

The Conquest of Scurvy

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THE YEAR 1953 is a "centenary year" in the history of scurvy. It is the bicentenary of the publication of James Lind's monumental.

A Treatise of the Scurvy (1) which was commemorated in May, 1953 in a two-day international conference of nutritionists at Lind's alma mater, the University of Edinburgh. World honors came tardily to this Scot physician to whom the sciences of nutrition and dietetics are forever indebted.

It was Dr. James Lind, the first great experimental nutritionist, who laid the foundation for the concept of deficiency diseases—that man became ill by lack of an essential food element. In a brilliantly conceived and carefully controlled clinical experiment, Lind compared the various current remedies used in treating scurvy. Aboard the warship, *Salisbury*, cruising in the English Channel, he evaluated the relative antiscorbutic activity of various "acidic principles," comparing sulphuric acid and water, vinegar, arid cider with oranges and lemons.

The description of the *Salisbury* experiment is usually the only thing now quoted from Lind's books. As most of you will recall, he took twelve scorbutic sailors, divided them into six groups. He housed them in the same "sick bay" and gave them the same basic diet of soups and broths, "water-gruel sweetened with sugar in the morning; fresh mutton-broth oftentimes for dinner; at other times light puddings, boiled biscuit with sugar, etc., and for supper, barley and raisins, rice and currants, sago and wine or the like." This was as good a scurvy-producing diet as any biochemist today could devise.

To this *control* diet, Lind added, as in paired feeding: 1 qt. cider a day, for his first group; 25 drops of "oil of vitriol" or sulphuric acid in water three times a day, for the second; "two spoonful of vinegar three times a day, on an empty stomach, for the third group." Two of the "worst patients" received a "course of sea-water, half a pint a day,

¹ Presented jit tin; History of Nutrition Luncheon held during the 36th Annual Meeting of The American Dietetic Association in Los Angeles, on August 27, 1953.

as a gentle physic." Two others each received two oranges and one lemon a day. The remaining two received only the control diet.

As Dr. C. P. Stewart, Professor of Clinical Chemistry at the University of Edinburgh and one of the editors of the University's bicentenary edition of Lind's *Treatise*, said recently (2): "This 'experiment,' the first carefully controlled therapeutic test in medical history, proved beyond doubt the efficacy of lemons and oranges and the relative or complete uselessness of the other remedies in vogue; above all, it showed that the disease was preventable."

The biography of Lind by Captain Louis H. Roddis, M.C., U.S.N. (3), not only affords interesting reading but an understanding of the second phase in the history of therapeutic dietetics. The first phase is that shrouded wholly in folklore and superstition, such as "frae fruites keep thine abstinence," because of the coincidence of diarrheas with the ripening of fruit².

In another passage in his treatise, Lind adds that the men receiving the cider also improved, but much more slowly. On the basis of the known ascorbic acid content of cider and of oranges and lemons, the nutritionist today can readily see how accurate Lind's observations were. They almost arrived at a bioassay value of ascorbic acid for these fruits.

THE LAG IN APPLICATION OF KNOWLEDGE

However it was no new idea, even in Lind's day, to use citrus fruits to cure scurvy. They had been recommended by physicians for two centuries. The Dutch physician, Ronsseus (1564), was the first to recommend oranges as the antiscorbutic for sailors. Dr. John Woodall, in 1639, had said (4): "The juyce of lemmons is a precious medicine; and well tried, being sound and good" for the scurvy. He was the first English physician to prescribe citrus fruits. Thus, one can see that more than a

² The warm weather afforded excellent opportunity for contamination of water supplies from the open ditches and unsanitary sewage disposal of Chaucer's England. The ripening of fruits was merely coincidental, but linked firmly with the other in the folk-mind.

century of "lag" occurred between Woodall's observations on "three spoonful of lemmon juyce in the morning" and Lind's testing it by comparison with other acidulous drinks.

It took fifty years for Sir Gilbert Blane, another Scot physician, to put Lind's findings into effect in the British navy and for its sailors to become known as "limeys" (the abbreviation for "lime juicers"). Blane, as the personal physician to Admiral Rodney, and later as physician to the British Fleet (equivalent to Surgeon General), had the influence and later the power to put into effect Lind's teaching. Lind apparently foresaw this lack in himself, for he wrote (5) what has now become his motto engraved on the bronze plaque placed on the portal of his alma mater last May: "The province has been mine to deliver precepts: the power is in others to execute."

Another twenty-year lag occurred before the infant American navy took heed of Captain David Porter's advice, in 1811, to make lemon juice a part of the American seamen's ration. Dr. William Barton, the former ship's surgeon of Porter's heroic *Essex* became Surgeon General of the Navy and recognized the value of citrus fruit. Those are well established dates in the conquest of scurvy.

SCURVY—A DISEASE OF NORTHERN SAILORS

Konsseus and Echthius, the northern European doctors of the sixteenth century, and Eualenus in the seventeenth century pioneered in the study of this disease whose name is strictly of Norse and Teutonic origin³. I doubt whether "the Greeks actually had a word for it." "Sceletyrbe" is defined by Maynwarding (6) as meaning "spots and pains in the thighs," which some of the early writers believed to mean scurvy. Nor can it readily be found in the writings of the Arabian, Jewish, Spanish, and Italian physicians. These were the medical men of countries bordering on the Mediterranean, with milder climates and longer seasons of fruits and fresh vegetables. Sailors on the Mediterranean, whether of Homer's *Odyssey*, or later, were seldom more than several days' journey away from land and vegetation, and one must remember that it usually takes some sixty days of deprivation of ascorbic acid to produce scurvy in human beings.

In the seventeenth century, however, England, Spain, Holland, and France were¹ busily plying their overseas trade routes to their newly-established

³ "The Latin name *Scorbutus*, now more frequently used among Physicians, being a name not of long standing, unknown to the Ancients, and therefore called by some a new disease, but falsely; and it, is not against Reason to think this disease to be of great antiquity as most infirmities incident to the body though known by (livers appellations, suting with some of the symptoms, or products that follow this Disease, yet insufficiently and erroneously discovered in their Causes" (6).

colonies. Global circumnavigation and exploration tempted the venturesome.

Transportation still lagged in the doldrums of the sail, and food preservation was circumscribed by the technologies of brining or drying, both of them destructive of ascorbic acid. Either more rapid transportation to offset the forty- to sixty-day "incubation period" of scurvy, or a stable source of an anti-scorbutic, would banish the "scourge of the sea." That is why we find such a zeal for conquering scurvy, particularly in England and Holland. The sailors of Spain and France carried on shipboard onions and leeks, with an excellent storage life for ascorbic acid. In addition, they doubtlessly had a better body reserve of ascorbic acid, due to their greater fruit consumption when ashore. That does not, however, mean that they were physiologically immune to scurvy as we shall see later.

SCURVY IN THE CITY

The seventeenth century also saw the development of large cities, reliance on the "green grocer" instead of on the family garden plot for fresh or, as they were then called, "recent" vegetables and fruits. This, too, is important in studying scurvy.

Historically, scurvy not only was a disease of northern climates (viz., "the Dutch Distemper"), but it was a disease of urban population before it was the "scourge of the sea." The rural dweller, except for a few weeks in late winter, still had meager stores of leeks, onions, and cabbages, while his medieval city cousin had been reduced to the monotonous winter diet of bread and meat.

Scurvy was an annual spring epidemic for the larger cities. No wonder the earliest writers on the subject were continental. They hailed from Amsterdam, Leipsic, Marburg. It was not until after 1492 that we read of "sea scurvy." Before then, voyages had been self-limiting in length, not only through fear of "sailing over the edge of the world," but fear of scurvy. Scurvy not only debilitates physically but induces mental changes—so-called "cantankerousness," the brooding and quarrelsomeness attributed to the many "scorbutic aches," and pains often described as rheumatic. In old narratives of exploration one finds descriptions of these temperamental upsets preceding mutiny.

There was, therefore, a pressing need for the immediate conquest of scurvy. Fortunately this seventeenth century passion for exploration extended beyond the discovery of new lands. It came just at the time when scientific; thinking, particularly in the "natural sciences" and in medicine, began to employ the experimental method of research.

Yet we wonder why Robert Boyle, in 1696, the father of chemistry and the greatest scientist of his day, failed to recognize the cure for his own scurvy and published eighteen recipes (7), which he called "receipts" for scurvy. All but one of them, we now



Courtesy U. S. Surgeon General's Library, Van Kaathoven Collection

Dr. Everard Maynwaringe, English physician of the seventeenth century, who wrote glibly of scurvy to promote the sale of his secret anti-scorbutic pill, He visited America in 1653 and formed an aversion to tobacco, linking its use with scurvy.

know, must have been without any value in the treatment of the disease. Boyle's *Medicinal Experiments, or A Collection of Choice and Safe Remedies* (7) lists thirteen remedies for "the fastening of the loose teeth." One of these is captioned: "A Medicine prescribed to a great Prince (Charles the First) to fasten the Teeth" and reads as follows:

Take a pint, of Spring-water, and put to it four Ounces of Brandy; let the Patient wash his Mouth with the Mixture of these every Morning, and twice oi' thrice a day besides; and let him in the Morning, roul for a little while, a bit of Roch-Allom to and fro in his Mouth

This would indicate that King Charles I was not immune to an ascorbic acid deficiency, and that poor nutrition is no respecter of rank or person, and that scurvy was not a, disease of the poor.

Loose teeth and bleeding gums were, and still are, one of the first observable diagnostic signs of scurvy. The petechiae and echymoses on legs, particularly the shins, came later. Space does not permit telling some of the other quaint diagnostic descriptions⁴ found in the older books.

MAYNWARINGE—LIND'S PREDEC ESSOR

We might also commemorate another "scurvy centenary." The year, 1953, is the three hundredth

¹ "Gingipedium," a descriptive word for scurvy used by a few early writers, coined to show simultaneous involvement of both the gums and the fool.

anniversary of the brief visit to America of the oft-quoted "authority" on scurvy—Dr. Everard Maynwaringe, whose *Morbus Polyrhizos et Polymorphaeus (A Treatise of the Scurvy)* (6), the same title which Lind's first edition bears, was written a hundred years before Lind.

In preparing a paper for the Lind Bicentenary Conference ("Some Pre-Lind Writers on Scurvy") (8), a number of the early "authorities" in their original texts had to be re-read. Among them was Maynwaringe, to whom Lind, in his own extensive review of the literature of scurvy, gave little heed.

Maynwaringe was an intriguing character. A one-line reference in the Latin foreword by Maynwaringe's friend, Dr. Christopher Lawrence, indicated that their "friendship had begun in America." More important, of course, is the ethical contrast between Maynwaringe and Lind. Whereas Lind was first and foremost a physician, true to his Hippocratic oath and the great traditions of medicine, Maynwaringe was an "empiric" as his contemporaries politely termed him in lieu of using the word "quack", which he turned out to be.⁵

A brilliant student of medicine⁶ at Cambridge University, Maynwaringe was everything that Lind was not. Even though we view Maynwaringe's work in the light of the charity of his having lived a hundred years before Lind, we cannot forgive the selfish quackery of his "Scorbute pill" and "Catholic (universal) elixir." These he "touted" in his book with all the rhetorical flourish of a "spieler" in an old-time medicine snow.

Maynwaringe published his *A Treatise of the Scurvy* (6) in London in 1665,⁷ the year of the plague, while he was in charge of the "pest house of the Society for Employing the Poor." Incidentally, he boasted that of the eighty-six plague patients treated with his elixir, fifty-six were returned "safe and sound."

⁶ Maynwaringe styled himself in later years as a Doctor of Hermetic Phylosophy arid Physick.

⁷ Maynwaringe's description of the process of digestion, viz., "meat being received into the stomach, must suffer a transmutation there in the first laboratory and preparatory Office, for nutrition of the body; the principal agent in this work, is the stomachical ferment; this ferment by its incisive acidity penetrates, rarefies, and volatiseth the food, and transmutes it into Chyle, or white juice: That which before was fixed, gross, hard or tough, is made Volatile, rare and fluid, which having obtained that previous digestion and perfection proper for that place, the lower orifice of the stomach opens and gives it emission, sending it to the next Office of digestion for a new impression" (6).

His references to the dietetic cause of scurvy are few since he was interested solely in promoting the sale of his pills. On page 33 of his *Treatise*, he cites as Theorem 8 "that the Scurvy is procured occasionaliter, by numerous and various diaetick accidental causes, reducing the vital principles to declension and deviation from their rectitude and integrity."

⁸ Maynwaringe's so-called *Treatise* was published in 1665. The advertisement for his "antiscorbutick medecines" which is bound in with tin; writer's copy is dated 1664, indicating that the advertisements for his "Scorbute Pills"

Everard Maynwaring wrote innumerable medical tracts, all of them boosting his "universal elixir"; the last one (9) in 1698, the year before his death, in poverty. One of the last acts of his life was to circulate copies of his diplomas from Cambridge to aid in the sale of this final pamphlet entitled *Ignota Febris*. The public had lost faith in his "cures."

SCURVY IN CALIFORNIA

Scurvy is to be found on the very first page of the history of California. Father Francisco Palou, the Franciscan missionary, who was with Father Junipero Serra when he founded the first of California's missions, the Mission San Diego, records in his memoirs (10) that the Spanish bark *San Carlos* arrived on April 20, 1769, to join the overland expedition led by Portola and Father Serra. Aboard the *San Carlos* was Don Pedro Prat (11), graduate of the medical school of the University of Barcelona, the first physician, incidentally, to set foot on the shores of California. The 200-ton *San Carlos* left Cape San Lucas (or La Paz) in Lower California and took 110 days to reach San Diego harbor. It carried a year's supply of food, including livestock, cattle, and chickens, with which to set up the agricultural economy of the new mission. During this 110-day voyage, Father Palou wrote (10), "the bark was infected and those on board stricken with scurvy . . . and spread⁸ quickly to the crew of the *San Antonio*, so that in a short time nearly all the men were suffering with the disease from which

and "Catholick Elixir" were circulated before the descriptive treatise of the disease itself was published.

The *Treatise*, however, had been written before 1665, since the writer's copy of Maynwaring bears the "imprimatur" of the Bishop of Lambeth, dated September 9, 1664, and is dedicated to the Earl of Lindsey, the Lord Great Chamberlain of England under Charles II. The Maynwaring family connections in England and America were excellent. They included Roger Mainwaring, the heroic Bishop of St. Davids, who, as Chaplain to King Charles I, preached a sermon censuring the King, for which he was imprisoned; and Sir Henry Mainwaring (the name has some eighty variations in spelling) who was one of the original shareholders in The London Company which colonized Virginia. Dr. Everard, himself, was the son of the Reverend Kenelm Maynwaring, a rector of the Episcopal Church of Gravesend, Kent.

⁸ The apparent discrepancy between Father Palou's and Dr. Prat's accounts, the former calling it "scurvy," the other regarding it as dysentery caused by the water taken aboard at Cedros Islands, is cleared up by the Palou reference to the "rapid spread" of the disease to the crew of the *San Antonio*. The *San Antonio* was a smaller ship, and a supply ship, and left La Paz 51 days later than the *San Carlos*, which got off its course and was becalmed and took 110 days, ample time for the development of scurvy. The *San Antonio*, taking only 51 days for the voyage, apparently suffered no serious outbreak of scurvy while at sea. Its crew was called upon to land the *San Carlos* and unload the supplies, and once in contact with the scurvy-dysentery weakened crew and soldiers of that ship, the sailors of the *San Antonio* contracted dysentery which is communicable whereas scurvy is not,

thirteen of the volunteer soldiers died." lie added that "of the crew of the *San Carlos* only five remained alive and of the *San Antonio* only seven were left."

The first building erected on California soil was a hospital of sailcloth and driftwood—half tent, half hut—by the men from the *San Antonio*. Dr. Prat's first action on being carried ashore was to search for anti-scorbutic herbs with which to treat his patients and himself. We have a record (12) of that first hospital meal: soup made with hardtack. This was on May 5 or 6, 1769.

In his own diary, Dr. Prat blamed the illness on the water which the ships had taken aboard at the Cedros Islands when the original fresh water casks were broken in the tossing of the storms. On the other hand, his subsequent action indicates clearly that he also recognized the disease as scurvy.

AN EARLIER VISCAINO

The Viscaino of the *San Antonio* is not to be confused with Don Sebastian Vizcaino who came to the California coast in the 1602-03 expedition, almost one hundred and seventy years before Father Serra and Portola. He also left a vivid account of scurvy and its treatment. We are indebted to Dr. RobeiVCilass Cleland (13, 14), eminent California historian of the Huntington Library staff, for bringing the Vizcaino account to our attention:

In the account of the expedition of Sebastian Vizcaino to the California coast in 1602-03 there is an interesting description of a very efficacious cure for scurvy which Vizcaino discovered at Mazatlan. When he reached that port his men were suffering "the greatest affliction and travail ever experienced by Spaniards; for the sick were crying aloud, while those who were able to walk or to go on all fours were unable to manage the sails."

But "God like a father of mercy caused to be provided in these islands a small fruit like agaves, called jocoistles.⁹ These because of their strength, when eaten by the men who had sore mouths, caused the ulcers to slough off and bleed profusely but such was the efficacy of the fruit that within six days there was not a single person whose mouth was not healed."

⁹ Dr. E. M. Harvey, Senior Plant Physiologist at the U. S. Department of Agriculture's Horticultural Field Laboratory in Pomona, believes that the Aztec word, *jocoistle*, may well apply to one of the cacti abundant in both the Mexico and California deserts and widely used as a food by the native Indians. "The quotation," Dr. Harvey writes (15), "was written so long ago that I cannot be sure the name applied then the same as today. *Jocoistles* and several other Aztec names, e.g., *xoconochtli*, *joconoxtle*, are used for a widely distributed species of cactus (*Opuntia imbricata*). The plant is large and often tree-like. The Indians throughout the area consumed quantities of its fruit. The natives usually roasted the fruit overnight in pits with hot rocks, so if Vizcaino's sailors ate them raw, it is no wonder the tops came off their ulcers!"

Two other methods of preparing the *Opuntia imbricata* for food use have come down from the early California settlers. The orange-colored fruits were peeled and eaten raw and also made into jt conserve or jam by the Spanish

The flagship of Vizcaino's fleet of three frigates was named the *San Diego*. The others were the *Tres Reyes* and the *San Tomas*, all sailing from Acapulco, then a great trading port. Like the *San Carlos* one hundred and fifty years later, the Vizcaino ships ran into trouble, storms, and sickness, so that the *San Tomas* had to be sent back to Acapulco with the sick. Only five of the crew of the *Tres Reyes* survived. Both its captain and pilot died on the voyage. By January 25, 1603, nine months after leaving Acapulco, Vizcaino sighted the harbor of Monterey where the Indians signalled with smoke. Vizcaino wrote (15):

We did not enter it because the state of our health was so bad and the sick were clamoring, although there was neither assistance nor medicines nor food to give them except rotten jerked beef, gruel, biscuits and beans and chick-peas spoiled by weevils.

The mouths of all were sore, and their gums were swollen larger than their teeth, so that they could hardly drink water, and the ship seemed more like a hospital than a ship of an armada. Affairs were in such a condition that anyone; who had ever in his life been at the helm steered, climbed to the maintopsail, and did the other tasks, and all who could walk assisted at the hearth, making gruel and porridge for the sick.

It was Vizcaino's intention to wait for the *Tres Reyes* from which they had become separated, at Santa Catalina, where he had arrived on January 29, and he adds: "Although many canoes of Indians came with fish and other things, inviting us to go to them, the General did not dare cast anchor among them, as he did not have men strong enough to raise the anchors, and as the sick were dying of hunger because they could not eat what was on board the ship on account of their sore mouths, so the General ordered that we go to the islands of Masatlan."

Vizcaino arrived there on February 18. Only five of the soldiers aboard were able to walk.

Being informed of the necessity which had forced the General to go there to succor his perishing men, the *Alcalde* (mayor) of Sacarita, Martin Ruis de Aguirre, aided generously with gifts of hens, chickens,

settlers. The main use, however, to which the Indians put the spiny cactus leaves was to make a sort of fritter. First, the spines were burned off. Then the broad leaves were dipped in a batter of acorn meal. To make this acorn dough palatable, the tannic acid had to be leached out; this was done by putting the wet ground acorn meal into a hole scooped in the sand, then pouring over it not less than ten gours of water. The dough mass (*masa*) was then suspended in water to permit the sand to settle out. The despined cactus leaf was then dipped into the batter, or the dough was patted around the leaf, and the fritter fried on hot stones. Chemical assays made by the author a number of years ago of the juice of the cactus leaves showed it to contain about 0.1 mg. ascorbic acid per gram.

kids, beef, veal, bread, fruits,¹⁰ and vegetables, from which the men "received great refreshment and nourishment." Then follows the passage regarding the use of the *jocoistle* cactus quoted above.

A slightly different version of this same Vizcaino voyage is to be found in Padre Miguel Venegas' *Noticia de la California* (16). These descriptions are clearly those of scurvy and further disclose that Father Venegas, born in Mediterranean Spain where scurvy was virtually unknown as such, failed¹¹ to recognize it. Again, Father Venegas writes:

Their bodies were sick, weak, and they were unable to work. They were covered by purple spots, some of which were "two fingers" high. Their knees were hard as rocks, and they were unable to use their feet. They could not move without great suffering, all their muscles remaining "deathlike". . . Their shoulders and knuckles were sore, and all wanted to die. Those who had remained healthy and tried to aid them only made matters worse. But this was not the worst part; besides this, their jaws, insides of the mouth, and gums and teeth were affected. The jaws would not come together and their teeth came out two by two, and wiggled when they moved their heads. They were unable to eat and could only drink liquids, such as *Poleadas*, *Ormiguillos*, *Almendras*¹² and such, and if they could not drink, there was no other way they could gain sustenance. They were so ill, they died while talking and conversing with one another.

NINETEENTH CENTURY CALIFORNIA

Numerous outbreaks of land scurvy occurred in the Mother Lode in the days of California's gold rush from 1848 to 1855. Harris (18) estimates that one miner in thirty-six had scurvy and that the mortality was 30 per cent. In the report of the San Francisco Hospital for December 8, 1850, forty-six cases of scurvy were listed. Some seventy miners were reported to have died in the "scurvy epidemic" of the winter of 1849-50 in Drytown, one of the placer towns in the northern mines. With the typical cynicism of history, the only building identifiable today is Dry town's butcher shop. Elsewhere one reads that in 1850 in Sacramento, "salt provisions

¹⁰ According to Father Ascension, it was the *Alcalde* of the Villa of San Sebastian, and the fruit is called *manzanilla* (*Opuntia imbricala*).

¹¹ "They didn't know exactly the cause of this sickness which was visited upon the sailors coming from China to Now Spain, and which brought death to so many. They thought it was probably caused by the high, sharp wind" (17).

¹² *Poleadas*: in Spanish cookery, a "clear soup or broth" corresponding to Mexican *atole*.

Ormiguillos (Spanish spelling, "hormiguillos"): an almond-flavored liquid dessert.

Almendras: almond-milk (*Leche de almendras*), an emulsion of almond meal in sweetened water.

are too plenty (plentiful) to pay storage, they are not in demand and, on acct. the prevailing bowel complaints."

Not all of California's scurvy tales are as doleful as these. There is romance and a successful happy ending for this one which also illustrates an important point in the treatment of scurvy at the time of Dr. James Lind.

In 1814 the British merchantman *Isaac Todd*, probably en route to the British possession of Vancouver, landed in the harbor of Monterey (California), to put ashore a twenty-year old Scot lad named John Gilroy Cameron. The young man had developed scurvy on the around-the-Horn voyage.

In the belief¹³ still prevalent among sailors of that day, young Cameron had to be put on land to recover from sea scurvy. To make the story brief, he was nursed back to health and became the first "foreigner" to be naturalized by the Spanish-Mexican authorities of California. He became a Roman Catholic and in 1821 married Senorita Maria Cara Ortega, the beautiful daughter of the wealthy and socially prominent Ortega family. He dropped the Scotch clan name "Cameron" and retained his "personal" name Gilroy which was later bestowed on the town that grew up on the site of his hospitable "Rancho Gilroy."

The history of scurvy is, as you can see, fasci-

¹³ "We observe that Sea-faring Men, who labour under very rank Scurvies, constantly grow better as soon as they set Foot on Shore. And though it be granted that their growing better is principally owing to their Removal from the foul Ship Air, yet it is not improbable that it is also in some measure owing to the Vapours or Exhalations of the Earth, which then surround them in great Abundance, and which consist chiefly of the most active balsamic Spirits of Trees, Shrubs, Grass, and Flowers, being much more freely imbibed into their Bodies, than they could be at Sea, and so giving a great and sudden Check to their near Approaches to Putrefaction . . .

"If the Patient then be on Shore, 'tis well known that the circumambient Air and the Fruits of the Ground will prove the best Remedies. Dr. Cockburn, who was a physician to the Fleet, tells us (19) that he has seen many scorbutic Persons put ashore in the weakest and most deplorable Condition, who by feeding only on Coleworts, Carrots, Cabbages, Turnips, and other Green Trade, as the Sailors call it, were able in three or four Days to walk several Miles" (20).

nating reading and research, and rewarding in more ways than in dietetic knowledge. It can lead you far afield, too, but I have never found it dull reading.

REFERENCES

- (1) LIND, J.: A Treatise of the Scurvy. 1st ed. Edinburgh: Sands, Murray and Cochran for A. Kincaid and A. Donaldson, 1753.
- (2) STEWART, C. P.: Prevention of deadly scurvy disease. Lind's treatise bicentenary. Edinburgh: The Scotsman, May 21, 1953.
- (3) RODDIS, L. H.: James Lind, Founder of Nautical Medicine. New York: Henry Schuman, 1950.
- (4) WOODALL, J.: The Chirurgeon's Mate, or Military and Domesticke Surgery. London: N. Bourne 1639.
- (5) LIND, J.: Treatise on Scurvy. Containing a Reprint of the First Edition of A Treatise of the Scurvy, with Additional Notes. A Bicentenary Volume. (Stewart, C. P., and Guthrie, D., eds.) Edinburgh: The University Press, 1953.
- (6) MAYNWAHNGK, E.: A Treatise of the Scurvy. London: T. Basset, 1665.
- (7) BOYLE, R.: Medicinal Experiments; or, A Collection of Choice and Safe Remedies. 3rd ed. London: Samuel Smith and 13. Balford for the Royal Society, 1696.
- (8) LORENZ, A. J.: Some pre-Lind writers on scurvy. Proc. Nutrition Soc. 12: 306, 1953.
- (9) MAYXWARINGE, E.: Ignota Febris. London: 1698.
- (10) PALOU, FR. FRANCISCO: Relacion historica de la vida y apostolicas tareas del Venerable Fray Junipero Serra, etc. Mexico: Don Felipe de Zuniga y Ontivros, 1787.
- (11) VILA, V.: Diary Academy of Pacific Coast Historical Publications. Vol 2, No. 1, July, 1911.
- (12) COXSTANSO, M.: Diary Academy of Pacific Coast Historical Publications. Vol. 1, No. 2, August, 1909; No. 4, March, 1910.
- (13) CLELAND, R. G.: Personal communication.
- (14) CLELAND, R. G.: From Wilderness to Empire. A History of California, 1542-1900. New York: Alfred A. Knopf, Inc., 1944.
- (15) HARVEY, E. M.: Personal communication.
- (16) Spanish Exploration in the Southwest, 1542-1706. (Bolton, H. E., ed.) New York: Scribner and Sons, 1916.
- (17) VENECAS, M.: Noticia de la California. Madrid: Manuel Fernandez, 1737.
- (18) HARRIS, H.: California's Medical Story. Springfield, 111.: Charles C Thomas, 1932.
- (19) ADDINOTON, A.: An Essay on the Sea Scurvy. Reading: C. Micklewright, 1753.
- (20) COCKBURN, W.: Sea Diseases, or A Treatise of Their Nature, Causes and Cure. London: G. Strahan, 1715.

James Cook and the conquest of scurvy / Francis E. Cuppage. Cuppage, Francis E. Date. 1994. Where to find it. Access this item on the Wellcome Library website. About this work. Publication/Creation. Physical description. ix, 163 pages, 16 unnumbered pages of plates : illustrations, maps, portraits ; 25 cm. Contributors. Cuppage, Francis E. Long sea voyages by early explorers created many problems for the crews, not least of which was the debilitating effects of scurvy. Frequently fatal, symptoms included rotting of teeth, swelling of limbs and loss of blood. The story of the solution to the problem was suspected for many years as the lack of fresh fruit and vegetables, but why did it take so long to finally solve the affliction? The story is well told by Harvie, and of course is intimately linked to the development of new ways of preserving food for those long sea voyages. One outcome was the development of lime juice, hence the... When will we see similar accounts of the conquest of rickets (vitamin D deficiency) and beri-beri (vitamin B deficiency)? Read more. 4 people found this helpful. The conquest of scurvy. J Am Diet Assoc. 1954 Jul;30(7):665-70. Scurvy is caused by a deficiency of Vitamin C, also known as ascorbic acid. People on long sea voyages and polar expeditions, without access to fresh vegetables and fruits, were highly susceptible. And, in fact, it took the lives of more British seamen than warfare in the 18th century. As C.C. Lloyd tells the tale of the "conquest of scurvy," there were strong hints before Lind. Jacques Cartier's crew in 1535 were cured with native American spruce beer. In 1617, the first manual of nautical medicine said lemon juice was a "precious medicine and well tried." But a lot of people didn't get that