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The explorers' sickness (1498–1700)

At the end of the Middle Ages, sailors began to make ever more daring voyages out from Western Europe. This could be explained, in part, by technical developments in the design of the ships that allowed them to sail at a greater angle from the direction of the wind, and in methods of navigation with a more reliable compass.¹ There were also strong commercial inducements to find a sea route that would eliminate the middlemen in the overland trade of silk and spices between Europe and the Far East. The new activity also seemed to reflect a new spirit of adventure and curiosity evident in this period of renaissance.

Portuguese and Spanish expeditions

From 1440 on, Portuguese sailors had been exploring the west coast of Africa, getting successively farther south, and finally rounding its southern Cape in 1487.² Ten years later, Vasco da Gama led an expedition designed to go by this route all the way to the Indies. The fleet of four ships, with a total of about 140 people on board, left Lisbon on July 9. By January 24 of the new year 1498, they had rounded the Cape and reached a river mouth on the southeast coast of Africa. They spent a month there cleaning the ship hulls and refitting a mast. Da Gama notes that "many of our men fell ill here, their feet and hands swelling, and their gums growing over their teeth so that they could not eat." They ran up the eastern coast, and on April 6, while beached at night, two boats manned by Moorish traders approached, one laden with fine oranges "better than those of Portugal." Two of the moors remained on board, accompanying them that day to Mombasa. "In front of the city there lay numerous vessels all dressed in flags. . . . Anxious not to be outdone we even surpassed their show, for we wanted in nothing but

¹ Quinn (1977), Chap. 4. ² Newby (1975), 62–81.

men, even the few we had being very ill." By April 12, "it pleased God in his mercy that . . . all our sick recovered their health for the air of this place is very good."³

On the return journey across the Arabian Sea, they were hindered by "frequent calms and foul winds," and were twelve weeks at sea (October to December, 1498). The sailors "again suffered from their gums; their legs also swelled, and other parts of the body, and these swellings spread until the sufferer died, without exhibiting symptoms of any other disease." As on the previous occasion, thirty men died, and only seven or eight were fit enough to navigate each ship.

In another two weeks there would have been no men at all to navigate the ships . . . all bonds of discipline had gone . . . we addressed vows and petitions to the Saints . . . it pleased God in his mercy to send us a wind which, in the course of six days, carried us within sight of land . . . at this we rejoiced as . . . we hoped to recover our health there as we had done once before. . . . On Monday, the 7th of January we again cast anchor off Mitindy. . . . the Captain-Major sent a man on shore to bring off a supply of oranges which were much desired by our sick.³

There is no further description of sickness in the later part of the voyage, just a comment, as they rounded the Cape of Good Hope, that "those who had come so far were in good health and quite robust." But they were no more than half of the original complement. What can we conclude from this record? First, it seems that the sickness they encountered had been quite outside their previous experience; nor do they relate it to anything they had read. It would also seem that, by the time of its second appearance, the crew were convinced that the oranges that they had eaten on the earlier occasion were powerful curatives, because they were specifically asking for them. On each occasion apparently, the sickness appeared only after they had been ten weeks at sea. Finally, the captain was convinced that landing places differed significantly in the quality of their air and that this could vitally affect his men's health.

At least one modern writer has suggested that the value of oranges and lemons in preventing scurvy was already known in the fourteenth century, and has cited a Spanish medical tract from that period. The reference, which appears in a section entitled "On foods and remedies which preserve the body against pestilential maladies," has been translated as follows: "One should use in all foods much vinegar, sorrel, juice of oranges and lemons and other acid things which are most beneficial."⁴ However, the translators make it clear in another paper that this tract is specifically written as advice for people trying to avoid the Black Death (bubonic plague) that was sweeping through Europe at that time.⁵

³ Ravenstein (1898), 20–1, 35, 39, 89, 93, 124. ⁴ Winslow & Duran-Reynals (1949), 80.

⁵ Winslow & Duran-Reynals (1948), 747.

After the return of da Gama, the Portuguese rapidly organized further expeditions, using the same sea route, and founded trading colonies at Goa in India (1510) and Malacca in Malaysia (1511), establishing their influence in the Moluccas and finally colonizing Macao, an island off the Chinese coast (1557). The published narrative of the first of these expeditions, led by Cabral, notes briefly that some were sick with "*amalati de la boccha*" (literally "the curse of the mouth") by the time they reached Mombasa. Here they obtained "sheep, hens, geese and lemons and oranges, the best in the world and the oranges made them well again."⁶ It seems that they were never able to eliminate the high risk of sickness and mortality on these voyages. In 1579, Thomas Stevens, who was a passenger on one of the regular voyages from Lisbon to Goa wrote home:

. . . by reason of the long navigation, and want of food and water, they fall into sundry diseases, their gums wax great, and swell, and they are fain to cut them away, their legs swell, and all the body becometh sore, and so benumbed, that they can not stir hand nor foot, and so they die for weakness, other fall into fluxes and agues, and die thereby . . . ; yet though we had more than one hundred and fifty sick, there died not past seven and twenty; which loss they esteemed not much in respect of other times.⁷

On this voyage they were 202 days at sea, and did not call at Madagascar. A paymaster's report from Goa in 1634 states that of 5,000 soldiers embarking from Lisbon in the previous five years, less than one-half survived the voyage.⁸ This was due, in part, to shipwrecks as well as to sickness.

In the same period as de Gama's voyage, Christopher Columbus, in his voyages from Spain, had been endeavoring to reach the Indies by sailing to the west. These voyages, in fact to the Caribbean area, were much shorter. He was never at sea for as long as twelve weeks at a time, and his crews are not generally thought to have been attacked by the new sickness, although two writers in this century have said that Columbus's second voyage had some such trouble.⁹ The only possible, and indirect, allusion that I have seen in the physician's account of the expedition refers to their being visited by Carib Indians "who come loaded with 'ages,' a sort of turnip, very excellent food, which they cook and prepare in various ways. This food is very nutritious, and has proved of the greatest benefit to us all after the privations we endured when at sea, which in truth were more severe than man ever suffered."¹⁰ But even this passage in another version appears much less serious:

They all bring yams, which are like turnips and very good food, and we prepare them for eating in a variety of ways. They are so nourishing that we are all greatly

⁶ Greenlee (1958), 65. ⁷ Hakluyt (1927), IV, 238. ⁸ Boxer (1959), 17n. ⁹ Morison (1939), 11; Moll (1944), 68. ¹⁰ Fernandez de Ybarra (1907), 452.

restored by them, for we have been living on the smallest possible rations during our months at sea. . . . it was only prudent that we should limit our consumption in order to have enough to keep alive however long the voyage might last.¹¹

Certainly, if there was any disease problem while they were at sea, it must have been unimportant in comparison with the malaria and other fevers that plagued them in the islands.¹²

Because Portugal had seized control of the eastward route to the Indies, Spain tried again to reach them by a westward route going around the southern part of the American continent. The next very long, pioneering voyage was that led by Magellan in 1519. Magellan himself was Portuguese and had gained his experience in Portuguese expeditions, but was then in disgrace at home and had transferred his allegiance to Spain. His five ships left Seville in August 1519. After fifteen continuous weeks at sea, including a stormy navigation of the "Straits of Magellan" and a long journey into the ocean that he named "Pacific," they were in a desperate state, but "above all other calamities this was the worst: in some men the gums grew over the teeth, both lowers and uppers, so that they could not eat in any way and thus they died of this sickness; nineteen men died and . . . 25–30 became sick, some in the arms, in the legs or other places, so that few remained healthy."¹³ However, their condition differed from that of the men in da Gama's expedition, because they were short of any kind of food, and chewing on leather or swallowing sawdust in their desperation.

Finally they reached the island of Guam and were able to obtain rice and fruit, on March 9. Ten days later they were in the Philippine Islands, and the sick were put to shore to enjoy exotic fresh foods that included bananas and coconuts. Magellan himself was killed in the following month. After making friends with the Sultan of Cebu Island, he offered to show his friendship by helping to attack any of his neighboring enemies. It was an ill-organized, amphibious operation on Mactan Island, and Magellan and seven of his crew died, bravely covering their men's retreat to their boats. A few days later, twenty-five more from his party were captured on Cebu by the Sultan's treachery, and the survivors escaped in two ships. After visiting the Spice Islands (i.e., the Moluccas) which were the target of their voyage, one ship continued the circumnavigation and finally reached Seville again on September 8, 1522. Despite the appalling losses, the value of the cargo of cloves in the one ship meant that the voyage had been commercially profitable to its sponsors.¹⁴

Three years later, Spain sent out a more ambitious expedition, with seven ships and 450 men, on the same voyage.¹⁵ This time more of the ships returned. The flagship reached the Spice Islands, but in the last leg of the voyage across the Pacific the Admiral and 4 of her crew of 150 died. The

¹¹ Cohen (1969), 153. ¹² Moll (1944), 68–9, 507. ¹³ Nowell (1962), 123. ¹⁴ Morison (1974), 415–32. ¹⁵ *Ibid.*, 474–98.

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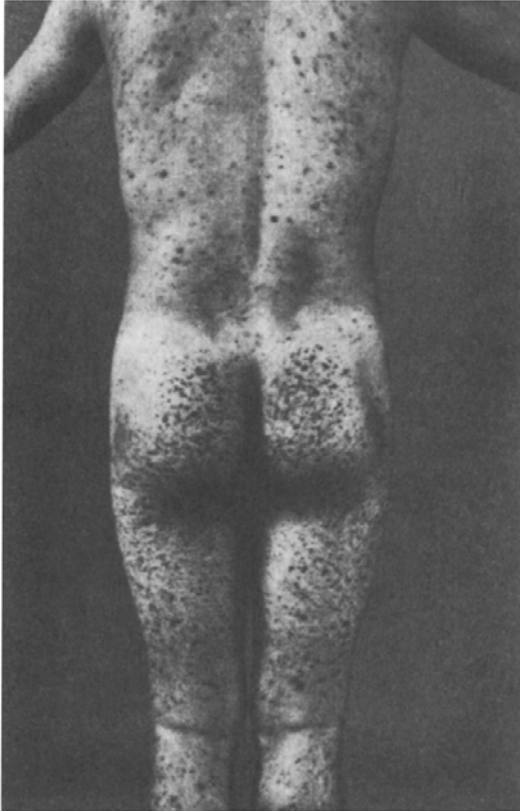
contemporary record of the voyage says only that they had “weakness and sickness” with deaths continuing over many weeks.¹⁶ In the Islands, the Portuguese, who were then well established, captured and burned the flagship. Spain then conceded that the Spice Islands were in the Portuguese “hemisphere,” but they remained in the Philippines, trading with them by galleon from their colonies on the west coast of America.¹⁵ This still involved a long, trans-Pacific voyage that was never freed from serious sickness, as is mentioned in the following account written seventy-five years later.

In 1602, Father Antonio de la Ascension, a would-be missionary of the Order of Barefoot Carmelites, was the diarist in an expedition from the south of Mexico exploring the coast of what is now Baja California and the State of California. Even though they had repeatedly been ashore and bartered for provisions with curious Indians, both officers and men began to suffer from disabling sickness. He said that it was the same illness that attacked

every year those who sail from the Philippines to New Spain [Mexico] and come in sight of the neighborhood of Cape Mendocino or in that latitude. . . . It is this which causes the death of almost all those who die on that route, there being years when hardly a person is left on the ships to manage the sails. . . . From the latitude of 30° upward, on those who are going . . . to Cape Mendocino, a very sharp, subtle and cold wind blows. . . . It must carry with it much pestilence, and if in itself the air is not bad, it produces with its subtlety and coolness some corruption of bad humors, especially in persons worn out and fatigued with the hardships of the navigation. The first symptom they notice is a pain in the whole body which makes it so sensitive to touch. . . . After this, all the body, especially from the waist down, becomes covered with purple spots larger than great mustard seeds. Then from this bad humour some strips or bands come behind the knee joints, two fingers and more wide like wales [weals]. . . . These become as hard as stones, and the legs and the thighs become so straight and stiff with them that they cannot be extended or drawn up a degree more than the state in which they were when attached. . . . The sensitiveness of the bodies of these sick people is so great that . . . the best aid which can be rendered them is not even to touch the bedclothes. . . . the upper and lower gums of the mouth in the inside of the mouth and outside the teeth, become swollen to such a size that neither the teeth nor the molars can be brought together. The teeth become so loose and without support that they move while moving the head. . . . With this they cannot eat anything but food in liquid form or drinks, . . . they come to be so weakened in this condition that their natural vigor fails them, and they die all of a sudden, while talking. Of this disease die those who come from China as well as did more than forty of this fleet, but Our Lord, Jesus Christ, was pleased that all passed away after having confessed and received extreme unction.¹⁷

Because conditions were so bad on this expedition, when they had reached Monterey (36°30' N and were well short of their objective of

¹⁶ C. Markham (1911), 50–3. ¹⁷ Wagner (1929), 244–6.



A sufferer from scurvy showing "the body, specially from the waist down, covered with purple spots," as described by Father Antonio de la Ascension in 1602. Photograph of a Russian soldier in World War I. (From Aschoff & Koch, 1919, p. 10.)

reaching at least 40° N), they headed south for home. When they had retreated as far as Mazatlan, what they regarded as a miracle occurred:

As the sickness was so pestilential and inflammatory, all had lost confidence in being able to regain their strength during the rest of their lives. When they arrived here, nothing was heard on the ship but pitiful lamentations, and calls upon Our Lady, the Virgin Maria del Monte Carmelo. . . . As a pious mother, she . . . came to their relief in such a way that, in the nineteen days the ship remained here, almost all recovered their health and strength, and the most crippled arose from their beds, so that when the *Capitana* sailed from this port for Acapulco all could assist in managing the sails and keep watch and guard, as they had done on the outward voyage. . . . health came not by doctors or surgeons, medicines or other drugs from the pharmacies, or by any human remedy understood to be a medicine usually given in this disease. If there was any human relief it was, in one case, the fresh and

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substantial food which was given them by the good efforts of the General and the *alcaldia mayor* of that province, and in the other a miraculous one, which brought health in a visible manner, namely, the eating of a little fruit found in those islands in great abundance at this season and which the natives call *jocoistles*. In other parts they call them *mancanillas*. . . . The pulp is white, . . . slightly sweetish, with a touch of acid, which gives it a very good flavor. It has a cleansing and astringent virtue, and besides is a recognized antiseptic. It produces all these effects with noteworthy pleasure and suavity, and, taking the swelling out of the gums, contracts and fortifies them. With this the teeth become tightened and fast. If this fruit had not produced this effect, the fresh food which came could not have been eaten or passed into the stomach.

The way that the virtue of this little fruit came to be known was this. When some soldiers went to the island with the Father Comisario, to say mass and bury some dead, a corporal anxious to try things of the country, plucked one and cutting it in half with a knife and separating the skin from the pulp, put it into his mouth with difficulty, as best he could. He tried to chew it to see what flavor it had, and found it of good taste. He soon commenced to throw out of his mouth much fetid blood. . . . He then continued eating others, and each time he found himself better able to eat them. When he returned to the ship, he took a bunch with him. His shipmates commenced to try it, and went again to the island and brought a quantity of the fruit, and found themselves much improved. When the General returned from his journey inland to bring fresh food, they began to eat what had been brought with good spirit, at which he was much amazed and gave thanks to Our Lord, Jesus Christ, and His Blessed Mother. He arranged that fresh bread, hens, calves, kids and fruits should be brought each day, so that they were cured and recovered their health inside of nineteen days, as I have stated.¹⁸

The modern editor of this journal suggests that the fruit came from the cactus *Opuntia imbricata*. Although southern California has come to be associated with the large-scale production of oranges and lemons, these fruit were not native, and the citrus industry was established only after 1850.¹⁹ It is again interesting that although we can now see that this sickness had been the common experience of long-distance voyagers for at least 100 years, Father Antonio regarded it as a local phenomenon brought on by some unique quality of the air off the central California coast.

The French and English in North America

When it became clear that the Portuguese and Spanish had, between them, secured the two southern routes to direct and profitable trade with the Far East, the French tried to find a northern route. An expedition setting out in 1523 explored much of the eastern coast of North America and established that it was indeed a thick, continuous land mass separating them from the

¹⁸ *Ibid.*, 260–1. Buño (1953) reproduces another, very similar account of these experiences; also Lind (1772), 332–8. ¹⁹ Lorenz (1957), 473.

East.²⁰ A second expedition, under Jacques Cartier, left in 1534 with the aim of trying to find a route that would lead them across the continent, beginning with a navigation into the St. Lawrence estuary. After a summer's reconnaissance, he returned safely to Saint-Malo, and immediately received support and royal approval for a further voyage. In the following May, he left with 112 men in three ships victualled for fifteen months. This time they took their ships up the Saint Lawrence River as far as the present site of Quebec, and some of them explored as far as the site of Montreal.²¹ By then (late September), it was too late to return home; they were faced with wintering where they were, and built a stockade on an island in the river bed. From mid-November until mid-April 1536, their ships were frozen in. The following is a summary of their account:

In the month of December we received warning that the pestilence had broken out among the people of Stadacona [i.e., the local American Indians] to such an extent, that already, by their own confession, more than fifty persons were dead. Upon this we forbade them to come either to the fort or about us. But notwithstanding we had driven them away, the sickness broke out among us accompanied by most marvelous and extraordinary symptoms; for some lost all their strength, their legs became swollen and inflamed, while the sinews contracted and turned as black as coal. In other cases the legs were found blotched with purple-coloured blood. Then the disease would mount to the hips, thighs, shoulders, arms and neck. And all had their mouths so tainted, that the gums rotted away down to the roots of the teeth, which nearly all fell out. The disease spread among the three ships to such an extent, that in the middle of February, of the 110 men forming our company, there were not ten in good health so that no one could aid the other, which was a grievous sight considering the place where we were. For the people of the country who used to come daily up to the fort, saw few of us about. And not only were eight men dead already but there were more than fifty whose case seemed hopeless.

There died Phillip Rougemont, aged some twenty-two years, a native of Amboise. And because the disease was a strange one, the Captain had the body opened to see if anything could be found out about it, and the rest, if possible, cured. And it was discovered that his heart was completely white and shrivelled up, with more than a jugful of red date-coloured water about it. His liver was in good condition but his lungs were very black and gangrened; and all his blood has collected over his heart; for when the body was opened, a large quantity of dark, tainted blood issued from above the heart. His spleen for some two finger breadths near the backbone was also slightly affected, as if it had been rubbed on a rough stone. After seeing this much, we made an incision and cut open one of his thighs, which on the outside was very black, but within the flesh was found fairly healthy. Thereupon we buried him as well as we could. May God in His holy grace grant forgiveness to his soul and to those of all the dead.

After this the disease increased daily to such an extent that at one time, out of the three vessels, there were not three men in good health, so that on board one of the ships, there was no one to go down under the quarter-deck to draw water for himself and the rest. We were also in great dread of the people of the country, lest they

²⁰ Morison (1971), 277–325. ²¹ *Ibid.*, 339–419.

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should become aware of our plight and helplessness. And to hide the sickness, our Captain, whom God kept continually in good health, whenever they came near the fort, would go out and meet them with two or three men, either sick or well, whom he ordered to follow him outside. When these were beyond the enclosure, he would pretend to try to beat them, and vociferating and throwing sticks at them, would drive them back on board the ships, indicating to the Indians by signs, that he was making all his men work below the decks; and that it would not do to have them come and loaf outside. This the Indians believed. And the Captain had the sick men hammer and make a noise inside the ships with sticks and stones, pretending that they were calking. At that time so many were down with the disease, that we had almost lost hope of ever returning to France.

From the middle of November until the fifteenth of April, we lay frozen up in the ice, while on shore there were more than four feet of snow, so that it was higher than the bulwarks of our ships, below hatches and above, there was ice to the depth of four finger breadths. And the whole river was frozen where the water was fresh up to beyond Hochelaga. During this period there died to the number of twenty-five of the best and most able seamen we had, who all succumbed to the aforesaid malady. And at that time there was little hope of saving more than forty others, while the whole of the rest were ill, except three or four. But God in His divine grace had pity upon us, and sent us knowledge of a remedy which cured and healed all.

One day our Captain caught sight of a band of Indians approaching from Stadacona, and among them was Dom Agaya whom he had seen ten or twelve days previous to this, extremely ill with the very disease his own men were suffering from. The Captain, seeing Dom Agaya in good health, inquired of him what had cured him of his sickness. Dom Agaya replied that he had been healed by the juice of the leaves of a tree and the dregs of these, and that this was the only way to cure sickness. Upon this the Captain asked him to show it to him that he might heal his servant who had caught the disease when staying in Chief Donnacona's wigwam at Canada, being unwilling that he should know how many sailors were ill. Thereupon Dom Agaya sent two squaws with our Captain to gather some of it; and they brought back nine or ten branches. They showed us how to grind the bark and the leaves and to boil the whole in water. Of this one should drink every two days, and place the dregs on the legs where they were swollen and affected. According to them this tree cured every kind of disease. They call it in their language *Annedda*.

The Captain at once ordered a drink to be prepared for the sick men but none of them would taste it. At length one or two thought they would risk a trial. As soon as they had drunk it, they felt better which must clearly be ascribed to miraculous causes; for after drinking it two or three times, they recovered health and strength and were cured of all the diseases they had ever had. And some of the sailors who had been suffering for five or six years from the French pox were by this medicine cured completely. Then there was such a press for the medicine that in less than eight days a whole tree as large and as tall as any I ever saw was used up, and produced such a result, that had all the doctors of Louvain and Montpellier been there, with all the drugs of Alexandria, they could not have done so much in a year as did this tree in eight days; for all who were willing to use it, recovered health and strength, thanks be to God.²²

²² Biggar (1924), 204–15. This is a more complete version than that used by Major (1932), 552.

From this dramatic account it seems clear that Cartier had not previously ever heard of such a disease, even though he had been on previous expeditions to Newfoundland and Brazil. It is also interesting that he regarded it as contagion, coming from their contact with the native Indians who were the first to show it. There has been a continuing controversy as to the identity of the tree which the Indian chief had called "*Annedda*." Jacques Rousseau made a careful review of all the possibilities; his conclusion is that it was probably the white cedar, *Thuja occidentalis*, and that this was brought to Fontainebleau from Canada in 1542 and named *arbor vitae* (tree of life), though the reason for this name was soon forgotten.²³ In 1542–43, another party of 200 French people, under the nobleman Roberval, wintered in almost the same spot. His account states: "In the end many of our people fell sick of a certain disease in their legs, loins and stomach, so that they seemed to be deprived of their limbs, and there died as a result about fifty."²⁴ There is no mention of their even trying the treatment that Cartier had found to be so successful only seven years previously.

For the next 100 years, the story was much the same.²⁵ Monsieur de Monts's party of eighty spent the winter of 1604–5 on another island, this time in the mouth of the St. Croix River (which now divides the state of Maine, in the United States, from New Brunswick, Canada, and is some 200 miles southeast of Cartier's island on the St. Lawrence), and thirty-six died. The chronicler, Monsieur Lescarbot, described the disease from which they were all suffering.²⁶ It was at that time called *mal de terre* (land disease), and, as he said, the description is virtually identical to that given by Cartier; *however*, the natives in that region had no knowledge of the *annedda* tree, and no other remedy could be found. "Our surgeons could not help, suffering themselves in the same manner as the rest."²⁷

Those who survived until spring all then recovered, and in summary, Lescarbot speculated that

. . . there is here another bad quality of the air by reason of Lakes . . . and great rottenness in the Woods during the rains of Autumn and Winter . . . the winds do participate with the air, . . . and in the quality have great power over the health and sicknesses of men. . . . The seasons are also to be marked in this disease . . . as the growing heat of the Spring maketh the humours closed up in the Winter to disperse themselves to the extremities of the body, and so cleareth it. . . . I would add willingly to the aforesaid causes bad food, this sicknesse proceeding from an indigestion of rude, gross, cold and melancholy meats, which offend the stomache, I think it good . . . to accompany them with good sauces, be it of Butter, Oil, or Fat, all well spiced, to correct as well the quality of the meat, as of the body inwardly waxen cold. . . . He that shall eate good Capons, good Partridges, good Ducks, and good Rabbits, may be assured of his health, unless his body is of a bad

²³ Rousseau (1953), 117. ²⁴ Hakluyt (1928), IX, 459. ²⁵ Biggar (1901), 18–62; Heagerty (1928), 1–15. ²⁶ Purchas (1906), XVIII, 236–42. (This is a new edition of Purchas's seventeenth-century translation.) ²⁷ Grant (1907), 54.