

introduced into the Navy in 1795, scurvy, which was formerly the scourge of that service, has gradually decreased, until it has finally become nearly extinct; while the disease is now so rarely encountered in this country, that opportunities are but seldom afforded for the observation of its symptoms or the investigation of its essential characteristics.

Although there is no difference of opinion as to lime juice being the best of all known antiscorbutics, when vegetable food is absent or deficient in quantity, it has not yet been decided upon which of its constituents this valuable property depends. Like other vegetable juices it is a complex substance. It contains citric acid in considerable quantity, a little malic and tartaric acid, sugar, vegetable albumen, mucus, mineral substances, and between 80 and 90 per cent. of water; and there can be no doubt that the antiscorbutic properties of the juice do not reside in all of these substances. It may, for instance, unhesitatingly be asserted that the water, which constitutes by far the greater part of the juice, has no special value in preventing or curing scurvy; but although the probabilities, founded on observation, are in favour of the free acids, and especially the predominating citric acid, being the valuable ingredient, this supposition has not yet been satisfactorily proved.

In the conditions in which lime juice is most commonly employed, it is not a matter of much moment to reduce its weight and bulk by eliminating its useless ingredients. In sledge travelling, however, it becomes important to diminish weight to the greatest possible extent; and it has been stated in evidence that if lime juice and about an equal weight of sugar to mix with it were carried on the sledges, it would "necessitate a reduction of three days provisions out of the forty-two that are generally carried" (171).

The removal of the greater part of the 80 per cent. of water would produce an extract, which may confidently be considered an equally efficient antiscorbutic preparation as the unconcentrated juice. A preparation of this kind was recommended many years ago by Dr. Lind, under the name of "Rob" (5249), but it would be advisable to depart from the procedure he seems to have followed, and effect the concentration at a low temperature. Some experiments, made for one of us by Mr. Gale, of the firm of John Bell and Co., of Oxford-street, show that a convenient extract may be obtained, preserving the special fragrance of the lime juice, and having only one-tenth the weight of the crude

"as long as it would last, three spoonfuls every morning fasting, not suffering them to eat anything after it till noone. This juice worketh much the better if the partie keepe a short dyet, and wholly refraine salt meat, which salt meat and long being at sea is the only cause of the breeding of this disease. By this meanes the generall cured many of his men, and preserved the rest, so that in his shippe (having the double of men that was in the rest of the shippes) he had not so many sicke, nor lost so many men as they did, which was the mercie of God to vs all. While wee stayed heere in this bay, wee had so royall refreshing that all our men recovered their heulthe and strength, onely foure or five excepted. But before our comming in, and in this place, wee lost out of all our shippes one hundred and five men, and yet wee made account wee were stronger at our departure out of this bay then wee were at our comming out of England, our men were so well inured to the southerne climates."

John Woodall, Master in Chirurgery, in *The Surgeon's Mate*, printed in London, 1617, has the following in his *Treatise upon Scurvy*:

"And further experience teacheth which I have oft found true, that where a disease most raineth, even there God hath appointed the best remedies for the same greefe, if it be His will they should be discovered and vsed; and note for substance, the Lemmons, Limes, Tamarinds, Oringes, and other choyce of good helpes in the Indies which you shall finde there, doe farre exceed any that can be carried thither from England, and yet there is a good quantity of Juice of Lemmons sent in each ship out of England by the great care of the Marchants, and intended onely for the releefe of every poore man in his needs, which is an admirable comfort to poore man in that disease; also I find we have many good things that heale the Scurvy well at land, but the sea-surgeon shall doe little good at sea with them, neyther will they indure. The vse of the juice of Lemmons is a precious medicine and well-tried, being sound and good, let it have the chiefe place for it will deserve it, the vse whereof is; it is to be taken each morning, two or three spoonfuls, and fast after it two houres, and if you adde one spoonfull of Aquavitae thereto to a cold stomacke, it is the better. Also if you take a little thereof at night it is good to mixe therewith with some sugar, or to take of the syrup thereof is not amisse.

"Some Surgeons also give of this juice daily to the men in health as a preservative, which course is good if they have store, otherwise it were best to keepe it for neede. I dare not write how good a sauce it is at meat, least the chiefe in the ships waste it in the great Cabins to saue vinegar. In want whereof vse the juice of Limes, Oringes or Citrons, or the pulp of Tamarinds; and in want of all these vse oyle of Vitrioll as many drops as may make a cup of Beere, water or rather wine if it may be had, onely a very little as it were sower, to which you may also add sugar if you please, or some sirups according to your store and the necessity of that disease; for of my experience I can affirme that good oyle of Vitrioll is an especial good medicine in the cure of Scurvy, as also in many other greefes."

Kramer, who was Physician to the Imperial Armies in Hungary from 1720 to 1730, says:

"But if you can get green vegetables; if you can prepare sufficient quantity of fresh, noble antiscorbutic juices; if you have oranges, lemons or citrons; or their pulp and juice preserved with sugar in casks, so that you can make lemonade, or rather give to the quantity of three or four ounces of their juice in whey, you will, without other assistance, cure this dreadful evil."—*KRAMER, Medicina Castrensis*.