instructions on the use of the medicines.

A fourth list is not in Father Viader's handwriting. It contains sixty medicines, many of which are on the other lists. There is no statement about whether or not all are in pharmacy. It is titled"The Efficacy of various medicines used both internally and externally and how they should be employed (Virtudes de varios medicamentos aplicados tanto interiormente, como exteriormente, con el uso de ellos deve hacerse)". The list ends with a statement that a physician could use them for more diseases and in different dosages, but that the circumstances being as they are at the mission, it is advisable to follow the directions exactly.

There is also a list of sixteen home remedies (Compendio de varios remedios caseros). After each of these Father Viader gives the name of the person from whom he obtained it. For example, to treat the itch (Sarna), heat equal parts of tallow, turpentine and

pitch, cool and apply this ointment to the sores. This medication was obtained from Father Marcelino. The others are for venereal disease, boils, burns, sores, pleurisy, dysenteries, diarrheas, etc. Most of the scatology which is found in the medicines occurs in this group. It consists chiefly of various dungs and urine.

Many other remedies are listed. They are for treating veneral disease (El Galico), pleurisy (dolor del costado), fevers (calenturas, tarbadillos, intermitentes), digestive upsets, itch, dysenteries, etc. In all there are about one hundred and fifty medicaments. The group includes two clipped from the Gazeta de Mexico.

The mission had two balances delicate enough to weigh medicinal amounts. Evidently the missionaries had some difficulty in working out the values of the weights since they bore only numbers. Captain Arguello furnished them with the necessary information for both the large and the small one. According to the lists each could weigh amounts as small as one adarme, or one-sixteenth of an ounce.[26]

In order to furnish some realistic idea of the materia medica available to the missionaries and coincidentally an indication of some of the diseases which the missionaries encountered, the medicines on the first list and which were

actually in the mission pharmacy are presented with information about their uses. There was some difficulty in identifying them since almost all were galenicals and the names given them by Father Viader are colloquial. However, by cross-checking in the Farmacopea Mexicana[27] the Ensayo para la Materia Medica Mexicana[28] and the Pharmacopoea Hispaña[29] and the dictionary this was accomplished. After they were identified, all were found listed in the Farmacopea Mexicana which was published in 1846, thus they must have been in common use at the time. The uses of the medicines are those given in Father Viader's book and do not always agree with those in the Farmacopea.

Medicines which are in this mission (Remedios que hay en esta mision)

Aguas - waters

Agua de la Reyna de Ungria - Alcohol roris-marini (rosemary). Used for rheumatism and injuries and is applied locally to affected areas. (Q).[30]

Aljali volatil - Azoturetum hydrogenicum aqua solutum (Smelling Salts). Stimulant - also used for bites of venomous animals. It is inhaled and also can be given orally, ten to sixteen drops in a glass of water. It can be applied locally to the injured part (Q).

Espiritu de nitro dulce - Aeter nitricus medicinalis (Spirits of nitrous ether). Used in dropsy as a diuretic and diaphoretic and as an antispasmodic.

Laudano liquido - Alcoholatum opii (tincture of opium). Used for

relief of pain, as an antispasmodic and in catarrhs.

Unguentos - Ointments. These were applied locally. The bases for these were bleached beeswax (Cera alba), yellow beeswax (Cera citrina), lard (Butyrum porcinum) listed in the "Farmacopea" as manteca and tallow (sebum).

Unguento amarillo - Unguentum picis compositum (Pitch ointment). Used to treat ulcers and sores. If these are putrid, mix with an equal amount of turpentine and apply locally (Q).
Unguento Rasis - Unguentum carbonatis plumbi (Lead carbonate ointment).
Used for drying ulcers and healing boils.
Unguento Isis- Unguentum oxidi cupri compositum (Copper oxide ointment with pitch). For ulcers, especially those with granulation tissue; also for boils which are already draining (Q).
Unguento Populeon - Butyrum populi compositum (Ointment with ground poplar buds and powdered tobacco, thorn-apple and nightshade leaves). Used for headaches, backpain and inflamed hemorrhoids (Q).
Unguento blanco - Butyrum carbonatis plumbi (Lead carbonate ointment). Used for superficial wounds, burns, childrens' scratches, etc.
Unguento altea - Butyrum trigonellae (Fenugreek ointment). For chest pain and carbuncles (Q).
Unguento estoraque - Unguentum styracis (Liquidambar with copal ointment). Used for ulcers and gangrenous sores after they have been cleansed with tincture of quinine or myrrh (Q).
Unguento dipalma - Unguentum sterati plumbi (lead oxide ointment). Used for ulcers which follow the breaking of blisters or pustules.
Unguento mesclilla - Butyrum cum oxido plumbico (Lead dioxide ointment). Used to treat ulcers and blisters (Q).
Unguento minio de Ribera - Unguentum oxidi plumbi rubrum (Red lead

oxide ointment). Used to promote healing and scar formation in wounds.

Unguento berengena - Ceratum oxidi cupri (Copper oxide ointment). Used for inflamed hemorrhoids (Q).

Unguento rosado - Butyrum rosarum (Crushed rose petal ointment). Used to soften scabs and ease pain of abrasions (Q).

Trementina - terebinthina (turpentine). Used as a stimulant or mixed with estoraque, amarillo, ranas, contra rotura or other Ointments in the treatment of putrid sores.

Aceites - Oils

Aceite de adormideras - Oleum papaveris (Oil of poppy). Applied locally to the abdomen for diarrhea.

Aceite de Agenjos - Oleum absinthii (Oil of wormwood). Used as a stimulant.

Aceite de escorpiones - Oleum hiperici (Oil of St. John's wort). Used as an external stimulant (Q).

Aceite de aparicio - Oleum hiperici compositum (Oil of St. John's wort with verbena and lavendar). Used to promote wound healing.

Aceite carminativo de Palacios - Oleum foeniculi (Oil of fennel). Applied locally to relieve gas pains; can be given internally in chamomile tea (Q).

Aceite de membrillos - Oleum cydoniarum (Oil of quince). Applied to the abdomen in diarrhea.

Aceite de almendras - Oleum amygdalarum (Oil of almonds). Applied externally to relieve chest pain and abdominal cramps (Q).

Aceite de rosada - Oleum rosarum (Oil of roses). Applied externally to the abdomen in dysenteries (Q).

Aceite de Palo[31]- Oleum de varias especies de pinos (Pine oil). Used externally to encourage healing of wounds and internally as

a laxative (Q).

Balsamo catolico - Alcoholatum hiperici compositum (Balm containing St. John's wort, benzoin and balsam of Peru). Used internally as an expectorant and externally to promote wound healing (Q).

Sales - Salts

Sales nitro - Nitras potassicus (Saltpeter). Used to quench thirst; to cool the blood and as a diuretic. Given orally in dose of one-eighth ounce in a class of water (Q).
Cremor - Tartras potassicus (Cream of tartar). Used for indigestion and stomach cramps. Given orally one-fourth to one-half ounce in a glass of water twice daily (Q).
Sales tartaro emetico - Tartras stibico potassicus (tartar emetic). Used as an emetic when the stomach is very sour and the tongue is heavily coated. Given orally in dose of four grains dissolved in a pint of water until vomiting is provoked.
Sales amoniaco - Chloruretum ammoniacum (Sal amoniac). Promotes sweating and production of urine and induces the menses in women. Given orally in dose of twelve to twenty-four grains dissolved in water.
Sales ipecacuana - Pulvis cephalis ipecacuanae (Ipecac). Used as an emetic in dose equal to twenty-four grains of barley dissolved in a pint of water until vomiting is provoked. (Q).
Sales ajenjos - Sulphus sodicus (Epsom salts). Used as purgative in dose of twenty-four to forty-eight grains in a pint of water.
Sales cremor - see above

Polvos - Powders

Polvos de quina - Pulvis corticus cinchonoe officinalis (Quinine). Given orally in dose of one-fourth ounce four times daily in

treatment of intermittent fevers. In other fevers half this dose is given daily. It is also used to cleanse putrid wounds (Q).

Polvos de ruibarbo - Pulvis rhei (Powdered rhubarb). Used as a purgative and in dysenteries in doses of one-eighth ounce daily for three days (Q).

Polvos de Minio - Pulvis oxido de plomo (Lead oxide powder). Used externally to cleanse and purify wounds.

Polvos de sangre de dragon - Pulvis sanguinis draconis (Dragon's blood powder). Used as a mouth wash to treat bleeding gums as occur in scurvy.

Emplastros - Plasters or pasty preparations spread on cloth and applied to the body; used medicinally as a curative or counter-irritant. The missionaries often spread them on pieces of suede. The base of these was usually beeswax or tallow.

Emplastro de contra rotura - Emplastrum oxidi plumbi ferruginosum (Lead dioxide plaster). Used in the treatment of hernias.

Emplastro de manus dei - Emplastrum oxidi et ferri magnetici (Lead oxide plaster with pitch and turpentine). Used in the treatment of headache and to promote wound healing.

Emplastro ranas simple - Emplastrum protoxide plumbi muscilaginosum compositum (Lead oxide plaster with pitch). Used to resolve tumors as in scrofula and other adenopathies (Q).

Emplastro ranas con triplicado mercurio - Emplastrum oxidi plumbi cum hydrargyro (Lead oxide plaster with mercury). Used to dissolve tumors especially those in venereal disease.

Raizes - Roots

Raize de contraierva - Dorstenia contrayerva (Contrayerva). Used

as a tonic and stimulant in weakening fevers.
Raize de orozus - Glycyrphiza glabra glandulfiera (Licorice). Used to soften the cough and as an expectorant. Given in barley water (Q).
Raize de caña fistula - Cassia fistula (Purging cassia). Used as a laxative and a purge.
Raize de zarzaparrilla - Smilax officinalis (Sarsaparilla). Used as a diuretic and alterative and especially in the treatment of venereal disease (Q).

Oja sen - Cassia acutifolia (Senna leaves). Used as a purgative.(Q).

Piedra lipis - Vitrolum caeruleum (Blue vitriol). Used to treat superficial sores of the mouth and genitalia and as an eyewash, four grains dissolved in one quart of water.

Cobalonga - Ignacia amara (Bean of St. Ignatius). Used as a stomach tonic.

Goma - There are many gomas in the "Farmacopea" but the only one mentioned in Father Viader's scrapbook is Goma Arabiga - Gum Arabic. Used for chest diseases, asthma and as a purgative (Q).

Agallas - Gallae cupressi or Gallae quercus infectoriae (Cypress or oak galls). Both are used as astringents.

Alcanfor - Laurus camphora (Camphor). Used in aguardiente (para alcanforar el aguardiente) to treat erysipelas. Also with aguardiente in a broth of willow and mallow leaves to treat inflammation (Q).

Alcaparrosa - Vitrolum viride (Green vitriol). Used as a tonic in doses of two to six grains; occasionally as an emetic in doses up to twelve grains.

In addition to the remedies available in the mission pharmacy, the Indians employed medicines of their own. In fact, Dr. Jose Maria Benites, the military surgeon at Monterey in 1805, states in his medical survey of seven missions that the Indians sometimes scorned the remedies of the missionaries and doctored themselves by washing their sores and wounds, and scarifying themselves with flints, even to the eyelids, whatever the sickness was.[32]

Probably the greater portion of the medicines in the mission pharmacy came from Mexico, but another source could have been the considerable trade, both legal and clandestine, which was carried on with visiting ships of all nations.[33] Louis Choris states in the report of his visit to California in 1816 that two hundred and fifty American ships came to the coast of California every year, half of them engaging in smuggling with enormous profit.[34] There is documentation that the Russians supplied smallpox vaccine on two occasions.[35] Also the missionaries exchanged remedies from time to time.

That the mission maintained a pharmacy, Father Viader's efforts to gain competence in use of the medicines it contained and his zeal in collecting others certainly indicates not only a concern for the health of the Indians, but also that he was actively treating them.

Glossary

Almond - sweet, Amygdalus communis (seed)
bitter, Amygadalus persica (seed)

Balsam of Peru - Myroxylon Peruifera (resin)
Bean of St. Ignatius - Strychnos ignacia (seed)
Benzoin - Stryax benxoin (resin)

Camphor - Laurus camphora (resin, oil)
Chamomile - Matricaria chamomilla (flowers)
Contrayerva - Dorstenia contrayerva (root)
Copal - Eloeocarpus copallifera (resin)

Dragon's blood - Sanguis draconis (resin)

Fennel - Anethum foeniculum (root, seeds, flowers and resin)
Fenugreek - Trigonella foenumgraecum (seed)

Gum arabic - Acacia vera (resin)

Ipecac - Cephaelis ipecacuanha (root)

Lavendar - Lavandula spica (flower)
Licorice - Glycyrrhiza glabra glandulifera (root)
Liquidambar - Styrax styraciflua (resin)

Mallow - Malva sylvestris or rotundifolia (flowers and leaves)
Myrrh - Balsamodendron myrrha (resin)

Nightshade - Solanum nigrum (young branches)

Opium - Papaver somnifera, oriental poppy (Juice from capsule)
Papaver hortense, Mexican poppy (Juice from capsule)

Poplar buds - Populus alba (young buds)
Purging cassia - Cassia fistula (fruit)

Quince - Pyrus cydonia (fruit and seeds)
Quinine - Cinchona officinalis (bark)

Rosemary - Rosmarinus officinalis (leaves and flowers)
Rose - Rosa gallica (flowers)
Rhubarb - Rheum palmatum (root)

Sarsaparilla - Smilax officinalis (root)
Senna - Cassia acutifolia (leaves)
St. John's wort - Hipericum perforatum (flower)

Thorn apple - Datura stramonium (fruit)
Tobacco - Nicotiana tabacum (leaves)
Turpentine - Terebinthina communis (resin)

Verbena - Verbena officinalis (flower)

Willow - Sambucus nigra (flower, fruit, inner bark)
Wormwood - Artemisia absinthium (flowers and bark)

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Chapter 4

Measles

In his The Ecology of Human Disease Jacques M. May states that measles is one of the most contagious disease known to medicine and that it has been recognized as a separate disease entity since Rhazes, an Arab physician of the tenth century, distinguished it from smallpox with which it had been confused in the past.[1]

Thus measles was already accepted as an entity, and Father Toribio de Motolinia describes it as such when he reported its appearance in New Spain in 1531.[2] It was introduced by a Spanaird who had contracted the disease in the Caribbean area where an epidemic had been raging since 1529 and in which one-third of the native population had perished.[3] From this time forward, epidemics of measles occurred sporadically in New Spain usually striking chiefly the immunologically unprotected autochthonic population.

Two generalized measles epidemics occurred in Alta California, one in 1806[4] and the other in 1827-28[5], and Mission Santa Clara de Asís was involved in both.

In 1806 the epidemic started in the south, measles breaking

out at Mission San Diego de Alcalá in January and progressing northward. The disease spread from this mission to Missions San Luis Rey, San Juan Capistrano, San Gabriel Arcángel, San Fernando and San Buenaventura. Measles was probably carried by boat to three other foci of infection, Missions Santa Barbara, San Carlos Borromeo and San Francisco de Asís, from which it spread to all the other missions. The disease arrived at Mission Santa Barbara in February, and from there spread to Mission La Purisima Concepcion, Santa Inez, San Luis Obispo, San Miguel Arcángel and San Antonio de Padua. The epidemic struck San Carlos Borromeo in March, and from there was carried to Missions Nuestra Señora de la Soledad, San Juan Bautista and Santa Cruz. Measles arrived at Mission San Francisco de Asís in March and spread from there to Missions Santa Clara de Asís and San Jose.

In 1806 there were two hundred and twenty-six deaths at Mission Santa Clara de Asís, one hundred and twenty-six more than the average number of deaths for the years 1805 and 1807. Seventy-three of these deaths occurred in April and May. Of all deaths, one hundred and fifty-two were adult, sixty-four male and eighty-eight female. Seventy-four children died, thirty-eight boys and thirty-six girls. Only a crude death rate of one hundred and eighty-nine per thousand could be derived because there are no census figures available for that year. This rate was one hundred and thirty percent higher than the average of the death rates for

1805 and 1807. The number of adult male deaths was thirty percent higher than the average number for 1805 and 1807 and the number of adult female deaths was one hundred percent higher. The increase in the number of deaths for children was thirty-one percent for boys and thirty percent for girls.

Table I shows that most of the adult male and female deaths occurred between the ages of ten and twenty-five. Most of the child deaths for both boys and girls were under age five years. The one hundred percent increase in the number of deaths among adult females indicates that this group was the one most affected by the epidemic. It is of interest that in spite of the fact that such a high number of deaths occurred during the childbearing ages and that an increase in the number of stillbirths could be expected as a complication of measles, there was no appreciable difference in the number of infants baptized in the years 1805, 1806 and 1807.

This epidemic also involved the wild Indians in the area surrounding the mission because there is a note in the Death Register at the end of the entries for 1806, just before Entry Number 3581, which states that the next thirteen names are of neophytes who had died of measles away (afuera) from the mission. The relatives had informed the priests of the deaths and that they had buried them according to the Indian custom.

Because of the conflicting reports in the literature, there

had long been some confusion about whether measles or smallpox was responsible for the 1827-28 epidemic which occurred in Alta California. Hubert H. Bancroft[6] and Zephyrin Engelhardt[7] always attributed the epidemic to measles. However, Sherburne F. Cook in his paper "Smallpox in Spanish and Mexican California (1770-1854)" states that smallpox[8] was the cause of the epidemic, but in his "Population Trends among the California Mission Indians", written one year later, that it was measles[9]. Henry Harris in his California's Medical Story says in one section that the disease involved was measles[10] and in another that it was smallpox[11]. James Ohio Pattie in his The Personal Narrative of James O. Pattie of Kentucky maintains that the epidemic was due to smallpox[12] and that he vaccinated twenty-two thousand persons against it in 1828 or 1829[13]. However, it was established that the disease responsible for the 1827-28 epidemic was measles by an investigation of the original mission records and an epidemiological study of the outbreak which is reported in "James Ohio Pattie and the 1827-28 Alta California Measles Epidemic".[14]

This epidemic also started in the south in October of 1827 at Mission San Gabriel Arcángel and ended in July of 1828 at Mission San Francisco Solano. It progressed generally northward and apparently there were three foci from which the infection spread to the surrounding areas. From Mission San Gabriel Arcángel the

disease was carried south to Missions San Juan Capistrano, San Luis Rey and San Diego Alcalá, and north to Missions San Fernando Rey, San Buenaventura and Santa Barbara. The disease appeared at Mission San Carlos Borromeo in January of 1828 from where it spread to Missions San Juan Bautista and Nuestra Señora de la Soledad. Probably the source of infection for Mission San Miguel Arcángel was from the south since the outbreak of the disease there coincided with that at Mission San Carlos Borromeo. Measles broke out at Mission San Francisco de Asís in February and from there spread to Missions Santa Clara de Asís, Santa Cruz and San Jose to the south, and to Missions San Rafael Arcángel and San Francisco Solano to the north.

Four of the missions, San Luis Obispo, La Purisima Concepcion, Santa Inez and San Antonio de Padua escaped this epidemic. This might have been due to the fact that there were no travellers between the infected missions and these missions during the epidemic or, if there had been travellers they had arrived in a non-infectious state. Also the possibility exists that they might have experienced local measles outbreaks in the not very distant past, as a result of which an appreciable number of persons would have acquired immunity to the disease and this herd immunity could have provided a measure of protection to the non-immune. A factor in the escape of Mission San Antonio de Padua might have been its relatively

isolated location.

Mission Santa Clara de Asís was not so fortunate. There were one hundred and eighty-six deaths listed in 1828, seventy-two more than the average for the years 1827 and 1829. Ninety-one or forty-nine percent of the deaths occurred in January, February and March. The crude epidemic death rate was one hundred and nineteen per thousand, thirty-two percent higher than the average rate of ninety per thousand. The adult death rate was eighty per thousand, fifty-three per thousand for males and one hundred and twenty per thousand for females. The child death rate was a dramatic three hundred and seventy-five per thousand, three hundred and forty-six per thousand for boys and four hundred and fifty per thousand for girls.

Seventy-eight percent of the male deaths and seventy-six percent of the female deaths occurred under age twenty-five. Approximately thirty-seven percent of the children in the mission perished in this epidemic. That it should have struck chiefly at the children and younger adults is not unexpected since many of the older adults would have acquired immunity to the disease from their exposure to it in the 1806 epidemic.

Following the 1828 epidemic there was a marked decrease in the number of infant (age one month or less) baptisms. In 1828 thirty-two infants were baptized and in 1829 only twenty. In view of the adult female death rate of one hundred and twenty per thousand

and the fact that three-fourths of the female deaths occurred under age twenty-five, which would include the childbearing years, this would not be unexpected.

Discussion

Some information such as how measles was introduced into Alta California, the incidence of the disease and the true mortality could not be determined because, as previously stated, the mission parochial records were not kept for the purpose of furnishing health statistics but rather for recording spiritual results, such as the number of baptisms, marriages and burials carried out according to the rites of the church.

It was not possible to determine how measles was introduced into Alta California in either the 1806 or the 1828 epidemic. Since there was a nidus of infection in Mexico, an effort was made to determine if it could have originated there, but this yielded no definitive results. A theory,[15] not universally accepted but worthy of consideration especially in connection with the 1828 epidemic, is that measles, after once being introduced, breaks out periodically and that each area acts as its own epidemiological unit. Thus the periodicity of the disease can probably be explained in terms of local factors such as general state of health, number of susceptibles

in the population, etc. Or, measles could have been brought in by any of the many ships, not only Spanish but also American, English, French and Russian which were calling at the Alta California ports. Or it may have been carried overland from the east or north by a trader or an Indian.

Because of the lack of any data about the total number of persons infected with measles, it is impossible to determine the incidence of the disease. However, there are a number of factors which suggest that it must have been high in both epidemics. One is the increase in the death rates, one hundred and thirty percent in 1806 and thirty-two percent in 1828. Another is that measles is one of the most contagious of the communicable diseases and since there is no record of a measles epidemic prior to 1806, and twenty-two years intervened between the 1806 and 1828 epidemics, much of the neophyte population must have been non-immune and the infection rate of those exposed to the disease would have been high.

No clinical description of the disease is given but there is good reason to believe that the missionaries were able to recognize measles. They had medical texts in their library and their training for missionary work at the College of San Fernando in Mexico provided them with some knowledge of medicine. In fact, the dispensaries operated by the Franciscans for their Indian students became the foundation for the famous Real Hospital de Los

Indios in Mexico City.[16]

While the missionaries were meticulous in recording in the Death Register whether or not the neophytes had received Extreme Uncion or Viaticum and had been buried according to the Roman Ritual, they listed the cause of death only occasionally. For example, measles is mentioned as the cause of death in only nineteen entries in 1806, including the thirteen listed at the end of the year. In 1828 only six deaths are recorded as due to measles. However, the additional deaths which occurred in both years must have been due to measles or its complications. In fact, this situation parallels that described by P.L. Panum in his classic report on the 1846 measles epidemic in the Faroë Islands in which he states that measles is mentioned as the cause of death in only twelve of the entries in the Sydstrømø Parish Death Register although forty persons must have died from the disease.[17]

At Mission Santa Clara de Asís eighteen percent of the Indian population perished in the 1806 measles epidemic and twelve percent in that of 1828. No doubt the crowded and not very sanitary living conditions contributed not only to the spread of the disease but also to the increased death rate. Probably another factor, one commented upon by both Father Viader and Father Duran of nearby Mission San Jose, was the general

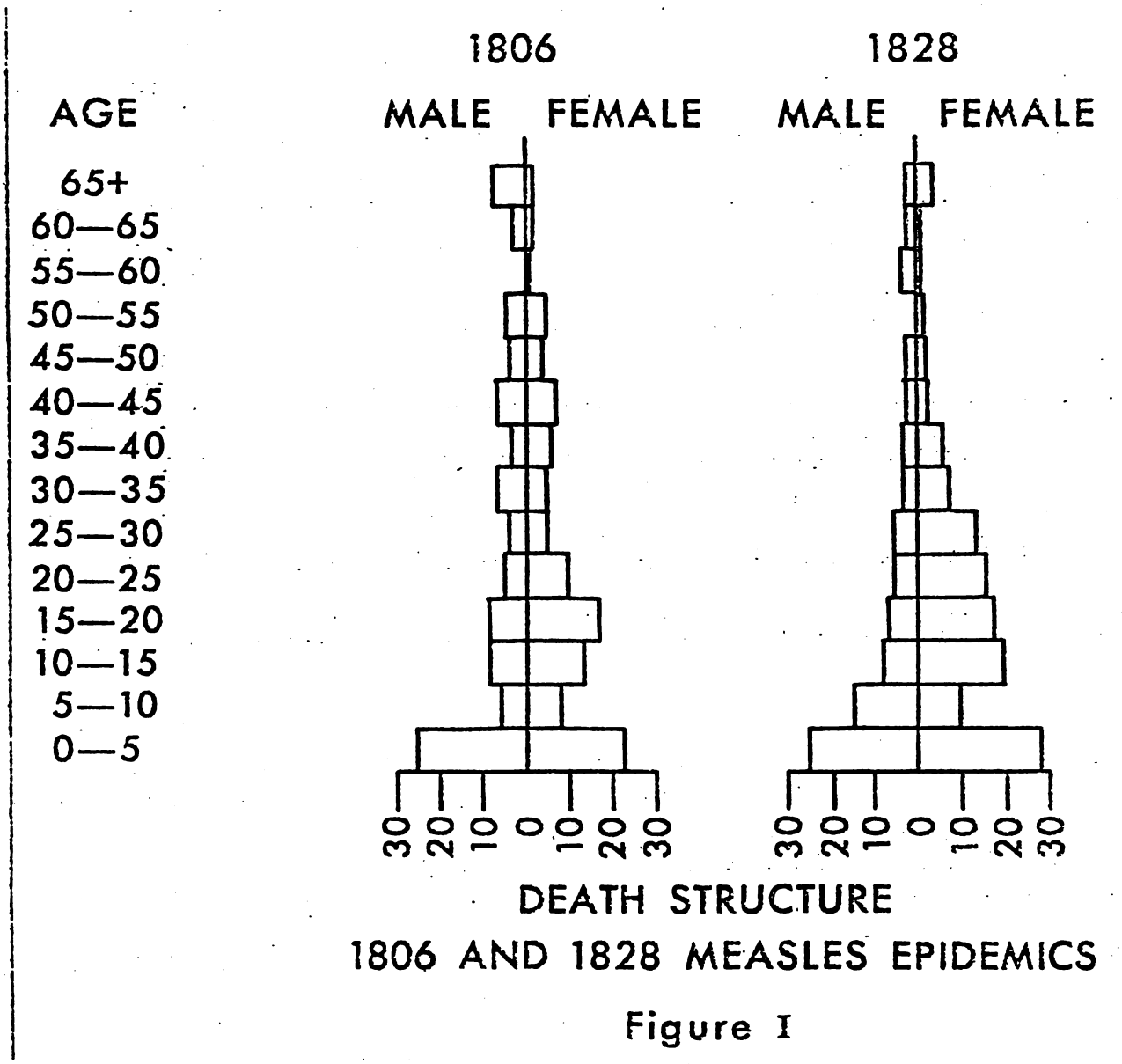
susceptibility of the Alta California Indian to disease. Father Viader states in a letter dated January 12, 1830 to Father Jose Sanchez, President of the Missions that the sickness is without end and that the end of the Indian race (Indiada) was approaching.[18] Father Narciso Duran says in a note in the Death Register of Mission San Jose "I am weary of all this sickness and dying. These Indians are more fragile than glass."[19]

That twelve percent of the Indian population perished in the 1828 epidemic while eighteen percent died in that of 1806 is not unexpected since an appreciable number of the adults would have acquired immunity to measles in the earlier epidemic.

Except for 1777, the year the mission was founded and when almost all the baptisms were of sick children, the highest death rates at Mission Santa Clara de Asís occurred in the measles years of 1806 and 1828. Since most of these deaths occurred among the women of childbearing age and the children, there can be little doubt that this disease seriously compromised the ability of the Indian population to replenish itself.

Except for Father Zephyrin Engelhardt's comment that the death toll was appalling in the 1806 measles epidemic, [20] California's historians, both general and medical, seem not to have appreciated the seriousness of this disease or the role it played in the decline of the Indian population. This is interesting in view of the fact

that measles had long been recognized as a "killer". For example, Sir William Osler states in his Principles and Practice of Medicine that measles with its complications is a bigger killer than smallpox and that it ranks first among the acute fevers as a cause of death among children.[21] Jacques M. May in his The Ecology of Human Disease says that measles in virgin (non-immune) populations not only spreads like wildfire but can cause a frightful mortality.[22]



DEATH STRUCTURE
1806 AND 1828 MEASLES EPIDEMICS

Figure I

Notes

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Chapter 5

Smallpox

Smallpox was introduced into New Spain shortly after the conquest. In 1522, one of the men who accompanied Panfilo Narvaez from Cuba, brought the disease to Mexico with disastrous results. Graphic descriptions of this epidemic are found in Father Toribio de Motolinia's Historia de los Indios de Nueva España[1], Father Bernardino de Sahagun's Historia General de las Cosas de Nueva España[2] and Bernal Diaz del Castillo's Historia Verdadera de la Conquista de la Nueva Espana[3]. From this time onward smallpox epidemics broke out periodically with varying degrees of severity, According to Father Jakob Baegert, one of the Jesuit missionaries in Baja California, this disease was a major factor in the decimation of the Indian population of the missions there.[4]

But while authors such as James O. Pattie[5], Sherburne F. Cook[6], Henry Harris[7] and others, refer to the devastating effects of smallpox on the Alta California mission Indians, investigation of the original mission records reveals no evidence that any epidemic of the disease occurred at Mission Santa Clara de Asís or any other mission in the province during the Franciscan mission period

(1769-1833).[8]

Doubtless the relative isolation of the area contributed to this escape, at least during the first few decades of the period, but a fact of much greater importance was the preventive measures taken by the Spanish and Mexican governments and the missionaries. The story of the early use of quarantine, isolation and immunization by variolation (inoculation with unmodified smallpox pus) and vaccination (at this time inoculation with cowpox pus) to prevent the introduction and spread of the disease is equally, if not more important than would be the description of a smallpox epidemic had one occurred.

What was probably the first smallpox scare was dealt with by quarantine and isolation. It occurred in August 1781 when a group of soldiers and colonists for the pueblo of Los Angeles arrived near Mission San Gabriel Arcángel from Baja California where an epidemic was in progress.[9] Governor Felipe de Neve, in a letter to the Comandante General de las Provincias Internas, dated October 29, 1781, states that L. José Zuñiga had placed the new arrivals under quarantine at a distance of one league from the mission because several of the children were convalescing from the smallpox.[10]

A further effort to control smallpox was an order issued by King Charles III of Spain, concerning the distribution of the book Disertacion Fisico-Medica en la cual se Prescribe un Metodo

Seguro para Preservar a los Pueblos de Viruelas hasta Lograr la Completa Extincion de Ellas en Todo el Reyno.[11] throughout the Spanish possessions in the New World. Don Joseph de Galvez, Marques of Sonora, transmitted this order to New Spain along with one hundred and fifty copies of the book. It is as follows:

> Your Excellency, you are being sent the attached Disertacion on the prevention, and even the extinction, of smallpox among the people, which His Majesty has ordered published under my direction. You are to make known its contents in all the cities under your jurisdiction through the parish priests, physicians and other concerned persons, wherever they may be, the importance of this benefaction which His Majesty wishes for his subjects in America together with the usefulness and absolute safety which accompanies the execution of these measures.
>
> As stated in the "Prologue" this method was used with good results in the Province of Louisiana, and whenever an outbreak of smallpox occurs, the directions set forth on page 57 and subsequent pages are to be followed. The first smallpox victim, along with any subsequent cases, is to be moved to a hermitage or country house which has been designated or built at a proper distance from the town. This shall be in a healthy place, selected by the authorities, so that the prevailing breeze cannot spread the contagion although it is generally thought by the physicians, and according to repeated experience, this pestilence is spread only by contact with the victims, or with things they have used...
>
> Aranjuez, April 15, 1785
> /Signed/ Joseph de Galvez

> There are 150 copies in the box accompanying this order.[12]

The book La Disertacion was written by Don Francisco Gil, Surgeon of the Royal Monastery of San Lorenzo (El Escorial) and a member of the Royal Academy of Medicine of Madrid. He is obviously a contagionist and while he does not denigrate the effectiveness of inoculation, he emphasizes the importance of quarantine and isolation in the control of smallpox and gives much attention to the supportive measures to be used in the treatment of those who are stricken with the disease.

This order was transmitted to California by Brigadier Jacobo Ugarte y Loyola, the military governor of New Spain. On September 13, 1785, he sent a letter to Governor Pedro Fages of California stating that he was forwarding a copy of the Royal Cedula and twenty copies of the book.[13] These were to be distributed in both Baja and Alta California, and while it is not known how many copies were actually received at the missions, there is a well-thumbed copy of the book in the Santa Barbara Mission Archives.

On February 28, 1797, as a result of the outbreak of smallpox in Mexico and Guatemala, Don Miguel de la Grúa y Branchiforte, Viceroy of New Spain, issued an edict containing thirteen sections of instructions on how to prevent and deal with a smallpox epidemic. For the most part it is a summary of the methods proposed by Dr. Gil

in his Disertacion which the Viceroy ordered reprinted in 1796.[14]

> Mexico, 6 August 1796
> Procure a certified copy of the order of April 15, 1785 from Aranjuez and put it with this decree at the beginning of La Disertacion Fisico-Medica sobre el Metodo de Preservar a los Pueblos de Viruelas hasta Lograr la Extincion de Ellas, written by Don Francisco Gil... a copy of which accompanies this, and reprint two hundred copies in this capital; thus the rules contained therein may be more widely known and the benefits thereof more readily available to everyone in accordance with the will of His Majesty.
>
> /Signed/ Branchiforte[15]

In Viceroy Brnachiforte's edict which is concerned chiefly with the administration aspects of the quarantine and how the care of the smallpox victims is to be financed, there are two sections of special interest. Section Seven deals with fumigation

> The letters which are sent out from the contaminated areas should be fumigated with sulphur; before being dispatched they should also be wrapped in damp fumigated paper. The mail carriers should cover themselves with linen clothing which they should remove before entering any town, even those in which there is no epidemic.

and Section Eight with inoculation

> When the latter [smallpox] becomes widespread, because of the inability to stop it at the beginning with the methods indicated, it will be advisable to put inoculation into practice, pointing out to those concerned, in order that

> they may adopt it voluntarily, its advantages and the great success obtained in Oajaca, Tehauntepec and other cities, where the results have been exceedingly favorable to humanity...[16]

Governor Diego de Borica acknowledged receipt of these instructions on July 20, 1797 and stated that he was transmitting them to his company commanders.[17] On April 15, 1798, Lt. José Arguello, commander of the Presidio of San Francisco, wrote to Governor Borica that he had received and duly noted the Viceroy's edict regarding smallpox.[18]

The second smallpox threat to Alta California occurred early in May of 1798 when the Concepcion, the regular boat from San Blas, arrived in Santa Barbara harbor with five cases of smallpox on board.[19] In accordance with Viceroy Branchiforte's instructions, Governor Borica on May 14, 1798 notified the presidio commanders and Father Fermin Francisco Lasuen, the President of the missions, of the incident and advised inoculation.[20] The passengers were quarantined from May 3 to May 16, but the governor thought it should have lasted for forty days. He so states in a letter dated May 28, 1798 to Captain Felipe Goycochea, military commander of Santa Barbara, in which he also is very critical of his handling of the whole affair.[21]

A direct result of this episode was the circulation through Alta California of an instruction on how to perform

inoculations. It was written by Dr. Pablo Soler, the military surgeon at Monterey and the only physician in the province at the time, and endorsed by Governor Borica. A copy of this instruction is found in the Santa Clara Mission Archives. Because it has never appeared in print before and it is so explicit about the method to be employed, the complete document is presented in translation.

> Method of performing inoculations against smallpox by which simple operation experience in New Spain has shown numerous fatalities are avoided.
> Wet the point of a lancet or similar instrument with smallpox pus; introduce the lancet thus annointed beneath the skin in the web between the index finger and the thumb, so superficially that hardly any blood appears; then place the finger on top of the wound when removing the lancet so that the pus will remain.
> Do not apply a bandage until the blood has dried.
> The food should be light and strengthening, such as atole of barley, corn, etc. Drink the same, such as water of lettuce [*Lactuca sativa*] or maiden hair [*Adiantum capillus veneris*]; and rest. Do not give medicine or other restoratives.
> All ages can be inoculated even if they suffer from the itch or some similar disease. Above all, cleanliness, fresh air and well-being are recommended in addition to all that indicated in smallpox which occurs naturally.
> I do not doubt that the reverend missionaries will secure this blessing for the neophytes in view of the havoc wrought

> among the Christian Indians as well as the Non-Christian savages in Baja California in 1781. Fortunately, San Fernando and San Borja escaped the contagion because of the inoculations which were carried by Father Crisostomo Gomez with the usual happy results.
> We would wish that this blessing will reach the poor non-Christian Indians through their relatives, for these instructions are directed to the good of humanity.
> Monterey, 17 May 1798 /Signed/ Pablo Soler
> For the Reverend missionaries of San Carlos
> /Signed/ Borica[22]

This instruction was definitely prepared for the use of the missionaries. Of special interest is Dr. Soler's comment that Father Crisostomo Gomez had successfully inoculated against smallpox in Missions San Fernando and San Borja in Baja California in 1781.

On May 25, 1798 Captain José Arguello, commander of the Presidio of San Francisco, wrote to Governor Borica that he had received his letter and the Metodo para Practicar la Ynoculacion and that he was sending copies to his troop commanders and Missions San Francisco de Asís, San Jose and Santa Clara de Asís, so that it could be put into practice. He further states that if the disease broke out, he would have his family inoculated as an example to others.[23]

Finally, on September 4, 1798, Governor Borica wrote to Viceroy José Miguel de Azanza that smallpox had not been introduced

into the province of Alta California at this time.[24]

Early in 1804, there was a flurry of interest in vaccination against smallpox in New Spain when Dr. Alejandro Arboleya of the Royal Spanish Navy arrived with some vials of vaccine matter and successfully vaccinated a number of orphans in Mexico City.[25] On April 25 and 26, the Gazeta de Mexico which was widely distributed in both Baja and Alta California published a two-part supplement on the procedure.[26] It states that if directions are followed carefully, anyone can vaccinate. The preferred site of vaccination is the anterior surface of the upper arms and as can be seen in Figure 1, the illustration which accompanied the article, multiple vaccinations were performed on each subject.

The anterior surface of the upper arm was being used most frequently as the site of vaccination. Other methods besides that described by Dr. Soler were being employed. Sometimes small areas of skin were scoriated and the inoculum was introduced into the scoriations. Blisters were raised by binding the leaves of Spanish fly (Lytta vesicatoria) or some similar herb against the skin and then placing a thread saturated with pus beneath the blister. This method was recommended for children since the reaction was supposed to be milder.[27]

Despite the earlier vaccination campaign, probably the most famous of all efforts to eliminate the scourge of smallpox in the

New World was the expedition of Dr. Francisco Xavier de Balmis. This vaccination expedition was undertaken at the instigation of Dr. Josef Ignacio Flores who had been born in the New World but who was serving as one of the court physicians in Spain in 1803. Its purpose was to introduce vaccination into the Spanish overseas possessions and it departed from La Coruña, Spain on November 30, 1803 and arrived at Vera Cruz, Mexico on October 27, 1804 after stops at ports in the Canary Islands, the West Indies and northern South America.[28]

On November 27, 1804, the Bishop of Sonora, Francisco Rouset de Jesus, who had jurisdiction over the California missions, wrote to Father Estevan Tapis, the president of the missions, announcing the visit of Dr. Balmis and instructing the missionaries as follows:

> We Father Francisco Rouset de Jesus... Bishop of Sonora, Sinaloa and the Californias...
> The unending zeal with which our everloving King seeks by so many means the betterment of his beloved subjects, has caused to be sent to the New World, at the expense of the Royal Treasury, a maritime expedition composed of trained persons and directed by the Royal Physician, Don Francisco Xavier de Balmis. The purpose is to eradicate in all the provinces of New Spain the most unfortunate ravages, which have been caused in the past, and may be caused at present by frequent epidemics of smallpox.

> This is to be achieved by means of vaccination which his Majesty is endeavoring to spread through his extensive domain through the above mentioned expedition... Since it is in accord with our obligation to cooperate efficiently, to put into practice and to make effective the sovereign will of the King by aiding and assisting as much as possible, the individuals and doctors who compose the charitable expedition already mentioned, I charge you that you shall send this communication to all the missions in your jurisdiction for execution of its requirements and that you retain the original in your archives and that you notify our private secretary of your compliance.
>
> Culiacan, November 27, 1804[29]

For some unexplained reason, no member of the Balmis expedition visited California but this letter no doubt served to focus attention on the problem of smallpox and its control.

The next mention of smallpox comes from Dr. Georg H. Langsdorff, the German-trained physician who accompanied Russia's Resanov expedition to California in 1806. He mentions in his report of this visit that Governor Jose Joaquin de Arrillaga had told him that vaccination had been used in California for many years. He further states that he was told that cowpox had been present in the cattle in the area south of Monterey for a long time and it had been used for the successful vaccination of many people. In fact, the inhabitants had so forgotten the dangers of smallpox that, as a

consequence, they had become careless about vaccination.[30]

This suggests the possibility that vaccinations were being performed in California at the same time Jenner was carrying out his experiments. Cowpox would be expected to be found among the cattle of California since they had come from Mexico, and the Mexican cattle had been brought from Europe where cowpox was prevalent. Alexander von Humbolt mentions in his Essai Politique sur le Royaume de la Nouvelle Espagne that Dr. Balmis had found cowpox among the cattle at Valladolid and the village of Atlisco near Puebla when he was in Mexico.[31]

In January 1810, the Audiencia of Seville authorized Dr. Francisco X. de Balmis to return to New Spain on a second vaccination expedition.[32] After his arrival in Mexico, he issued a broadside, Reglamento de Orden de S. M. para que Propague y Perpetue la Vacuna en Nueva España, a copy of which is found in the Archives of Mission Santa Clara de Asís. This is dated October 10, 1810 and concerns the method to be used for the preservation of the vaccine and for setting up vaccination stations. He remarks herein that although vaccine matter preserved in sealed vials of glass or wax, scabs, or pus dried on threads, splinters or quills had been used for vaccination, the best results were obtained by arm to arm transfer of the pus. Dr. Balmis in his Tratado Historico y Practico de la Vacuna which was widely distributed in Spain and her possessions makes the usual

statement that vaccinations can be performed by anyone. He also points out that while four vaccinations on a subject are sufficient, ten, twelve and even more had been performed without untoward effects.[33]

Activity regarding vaccination seems to have subsided, however there is a letter from Father Viader to Governor Pablo Vicente de Sola, dated February 21, 1816, in which he requests one or two lancets. Of course these could have been used for any purpose but is possible they were for use in vaccinations.[34]

Vaccination is again mentioned in 1817, when, according to Hubert H. Bancroft, Jose Verdia brought some vaccine matter to Monterey but no additional information could be found.[35]

In 1821, the Russian ship Kutusoff landed at Monterey with vaccine lymph which had been obtained in Lima, Peru. Approximately ninety children were vaccinated with this material but on September 13, Governor Pablo Vicente Sola writes that the procedure had been a failure because the vaccine matter had lost its effectiveness.[36]

Evidently procurement of effective vaccine matter was a great problem in Mexico and California. On August 27, 1823, Lucas Ignacio Alaman, the Mexican Secretary of State, wrote to the Governor of California as follows:

> The supreme executive power has directed his attention to the conservation and propagation of the vaccine fluid, noting

> with considerable anxiety that a preventative so efficacious against epidemics of smallpox has almost disappeared from our midst. The Municipal Councils, Provincial Deputations and local functionaries are responsible for the public health. These authorities are charged with the encouragement of the propagation of so precious a fluid. Therefore, in order that the inhabitants may guard against this plague, his Highness desires that you proceed at once, in conjunction with the Provincial Deputation and the Board of Health, to obtain vaccine from the nearest source. We have been advised that it may be preserved and transported in thin gut or glass containers. If such means do not suffice, then vaccinated children should be sent from one place to another at the expense of the respective municipalities...[37]

There is no evidence that these recommendations were ever carried out in California, but it is interesting to note that arm to arm transfer from child to child was still considered the best method for preserving and transporting the vaccine matter.

The next statement regarding smallpox in Alta California is that of James Ohio Pattie, a fur trader and prospector who arrived on the Pacific coast in 1828. He states in his "Personal Narrative" that an epidemic of smallpox broke out in 1828 and caused many deaths.[38] Investigation of the original mission records and an epidemiological study of the 1827-28 epidemic reveals that it was due to measles and not to smallpox, and that none of Pattie's

statements correspond to the extensive contemporary evidence.[39] Pattie also mentions that he vaccinated twenty-two thousand persons[40] against the disease but close scrutiny of this assertion and comparison with the records shows that he claims to have vaccinated six thousand more persons than were actually present in the fourteen missions he is supposed to have visited.[41] In fact, search of the original mission records fails to reveal any evidence of Pattie's tour, a fact also noted by Hubert H. Bancroft in his History of California.[42]

Hubert H. Bancroft mentions that the Russians again brought vaccine matter to San Diego and Monterey in 1829.[43] At this time William A. Richardson was hired to vaccinate in the missions and thus earned his nickname "Doc".[44]

An interesting statement is made by Governor Manuel Victoria in a report to Mexico dated June 7, 1831, that vaccinations were being and had long been carried out by amateurs because there were no professionals to perform them. He further states that smallpox was unknown in Alta California.[45]

The reports of two foreign visitors, both of whom stopped at Mission Santa Clara de Asís, are of interest because they attest to the absence of smallpox in Alta California. Captain Frederick W. Beechey who sailed up and down the California coast in the English ship Blossom during the years 1826 through 1828 mentions in his

Account of a Visit to California that it was obvious that there had been no smallpox in Alta California for many years.[46] Auguste Bernard du Haut-Cilly, Captain of the French ship Le Heros who visited many of the missions states in his Voyage Autour du Monde, 1826-1829 that it was apparent that the Alta California natives had escaped the ravages of smallpox.[47]

Father Zephyrin Engelhardt who devoted a liftime to the study of the missions, states in his Missions and Missionaries that the precautions taken by the government and the missionaries seemed to have prevented the spread of epidemics other than measles and fevers, and that there is no record of smallpox having occurred prior to 1838.[48]

From the foregoing, it appears that there were no smallpox epidemics in Alta California during the sixty-four years of the Francisco mission Period (1769-1833). Neither can there be any doubt about the concern of the government and the religious for the prevention of the disease, and their achievement in this respect was remarkable, especially in view of the terrible havoc caused by smallpox in many other parts of the world.

Gazeta de Mexico
Courtesy of Bancroft Library

Figure 1. Child exhibiting multiple vaccinations. Type of lancet in use at the time. Appearance of vaccination at four days, eight days and ten and eleven days, and of a false positive.

Notes

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3. Diaz del Castillo, Bernal, Historia Verdadera de la Conquista de la Nueva España (Mexico, Genaro Garcia, 1904), 1:409
4. Baegert, Jakob, Nachrichten von der Amerikanishen Halbinsel Californien (Mannheim, Churfurstl', 1772), p. 139
5. Pattie, James O., The Personal Narrative of James O. Pattie of Kentucky, edited by T. Flint (Cincinnati, E. H. Flint, 1833), p. 202
6. Cook, Sherburne F., "Smallpox in Spanish and Mexican California (1770-1854)", Bulletin of the History of Medicine, 1939, 7:173
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8. Valle, Rosemary K., "James Ohio Pattie and the 1827-28 Alta California Measles Epidemic", California Historical Quarterly, 52:28-36
9. California Archives, CA-22:304, Bancroft Library

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11. Gil, Francisco, Disertacion Fisico-Medica en la cual se Prescribe un Metodo Seguro para Preservar a los Pueblos de Viruelas hasta Lograr la Completa Extincion de Ellas en Todo el Reyno (Madrid, Joachin Ibarra, 1784)

12. Reales Cedulas, Tomo 130, Expediente 268, Archivo General de la Nacion, Mexico

13. California Archives, CA-3:338. This order was transmitted through the Commandante General de las Provincias Internas, the military governor of New Spain because the Alta California government was a military one.

14. Gil, Francisco, Disertacion Fisico-Medica en la Cual se Prescribe un Metodo Seguro para Preservar a los Pueblos de Viruelas hasta Lograr la Completa Extincion de Ellas en Todo el Reyno (Mexico, Zuñiga y Ontiveros, 1796). There are two copies of this book in the library of the University of California Medical School in San Francisco.

15. Ramo de Epidemias, Tomo 11, Exp. 2, Archivo General de la Nacion, Mexico

16. Ibid., Tomo 16, Exp. 1

17. California Archives, CA-24:418, Bancroft Library

18. Ibid., CA-10:109

19. Ibid., CA-14:280. Letter dated May 28, 1798 from Governor Borica to Juan Matute, Captain of the Concepcion, in which Borica mentions that there had been five cases of smallpox on board.
20. Ibid., CA-23:441
21. Ibid., CA-23:378
22. There is another copy in the Santa Barbara Mission Archives and there may be more in the records of other missions.
23. California Archives, CA-1:170, Bancroft Library
24. Ibid., CA-24:426
25. Gazeta de Mexico, 12:93, 1804
26. Ibid., 12:93-109, 1804
27. Flores, Josef Felipe, "Instruccion sobre el Modo de Practicar la Inoculation de las Viruelas...", Boletin de la Oficina Sanitaria Panamericana, 1971, 70:502
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42. Bancroft, Hubert H., History of California (San Francisco, The History Co., 1886-1890), 3:169
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46. Beechey, Frederick W., An Account of a Visit to California (London, Coburn and Bentley, 1831), p. 58

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48. Engelhardt, Zephyrin, Missions and Missionaries (San Francisco, The Barry Co., 1913-1915), 4:321

Chapter 6

Syphilis

"Venereal Disease" might be a more appropriate title for this chapter since at the time of the missions no distinction was made between syphilis and gonorrhea. Much earlier it had been suspected that they were separate diseases and John Hunter (1723-1793) so thought when he carried out his unfortunate experiment on himself. In his effort to prove that syphilis and gonorrhea were separate entities, he inoculated himself with what he thought was gonorrhea but his inoculum was contaminated with syphilis, thus he infected himself with both diseases. As a result he became convinced that syphilis and gonorrhea were two manifestations of the same disease and reported this in his Treatise on the Venereal Disease in 1786.[1] His findings were widely accepted and as a result no further serious effort was made to determine whether or not syphilis and gonorrhea were distinct diseases until Philippe Ricord (1800-1889) carried out his experiments between 1831 and 1837 in Paris. He demonstrated that syphilis and gonorrhea were separate diseases and reported his findings in his Traité Pratique des Maladies Veneriennes[2] in 1838.

Probably no disease has been the subject of more investigation and controversy than syphilis. Much of the debate has centered around

determining the geographical origin of the disease. Three schools of thought have developed on the subject. One of these is the pre-Columbian school which contends that syphilis is a disease as old as man himself and has been present in all civilizations from the earliest time and finds evidence to support this theory in the Bible, the works of Hippocrates and Celsus. Proponents of the Columbian school claim syphilis to be a disease of the Western Hemisphere which was not present in Europe until introduced by the sailors of Columbus. The evolutionary school could be considered related to the pre-Columbian in that it assumes that the treponeme has always existed in some form and that the outbreak of syphilis in Europe and the discovery of the New World by Columbus were only coincidental.[3] There are two leading theorists of the evolutionary school. One is Thomas A. Cockburn[4] who reasons that after the glaciers retreated, sea levels rose leaving man isolated in several parts of the world until relatively recently and this isolation produced different groups of men and their respective treponemes. He explains the sudden appearance of syphilis in Europe at the time of Columbus' discovery of the New World as due to the new mobility of the population during the Renaissance and that groups which had developed a tolerance to their own pathogens of a particular disease were suddenly exposed to the pathogens of another group, and this resulted in the appearance of an acute form of the disease which simulated an epidemic. The

other is Ellis H. Hudson,[5] a proponent of the unitarian theory that the treponeme has remained unchanged but that the clinical variations in syphilis, yaws, bejel and pinta are due to health, hygiene, mode of transmission and geographic distribution rather than etiologic differences.

Whatever the origin of syphilis, tracts on the disease began to appear in all countries in the late fifteenth and early sixteenth centuries. Some of the very early ones were of Spanish origin and these are of special interest because they indicate an awareness of the disease in this country and demonstrate its presence in the New World.

Before discussing the early references to syphilis, it should be explained that the name, syphilis, was not given to the disease until 1530 when Girolano Fracastoro published his poem Syphilis Sive Morbus Gallicus.[6] Prior to this time the disease had been referred to as Le Mal Français, Le Mal de Naples, and the Spanish called it El Mal Serpentino, Las Bubas, Las Buvas or Las Buas. In both Baja and Alta California the disease was referred to as El Mal Galico or simply El Galico.

One of the earliest treatises on syphilis was written by Francisco Lopez de Villalobos (1473-1560). It was titled "Un Tratado sobre las Pestiferas Bubas" and was part of his Sumario de la Medicina en Romance Trovado which was published in 1498. This

work was written in verse and in it he states that a pestilence had appeared which had never been seen before.[7] He further says that it affects the shameful parts and describes the primary induration of syphilis.[8]

A later work is that by Rodrigo Ruiz Diaz de Isla who practiced medicine in Barcelona, Seville and Lisbon. He refers to the disease as the serpentine disease in his Tractado contra el Mal Serpentino: que Vulgarmente en España es llamado Bubas...[9] which was first published in 1539. This work is thought to have been written earlier since the manuscript is dedicated to King Manuel of Portugal who died in 1521. Diaz also refers to the new disease as the disease of the Isle of Española (Haiti). William A. Pusey in his History of Syphilis states that there are several paragraphs in the original manuscript which were omitted from the printed book. One of these mentions that a pilot of Palos who was called Pinçon was infected with the disease.[10]

Gonzales Hernandez Oviedo y Valdes (1478-1557) writes in his Historia General y Natural de las Indias which was first published in 1525 that the sailors of Columbus brought to Spain the disease which they had contracted from the Indian women and that it had been transmitted to the army of Charles VIII by Spanish soldiers. He further states that many times he laughed upon hearing the Italians call it (syphilis) the French disease and the French call it the disease of Naples, when it should have been rightly called

the Disease of the Indies.[11]

Bartolome de las Casas (1474-1566) mentions the disease in his Historia General de las Indias which he began to write in 1527. He says "There were and still are two things which at the beginning were very dangerous for the Spaniards. One is the disease syphilis which in Italy is known as the French disease". He further states that he was informed by the Indians that the disease was an ancient one and had been present before the coming of the Christians and that they had no memory of its origin. He remarks that the disease had been brought to Spain from the Indies by both the Indians taken to Spain by Columbus and the incontinent Spaniards who had become infected with it by the Indian women. He notes that the Indians, men and women, seemed to be little affected by it, almost as little as if they only had smallpox, but that for the Spaniards the pains were intense particularly up to the time the bubas appeared.[12]

The presence of syphilis in Mexico is mentioned by Father Bernardino de Sahagun (1499-1580) in his Historia General de las Cosas de Nueva España which was begun in 1536 but not presented to King Phillip II until 1585. He describes two types of bubas, one which is very filthy, called Tlacaçol Nanvatl and the other of less severity called Tecpilnanavatl. The latter, he says, gives great pain and cripples the hands and feet and becomes embedded in the bones.[13]

Francisco Hernandez (1514-1578), physician to King Phillip II, was sent to Mexico by the King to write a report on the natural history of New Spain. He completed his report in 1575 and his manuscript was deposited in the Escorial. It was partially destroyed by fire but the remainder was translated into Latin and published in Rome in 1651. He mentions venereal disease several times and identifies it with that called the French or Neopolitan disease and says that there can be no doubt that it came out of the West Indies.[14]

Nicolas Monardes (1512ca-1588) says that in 1493 the disease appeared in Spain and that the Indians who were brought back by Columbus carried with them the fruit of their land, which was buas. This appears in Part I of his Primera y Segunda y Tercera Partes de la Historia Medicinal de las Cosas que se Traen de Nuestras Indias Occidentales que Sirven en Medicina which was published in 1574. However Part I of this work first appeared in 1545.[15]

There is ample evidence that syphilis was present on the mainland of North America in Mexico, but it is interesting that none of the early explorers of California mention the disease. In fact Father Francisco Xavier Clavigero states in his Storia della California that syphilis (Il mal Francese) was not seen in California during the Jesuit period, 1697-1768.[16] However, this is not borne out by the statements of other historians. Father Jakob Baegert

who was one of the Jesuit missionaries in Baja California says that this disease and phthisis were the two European diseases which worked the worst havoc among the Indians.[17] Father Francisco Palou writes in a report, dated November 24, 1769, to Father Juan Andres, the Guardian General of the College of San Fernando in Mexico, that epidemics and syphilis were the causes of the depopulation of Baja California. He further states that the latter was divine retribution for the murder of two Jesuits during the revolt of 1734-36 indicating that he did not think the disease had been present before this time.[18] Governor José Joaquin Arrillaga says in his biennial report from Loreto dated June 8, 1786 that Baja California was in dire straits and had been almost depopulated by El Galico.[19] Apparently, there is general agreement among the majority of the reports that syphilis had not appeared until after the coming of the Europeans and Sherburne F. Cook in his "Extent and Significance of Disease among the Indians of Baja California from 1691-1773" seems to accept this.[20]

Regarding Alta California, there is archeological evidence that syphilis was present as early as 4000 B.C. among the Costanoan Indians, the group to which the Indians of Mission Santa Clara de Asís belonged. James G. Roney in his "Paleopathology of a California Archeological Site" reports the results of a study carried out at a burial ground near Bodega Bay which revealed that several skeletons,

dated approximately the fourth millenium B.C., exhibited signs of syphilis.[21]

Again, none of the early explorers to Alta California mention the disease which might mean that in several thousand years the Indians had developed a symbiosis with their own pathogens and the clinical signs of the disease were not obvious enough to be noted or that the explorers who were interested in promoting settlement, did not mention anything which might possibly discourage it. But if syphilis was not present before the arrival of the missionaries, there was ample opportunity for its introduction with their coming. Not only were the settlers, the Indians and the military personnel for setting up the first missions who came from Baja California where the disease was rampant, a possible source but also the colonists who came later for the pueblos of Los Angeles, San Jose de Guadalupe and Villa Branchiforte. Father Zephyrin Engelhardt mentions a letter of Governor Borica's which states that the colonists who had arrived for Villa Branchiforte were almost naked and several were diseased with El Galico.[21] Also there was communication between the Indians and the sailors on the supply boats which came regularly from San Blas and the many visiting ships.

It should be mentioned that sometimes it is difficult to determine from the early reports whether the writers are referring

to Baja or Alta California, unless specific missions are mentioned, because both Californias were under the same military government until 1804 even though the missionary activity had been divided between the Franciscans and Dominicans at approximately the thirty-second parallel by the Concordat of 1773.[23]

Syphilis is not mentioned in any of the available early original mission records. It appears that the first mention of the disease in Alta California comes from a visitor, M. Rollin, the surgeon who visited the province with the La Perouse expedition in 1786. He states in his "Memoire Physiologique et Pathologique sur les Americains" that he was told by enlightened persons at Monterey that syphilis had spread among the Indians of California only after they had come into contact with the Europeans, but that whatever its origin, the disease caused the same ravages among the natives as among the Europeans, buboes, chancres, gonorrhea, etc. His account would indicate that the disease was already widespread. He also mentions that the remedies used by the Americans for the disease were the temescal and a decoction of a sudorific herbs taken as a drink.[24]

Dr. Jose Maria Benites, the Monterey surgeon from 1803 to 1807, carried out a medical survey of seven of the missions in 1804 and sent the report to Mexico on January 1, 1805. He considers syphilis the commonest and most serious disease to be dealt with in

the missions.[25]

Georg H. Langsdorff, the physician who accompanied the Resanov expedition in 1806, writes in the report of his visit that venereal disease was the most terrible of all those prevailing and that it was universal among the Spaniards as well as the Indians. He says that it caused greater ravages among the Indians because they rejected treatment and that the disease was characterized by spots on the skin, hard swellings, pains in the bones, inflammation of the throat, loss of the nose, consumption and death. He also thought the ophthalmias, rheumatic pains, swellings at the corners of the mouth as well as chronic diseases of many sorts could be due to this disease.[26]

In 1813, when responding to Question Fifteen of the Interrogatorio the missionaries at the nineteen missions in existence at the time reply that syphilis is one of the most prevalent diseases.[27] Fathers Jose Viader and Magin Catalá state that the disease was chronic among the Mission Santa Clara de Asís Indians which would indicate that syphilis had been present for a considerable time.

Adelbert von Chamisso, the botanist who was with the Kotzebue party in 1816 also mentions syphilis stating that, though opinions are divided, it has probably been spready by the Europeans and carries off its victims without opposition. Further, he states

that it also prevails among the savage tribes but that these do not disappear from the earth with the same dreadful rapidity.[28]

That the government authorities and the missionaries were very much aware of the disease and the havoc it was causing is evidenced by the comments, almost a litany, about it. For example Father Vicente Francisco Sarria states in a letter to Governor Sola on June 28, 1815 that El Galico is destroying these poor people, especially the women and in some missions "to marry is to die".[29] Father José Abella says in a letter to Governor Sola dated January 29, 1817 that the Indians at Mission San Francisco de Asís are so weak from syphilis that they cannot work and that he has been told by a German physician (Langsdorff?) that the disease is incurable.[30] Governor Manuel Victoria in his biennial report to Mexico dated June 7, 1831 writes that venereal disease is devouring the Indians. He further says that lack of professional medical care is a factor in the spread of the disease and that the pharmacies maintained by the missions are valueless because they are not staffed by professionals.[31] In considering this statement about the mission pharmacies, it must be remembered that is was made near the end of the mission period when secularization was imminent and when every effort was being made to discredit the mission effort. Also there is no indication that syphilis was any less common at Mission San Carlos Borromeo which was very near Monterey where

professional help was available.

Despite Governor Victoria's statement, it appears that some effort was devoted to the treatment of syphilis at Mission Santa Clara de Asís where the disease was considered to be chronic. Father Viader lists two regimens for the treatment of syphilis. His forty-three day treatment is presented in translation.

> Boil three-fourths ounce of sarsaparilla [Smilax offinalis] and a piece of mashed guaiacum the side of the little finger [Lignum vitae] in twelve pints of water until only nine remain. Set aside in a new pot or well-washed jar. This water, and no other, is to be drunk for forty-one days; the first eleven lukewarm and the remainder cold, according to the following directions:
> The patient should be confined in a well-shuttered, isolated room the night before the treatment is to begin; at six o'clock in the morning he should drink a pint of the above mentioned warm water and be well covered to promote sweating. In two hours he should have a breakfast of well-cooked beef, lamb or chicken with tortillas or toast and drink as much of the lukewarm water as he wishes. For these ten days he should eat at noon and in the evening in the same manner. He should stay in the room which should be lightly filled with smoke from bird or horse dung. The patient should remain lying or sitting up in bed for the first nine days and be provided with a chamber pot and a urinal. On the tenth day at six o'clock in the morning, he should take the following purgative: one-fourth ounce of oja sen [Cassia acutifolia]

in a mug of sarsaparilla water after it has been filtered through a cloth. Later boil a chicken (but not a setting hen) and after two hours take a large cup of the broth without salt and repeat every half hour. For lunch have one-fourth of the cooked chicken. Cook the other quarter with garbanzos or rice, and lamb or beef seasoned to taste. Each preparation of water should last two days because it does not spoil.

The eleventh day, eat in the same manner but instead of taking a purgative at six o'clock in the morning, take a pint of the lukewarm water and follow the same schedule as the previous day.

From the eleventh to fortieth day inclusive, the patient can go out on good days, taking a siesta in his room before the sun sets; and after the twelfth day, no more smoke. Fog, damp breezes and humidity are to be avoided. On the fortieth day, he should take the same purgative as he took on the tenth day, and on the forty-first the same as on the eleventh day and the diet should be the same as on those days.

On the forty-second day, he should go out.

On the forty-third he should bathe in cold water to see whether or not the diseased parts are delivered. He may eat what he wishes and if he follows a good diet he will remain cured and his blood completely purified. If he does not, he will always be debilitated and while improved, will not be cured.

Note - Syphilis will be cured with the quarantine (especially in those not too gravely diseased) but it will be well to apply burned alum and powdered cardinillo [Paris green]

> to the ulcers and sores, but since these are chronic and very stubborn, they will not always heal.
> Note - Dr. Quijano says that the sarsaparilla water can be recooked and used if a little fresh drug is added. The source is P. Florencio Ibañez who used it with good results in Sonora.[32]

The other regimen is for twenty days and also employs a sarsaparilla and guaiacum infusion. A number of preparations for the reatment of syphilitic sores and ulcers are given, among them the emplastro ranas triplicado mercurio (page 64) and a wash included with the home remedies which was made from the bark of the California live oak (encina) boiled in urine. The list of medications attributed to Dr. Quijano contains purgative mercury pills (pildoras mercuriales purgantes para los galicos) and the instructions call for twenty pills to be taken on the first day, and if this doesn't produce results, twenty more are to be taken on the third day.[33]

Promoting sweating and purging were considered therapeutic but none of the above medications would have resulted in any permanent cure of the disease. They were the treatments of the time[34] and are remarkably similar to those used in the sixteenth century. For example, Francisco Lopez Villalobos mentions mercury in the treatment of syphilis in his poem "Un Tratado sobre las Pestiferas Bubas" which was published in 1498.[35] In 1530

Girolano Fracastoro in his Syphilis Sive Morbus Gallicus speaks of the use of both guaiacum[36] and mercury[37] among a number of other medications for syphilis, and Andreas Vesalius discusses the use of sarsaparilla in the treatment of syphilis in his "China Root" letter which was written in 1546.[38]

A factor in the spread of syphilis was the amorality of the Indians or their completely different sense of morality. Gaspar Portola says in the diary of his visit in 1769-70 that the Indians were completely vile and offered their women in exchange for clothing and trinkets.[39] M. Rollin remarks in his "Memoire Physiologique et Pathologique sur les Americains" that the Indians attached no importance to the exclusive possession of their wives and often tried to traffic in their favors for a piece of iron or a few glass beads.[40] In the responses to Question Twenty-four of the Interrogatorio, it becomes apparent that the casual attitude towards sex prevailed throughout the missions.[41] In fact the missionaries at Mission Santa Clara de Asís in answer to this question, state that fornication was the dominant vice among the Indians. Their sex mores included not only promiscuity but also homosexuality. Father Francisco Palou in his report on the founding of Mission Santa Clara de Asís says that there appeared among the Indians a man dressed as a woman, and that the missionaries became suspicious and had him confined to the guardhouse for three

days and stripped of his female clothing. An effort was made to point out to him and the other Indians, the wickedness of what he was doing but when he was released, he disappeared and was never seen again at the mission. Father Palou further states that he had the opportunity to learn more about this custom at Mission San Antonio de Padua where they had caught two Indian men, one in female dress, in an unspeakable act.[42]

An in depth discussion of the venereal disease situation at the missions would be in the realm of a syphilologist and is beyond the scope of this work. However, from the visitors' descriptions, the disease was present in all its stages, buboes, chancre (primary), spots on the skin (secondary) and loss of the nose, bone and joint pain (tertiary). There is no mention of paresis.

Prevalent as syphilis was, it could have been an important determinant in the decline of the Indian population. The disease among the women would not only have decreased their fertility but also increased the prospects of abortion and stillbirths when they did conceive. Congenital syphilis could have been an important factor in the high infant mortality. This disease probably contributed significantly both directly and indirectly to the high over-all mortality. The debilitating

effects of syphilis would not only have increased susceptibility to disease but also would have influenced mortality in that illnesses resulting in morbidity in uninfected individuals would result in death in those infected.

Notes

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4. Cockburn, Thomas A., "The Origin of the Treponematoses", Bulletin of the World Health Organization, 1961, 24:221-228
5. Hudson, Ellis H., "Treponematosis in Perspective", Bulletin of the World Health Organization, 1965, 32:735-748
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7. Lopez de Villalobos, Francisco, The Medical Works of Villalobos, translated by George Gaskoin (London, J. Churchill & Sons, 1870), p. 94
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9. Diaz de Isla, Rodrigo Ruiz, Tractado contra el Mal Serpentino que Vulgarmente en España es Llamado Bubas (Seville, Robertis, 1539)
10. Pusey, William A., The History and Epidemiology of Syphilis

(Springfield, Ill., C. Thomas, 1933), p. 21. This was probably Martin Alonso Pinçon who died shortly after returning from the New World.

11. Oviedo y Valdez, Gonzales Hernandez, Historia General y Natural de las Indias (Salamanca, J. De Junta, 1547), Book 2, Chapt. 13, pp. 20v and 21r. Oviedo made eight voyages to the New World and at one time was the superintendent of the gold and silver mines in Hispañola.

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15. Monardes, Nicolas, Primera y Segunda y Tercera Partes de la Historia Medicinal de las Cosas que se Traen de Nuestras Indias

Occidentales que Sirven en Medicina (Seville, A. Escruiano, 1574), pp. 12v and 13r

16. Clavigero, Francesco Saverio, Storia della California (Venice M. Fenzo, 1787), p. 113

17. Baegert, Jakob, Nachrichten von der Amerikanishen Halbinsel Californien (Mannheim, Churfürstl', 1772), p. 137

18. Palou, Francisco, M M 1847, f 273, Bancroft Library

19. California Archives, CA-52:93-95, Bancroft Library

20. Cook, Sherburne F., "Extent and Significance of Disease among the Indians of Baja California, 1697-1773)", Ibero-Americana, 1937, No. 12, pp. 28-35

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24. Rollin, M.,"Memoire Physiologique et Pathologique sur les Americains", Voyage de LaPerouse autour du Monde, edited by M. L. A. Millet-Mureau (Paris, Imp. de la Republique, 1797), 4:51
25. California Mission Documents, No. 671, Santa Barbara Mission Archives
26. Langsdorff, Georg H., Bemerkungen auf einer Reise um die Welt in den Jahren 1803 bis 1807 (Frankfurt am Mayn, F. Wilmans, 1812), p. 182
27. Geiger, Maynard, Preguntas y Respuestas, unpublished manuscript
28. Chamisso, Adelbert von, Reise um die Welt mit der Romanzoffischen Entdeckungs Expedition in den Jahren 1815-18 (Leipzig, Weidemann, 1852), 2:30
29. Taylor Papers, No. 441, Archbishop's Archives, San Francisco
30. Ibid., No. 698
31. California Archives, CA-49:140, Bancroft Library
32. Santa Clara Mission Archives. Father Ibañez (1740-1818) was assigned to Mission Delores del Saric in Sonora, Mexico in 1783. He served in Alta California from 1800 to 1818 at Missions San Antonio de Padua, Nuestra Señora de la Soledad and San Juan Bautista (one month in 1806).
33. Ibid., Father Viader's scrapbook

34. Farmacopea Mexicana, Formada y Publicada por la Academia Farmaceutica (Mexico, M. de la Vega, 1846), p. 213 lists the sarsaparilla and guaiacum infusion (Decoctum smilacis compositum) as a specific for venereal disease.

35. Lopez Villalobos, Op. Cit., p. 123

36. Fracastoro, Op. Cit., f. d^{2v}

37. Ibid., f. c^{8v}

38. Vesalius, Andreas, The China Root Letter, translated by John B. de C. M. Saunders, unpublished manuscript

39. Portola, Gaspar, Diary of Gaspar Portola during the California Expedition of 1769-70, translated by D. E. Smith and F. Teggart (Berkeley, University of California Press, 1909), 1:19

40. Rollin, Op. Cit., p. 46

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42. Palou, Francisco, Relacion Historica de la Vida y Apostolicas Tareas del Venerable Padre Fray Junipero Serra (Mexico, Zuñiga y Ontiveros, 1787), p. 221. Palou says that he learned that the Indian name for these men in female dress was "joyas". He further states that the custom was particularly prevalent among the Santa Barbara Channel Indians.

Chapter 7

Other Diseases and Accidents

As would be expected, the Indians were subject to many diseases other than those already mentioned, and again the visitors are excellent sources of information.

The earliest of these, M. Rollin, the surgeon who was with the LaPerouse expedition in 1786, gives a most detailed account.

> Maladies of the throat, catarrhal affections, pleurisies and pleuro-pneumonias are the commonest winter illnesses. The remedies they use for the treatment of these maladies consist of a decoction to be drunk, made of some kind of plants, which they also crush and apply to the throat or wherever they feel pain. When these illnesses attain a certain degree of severity, they commonly degenerate into chronic diseases because of the inadequacy of these measures, and the patients who have survived the rigors of the development of the acute stages soon die of phthisis or consumption.
>
> Ephermeral and intermittent fevers and digestive disturbances occur especially in the spring and autumn. I have been unable to determine whether these people know some remedy which could take the place of quinine in the treatment of fevers. Their practice seems to be limited to inducing vomiting by thrusting a finger

> into the mouth and to exciting abundant sweats by a sort of steam bath.
> In the summer, the commonest maladies are putrid fever, bilious fever, petechial fever and dysentery. Lack of care and wisdom in the treatment of these maladies nearly always gives them a serious character, and when nature's efforts are insufficient to bring about salutary evacuation, either by stools, or by the excretion of urine or by sweating, the patients ordinarily die. It is to be noted that these critical evacuations are most helpful when they take place from the eleventh to the twenty-first day, counting from the onset of the attack. But the maladies most feared by them are the high fevers and the bilious fevers. Their development is so violent that it is rare for individuals attacked by them to have the strength to withstand them. Besides these diseases, the inhabitants of California are further subject to neuritis, rheumatic affections, scabies, ophthalmias, pox [syphilis] and epilepsy. Conjunctivitis and itch affect the majority of these Americans although they make no use of spiritous liquors nor of pork, fresh or salted, to which these maladies are ordinarily attributed, as well as herpes and other cutaneous affections which commonly attack them. Nor do I believe that their attribution to tattooing or to the custom of painting the skin is well founded.[1]

In addition, Dr. Rollin states that infants were subject to the

discomforts of teething, chapped skin, convulsions, whooping cough, worms, colic, diarrhea, malnutrition and strabismus. He says he did not see any rickets.[2]

Dr. Jose Maria Benites, the military surgeon at Monterey from 1803 to 1807, in the report of his medical survey of seven missions says that the most common diseases in the province after syphilis were tuberculosis, pleurisy, dysentery, scrofula and inflammatory fevers in that order.[3]

Dr. Georg H. Langsdorff in the report of his visit to the San Francisco Bay area in 1806 states that the Indians are frequently attacked by fevers and being weak, succumb. He says that ophthalmias, rheumatic pains, inflammation of the throat, consumption and other chronic diseases, all of which he attributes to syphilis, are common.[4] He also mentions a disease called el latido which was described to him by Father Luis Gil y Taboada at Mission San Jose.

> It begins with a pulsation in the lower abdomen, which increases gradually, and through the years becomes stronger. It affects only adults of both sexes and it is never found in children. Among other symptoms are pain stretching from the abdomen to the neck, producing a feeling of strangulation. Following a disinclination to eat comes a complete loss of appetite, sometimes

> associated with nausea, and an internal heaviness. Cramps are frequent and even the men appear to have hysterial fits. The sufferer leads a miserable existence, constantly wasting away until he dies. However, the death does not seem to have been very much accelerated by the disease, as old people are often seen who have been afflicted with it for many years. Taenia, aneurisms or other known causes to which physicians have attributed this disease do not appear to have any connection with its cause.[5]

Louis Choris, who was with von Kotzebue's expedition in 1816 says that severe fevers occur constantly among the Indians and that these maladies commonly carry off a very great number.[6]

In response to Question Fifteen of the Interrogatorio, Fathers Jose Viader and Magin Catalá state that after syphilis, dysentery which occurs during the autumn is the most prevalent disease. They also say that the Indians suffer from respiratory disorders, fevers, tarbadillos, etc.[7]

Without any clinical description of the various diarrheas and dysenteries, it is not possible to determine the specific type of disease. However, Father Viader had several treatments for diarrheas and dysenteries in his scrapbook, one of which is presented in translation.

As soon as the pains in the abdomen begin and the

> tongue becomes coated, give the following emetic: two grains of tartar emetic and three ounces of powdered ipecac root in cup of cold water. Make another infusion, strain it and let it sit overnight. Before using this infusion, strain it again and heat it. In order to be certain that it is not too hot, let it stand fifteen minutes before drinking. After two hours begin drinking ordinary water.
>
> If the coating on the tongue disappears, stop treatment. However, in stubborn cases, repeat the treatment on the third day and every two hours drink a pint of wine with a tablespoon of the ipecac infusion.
>
> When the patient suffers anal-rectal pain, give an enema composed of two egg yolks cooked in sour milk. If abdominal pain persists, apply hot Altea Ointment [page 61] externally to the abdomen.
>
> The following beverage is to be drunk at four o'clock in the afternoon: boil together three ounces of grated deer horn and one ounce of gum arabic in four pints of water until only one pint remains. Strain and cool before drinking.

Father Viader lists two other medications for diarrhea and dysentery in his scrapbook and both contain cascara. From the use of emetics and purges, it appears that the principle of promoting salutary evacuations, mentioned by Dr. Rollin,

was applied in treating these disorders.

The crowded living conditions, inadequate housing and exposure must have contributed to the frequency and severity of respiratory infections which apparently ran the gamut from colds, pneumonias and pleurisies to tuberculosis. Determing the specific disease without any clinical description is impossible. However, it is unlikely that the missionaries, or even the physicians of the time, were very much concerned about fine distinctions between the various disorders because the treatments usually covered chest diseases in general. In his scrapbook, Father Viader lists several treatments for pleurisy (dolor del costado) and pneumonias (pulmonias). One of the regimens for treating both diseases, Receta para el dolor del costado y pulmonia is as follows:

> Wash two ounces of barley in hot water and cook in five pints of water until the grains burst; while still boiling add one and one-half ounces of saltpeter and remove from the fire; add one and one-half ounces of water of cloves and four ounces of ojimiel [honey and vinegar mixture] or, if this is not available, two ounces of honey and a minim [one-sixteenth of a dram] of vinegar. When the patient suffers great pain and constriction in the chest, heat the medicine and have him drink

a chocolate cup of the medicine, as hot as he can bear it, every hour until the pain disappears or lessens sufficiently. In this case he should continue to take the medicine every three or four hours, but if the pain persists or intensifies, he should take a cup every half hour.
This medication must be prepared fresh every day because it cannot be held over from one day to the next.
Chest Ointment - Place in a container a small amount of lead acetate [sal de saturno], vinegar of rue [Galega officinalis] and oil of roses [page 62] and stir until the salt is dissolved, slowly adding vinegar and oil until a smooth ointment is formed. Warm and apply frequently to the chest.
Diet - Take only atole [page 33] every two or three hours, or cook one-half pound of bread in two quarts of water until it disintegrates; then strain and give a cup of this broth every three or four hours.

Whether or not tuberculosis was present before the arrival of the Spaniards, although it is generally considered to be of European origin, is not known but from the reports of the visitors, of Dr. Benites, and the missionaries, it was common after their coming and since the disease is so contagious and living conditions in the province so conducive to its spread, this is not surprising. There is documentation that

at least two Spaniards died of the disease. One was Captain Hermenegildo Sal who died on December 8, 1800 at Monterey of phthisis.[8] Evidently the disease was considered very contagious because Governor José Joaquin Arrillaga reports to Mexico on March 7, 1801 that all of Captain Sal's personal effects had been burned on the orders of Dr. Juan de Dios Morelos, the military physician at the time, as the only way to prevent spread of the contagion.[9] The other was José Viader who died in 1816 and whose effects were also burned.[10] The Indians were afflicted with scrofula, tuberculous lymphadenitis, and some of the bone and joint pain mentioned may have been due to this disease.

All reports indicate that fevers were very prevalent, but it is very difficult to identify them in terms of modern diseases. Dr. Rollin speaks of ephemeral, intermittent, putrid, bilious and petechial fevers.[11] C. E. A. Winslow in his "The Colonial Era and the First Years of the Republic (1607-1799) - The Pestilence that Walketh in Darkness" states that it is almost impossible to distinguish between the agues, bilious fevers and the like, since there are no clinical descriptions and that they were probably malaria, typhoid and typhus.[12] The title of the work in which Pierre-Charles Louis gave

typhoid fever its name in 1829, Recherches Anatomiques, Pathologiques et Therapeutiques sur la Maladie Connue sous les Noms de Gastro-Enterite, Fievre Putride, Adynamique, Ataxique, Typhoide etc., etc.[13] also indicates the confusion in nomenclature at the time.

Although some physicians, such as Thomas Willis[14] in the middle of the seventeenth century and John Huxham[15] in the mid-eighteenth century distinguished between typhus and typhoid fevers, many physicians continued to consider them as two forms of the same disease and it was not until 1837, according to Fielding H. Garrison,[16] that Dr. William W. Gerhard established the clinico-pathological differentiation between these two diseases with his "On the Typhus Fever which Occurred in Philadelphia in the Spring and Summer of 1836".[17]

Fathers Viader and Catalá mention fevers and tarbadillos as entities in their response to Question Fifteen of the Interrogatorio. They give no clues for the identification of the fevers, but tarbadillo is still the common name for Mexican typhus.[18] Fleas and lice, the vectors for this disease were present. Captain George Vancouver who visited Mission Santa Clara de Asís in 1792 mentions that the Indians were filthy and verminous,[19]

and Captain Frederick W. Beechey, who spent several days at the mission in 1827, states that he slept as well as the fleas permitted.[20] Edmund LeNetrel, who visited Alta California in 1827-28 with Auguste Bernard du Haut-Cilly reports that the Indians were lice-ridden and that he had observed them hunting and eating their lice at Mission San Francisco de Asís.[21]

There is still debate about whether malaria is indigenous to North America or was imported from Europe and Africa, but in either case it was already endemic in many areas of North America[22] at the time of the missions and it is likely that some form of the disease was present among the Indians at Mission Santa Clara de Asís. The vectors, the Anopheles maculipennis freeborni and Anopheles punctipennis,[23] were present for transmission of the disease and if they were not already infected with the plasmodium, there was a reservoir in the settlers of San Jose de Guadalupe and Villa Branchiforte who had come from Mexico[24] and Baja California[25, 26] where the disease was prevalent. There also was some contact in the latter part of the mission period with American traders from the Mississippi-Missouri River basins where the disease was endemic. Jedediah Smith and some members of his party were at Mission Santa Clara de Asís in 1827 to purchase blankets

and other supplies for their trip back east.[27] However, there is no indication that the Indians of this mission were in any way affected by the epidemic of malaria which almost wiped out the tribes in the central valley in 1830-33.[28]

Quinine (quina) was used in the treatment of fevers and the following prescription is found in Father Viader's scrapbook.

> This is the best specific [treatment] for intermittent fevers and should be administered as follows: after five or six fever episodes have passed, the patient should be given an emetic; then he should be given barley broth to drink; on the day of remission, he should be given one ounce of powdered quinine, divided into four doses and taken with a little water; if this is not sufficient to relieve symptoms, another ounce should be given in the same manner in the next time of remission and this should bring about a total cure. This medication is also used for treating putrid fevers and other illnesses when given in one-half the dose described above.

That skin diseases were common could be expected since the reports of all the visitors indicate that cleanliness was not one of the Indians' virtues. According to the responses of Question Fifteen of the Interrogatorio, skin disorders were

a problem at all of the missions even though they had begun to permit the Indians to use the temescal in an effort to prevent them.[29] Father Viader lists several remedies for the itch (sarna), one of which is given in the chapter on Materia Medica [page 58] and there was a large number of ointments in the mission pharmacy for the treatment of sores (llagas) and ulcers (ulceras).

Ophthalmias and conjunctivitis were evidently prevalent and it is possible that exposure to glare, smoke and filth played a role in their occurrence. They are mentioned by Dr. Rollin[30] and by Dr. Langsdorff[31] who thought they were due to syphilis. In the Baptismal Register of Mission Santa Clara de Asís eight persons are listed as having been blind at the time of baptism, the first in 1784. There are twelve Indians listed in the Death Register as having been blind at the time of death, two of whom were among those listed in the Baptismal Register. This would indicate that eighteen persons, seventeen adults and one child, are identified as having been blind although it is probable that there were others in the population.

It is possible that other epidemics occurred in addition to that of 1777 of unknown origin and the 1806 and 1827-28 measles epidemics. For example, 1802 was the year of the fourth highest death rate, one hundred and sixty-nine per

thousand, at the mission. Eighty-five Indians died in the month of July, but no mention is made of the cause of so many deaths. Hubert H. Bancroft in his Pastoral mentions that there was much sickness during this year and that at Monterey and Missions Nuestra Señora de la Soledad and San Luis Obispo there were reports of coughs, pains in the joints and high fevers usually accompanied with stricture of the throat[32] which could have been scarlet fever, diptheria or some other disease. This same situation may have been present at Mission Santa Clara de Asís but also there exists the possibility that all the deaths may not have been due to one disease, but to a combination of two or more which though not present in epidemic proportions themselves, in combination gave the appearance of an epidemic.

Accidents must have been more common than the notes in the Death Register indicate. According to the record two persons were reported as having been burned to death, but no particulars are given about the manner of burning. One is listed as having drowned and another died after falling out of an oak tree. One death is listed as "violent " and there were two murders. Five were killed by bears, which were apparently ferocious. José Longinos Martinez states in the

report of his visit to California in 1792 that the animals which attack man are the bears and the vipers and that he had seen two Indians who had been killed by bears.[33] LeNetrel describes a bull and bear baiting which he witnessed at Mission Santa Clara de Asís and says he was amazed at the size of the bears.[34]

There is no factual information available about the mental health of the Indians at Mission Santa Clara de Asís. There are only a few comments by visitors which could have some bearing on this subject for the missions. The disease el latido described by Langdsorff could represent a form of hysteria.[35] There are two other comments worth noting but they reflect an attitude or philosophy rather than an actual mental condition. One is Langsdorff's statement that he had been told by the missionaries that the Indians became wholly cast down and dejected upon the slightest illness, surrendering themselves to a depression of the spirit and rejecting all efforts to effect their recovery,[36] an attitude not uncommon among primitive peoples.[37] The other is Adelbert Chamisso's description of an incident he observed at Mission Santa Cruz in which two elderly Indians who were too ill to make the biennial trip to their native village just lay down on the

beach, gazed at the mountains, refused all sustenance and seemed resigned to death. However, he says that the missionary came and persuaded them to return to the mission with him.[38]

While much of the information in this chapter can only be called inconclusive, complete descriptions of the diseases simply do not exist, and even if they did, a great amount of guesswork would still be involved in identifying them. The bacteriological era with the laboratory identification of the causative agents of diseases and the concept of vectors did not arrive until the last half of the nineteenth and the early twentieth centuries. Before this recognition and differentiation of diseases were dependent upon clinical signs and symptoms, a reliable method only in the hands of trained and experienced clinicians.

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Chapter 8

Surgery, Obstetrics and the Cesarean Operation

From the available information, it would seem that the missionaries had not concerned themselves with surgery, other than the caesarean operation which will be discussed later, or obstetrics. Thus whatever was done in these fields was probably left to the Indians. Perhaps the missionaries did not feel qualified or were reluctant to carry out surgical procedures, or perhaps they thought that surgery did not offer much in the way of treatment, for as Dr. Cephas Bard states in the address "Medicine and Surgery among the First Californians" which he delivered to the Southern California Medical Society in 1894, surgery at the time of the founding of the missions had hardly been separated from the trade of barber.[1]

M. Rollin, the surgeon who accompanied the LaPerouse expedition which visited California in 1786 in his "Memoire Physiologique et Pathologique sur les Americains"[2] gives one of the most detailed first-hand descriptions of medical affairs in the missions. He says that he was assisted in his observations by Father Mattias of Mission San Carlos Borromeo and Dr. Carbajole,[3] the military surgeon at Monterey, however when he discusses surgery he mentions that the natives of the San Francisco Bay Area have the

same customs. His statements regarding surgery seem to support Dr. Bard's opinion for he says that the external diseases among the Indians which require surgery are fractures, wounds, ulcers, homoral tumors, hernias and dislocations.[4] His description is of such interest that it is presented in a rather free translation.

> They [the Indians] leave the cure of simple wounds and ulcers to nature. In severe cases they apply certain herbs, entire or crushed, to the wound or ulcer. If the discharge produced causes pain and erodes the tissues, they bathe it with a lotion made of herbs and emollient seeds. When a wound is accompanied by hemorrhage, they insert a tampon of animal hair and apply pressure by means of pieces of rawhide held in place by bindings which serve the same purpose as our bandages. If this procedure is not enough to stop the flow of blood, the wounded man usually bleeds to death, but if they succeed in stopping the hemorrhage they wait for the plug in the wound to become detached by suppuration. The scars which they get after wounds or cuts of soft tissue are almost always defective. When the Americans develop homoral tumors, they apply no treatment unless they become inflamed, at which time they use emollients locally as warm fomentations.
> Tumors or swellings formed by the displacement of organs, such as hernias, are very common, chiefly among the children. It seemed to me that they did not know the method of restoring the parts to their normal position by manual reduction, nor of maintaining them there by a bandage. I reduced hernias in several children in the presence of their fathers and

> mothers with the intention of showing them how to do it, and thus cure them or prevent accidents due to this condition, but their low intelligence left me in grave doubt as to the success of my efforts.
> Their knowledge of the art of reducing dislocations is very limited; they give a few pulls to the dislocated member but their efforts are so badly directed that they almost never obtain reduction.
> Their treatment of fractures appeared more reasonable. They bring the ends of the bones into contact and hold them by a bandage, immobilizing the limb in the bark of a tree which is fastened like a box by strips of rawhide. The patient rests until the parts are perfectly mended.[5]

In their response to Question Fifteen of the Interrogatorio, the missionaries mention that the Indians employed a primitive sort of blood-letting. They scarified the flesh with a sharp stone and then extracted blood by sucking, but this seems to have been the extent of the practice as known to the missionaries.[6]

Dr. Bard presumes that the sharp flint knives of the Indians were used to open abscesses, draw blood, amputate toes and fingers, and remove fish-hooks and arrowheads[7] which is quite possible, but there is no documentation for it in any of the mission records. He also states that Father Rubio, who was in charge of Mission San Buenaventura, had informed him that he had seen an Indian whose arm had been amputated by a missionary,[8] but this could not be verified.

Dr. Manuel Quijano is credited with performing the first

autopsy in California on Father Andres Quintana in October of 1812.[9] Foul play had been suspected in the death of the missionary and a post mortem examination was requested. It was performed approximately one week after death and Dr. Quijano reported that death had been due to natural causes. However, some time later two Indians confessed that he had been tortured "in pudendis" and murdered, which casts some doubt upon the thoroughness of the autopsy.[10, 11]

Obstetrics seems to have been left to the women, which for the era was the rule rather than the exception. M. Rollin's account of the obstetrical practices is the best available and is as follows:

> In addition to those which they suffer in common with man, the women are subject to the special disorders of their sex. These are the after effects of childbirth, uterine hemorrhages or loss of blood, miscarriages, etc. They experience few discomforts during pregnancy and almost all give birth easily. Difficult or unnatural deliveries are rare, but when they do occur, both mother and child are usually lost. This is probably due to discrepancies between the size of the pelvis of the mother and the size of the infant, or a bad presentation of the fetus.
>
> As soon as the mother is delivered, she bathes in the sea or a river. She then sits on a hot stone to sweat. She sometimes repeats this procedure for several days. These immersions often cause suppression of the lochia [vaginal discharge which appears the first week after childbirth],

> inflammation of the organs of reproduction and the urinary passages with suppression of the urine, and to scirrhus [induration or hardening of the tissue] of the breast which sometimes develops into cancer.
> When these practices lead to such accidents, the midwives limit their treatment to bathing the painful areas with a decoction of herbs or emollient seeds. This is also used in acute fevers as a drink or fomentation. It resembles flaxseed and is called passelle [Linum californica].
> Pregnancy does not always culminate happily. Miscarriages are not unusual. In such cases, the women follow the same procedure as if they had been brought to bed at the proper time, except when there is a discharge or hemorrhage, in which case they keep to their beds and the abdomen and genitalia are bathed with cold fomentations.
> I was unable to get any information on the means used by the midwives to extract the placenta.
> As soon as the child is born the midwife ties the umbilical cord and plunges the infant into cold water and removes the viscous material which is found all over its body. The infants are swaddled and bound into bark from a tree shaped like a roofing tile.[12]

José Longinos Martinez mentions in the report of his visit to Alta California in 1792 that the Indian women believe that unless they have an abortion of their first pregnancy, or unless the child, if born, dies immediately, they will never become pregnant again. For this reason they murder their babies. They also give themselves such sharp blows and take such barbarous

remedies in order to cause an abortion that some die and others are badly injured. He also describes the swaddling of the infants and says that they remain immobilized until they are old enough to walk.[13]

George H. Langsdorff who visited the San Francisco Bay area in 1806 with the Resanov expedition states in his journal that the Indians die frequently in childbirth, mainly because of the abuses they practice, among them forceful pressure on the abdomen in order to hasten parturition. He also says that miscarriages, usually from the third to the seventh months, are by no means uncommon.[14]

In 1813, the missionaries at Mission Santa Clara de Asís mention that abortion is one of the vices of the women in their response to Question Twenty-four of the Interrogatorio.[15] However, there is no information in the mission records about how these abortions were brought about.

The cesarean operation appears to be the extent of the surgery performed by the missionaries, if it can be called such. Except for the translation into English of Father Vicente Francisco Sarria's 1830 treatise "Descripcion de la Operacion Cesaria"[16] and "The Cesarean Operation in Alta California during the Franciscan Mission Period (1769-1833)"[17] which reports the number of operations performed and reviews the historical and religious background for

its performance, most of California's medical historians have only casually mentioned the cesarean operation. The story is an intriguing one, especially since the first such operation performed in Alta California was done at Mission Santa Clara de Asís by Fathers José Viader and Josef Viñals. It was performed on January 26, 1799 on an Indian neophyte who was eight months pregnant and who died of some sort of fever (tarbadillo). The infant was baptized and lived for seven hours when the missionaries reported its death either from the same disease which had killed its mother or of starvation. (Figure 1) No details of the operation are given and, of course, this was not a cesarean operation in the modern sense but involved only the extraction of the fetus after the death of the mother. The technique used was probably that described by Father Josef Manuel Rodriguez in his La Caridad del Sacerdote para los Niños Encerrados en el Vientre de sus Madres Difuntas y Documentos de la Utilidad y Necesidad de su Practica[18] which is very similar to that described in the instructions which accompanied the Pragmatic of King Charles IV and which is presented in translation later in this paper.

The coming of the cesarean operation to Alta California is documented in Father Viader's scrapbook, but the operation is an ancient one. J. Paul Pundel in his Histoire de l'Operation Cesarienne states that the mythologies of many peoples contain tales of the deliveries of infants by this means.[19] The Lex Regia of Roman Times required that the operation be performed post-mortem on all pregnant

women in the hope of obtaining a viable infant and thus another citizen for the state.[20] The chief reason for the Roman Catholic Church's advocacy of the performance of the operation is to obtain the fetus for baptism and thereby secure its eternal salvation.

In the very early church, infant baptism was neither universal nor compulsory.[21] However, baptism at as early a date as possible became necessary after the fifth century when the church adopted the Augustinian doctrine that original sin is present from the moment of conception.[22] St. Augustine (354-430) also states that he sees no reason why embryos cannot share in the resurrection.[23] A result of the acceptance of these two concepts was a church concern for the fate of the soul of the unborn infant in the womb of the dead pregnant woman.

It is possible that cesarean operations were performed from the fifth century onward. However, the operation is not given much attention in the church literature until the thirteenth century when it begins to appear in the reports of the various synodal councils. For example, it is mentioned in the reports of the Councils of Canterbury (Canon 14) in 1236[24], of Cologne (Canon 4) in 1280[25] and of Treve (Canon 114) in 1310[26].

St. Thomas Aquinas (1227-1274) states in his Summa Theologica that if the mother dies with the child still in her womb, she is to be opened and the child removed and baptized if still alive.[27] St. Charles Borromeo (1538-1584) makes a similar statement in his

Acta Ecclesiastica Mediolanensis which was first published in 1599.[28]

Pope Paul V (1550-1621) who standardized the ritual of the western church in 1614, introduced the following statement about the performance of the cesarean operation into the Rituale Romanum "Si mater pregnans mortua fuerit, foetus quam primum caute estrahatur, ac, si vivus fuerit, baptizerur".[29]

There was a general resurgance of interest in the performance of this operation in the mid-eighteenth century. It was probably occasioned by the publication of Msgr. Francesco Emanuello Cangiamila's Embriologia Sacra, ovvero del 'Uffizio de' Sacerdoti, Medici, e Superiori, circa l'Eterna Salute de 'Bambini Racchiusi nell' Utero in four books in Palermo in 1745.[30] This book which was translated into Latin,[31] French,[32] and Spanish[33] deals with the performance of the cesarean operation on both living and dead pregnant women. Msgr. Cangiamila and Abbé Dinouart both state that the reason for writing the book was that surgeons and midwives were neglecting to perform the operation because it so seldom resulted in a viable infant. While both authors quote a number of instances in which the child and the mother, or one or the other, survived the procedure, they point out that the main purpose of the operation is to secure the fetus for baptism.[34]

This book so impressed King Charles of Sicily, later

King Charles III of Spain, that he issued a pragmatic in 1749 which made the performance of the operation on dead pregnant women a legal obligation for all parties concerned and also prescribed the penalties for failure to perform it. The pragmatic deals with both the performance of the cesarean operation and the procurement of abortions in such detail that only the more pertinent portions of its fourteen sections are presented in translation.

> Charles, by the Grace of God, King of the Two Sicilies, of Jerusalem, Infante of Spain, Duke of Parma, of Plasencia, etc. To the Viceroy and Captain General of this Realm, to those Venerable Christian Fathers, Archbishop, Bishops, Abbots, Priors, Parish Priests and their vicars and assistants; to the Presiding Judges of the Royal Courts, to Princes, Dukes...
>
> It is without a doubt despicable that, in many cities and places in this Realm, pregnant women have died without any effort having been made to remove the fetuses from their wombs... by which means it is possible to save the fetus from certain death, or at least baptize it so that it is able to enter the Kingdom of Heaven. But it has happened more than once, that the mother has been buried with the infant in her womb without anyone having had the least compassion for this helpless creature. Moved by this situation and encouraged by many concerned parties, we have appointed a commission to examine the matter; and this commission has suggested that we should issue a

pragmatic with the force of law and prescribe what should be done in such matters...

1. Whenever a woman, of whatever class or condition, expires who the husband, the parents or servants think might be pregnant, each and everyone of them is obligated, after ascertaining that she is truly dead, to see that a cesarean operation is performed to remove the fetus from the womb and that it is baptized. To this end they are to notify in advance the surgeon or other trained person so that they can be prepared to perform the operation and if, for any reason, it cannot be performed immediately, they should keep the abdomen of the dead woman warm by applying hot packs...

XIV. Finally, we order that anyone who violates this pragmatic which we wish to be perpetually valid, whether he be husband, a relative of the pregnant woman or any other person, who by fraud or negligence, or for any reason, interferes with the cesarean operation or endangers the fetus, or who maliciously promotes an abortion, be reported as a homicide and be treated as a criminal...

And so that all will have knowledge of this, we order that it be published and posted according to the law...

Issued in Palermo, 9 August 1749[35]

The obligation of performing a post-morten cesarean operation on pregnant women was introduced into New Spain by Don Frey Antonio Maria de Bucareli y Ursua. Shortly after arriving in Mexico to assume his duties as Viceroy, he issued the following order:

Considering the importance [as was pointed out to me by

the King's Minister] of imposing the practice of carrying out the cesarean operation in all areas of this Viceroyalty as advocated by the Reverend Father Josef Manuel Rodriguez of the Franciscan Order in his recently published work La Caridad del Sacerdote para con los Niños Encerrados en el Vientre de sus Madres Difuntas, y Documentos de la Utilidad y Necesidad de su Practica: I advise you that whenever official assistance is requested and deemed necessary in carrying out this operation, it will be furnished promptly under penalty of 500 pesos; if necessary the surgeons should be compelled to perform it; also the parents, spouses or relatives of the dead woman, if they oppose or refuse to permit the operation, should be reported to the authorities so that proper punishment can be meted out.
God Bless you for many years Mexico, 21 November 1772[36]

Viceroy Bucareli's order was implemented by an edict sent out on December 4, 1772 by Don Alonso Nuñez de Haro y Peralta, the Archbishop of Mexico.

We, Alonso Nuñez de Haro y Peralta, by the Grace of God and the Holy See, Archbishop of the Holy Metropolitan Church of Mexico, of the Council of Your Majesty, etc.
Among the grave obligations of our pastoral ministry, we consider the eternal salvation of the souls of our subjects to be of primary importance... Having before me the Pragmatic published in 1749 by our King Charles in his Kingdom of Sicily... We send a formal order to all priests and vicars in our Archdiocese, that always when they find a pregnant woman in danger of death, they send for a surgeon, and after determining that the woman is truly dead, have the

cesarean operation performed and baptize the infant. And because we have been informed that in many cities of our Archdiocese there are no surgeons or other persons capable of performing the cesarean operation, it is our wish that the priests have in their homes and study a small book recently published by Father Josef Manuel Rodriguez, OFM which describes an easy method of performing the operation, so that they may carry it out themselves when there is no lay person capable of doing it... We exhort all secular priests and monks to do all in their power to lessen the horror associated with this operation so necessary for the salvation of infants who are so unfortunate as to lose their mothers before being born. As evidence of our interest in this subject and of the religious importance of it, we offer an indulgence of eighty days to persons who perform the operation or notify the priests or authorities of any pregnant woman in danger of death with the purpose of saving the offspring by means of the operation and its subsequent baptism. And so that our edict will come to the attention of everyone, we order that it be posted in the proper place in all the parishes of our Archdiocese.
Given under our Seal in the City of Mexico 4 December 1772[37]

Father Jose Viader of Mission Santa Clara de Asís carefully copied Father Josef Manual Rodriguez' instructions for performing the operation in his scrapbook and also mentions that Archbishop Nuñez de Haro y Peralta had decreed an indulgence of eighty days for all those who assisted in its performance.[38] He comments also that the translation of the method of performing

the operation by Father Jayme was superior to that of Father Rodriguez. Other missionaries must also have been familiar with these instructions because five of the fourteen cesarean operations recorded in Alta California were performed before the second pragmatic on the cesarean operation was issued by King Charles IV in 1804.[39]

The Pragmatic of Charles IV is not as lengthy or as detailed as that of Charles III and is as follows:

> Charles IV, by the Grace of God, King of Spain and the Indies - It has been brought to my attention... that many spiritual and secular evils have resulted from not following the instructions for performing the cesarean operation... I have discussed this subject with my Council of the Indies and my Secretary of State and on December 25, 1802 ordered the College of San Carlos to prepare instructions, which approved by the court surgeon, are to accompany my Royal Decree; and it is my will that the following instructions be obeyed:
>
> First, that in towns where there are physicians, he who attends any pregnant woman is to advise the parish priest as soon as she dies; and if he happens to be a surgeon, and even if he is not a surgeon, he should proceed immediately to perform a cesarean operation, after ascertaining according to the said instructions that the woman is truly dead.
>
> Second, that the priest, as well as the surgeon, should without fail come immediately to the house of the deceased at whatever hour of the day or night they are called.

Third, that in towns where there is no physician, the parish priest in agreement with the authorities should select the person best fitted to perform the operation in exact accordance with the instructions which the priest should have at hand.
Fourth, and last, that for this purpose the priest and the authorities should have in their possession the order regarding the subject which was issued to them by the church and government. The former should not permit the burial of any pregnant woman, regardless of class, without first verifying that the operation has been performed, and the latter must report to their superiors that all has been done according to the instructions and also any omissions they observe in a matter so important to humanity.
Therefore, I order the Viceroys, the Courts and Governors, and I pray and charge the Archbishops and Bishops in my Dominions of the Indies and the Philippines to forward the accompanying instructions to the district authorities and the diocesan priests and to impress upon them that this is my will and sovereign command.
Given in Aranjuez, 13 April 1804[40]

On July 19, 1804 Viceory Josef de Iturrigaray issued the following order from Mexico City:

Attend and carry out that which is ordered in this Royal Decree. It is to be entered in the official government records. Have it printed along with the instructions which accompany it and distribute as directed.
Mexico 19 July 1804[41]

The Bishop of Sonora who had jurisdiction over the California missions in such matters forwarded a copy of the instructions to Father Estevan Tapis, the president of the missions September 14, 1804. Father Viader carefully copied the instructions into his scrapbook. They are as follows:

> Method of Performing a Cesarean Operation after the death of the mother.
>
> It is not easy for one who lacks knowledge of anatomy to carry out a cesarean operation after the death of the mother because he needs the same instructions as those required for carrying it out on a living woman. However, since the spiritual and temporal welfare of the infant is of major concern, and since trained surgeons cannot be found for all the cases which need the operation, other help which does not have formal training is justified, and as exact and intelligible instructions as possible are presented for performing the operation.
>
> 1. Before opening the abdomen, determine whether or not the mother is living or dead, for which purpose spirits of ammonia should be applied to the mouth, the nostrils and eyes, a pin should be introduced beneath the fingernail of any finger, or any other known stimulants used; but if, after any of these diligently applied measures, no signs of life are evidenced, proceed immediately with the operation.
> 2. If the infant presents itself in the normal manner, it should be delivered as usual.
> 3. Although the operation should be performed as soon as possible, it should be carried out even after many hours

have passed.

4. Also it should be done in early pregnancies and the infant should be baptized in such a manner that the water touches it directly. The operation in this form requires more knowledge than is possessed by one who is not a surgeon, therefore we will not explain the various circumstances which must be dealt with, such as emptying the bladder, opening the abdomen between the pyramidal muscles, opening the fetal membranes with care, etc. However, supposing that the pregnancy is more advanced and that the uterus is located in the mid-abdomen and extends up to the border of the chest, which is more usual, the operation should be carried out as follows:

Operation

The only instruments needed are a sharp scalpel for the incision and another with a blunt tip, or if these are lacking, a razor or even a penknife will suffice. Place the cadaver on the bed, or on whatever is available, slightly on the side without exposing more than is necessary; compress the abdomen slightly and make an incision a little more than six inches long, equal to about one-third of a Castillian vara [yard]; this incision should include the skin, the muscles and the peritoneum which are closely adherent and difficult to separate. These are retracted and the abdomen is opened. To do this without injuring the viscera, such as the intestines, stomach, etc., a small incision is made first and two fingers are introduced through it to guide the blunt tipped scalpel or razor until the incision is of the proper length. The incision is made in the line where the abdomen is most

extended, or where the fetus is nearest. It should be two finger-breadths below the lowest ribs and four finger-breadths above the spine. The incision in the abdomen completed, a similar incision is made in the uterus which is a large meaty sac in which the fetus is contained; then with equal care open the fetal membranes which are like a sort of tissue or sac and which envelop the fetus; remove the blood with sponges or cloths and proceed as follows: if the fetus shows no signs of life, do not remove it before baptizing it conditionally; if it lives and seems robust, remove it by grasping it by the feet, or in whatever manner is easiest, and baptize it, sprinkling the redeeming water on the head. After removal, tie the cord one or two finger-breadths from the umbilicus and sever it another two finger-breadths from the ligature; then the placenta is removed by pulling gently on the cord, or if it is adherent to the uterus, it is separated gently with the fingers, or preferably with the edge of the palm. It is better not to suture the abdomen of the mother, but only to approximate the edges of the wound and fasten a towel around the body from the back to the front.

Furthermore

When a hernia or rupture occurs, the uterus and the placenta and membranes are in the site of the incision, etc. These and other abnormalities are omitted because they require the attention of a competent surgeon to be handled with success. We are obliged to state that all small incisions will be a handicap to persons who lack knowledge of the procedure and will lead to poor results. On the commission of the Council of the Royal College of San Carlos, we have

proclaimed the foregoing method.

Madrid 15 October 1803 /S/ Dr. José Ribes

/S/ Dr. Manuel Bonafos

This is certified to be a true copy of the original.

Madrid 12 November 1803 /S/ Dr. Sebastian Aso y Travieso

In conformance with the order of the Kind directed to this diocese by the Supreme Council of the Indies, His Reverence, the Bishop in the City of Culiacan endorses this order.

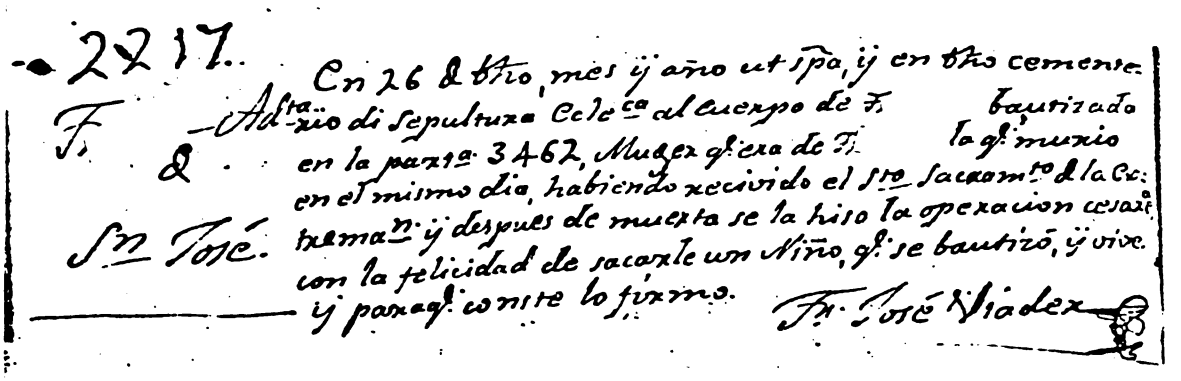
14 September 1804 /S/ José Dario Rouset[42]

Father Vicente Francisco Saria's treatise on the cesarean operation was circulated through the missions in 1830, but only one operation was performed after this date. The treatise is not presented because it is readily available in Dr. Sherburne F. Cook's English translation. Father Sarria states in the letter which accompanied the "Descripcion de la Operacion Cesaria" that he has never seen any circular or official correspondence pertaining to the ministry which treats of, or makes the slightest mention of the cesarean operation.[43] This is a strange and mystifying statement in view of the existence of the earlier regulations and instructions regarding the performance of the operation and the fact that he had done one himself in 1822 at Mission San Carlos Borromeo.[44] The circular letter with the treatise was received at Mission Santa Clara de Asís because Father José Viader's signature appears at the bottom of the

letter along with those of the other missionaries who had recorded it and passed it on.

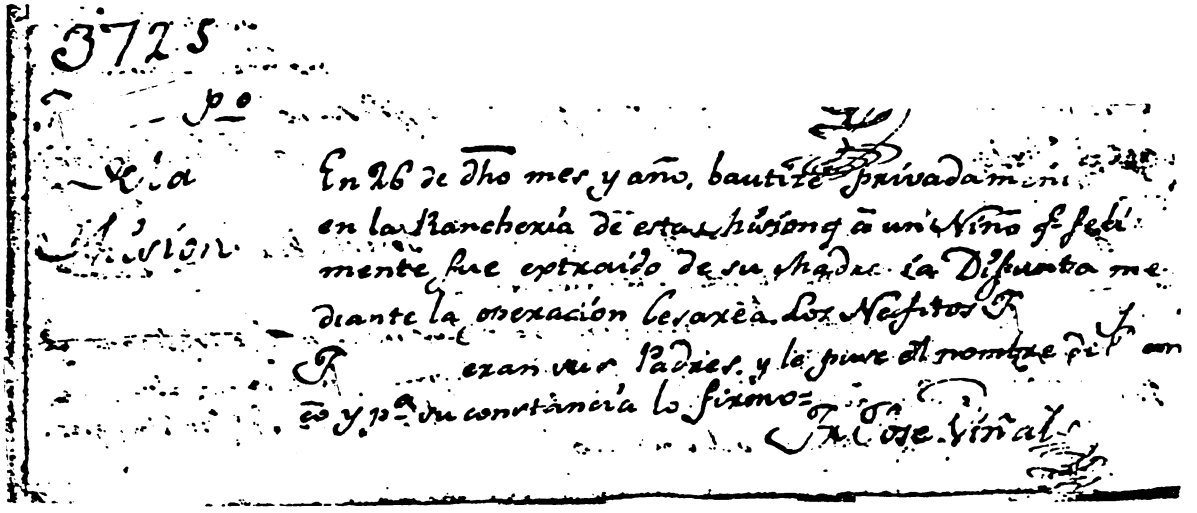
All the instructions furnished for the performance of the cesarean operation make it clear that it was preferable that the operation be carried out by a surgeon, a physician or a midwife, and by a non-professional (non-facultivo) only when none of these was available. In Alta California the performance of the operation became the duty of the missionary because during the mission period, there was never more than one physician in the province at any one time and he was stationed at Monterey.[45]

It is of interest that, in spite of the strong insistence by both the government and the church on the performance of the cesarean operation, only fourteen were done in the sixty-one years between 1772 and 1833. Only one was performed at Mission Santa Clara de Asís. In the absence of any recorded explanation for the rarity of its use, it can only be speculated that perhaps this was due to a reluctance to perform the operation on the part of the missionaries, or an antipathy towards it among the Indians, or a combination of the two factors.



2217.

En 26 de dho mes y año ut supra, y en dho cemente-
rio di sepultura eclesiastica al cuerpo de F. bautizado
en la parte 3462, Muger que era de F. la que murio
en el mismo dia, habiendo recivido el Sto Sacramto de la Ex-
tremaun y despues de muerta se la hiso la operacion cesarea
con la felicidad de sacarle un Niño, que se bautizó, y vive.
y para que conste lo firmo. Fr. José Viadex



3725

En 26 de dho mes y año, bautise privadamente
en la Ranchería de estas Misiones a un Niño que feli-
mente fue extraido de su Madre la Difunta me-
diante la operación Cesarea. Los Neofitos F.
eran sus Padres, y le pusse el nombre de F. con
ex y p. su constancia lo firmo. Fr. José Viñal

Figure 1. Top, entry in the Death Register recording the performance of the cesarean operation on the dead mother.
Bottom, entry in the Baptismal Register noting the baptism of the infant delivered by cesarean operation.

Notes

1. Bard, Cephas, "Medicine and Surgery among the First Californians", Touring Topics, 1930, 22:25
2. Rollin, M. "Memoire Physiologique et Pathologique sur les Americains" in Voyage de LaPerouse autour du Monde, edited by M. L. A. Millet-Mureau (Paris, Imp. de la Republique, 1797), 4:36-61
3. This was Father Matias de Santa Catalina y Noriega. Dr. Pedro Carbajal was the military surgeon at Monterey from 1785 to 1787.
4. Rollin, Op. Cit., p. 57
5. Ibid., pp. 58 and 59
6. See Appendix
7. Bard, Op. Cit., p. 22
8. Ibid., p. 26
9. Lyman George, "The Scalpel under Three Flags", California Historical Quarterly, 1925, 4:147
10. Engelhardt, Zephyrin, Missions and Missionaries (San Francisco, The Barry Co., 1913-1915), 3:12-16
11. Geiger, Maynard, Franciscan Missionaries in Hispanic California (San Marino, Ca., Huntington Library Publications, 1969), pp. 204 and 205
12. Rollin, Op. Cit., pp. 54 and 55

13. Longinos Martinez, Jose, The Expedition of Jose Longinos Martinez, translated by Lesley B. Simpson (San Marino, Ca., Huntington Library Publications, 1938), pp. 47 and 48

14. Langsdorff, Georg H., Bemerkungen auf einer Reise um die Welt in den Jahren 1803 bis 1807 (Frankfurt am Mayn, Wilmans, 1812), p. 182

15. See Appendix

16. Cook, Sherburne F., "Sarria's Treatise on the Cesarean Section, 1830", California and Western Medicine, 1937, Vol. 37, Part 1, pp. 107-109; Part 2, pp. 187-189 and Part 3, pp. 248-250

17. Valle, Rosemary K. "The Cesarean Operation in Alta California During the Franciscan Mission Period (1769-1833)", Bulletin of the History of Medicine, in press

18. Rodriguez, Josef Manuel, La Caridad del Sacerdote para con los Niños Encerrados en el Vientre de sus Madres Difuntas y Documentos de la Utilidad y Necessidad de su Practica (Mexico, Zuñiga y Ontiveros, 1772). This book is a translation of Book II of Francesco Emanuello Cangiamila's Embriologia Sacra, ovvero dell' Uffizio de' Sacerdoti, Medici, e Superiori, circa l'Eterna Salute de' Bambini Racchiusi nell' Utero (Milan, G. Cairoli, 1760), which deals with the performance of the cesarean operation on dead pregnant women.

19. Pundel, J. Paul, Histoire de l'Operation Cesarienne (Brussels, Presses Academiques, 1960), p. 21

20. Ibid., p. 99. The Roman Lex Regia is attributed to Numa Pompilius (ca 700 BC)

21. Encyclopedia of Religion and Ethics, edited by James Hastings (New York, Charles Scribners' Sons, 1928), p. 393

22. St. Augustine expounds his doctrine of original sin in Book I of "De Nuptis et Concupiscentia", Patrologiae Latinae (Paris, J-P. Migne, 1863), 10:412-453. He states in "De Gratia Christi et de Peccato Originali", Book II, Chapt. 41, Pat. Lat., 10:409 that his inspiration for the doctrine of original sin was a statement by St. Ambrose in his "De Poenitentia", Book I, Chapt. 3, Pat. Lat., 16:490 who quotes David, Psalm 50.5 "Ecce enim in iniquitatibus conceptus sum, et in delictis peperit me mater mea". This is Psalm 51.5 in the standard revised version of the English bible.

23. St. Augustine, De Civitate Dei (Basel, Ambrosium et Aurelian Frobenius, 1570), Book XXII, Chapt. 13, Col. 1361

24. Hefele, Charles J., Histoire des Conciles, translated by Dom T. LeClercq (Paris, Letouzey et Ané, 1907-1938), 5:1375

25. Ibid., 6:260

26. Ibid., 620

27. St. Thomas Aquinas, Summa Theologica, translated by the Fathers of the English Dominican Province (New York, Benziger Bros, 1947), Part 4, Q. 68, Art. 11, p. 2045

28. St. Charles Borromeo, Acta Ecclesiastica Mediolanensis (Milan, F. Pagnonio, 1863), 1:562

29. Pope Paul V., Rituale Romanum, edited by Pope Benedict XIV (Rome, 1874), p. 5

30. Cangiamila, Francesco Emanuello, Embriologia Sacra, ovvero dell' Uffizio de' Sacerdoti, Medici, e Superiori, circa l'Eterna Salute de' Bambini Racchiusi nell' Utero (Milan, G. Cairoli, 1760). Msgr. Cangiamila was the Inquisitor General of Sicily at the time he wrote this book.

31. Cangiamila, Franc:Emmanuele, (Translator), Sacra Embryologia sive de Officio Sacerdotum, Medicorum, et Aliorum circa Aeternam Parvulorum in Utero Existenium Salutem by F. E. Cangiamila (Ghent, Walwein, 1775)

32. l'Abbe Dinouart (Translator), Abregé de l'Embryologie Sacrée ou Devoir des Pretes, des Medecins, des Chirurgiens et de Sages-Femmes envers les Enfants que sont dans le Sein de Leurs Meres by F. E. Cangiamila (Paris, Nyon, 1762). Abbé Dinouart states in the introduction to this work that his translation is from the Latin.

33. Castellot, Joaquin (Translator), Embriologia Sagrada o Tratado de la Obligacion que Tienen los Curas, Confesores, Medicos, Comadres y otras Personas, de cooperar a la Salvacion de los Niños que no han Nacido, de los que Nacen al Parecer Muertos, de los Abortivos, de los Monstruos, etc., by F. E. Cangiamila (Madrid, Panteleon, 1785). Castellot made his Spanish translation from Abbé Dinouart's French version.

34. Cangiamila (n. 27), p. 56; Dinouart (n. 28), p. 103

35. Castellot, Op. Cit., pp. 277-285

36. Bandos de Bucareli 1771-1774, M 381, Biblioteca Nacional, Mexico

37. Arquidiocesis, M 384, Biblioteca Nacional, Mexico

38. Mission Santa Clara Archives. Only parts of this entry in the scrapbook are legible.

39. Valle, Op. Cit.

40. Reales Cedulas, Vol. 192, Exp. 35, Archivo General de la Nacion, Mexico

41. Ibid., Exp. 168

42. Mission Santa Clara Archives. There is another copy in the Book of Patentes for Mission Santa Barbara, Santa Barbara Mission Archives.

43. Carta Circular, C-C-26, Bancroft Library

44. Valle, Op. Cit.

45. There was never more than one military surgeon in Alta California and from 1824 to 1829 there was none.

Chapter 9

Vital Statistics

Mission Santa Clara de Asís represents a relatively closed population. It was founded in 1777, early in the mission period, and experienced no large immigration from one of the older missions or influx of Indians from distant parts. To the north was Mission San Francisco de Asís, founded one year earlier and to the immediate south and west was the pueblo of San Jose de Guadalupe which was founded in the same year and whose lands completely cut off the mission in these directions. In their response to Question Two of the Interrogatorio in 1813, the missionaries state that all the Indians were born at the mission or in its vicinity and that there were no more Indians in the area to conquer, except toward the east, at a distance of twenty leagues.[1]

The sources of information for vital statistics are the mission books, the Libro de Bautismos (Baptism Register), Libro de Casamientos (Marriage Register) and the Libro de Mortuos (Burial Register) and the Annual and Biennial reports or Informes which the missionaries furnished the President of the missions and the College of San Fernando. There is considerable variation in the type of information given, the early reports or Memorias being

long narratives in which the statistics do not always agree with those in the mission books. However, after 1800, these reports were standardized and while they became very brief and omitted some very desirable information such as the number of married and unmarried persons in the population, the age at death and the number of male and female adults and children, etc., they became more consistent and amenable to study. It must be realized that these books were not kept to provide vital statistics but rather to record the administration of the sacraments of baptism and matrimony, and burials according to the rites of the church.

The mission books were meticulously kept. When the neophyte was baptized, he was given a saint's name and a baptismal number. Family names were not listed but he was identified by his baptismal number when he married, mothered or fathered a child, complied with his sacramental obligations and when he died. When the neophyte was baptized, his age was usually given. When he died, he was generally listed only as being either adult or child, but by cross-checking with the baptismal register, it was possible in almost every instance, to determine the age of the neophyte at the time of death. The exceptions were when the neophyte had transferred from another mission or the priest neglected to list the baptismal number, neither of which was a

frequent occurrence at Mission Santa Clara de Asís.

This attempt to obtain some vital statistics for the Indian neophyte population of this mission is admittedly not an in-depth population study. It was undertaken as an adjunct to and vital part of the overall report on the health situation at the mission. The investigation of the available mission records reveals that, while the methods of analysis of parish registers developed by D. E. C. Eversley[2] in England and by M. Fleury and L. Henry[3] in France could not be fully applied to the material in its present form, much pertinent information could be derived. No family reconstitutions could be carried out because of the lack of family names, but it became evident that the data would lend itself very well to a computerized study which would be a dissertation in itself.

The period covered by this survey is 1777 through 1833. While secularization did not officially take place until December 27, 1836 the Zacatecan Franciscan, Father Francisco Garcia Diego y Moreno took over Mission Santa Clara de Asís on March 6, 1833. This coincided with a decrease in activity at the mission because according to the records, not one Indian adult was baptized in 1832 and of the fifty-eight infants baptized in this year, only thirteen were of Indian parentage.

The system of quinquennial aggregates or five year averages

is used in compiling statistics. Since the period covers a span of fifty-five years, this simplifies both presentation and comparison and while it tends to "flatten out" the statistical picture to a certain extent, it probably gives a more accurate one. In order to correlate data derived from the mission books with with that in the Informes, it is necessary to accept the mission system of using age ten to distinguish between the child and adult.

During the fifty-five years of its existence approximately seven thousand six hundred Indians of all ages were baptized at Mission Santa Clara de Asís, three thousand seven hundred males and three thousand nine hundred females. The mission was founded in January 1777 but the first group of Indian baptisms was performed in June of that year. Under Entry Number 7, dated June 6, 1777, Father Josef Antonio Murguia states that being informed that there were many sick children at El Roblar, an Indian rancheria about two leagues distant from the mission, they visited the village and baptized thirteen sick children, almost half of whom died. However, progress was slow and in the Memoria for 1779, the Missionaries state that they had not made much spiritual progress, that they were instructing the Indians who were living at the mission but that those at the outlying rancherias seldom came to the mission and showed no inclination to become Christians. They

also state that the Gentiles were not bringing the children to be baptized unless they were sick. For the first decade of its existence, almost all the baptisms were of children, which might indicate that the Indians were permitting the children to be baptized freely, but it is more likely that the missionaries were requiring a period of catechization before baptism for the adults but not for the children.

Baptisms are not births but since no mission birth register was kept, baptisms performed on infants age one month or less were counted as births. No doubt this results in an underestimation of the number of births at this mission since approximately one-half the population lived in the outlying rancherias[4] and not being under the close supervision of the missionaries some stillbirths and births of infants who died during the neo-natal period must have been unrecorded.

Deriving fertility or true birth rates was not possible because the available information does not include the number of women of childbearing age in the population nor is it possible to reconstitute families. The only information about the birth rate found in the mission records is a response to Question Fifteen of the Interrogatorio in which Fathers Viader and Catalá state that the number of births is fifteen percent of the number of married women. There is no way to verify this information since it is not

known how many married women were in the population.[1] A refined birth rate was obtained by determining the ratio between the number of births (infant baptisms) and the total adult female population. This is probably the method used by the missionaries in 1813 because their estimate of fifteen per hundred does not differ greatly from the derived birth rate of twelve per hundred for the quinquennium 1808 to 1812.

The earliest year for which the adult female population is given is 1792 and the birth rate for this year was twenty per hundred. This is the highest rate for the whole mission period and probably reflects the fact that the missionaries were baptizing infants born to mothers not yet baptized and who therefore would not have been included in the mission census. The rates prior to 1812 were higher but after this date, when fewer non-Christian Indians were awaiting baptism, the rate fell and continued to decline until it reached five per hundred in 1831 (Figure 1).

Girl infant (age one month or less) baptisms were ten percent greater than for boys. However, female child (age nine years or less) baptisms were ten percent less than for males. Eight percent more female adults than males were baptized (Figure 2). The fact that fewer female child baptisms were performed among the Indians coming into the mission, could have been the result of preferential care given to the boys, a not uncommon practice in

primitive societies.

The adult male/female sex ratio was always high but increased more rapidly in the later years of the mission period. The child male/female sex ratio exceeded parity in favor of the female until 1812 when it reversed itself (Figure 3). The adult male/female sex ratio increased from eighty females for every one hundred males in the population in 1782 to sixty-one females for every one hundred males in 1832. It was thought that marriage of Indian women to Spaniards might have been a factor in the increase of the male/female sex ratio but a study of the Marriage Register did not reveal a single instance of such intermarriage. There can be no doubt that the scarcity of women definitely limited the possibility for population growth.

Abortion, which the missionaries mention in their response to Question Twenty-four of the Interrogatorio as one of the vices of the Indian women, may have been a factor in the low birth rate. However, it is not possible to estimate the extent of its impact because no information is available about its frequency. Another factor may have been miscarriages which according to M. Rollin, the surgeon who accompanied the LaPerouse expedition, were not uncommon.[5] Georg H. Langsdorff, the German trained physician who with the Resanov expedition in 1806 when they visited California makes the same statement.[6]

Approximately two thousand three hundred marriages were performed at Mission Santa Clara de Asís. A great many of these were mass marriages which were in effect confirmation of unions entered into by the Indians before becoming Christians. The largest number of marriages, one hundred and seventy-nine was performed in 1794, which was also the peak year for baptisms.

Since a number of marriages were frequently performed at one time, not much information is given other than the names and the baptismal numbers. However, through these it is possible to determine the age at marriage. A sampling of ten marriages showed that five of the men were widowers aged forty-six, fifty-two, thirty-five, twenty-eight and twenty-two. The average age of the remaining five who had not been previously married was nineteen. Three of the women were widows aged forty-six, forty-one and twenty-four respectively. Of the seven women being married for the first time, two were fifteen years of age, one was thirteen and the average age was sixteen. Because of the high male/female sex ratio it is likely that almost every female would marry at least once. Also the shortage of women probably encouraged youthful marriage. Canon Law at this time permitted girls to marry at age twelve and boys at age fourteen and the ages listed in the Marriage Register indicate that marriages between the very young were just as common among the Spaniards as among the Indians.

In the early years, in fact until 1790, the total number of deaths listed in the Death Register does not agree with that in the Annual and Biennial Reports, leading to the assumption that the number of deaths which actually occurred is given in the reports and only those receiving Christian burial were listed in the register. For example, the report for 1779 states that twenty-nine deaths occurred, but only four are listed in the Death Register. Admittedly this is the year of the largest discrepancy but it demonstrates that the death rates for the early mission years are probably only approximate.

Six thousand four hundred and eighty-six deaths occurred among the Indian neophytes at Mission Santa Clara de Asís between 1777 and 1833. The structure of all Indian deaths during this period shows that twenty-eight percent occurred before age five. Fifty-eight percent of the male deaths took place under age twenty-five, twenty percent between ages ten and twenty-five and thirty percent before age five. Sixty-four percent of all female deaths occurred before age twenty-five, twenty-seven percent between ages ten and twenty-five and twenty-six percent under age five (Figure 4).

A neo-natal (age one month or less) death rate was derived by determining the ratio between baptisms and deaths in this age group. As previously stated it is suspected that births were under-

reported and it is just as likely that the same is true for neo-natal deaths. In fact only four newborn deaths are recorded for the whole mission period. That the neo-natal death rate for males was higher than for females is not remarkable but it is extremely important that while the crude neo-natal death rate fluctuated between ninety per thousand and one hundred and thirty-five per thousand, the overall trend was downward (Figure 5).

The child death rates were consistently higher than the adult death rates (Figure 6). The child female death rates were always greater than the child male death rates except under age five when the male death rate was slightly over five percent higher.

Almost two-thirds of the female deaths occurred before age twenty-five and twenty-seven percent between the ages of ten and twenty-five. According to G. J. Stolnitz[7] the fact that such a large percentage of the deaths took place in this age group is not unusual because in societies with high mortalities, the highest are usually found among females in late childhood and early adulthood. He does not qualify this statement in any way but it seems probable that among the mission Indians, youthful marriage contributed to the high death rate in that maternal mortality is highest among teenage primaparas and multiparas. Also the high male/female sex ratio and the low birth rate are likely consequences

of this high death rate.

Without programming and a computer analysis to determine the number of persons of a given age in the population at a given time, no truly accurate statement about life expectancy at any age can be made. From the crude data it can only be said that life expectancy was probably short since the death rate was so high and fifty-eight percent of the male deaths and sixty-four percent of the female deaths occurred before age twenty-five.

The natural increase is the difference between baptisms and burials. The rates of natural increase were derived and Figure 7 presents the relationship between the average baptismal rates, the average death rates and the average rates of natural increase, or in the case of Mission Santa Clara de Asís, decrease. It shows that, in spite of the apparent growth in population, the rate of natural increase was actually a negative one, or a decrease from the very founding of the mission. This would be expected in view of the increasing male/female sex ratio, the decreasing birth rate and the high death rate, although it was showing signs of levelling off. However, it is of utmost importance that while the rate of natural increase varied from a loss of fifty-five per thousand to a loss of ninety-nine per thousand, it was in fact decreasing. In the thirty years between 1802 and 1832 in spite of the high death rates in the 1806 and 1828 measles epidemics, this

rate dropped from a loss of ninety-nine per thousand to one of seventy-one, a twenty-eight percent improvement (Figure 7).

The population at Mission Santa Clara de Asís peaked at one thousand five hundred and forty-one Indians in 1795 following the large number of baptisms in 1794 (Figure 8). While the mission gained population by immigration, the coming in of Indians from the wild to be baptized, and natural increase, it lost through emigration as in 1806 when according to the Annual Report fifty-four persons of both sexes transferred to Mission San Jose, the running away of an undetermined but probably not a very large number of neophytes and deaths. However, the most important factor in the decline of the mission population was probably the high death rate in general and in particular the high female death rate between the ages of ten and twenty-five which diminished the number of females of childbearing age to such an extent that it compromised the ability of the population to replenish itself.

The fact that the death rate was very high from the beginning of the mission and was actually highest in the early years leads to the speculation that the decrease in the Indian population may have begun before the mission period and the coming of the missionaries with the keeping of records only documented it. Thus the change in life style and exposure to diseases to which it

had no immunity were contributing factors to the decline of the Indian population, rather than its causes.

Also it is possible that since the overall death-rate showed signs of levelling off, the neo-natal death rate was decreasing and the rate of natural decrease was declining, there may eventually have been a reversal in the trend and the Indian population would have begun to increase instead of continuing to decrease. However, this will never be known because of the disbanding of the missions and the dispersal of the Indians upon secularization in 1833.

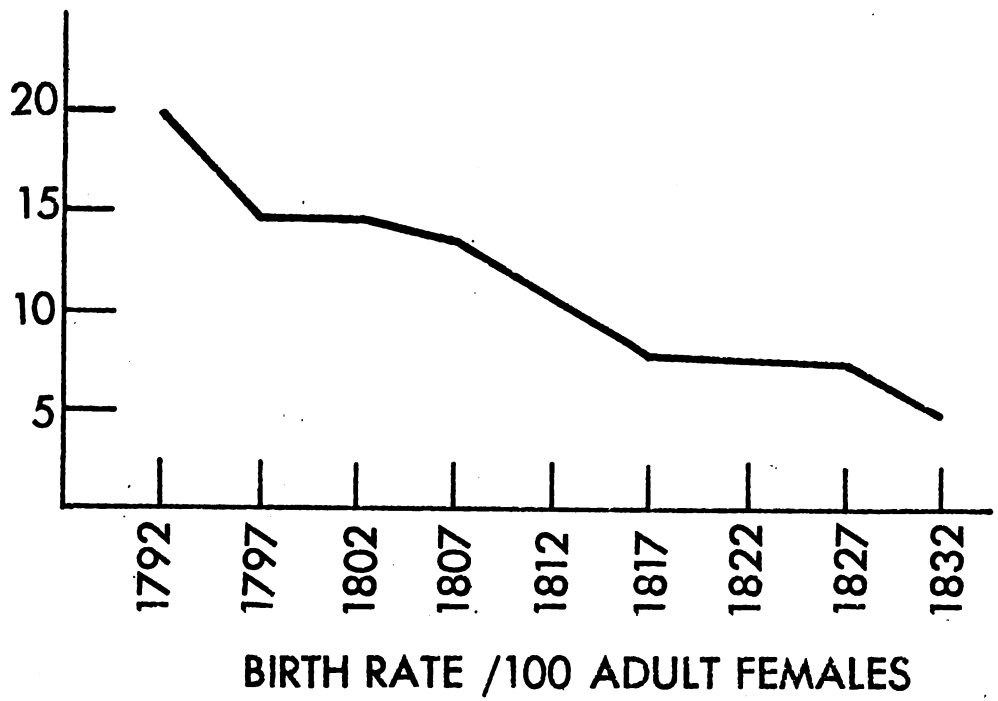

20
15
10
5
1792
1797
1802
1807
1812
1817
1822
1827
1832
BIRTH RATE /100 ADULT FEMALES

Figure 1

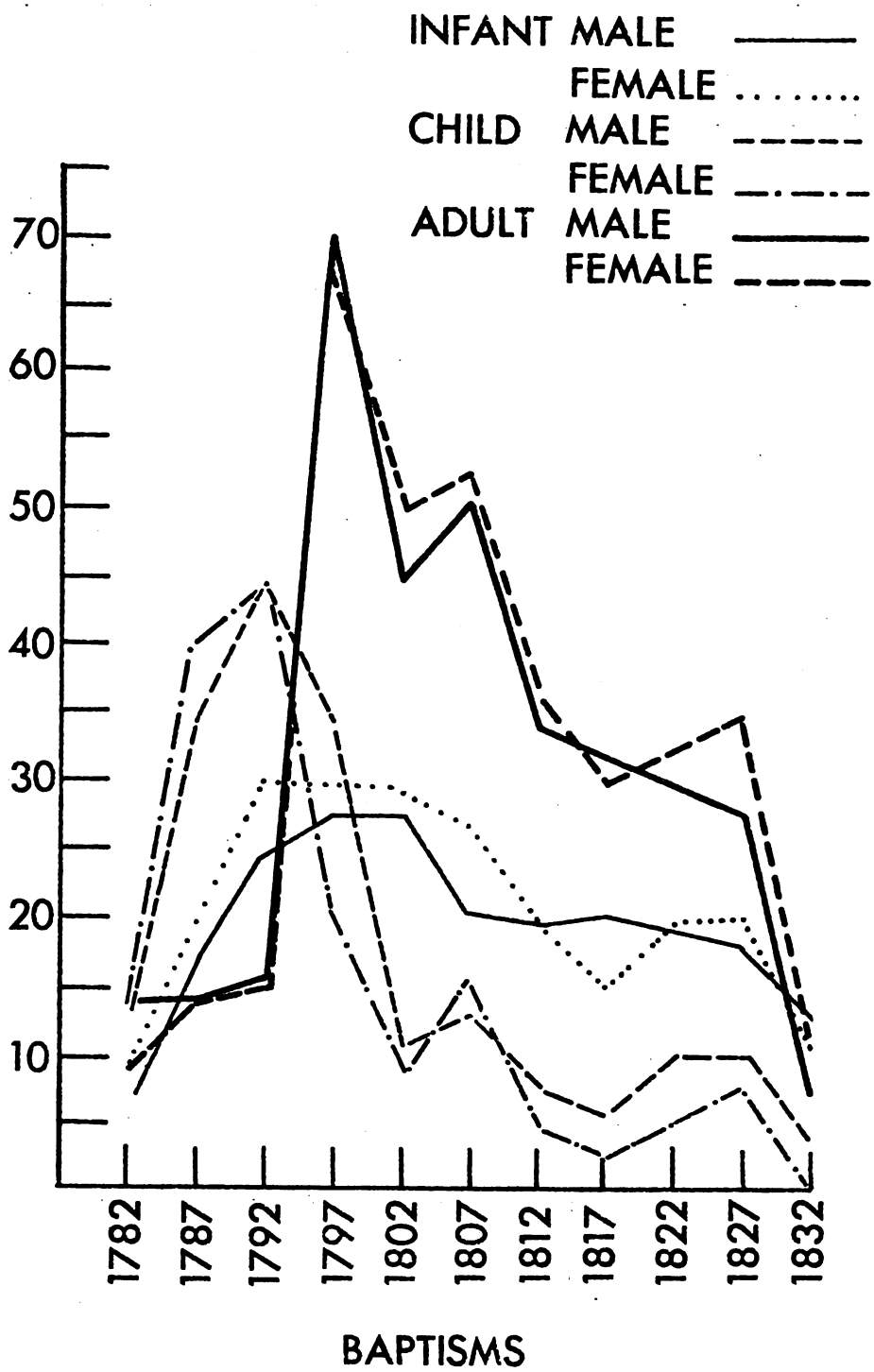

INFANT MALE
FEMALE
CHILD MALE
FEMALE
ADULT MALE
FEMALE
70
60
50
40
30
20
10
1782
1787
1792
1797
1802
1807
1812
1817
1822
1827
1832
BAPTISMS

Figure 2

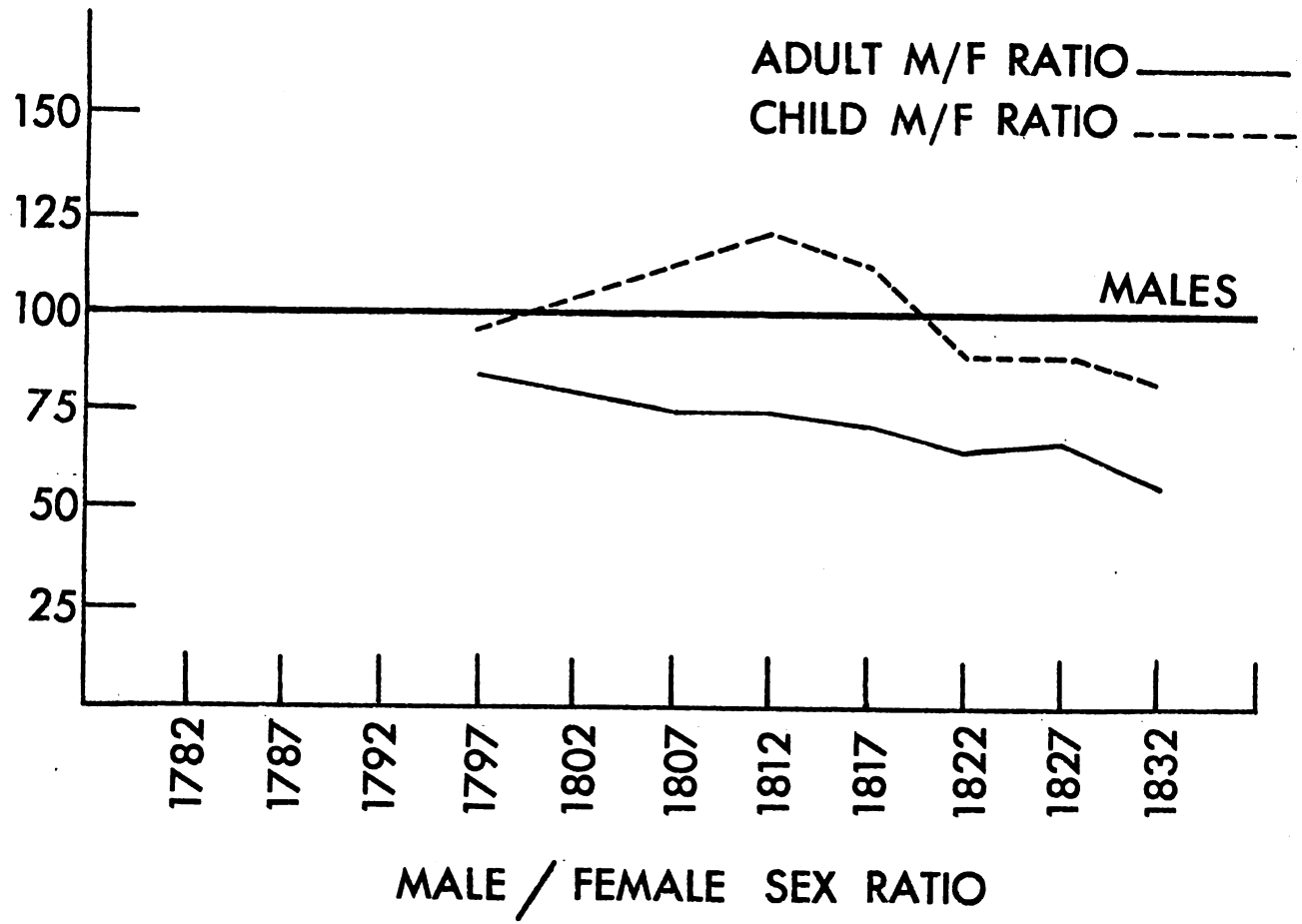
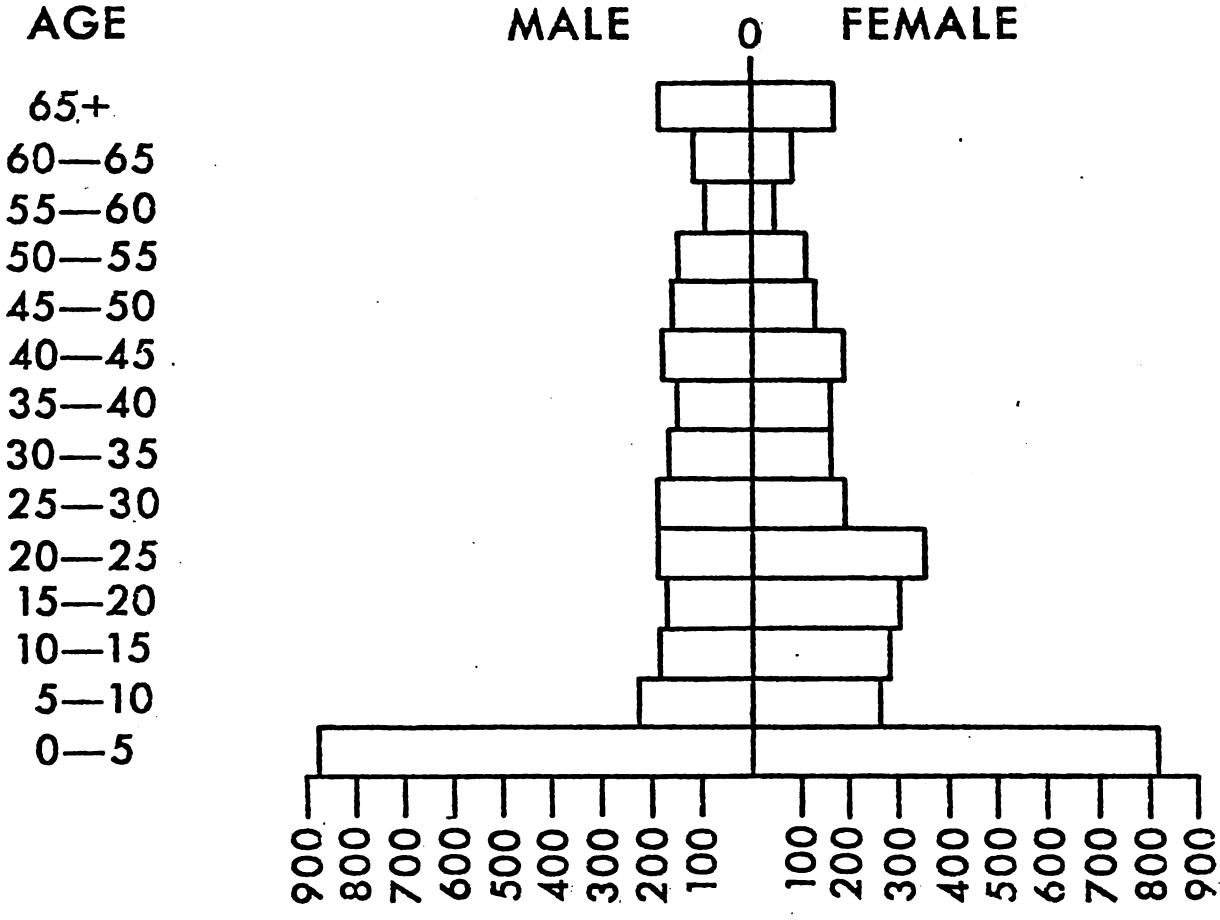

ADULT M/F RATIO
CHILD M/F RATIO
MALES
150
125
100
75
50
25
1782
1787
1792
1797
1802
1807
1812
1817
1822
1827
1832
MALE / FEMALE SEX RATIO

Figure 3



DEATH STRUCTURE 1777—1833

Figure 4

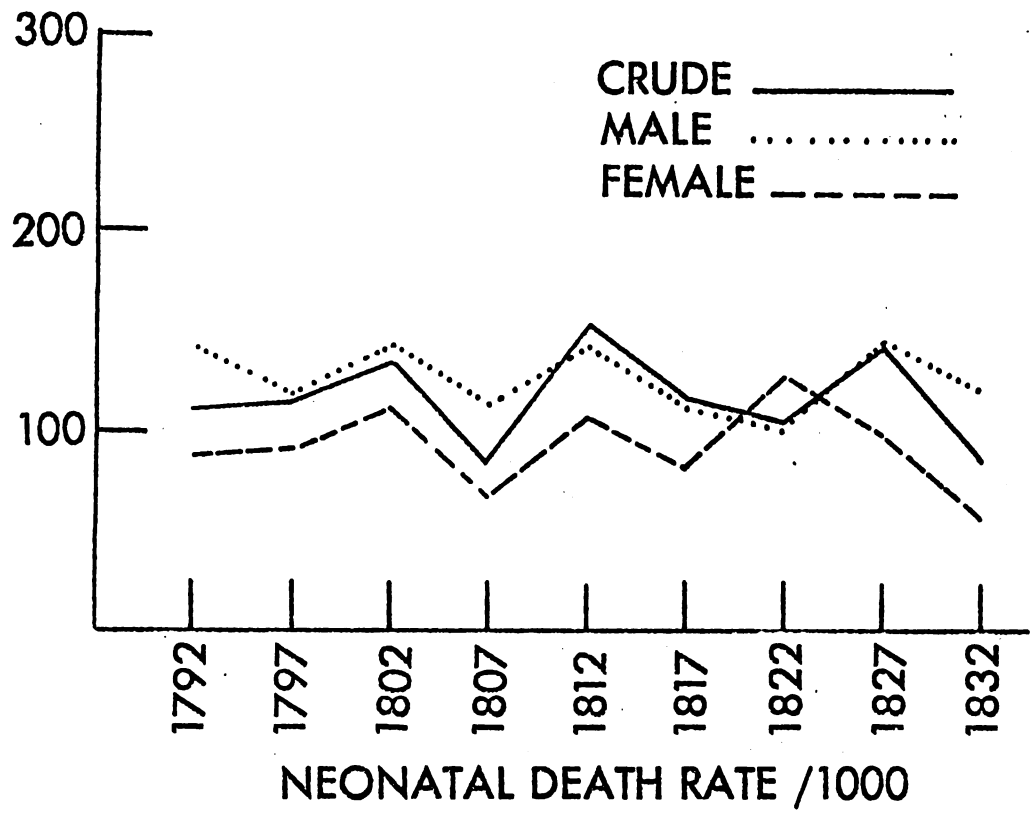

300
200
100
CRUDE
MALE
FEMALE
1792
1797
1802
1807
1812
1817
1822
1827
1832
NEONATAL DEATH RATE /1000

Figure 5

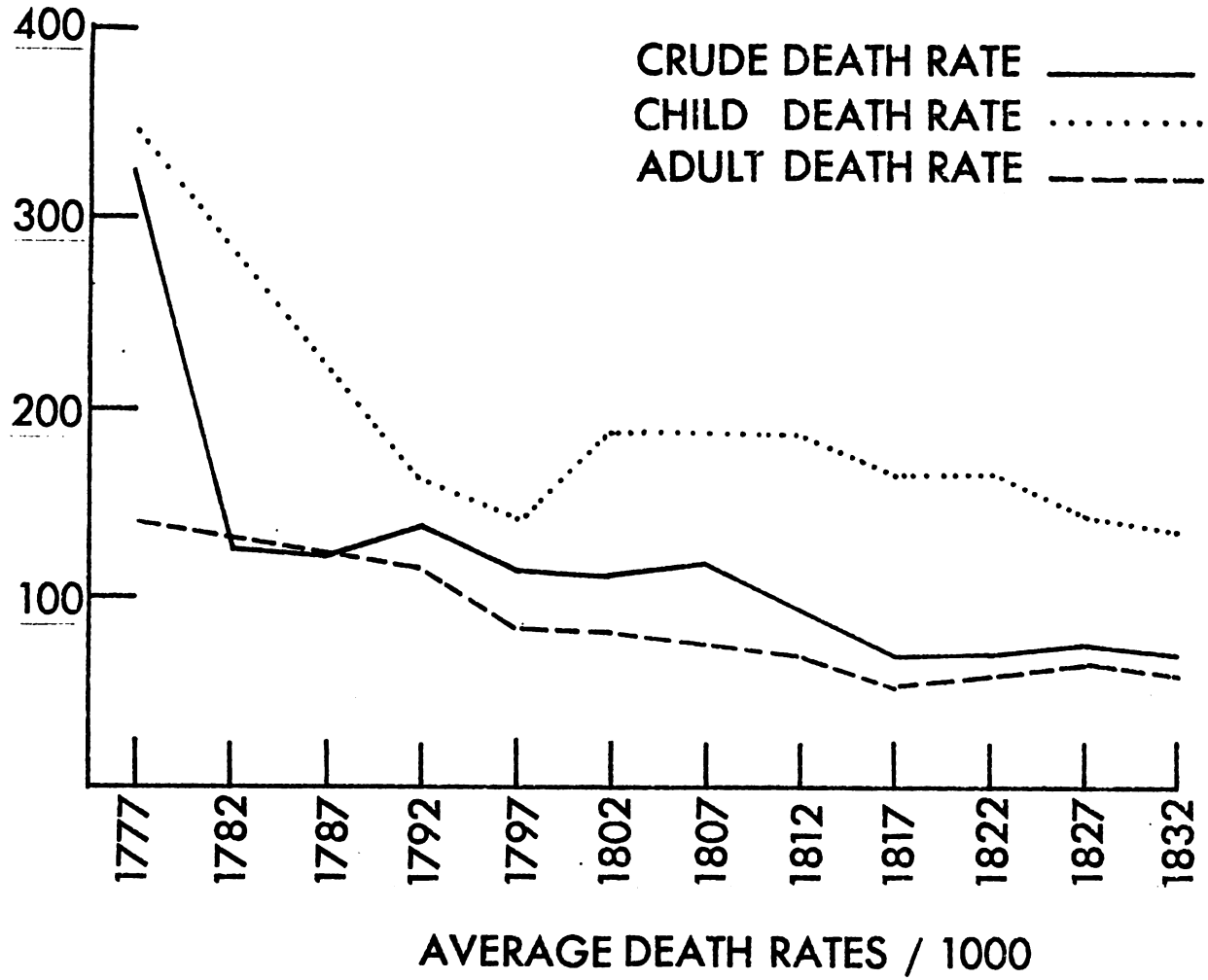
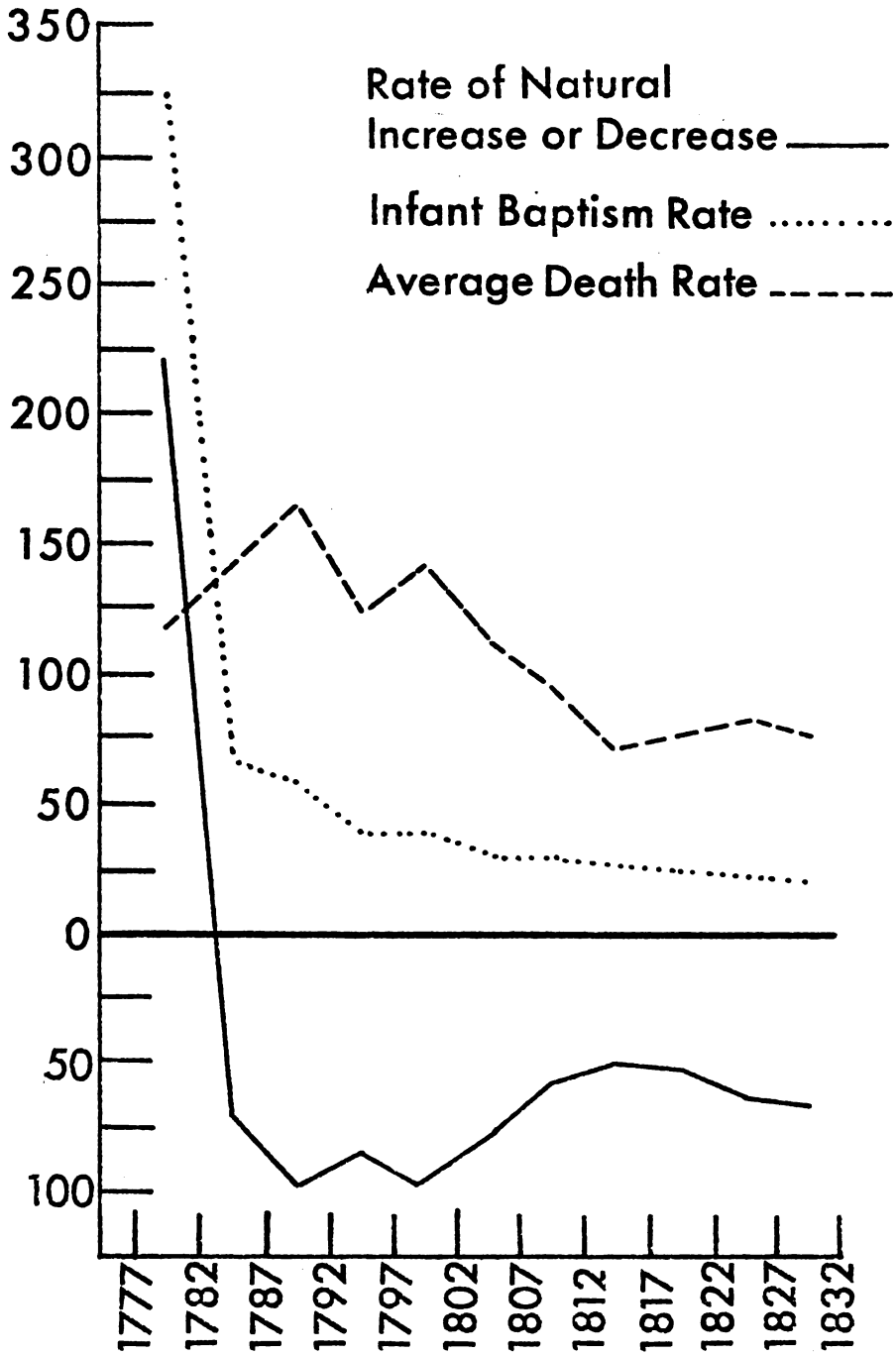
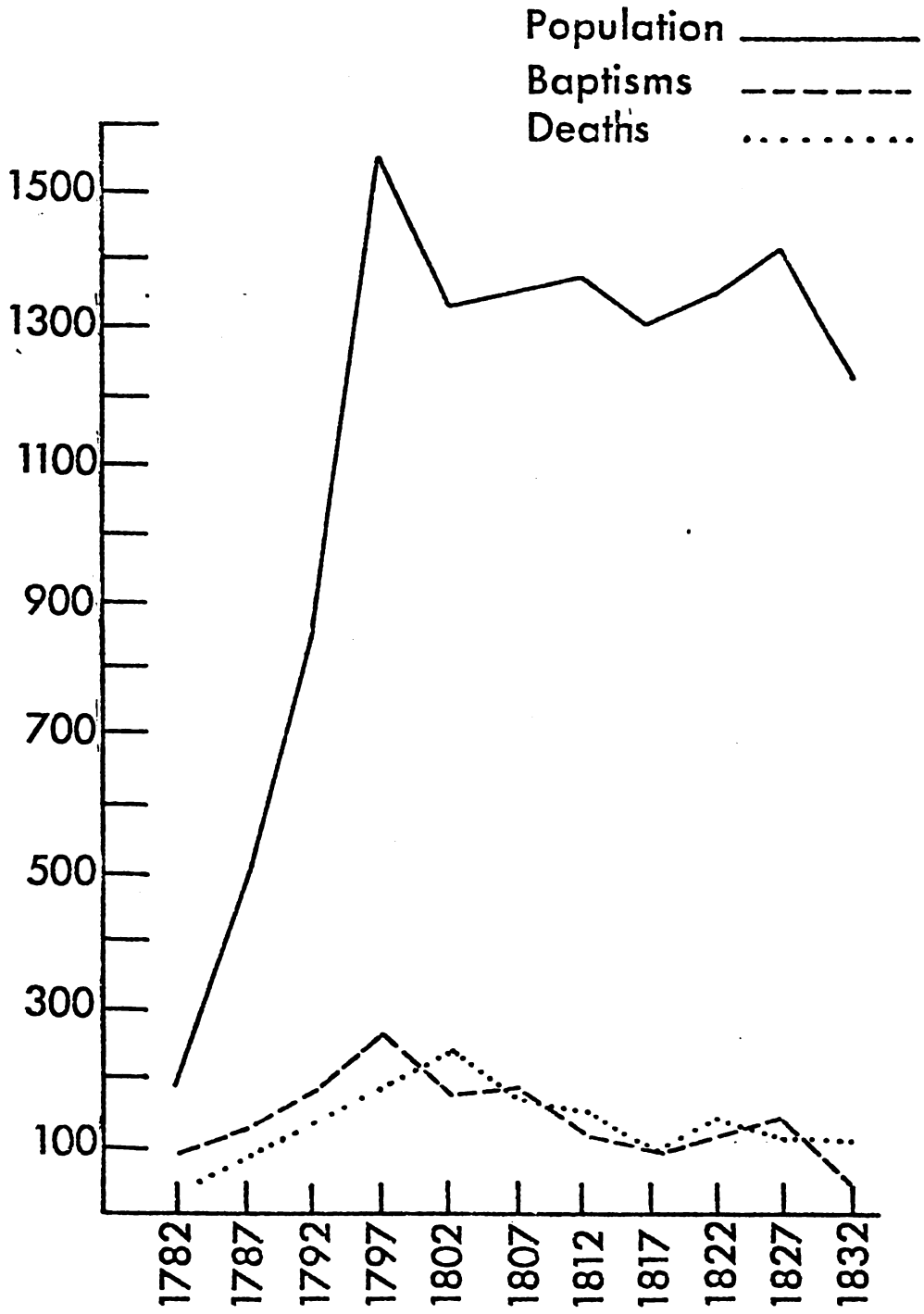

400
300
200
100
CRUDE DEATH RATE
CHILD DEATH RATE
ADULT DEATH RATE
1777
1782
1787
1792
1797
1802
1807
1812
1817
1822
1827
1832
AVERAGE DEATH RATES / 1000

Figure 6



Relationship Between Average Infant Baptisms and Death Rates and Rates of Natural Increase or Decrease / 1000

Figure 7



Relationship Between Average Population and Average Baptisms and Deaths

Figure 8

Notes

1. See Appendix. When the missionaries mention that the only Indians left to convert were twenty leagues to the east, they were thinking of the missions in the larger sense, because these Indians would not have been under Mission Santa Clara de Asís.
2. Eversley, D. E. C., "Exploitation of Anglican Parish Registers by Aggregative Analysis" in Introduction to English Historical Demography, edited by E. A. Wrigley (London, Weidenfeld & Nicolson, 1966), pp. 44-95
3. Fleury, M. and Henry, L., Des Registres Paroissiaux a l'Histoire de la Population (Paris, Institut National d'Etudes Demographiques, 1956)
4. Vancouver, George, A Voyage of Discovery to the North Pacific Ocean and Round the World (London, J. Stockdale, 1801), 3:40. Vancouver says that the number of Indians at the Mission was deceptive because more than half again as many lived in the outlying rancherias.
5. Rollin, M. "Memoire Physiologique et Pathologique sur les Americains", in Voyage de LaPerouse autour du Monde, edited by M. L. A. Millet-Mureau (Paris, Imp. de la Republique, 1797), 4:55
6. Langsdorff, Georg H., Bemerkungen auf Einer Reise um die Welt den Jahren 1803 bis 1807 (Frankfurt am Mayn, Wilmans, 1812), 2:182

7. Stolnitz, George J., "A Century of International Mortality Trends" in Population Studies (London School of Economics), 1956, Part 2, 10:22

Chapter 10

Conclusion

As pointed out in Chapter 1, the missionaries were not only religious agents but were also agents of the Spanish government in its effort to control and civilize the Indians, and as such were an integral part of the Spanish colonial system. Therefore, their work was not only to Christianize the Indians, but also to discipline them and lead them to accept European civilization. At the same time they acted as buffers between the Indians and the military government of Alta California, and, at least during the mission period, the Indians shared in the fruits of their lands. The missionaries cushioned the shock of the Indians' introduction to western culture by their efforts to Christianize them and by instructing them in the Spanish language and the rudiments of self-government. They prepared the Indians for their new way of life by teaching the men the skills of farming and animal husbandry and by training them for such occupations as cowboys, shepherds, shoemakers, stonemasons, carpenters, blacksmiths, tanners and teamsters. The boys attended school and the women and girls were taught skills considered appropriate to their sex, such as weaving, sewing, cooking and poultry raising. Both the reports of visitors and the mission

statistics document the missionaries' success in these activities.

The missionaries devoted much time to religious activities, but that they were aware that the spiritual and temporal welfares of the Indians were inseparable is evidenced by the rules for governing the missions issued by the College of San Fernando. These rules point out the necessity of providing food and housing for the Indians and include health care, instructing the missionaries not only to visit the sick but also to restore them to health. From a review of the cedulas, decrees, edicts and orders concerning health matters issued by the King or other government officials, it is seen that in the absence of physicians, surgeons and other trained professionals, the responsibility for their execution fell upon the clergy. This was the case in Alta California since there was never more than one physician, the military surgeon assigned to the Presidio at Monterey, in the province at any one time and for five years, 1824 to 1829, there was none. To prepare for this responsibility, the missionaries were given some basic training in medicine at the College of San Fernando and were provided with medical texts and medicines.

Probably the amount and quality of health care varied at each mission, depending chiefly upon the individual missionary's interest in and aptitude for medicine. However, every mission had an infirmary and a pharmacy and there can be little doubt about the

interest of Father José Viader, who spent thirty-seven years at Mission Santa Clara de Asís, in the health of the Indians as evidenced by the entries in the sole remaining volume of his two-volume scrapbook.

From the information in the Interrogatorio, it appears that the Indians of Mission Canta Clara de Asís had very little in the way of materia medica of their own, thus whatever the mission pharmacy offered was an improvement over what they had had before the arrival of the missionaries. Father Viader's efforts to gain competence in the use of the medicines in the mission pharmacy and his zeal in collecting others not only indicates his interest in the health of the Indians, but also that he was actively treating them. Most of the medications in the pharmacy were those in general use at the time. The sarsaparilla-guaiacum infusion in the treatment of syphilis and emetics and purges for dysenteries were those in current use. Quinine for fevers and mercury ointment for syphilitic sores and ulcers remained the treatments of choice for these ailments until long after the mission era had ended.

One of the remarkable achievements of the missionaries and the Spanish and Mexican governments was the prevention of the introduction of smallpox into Alta California during the mission period (1769-1833). This was accomplished by the employment of

quarantine and isolation and the early use of variolation and vaccination against smallpox. Epidemics of this disease had contributed to the decimation of the Indian population of Baja California and it is likely that the result would have been the same in Alta California, especially if the disease had been introduced in the early years of the missions before any of the protective measures could have been extended to an appreciable number of Indians.

Except for 1777, the year Mission Santa Clara de Asís was founded, when an epidemic was in progress among the Indians and when most of those baptized were already ill, the two highest death rates occurred in the measles years of 1806 and 1827-28. For some reason most historians underestimated the importance of the measles epidemics, and looked for the more dramatic smallpox, as in the epidemic of 1827-28, to blame for the high mortality rates. However, measles has long been recognized as a "killer" especially among children, and also among adults when it strikes a non-immune population. At Mission Santa Clara de Asís, the chief victims in both measles epidemics were the women of child-bearing age and the children. In taking such a heavy toll among these groups and increasing the already disproportionate male/female sex ratio, the ability of the population to replenish itself was very much compromised.

Syphilis, which the missionaries state was chronic, would have been directly responsible for some deaths, but would have had a greater indirect influence on mortality in that it would predispose those infected with it towards death rather than morbidity when afflicted with other diseases. Among the women it would have decreased fertility and increased the possibility of abortions and stillbirths when they did conceive.

The role of fevers, typhus and typhoid, malaria, dysenteries and tuberculosis as contributors to the high mortality among the Indians should not be overlooked. Not only could any of these diseases have caused death themselves, but the general debilitating effect of their constant presence or periodical recurrence would have increased susceptibility to, and influenced mortality from other maladies.

Another factor in the high mortality at the mission may have been the Indians' attitude towards disease. Langsdorff says that the missionaries had told him that the Indians became completely cast down on the slightest illness, and resigned themselves to dying, an attitude which would not have been conducive either to a quick recovery or survival.

Gathering health information and vital statistics from parochial records has limitations because they were not kept for the purpose of providing such data, but rather for recording

spiritual results, the baptisms, marriages and burials carried out according to the rites of the church. However, sufficient information could be derived to show that the death rate which had been highest in the early years of the mission was steadily declining, which could mean that the mortality rate among the Indians had been high before the arrival of the missionaries and that it had been carrived over into the mission and documented. It was also found that the infant mortality rate was decreasing and that this combined with the lower overall mortality rate resulted in a decline in the rate of natural decrease (excess of deaths over births). In fact there had been a twenty-eight percent improvement in the rate of natural decrease in the thirty years between 1802 and 1832. The raw data gave no indication of this trend and it was only when the material was processed and graphed that it became apparent. Evidently Father Viader was not aware of this trend because if he had been he probably would not have expressed such despair in the letter to Father José Bernardo Sanchez, the President of the missions, which accompanied the Informe for 1830 in which he said "There are many deaths and few births. Sickness is always with us and I fear it is the end of the Indian race. What can we do?"

If cultural shock or change in life style played any significant role in the high mortality rate among the Indians,

it was in exposing them to new diseases, such as measles, to which they had no immunity. The actual transition from the "wild" to mission life probably had little influence on mortality. The mission system of preparing the Indians for acceptance of Christianity and the Spanish way of life cushioned this process to a great extent, and if it had any effect it would have been only in the early years. At Mission Santa Clara de Asís the last mass baptisms took place in 1794, thus in the later years most of the Indians would either have been born, or grown up, in the mission.

There can be little doubt that disease, both chronic and epidemic was the main factor in the high mortality among the mission Indians. However, the provision of a steady and varied food supply, improved housing and clothing, and health care, although these benefits were counteracted to a considerable extent by disease, bettered the Indians' general physical condition sufficiently to bring about a gradual decrease in the death rate and the rate of natural decrease.

Whether or not this trend towards lower death rates and the decline in the rate of natural decrease would have continued will never be known, because with the issuance of the decree for secularization in 1833, time ran out for both the Indians and the missions.

Appendix

Interrogatorio

The Interrogatorio was a questionnaire compiled by the Council of the Indies and sent out by the Spanish government in 1812 to all civil and ecclesiastical authorities in their overseas dominions. It consists of thirty-six questions concerning cultural aspects of the native races in both their pre-Christian and Christian states. It was forwarded to Alta California on August 13, 1813 by the Bishop of Sonora, Mexico who had jurisdiction over the missions. In California, it was received by Father José Señan, President of the missions. The missionaries at each of the nineteen missions then in existence completed the questionnaire, copies of which are in the Santa Barbara Mission Archives.

This questionnaire is such a valuable source of information about the mission Indians that it is presented in its entirety as translated into English by the Reverend Doctor Maynard Geiger, OFM and slightly edited by the author.

> Answers which the Missionary Fathers of Mission Santa Clara de Asís in Alta California give to the questionnaire of the government, sent to us by the Illustrious Bishop of Sonora, and circulated among us by the Reverend Father President of these missions and Vicar Forane of this district, Fray José Señan.
>
> 1. Let them state into how many castes the population is divided: for example, whether they are Americans,

Europeans, Indians, Mulattos, Negroes, etc., omitting no group whatsoever.
This mission consists of two missionary fathers who are Europeans, of the Apostolic College of San Fernando in Mexico, and 1,347 Christian Indians. There is, moreover the military guard, which consists of a corporal and five soliders, all married, and all having children. These, as well as the inhabitants of the nearby town of San José de Guadalupe, which contains 277 souls, because of the lack of a parish priest, in spiritual matters are under the charge and care of the missionary fathers of this mission. We consider them Spaniards, or gente de razon although among them there are one or the other belonging to other castes.

2. Let them state how these castes originated with the exception of the first two. This calls for an account of the Negroes whose origin is not the same everywhere for although in general they are Africans who came to America, in the Philippines they are natives of that country who have sought shelter in the forests from the time the Malayans obtained the upperhand in those islands.
All the Indians were born at this mission or in its vicinity. There are no more Indians in the area to conquer except toward the east, at a distance of twenty leagues. Neither the Christian Indians nor the pagans have any knowledge of their origin.

3. Let them state what languages there people generally speak and if they understand any Spanish.
The language they speak is their native tongue. At this mission, there are three languages, two quite similar,

the third, hailing from the east, which is entirely distinct from the other two. Nearly all Indians understand Spanish or Castillian, particularly the young folks and those who were reared at the mission.

4. Do they love their wives and children? What sort of education do they give their children and do they urge them on to agriculture and the mechanical arts?
Generally speaking, both the Christian and pagan Indians love their wives and children. The pagan Indians give their children no education whatever. They know nothing about agriculture, nor do they need to practice it, for they are satisfied to live on wild seeds, on the hunt and fishing. In these things the forests, fields, the ocean, rivers and marshes abound. The Indians know no other art than the making of bows and arrows, and this they do to perfection, and they employ them with dexterity and acumen. The Christian Indians residing at the mission are instructed daily in agriculture and the other mechanical arts.

5. Do they have any attraction or love for the Europeans or Americans or do they manifest hate, or complain? And if so, what is the nature of these complaints?
Granting that the Indians have sufficient affection for and show sufficient respect to the gente de razón, no particular means is necessary in order to inculcate these qualities.

6. Supposing the causes that give rise to complaints exist, what remedies could be put into effect to attract and reconcile the natives?
Granting that the Indians have sufficient affection for

and show sufficient respect to the gente de razón, no particular means is necessary in order to inculcate these qualities.

7. Is there any inclination towards reading and writing in their own languages? Do they use European type of paper or the leaves or barks of trees or plants? If so give the names of these media.
We observe in the Indians no inclination towards reading or writing. Certainly some of the Indian boys learn how to read with undoubted facility. However, since we missionary fathers are interested only in teaching and explaining the Christian doctrine and in having singers and musicians for church functions, we are satisfied with these efforts, taking into account on the other hand the lack of interest on the part of the Indians and the arduous labors in which we are engaged.

8. What simple and easy means could be employed in order to induce them to speak and understand Spanish? Also state the causes that have hindered them from doing so up to the present.
Since the Christian Indians already speak and understand Spanish, due entirely to the encouragement of the missionary fathers, the Indians' frequent intercourse with the gente de razón, and the boys' attendance at school, we know of no other simple and easy methods[for encouraging them to use Spanish]. If the said Indians do not speak and understand Spanish better, it is because of their great dullness and the utmost repugnance on their part to give up their own tongue.
9. Which virtues are the most eminent among them? For

instance, are they charitable, generous, compassionate? State by which sex they are practiced.
Without doubt, their dominant virtues are their love for their relatives and members of their household, docility, respect, and obedience towards the Spaniards or gente de razón, and particularly towards the missionary fathers.

10. Do they retain any superstitions? Which means can be used to destroy these superstitions?
The Indians are very superstitious. They worship the devils, offering them seeds, and they fast and dance in their honor, in order to placate them. They practice vain observances. By using certain herbs, roots, feathers and other items, they believe they can free themselves from their enemies and from illness. They practice witchcraft by means of herbs, thorns and other enchantments by means of which they attempt to injure others and obtain revenge. Finally, they believe in all they dream about. To destroy such an accumulation of evil, we know of no methods more opportune than frequent preaching and instruction, time, and patience.

11. Are there catechisms of Christian doctrine approved by the bishops in the diverse and various languages in which the Americas and the islands abound?
At this mission there are catechisms in the languages of the Indians, composed and written by the same missionary fathers, after the fashion of others approved by bishops. But our compositions have been inspected and approved only by our own immediate superiors.

12. Is there still noticeable among them any tendency towards idolatry? Explain the nature of the idolatry

and discuss the means that can be employed to root it out.

Among those who have come to the mission from the country in their adult age, particularly the old people, we notice a hankering after the things of paganism, idolatry and superstition. However, by the grace of God, by preaching, and labor, they will be giving up these abominable evils.

13. Having compared the moral and social status of the Indians of twenty or more years under our domination with their present status, based on the opinions of contemporary historians, you are requested to state the advantages or disadvantages resulting, as well as the causes contributing to the latter.

Those who have been Christians about twenty years are more Christian in spirit and more civilized, particularly those who were born and who have been brought up at the mission.

14. What agreements or conditions do they enter into for matrimonial alliances? What sort of services do the aspirants give to the parents of the engaged female and for how long a time?

In their pagan state, the Indians did not enter into formal agreements, pacts or stipulations. Once a lover obtained the consent of his bride-to-be and that of her parents, he gave them a little present, and from that moment on, the two were considered married. At the mission, they marry according to all the solemnities of the church. No other agreements are made nor are services rendered by the married men, other than the

bestowal of little presents before the marriage ceremony, to the bride or to her parents or nearest relatives.

15. Not having physicians in their villages what curative methods do they use in time of sickness? If they employ plants, roots, barks or leaves of trees, give their names and the manner of their application. Do they employ blood letting, purgatives or emetics? State whether these are simple or compound remedies. Do they bathe in hot springs which abound in the Americas and for the cure of which diseases? Which are the dominant diseases and are they seasonal or chronic? Does the number of deaths equal that of births? If unequal in number, state the difference.

Though there are no doctors, there are not a few sorcerers and wizards who at the same time are, or claim to be, healers. The one method these deceivers use is to scarify the flesh with a sharp stone and extract blood by sucking. They employ the charm which they have well hidden in their mouth, and which is a thorn, a pebble, or little tufts of feathers or some other items. By these means, they so convince their patient of their powers that in case an accidental cure is effected, they obtain great renown. They do not employ blood-letting, nor do they use purgatives or emetics. We have known, and in one instance we have seen them use it, that in their pagan state they used a very bitter root which tasted strong and piquant and warm at least to us. Since they use it until they develop dysentery, we missionary fathers have prohibited them from using it, since we saw it caused them great harm. Here at the mission, from what they have seen

done by the missionary fathers and learned from them, or from the gente de razón, they now employ blood-letting, though rarely, and also purgatives, injections, emetics, and other items, such as boiled barley, boiled camomile, etc. These they use for internal ailments. For external afflictions they use salves, poultices, etc. The dominant diseases of the Indians and the most devastating, are syphilis, which is chronic, and dysentery which occurs during the autumn. Moreover, they suffer from colds in winter, fevers, tarbadillos, etc. The number of deaths is always greater than the number of births. The number of deaths is a little more or less than 8 per cent of the population, and the number of births is 15 per cent of the number of married women.

16. How do they know and distinguish the seasons of the year? Do they have their own calendars or are they the same they had in their pagan state? Explain this matter and accompany it with a drawing. How do they regulate the hours of the day for the distribution of sleep, meals and labor?
Here at the mission they live a common life, and the Indians are called to Mass, prayers, to work and to rest, to breakfast, dinner and supper, by the bell. In the past, as now, they distinguish the seasons of the year by the phases of the moon, the rains, heat, and cold, and especially by harvest time. They never had, nor do they have now, any calendar.

17. How many meals do they eat in a day? What sort of food do they use? What does it cost per person?

They have three meals a day in common. Breakfast consists of atole, which is cooked flour. Dinner consists of cooked grains, which are horse-beans, peas, Indian corn, and wheat. At supper they are given atole, as in the morning. Moreover, every week, forty head of cattle are slaughtered and the meat served to the community. Also, more than fifty or sixty fanegas of wheat are divided among them every week. Since everything is from the mission and is the product of their labor, the cost hardly amounts to one real for each person.

18. What kind of fermented drinks do they use? Are they useful or harmful to them? Explain also the ingredients and types of these drinks.
They have no fermented drink, and their only beverage is water.

19. In their pagan state in many places they adored the sun and the moon. You are to state if they still have any memory of this or any hankering or tendency toward it.
Neither in their pagan state, nor today, have they adored nor do they adore the sun.

20. Do they still retain any customs of their early ancestors? Also do they have any knowledge or tradition concerning the area or territory their ancestors left to settle in their present abode?
They have no knowledge of their remote ancestors, nor the land from which they came.

21. Do they use any strange ceremonial at the time of burial or mourning? Describe this with all simplicity and correctness.
In time of mourning and at funerals, the Indians have no other ceremony than to weep or yell until they tire. Sometimes they bury the deceased's clothes and trinkets with him.

22. Are they faithful in their dealings? Do they keep their word or promises?
In general, the Indians are quite faithful in their dealings, promises, in buying and selling.

23. Are they inclined to lying? If they have any erroneous notions on this matter, what are they?
They are quite inclined to lying. However, they have no notions of morality concerning it.

24. Which vices are the most dominant among them and in which sex?
The most dominant vices of these Indians are, first fornication; second, stealing; games, dances, and among women, abortion.

25. Do they readily lend one another money, seeds or other effects? Also which agreements and conditions do they carry out? Describe the various contracts they employ and likewise name them.
They readily lend any article to each other, especially to relatives and friends; nor do they ever draw up a contract, agreement or stipulation.

26. What sort of agreements do they enter into for planting whether for themselves or others? State in

detail what they pay for their lands, for seed, for a plow with a yolk of oxen as well as for the money which is given and advanced to them at various times. Also if in certain parts they pay tribute in kind or with fruits and at what price.
The Christian Indians sow and gather the harvest as a group. Without causing any harm to this community effort, we missionary fathers encourage many to plant for themselves, in order to get the Indians to like it. For this purpose we loan them yokes of oxen, seeds, and give them the time for it without any burden accruing therefrom. The Indians thus grow inclined towards it and find it profitable.

27. Are they irascible or cruel? What sort of punishments do they employ among themselves?
The pagans are quite irascible, and even cruel, especially towards their enemies. Among themselves, they inflict no punishment, for among them there is no public correction or legal punishment. Only during a quarrel are they inclined to commit murder. Here at the mission, no Indian is allowed to punish another. All punishments are meted out under the supervision of the missionary fathers or the corporals of the guard.

28. Do you notice among them any inclination to immolate human victims to their gods in cases of idolatry into which they fall and of which there are examples?
We know that they are inclined to offer sacrifice to the devil. As a matter of fact, they do offer seeds, fruits and other kinds of food which they ate in

their pagan state. However, we have never heard nor known that they immolated human victims. The dead they sometimes bury, at other times, cremate. We do not think they bury food with the deceased.

29. If among the untamed Indians these sacrifices to their gods are still observed and if they offer human victims, what ceremonies do they observe in regard to the corpses they bury? Do they in some parts place food with the interred or do they burn the corpses entirely?

We know that they are inclined to offer sacrifice to the devil. As a matter of fact, they do offer seeds, fruits and other kinds of food which they ate in their pagan state. However, we have never heard nor known that they immolated human victims. The dead they sometimes bury, at other times, cremate. We do not think they bury food with the deceased.

30. Are there Indians of different castes, rich and well-provided for? By what means do they institute their chiefs?

The Indians here at this mission are all equal, for we distribute whatever is to be given away, in equal measure. Accidentally, some who are more industrious and parsimonious, have more, which is the result of their own plantings and personal labors, and are able to dress better, make better bargains, and to appear better than the rest. In the state of paganism, there are neither rich nor poor, for the Indians are satisfied with almost nothing.

31. What sort of life do the present Indian chiefs

live? Also how did the past rulers live? How do they treat the rest of the Indians? Are they paid a daily wage and how? What vexations do they cause them? What sort of services do they demand?
Here at the mission, the Indian captains who have become Christians are on the same footing as the rest. In their pagan state, no superiority of any kind was recognized. Only in time of war did the Indians obey the captain, and the sorcerers and wizards in regard to their superstitious practices. In all other things, each one does as he pleases. In case of a dispute or quarrel, whoever displays the greatest force, wins out. Here at the mission, all the Indians are under the direction of the missionary fathers in all civil and political matters, and under the corporal of the guard in criminal matters.

32. Do the male and female Indians give their personal services? What sort of service? To which persons are services rendered?
Here at the mission, all the Indians, both men and women, are free. Only we missionary fathers have for the service of the house some few youths, who at the same time serve Mass, who assist at the administration of the sacraments, etc. For the other occupations, such as cowboys, shepherds, shoemakers, stonemasons, carpenters, blacksmiths, tanners, teamsters, etc., the men are employed commonly. The boys are obliged to attend school. The women are given work appropriate to their sex, weaving, cooking, etc. Everything is ordered toward the common good and utility of the mission.

33. Have they any inclination towards music? With what musical instruments are they acquainted? With string or wind instruments? Are these the same they have always used? Are they acquainted with our instruments and do they use them? Do they have any songs in their own languages? Are they sweet, lively and in tenor? Are they more inclined to music of a sad and melodious kind or to that which is warlike? In case they have their own songs which tones do they use? If possible describe these and give the notes.

In their pagan state, the Indians knew no kind of instrument, either wind or string. Their diabolical and extravagant songs of cries and yells for their dances cannot be reduced to tones, not even to scales. However, they observe very good time. Here at the mission, after much effort, the boys have learned music quite well, when one considers they do not have skilled teachers. They sing and play on sixteen violins and three cellos. They enhance the church functions with great solemnity.

34. What famous men have they had among them notable for prowess of arms or for literary works? To what type of literature are they most inclined? Tell who they are, the names of the one group as well as the other. State at what period they flourished. Give a brief description of their writings and of their deeds. Are their works in print?

These Indians are ignorant to the nth degree. They do not even know what literature is. However, in

handling the bow and arrow, they are very skillful. In this alone is their skill comprised. Whoever has brought about death, either by arms or by sorcery, he is held the most courageous and famous.

35. What are their ideas of eternity, reward and punishment, final judgement, glory, purgatory and hell?

In their pagan state, these Indians held and still hold a most ridiculous idea concerning the immortality of the soul. Namely, it goes out to sea to a certain place which they cannot designate, and there it is happy, etc. Concerning reward, punishment, purgatory, etc., they have no idea or explanation. At the mission they are beginning to learn these beliefs by dint of the unceasing effort, teaching, and preaching of the missionaries.

36. Lastly, what kind of clothes do the Indians, male and female, wear in their villages? Also, what do they wear in the more populous cities? Accompany this answer, if it is feasible, with copies or drawings of the respective garments. State likewise what means can be used to overcome nudity where it existed.

The pagans generally wear the clothes which they brought with them from their mother's womb. Sometimes they wear a deerskin from the many deer they kill. The women always cover themselves with sufficient care with these deerskins or with woven herbs or grasses. At the mission, the Indians clothe themselves with coarse cloth, blankets, or soft tanned leather,

etc., all of which is made at the said mission. All the men and women are decently dressed. So no special method is necessary to do away with nakedness, because it does not exist, thanks be to God.

These are the things we have to offer in response to the aforementioned questionnaire, with sincerity and truth. That this may be verified, we, at this above-named mission of Santa Clara, on November 4, 1814, sign our names.

Fray Magín Catalá. Fray José Viader.