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ON THE PROPHYLACTIC INFLUENCE OF QUININE.

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It has long been a standing rule in the Navy, enjoined by the 9th Article of the Surgeons' Instructions, that when men are to be sent on shore, in tropical climates, to procure wood and water, or on other laborious duties, the Surgeon, if he consider it advisable, is to recommend for each man, previously to his leaving the ship in the morning, a dram of powdered bark in half a gill of wine, and the like quantity of wine after the mixture; or, if there be no wine on board, one-eighth of a gill of spirits, mixed with the fourth of a gill of water, is to be used in lieu of it; and the same proportion of each is to be given to the men on their return to the ship in the evening. Though this rule has been pretty generally observed in some vessels, particularly in unhealthy climates, and in localities known to abound in the exciting causes of fever, still it has nearly as often been neglected, because, in many instances, the bark did not appear to have had any influence whatever in preventing fever; while in others it appeared so doubtful, that many intelligent medical officers lost all faith in it; still there were cases occasionally occurring, which showed that its protective influence could not be disputed. For instance, twenty men and one officer were employed on shore for one day at Sierra Leone; to the former, bark mixed with wine was given; but the latter refused to take it. He was the only person of the whole party who was subsequently attacked with fever.^(a) Again, two boats' crews were detached from the Hydra to examine the river Sherbro. They remained away a fortnight, and, during the whole time, took bark and wine, as directed by the instructions; yet, though the locality is a most dangerous one, not one case of fever followed; but another boat's crew, who were absent for two days only, in the same locality, and at the same time, who did not take bark, were all attacked except the officer in command of the boat.^(b)

There are many instances on record in which bark was given to men while exposed to the influence of marsh miasmata, and no fever following, the absence of the latter has been ascribed to the former; but it has sometimes happened also that men have been exposed in the same, or in similar places, without taking bark, and yet they, in like manner, have escaped without contracting any febrile disease. Evidence of this kind is not of much value, for, whether the escape from fever was owing to the absence of the exciting cause,—miasmata,—the non-susceptibility of the men to their influence, or, in the first instance, to the effects of the bark, are questions which can only be answered hypothetically; in the present state of our knowledge they do not admit of proof. There is no reason to doubt that the physical conditions of certain localities, such, for example, as the Valley of the Xanthus, and nearly all the alluvial deltae in the Gulf of Guinea, and on the Coast of China, are more productive of the exciting causes of fever at one time than they are at another; and there is as little reason to doubt that the human constitution is at one time more liable to become affected by these than it is at others, hence the liability to error if we attempt to form any positive opinion on cases similar to the preceding. But, as regards the instances in which all who took the bark escaped, while those who did not take it were attacked, the evidence is much more conclusive.

Besides the doubts which many medical men had, and still have, respecting the preventive influence of bark, there were other circumstances which occasionally led to its disuse as a prophylactic in the Navy. The quantity required for an effective dose is large, and though mixed with wine, or with spirits and water, it forms a disagreeable draught, which was generally taken with reluctance, and often evaded. There is no class of men more passive and obedient to the will of their medical adviser than the seamen of the British Navy; they take what is offered to them,

and generally abstain from what is interdicted, with perhaps one exception; but, when not in the "sick list," they are less submissive, as regards any precautionary measures for the preservation of their health, and will run any risk, rather than continue taking, for several days in succession, a nauseous medicine, which seems to them to have no influence or action on the system beyond that of exciting nausea, and sometimes vomiting. Regardless of any visible danger, they do not see the necessity of providing against one that is invisible; and, in common with their more enlightened superiors, they are not easily convinced, that, under the green foliage of a mangrove thicket, there generally lurks an enemy which is more destructive of human life than the weapons of civil warfare. With these objections against the continuous use of bark as a preventive of fever, it will not seem strange that its issue fell pretty generally into abeyance throughout the Navy.

The service was indebted to the Director-General, Sir William Burnett, for the introduction of quinine into the medicine chests of the Royal Navy at a time when it was but little known, and its superiority over bark was still doubted. At first the supply was small, in consequence of its great price; but, as it became cheaper, and its usefulness more generally known, the supply was, from time to time increased, until it was found to be ample for all theoretical purposes, even on the most sickly stations, especially as the surgeons were permitted to purchase additional supplies at the public expense, should any unforeseen exigency occur. Still, though ample for the treatment of disease, it was inadequate for general use as a prophylactic.

Convinced that the preventive influence of bark and quinine had never been fairly tried, in drawing up a Report on the African station, in 1847, I suggested that the latter should be given, not exactly on a different plan, though with a somewhat different object in view. Up to that period, bark had been used only during the time the men were exposed on shore, or while absent in boats near swampy places, and, as I have understood, for the purpose of acting as a tonic, and thereby protecting the system against the influence of fever-exciting miasmata. Immediately after they returned on board, the bark was discontinued. This was evidently wrong; for, although we know that both bark and quinine will prevent the occurrence of aguish paroxysms, and probably prevent the evolution of remittent fever, still we do not know, nor have we any reason to believe, that they have any effect whatever in preventing the peculiar exciting cause,—or, to use the more familiar phraseology, the morbid germs of the disease,—from entering the system, or that they have any permanent neutralising power over them after they have entered it. It was therefore clear that when the influence of the bark or quinine so administered had ceased, the evolution of the fever might take place at any time within twenty days from the day the persons were last exposed on shore, or to miasmata productive of fever, though in nine cases out of ten the incubative period does not exceed fifteen, sixteen, or seventeen days. Up to the fourteen, however, the disease may occur with as much force as on any intermediate day from the first; but after that, if developed at all, it is seldom that the fever either runs high or lasts long. With the most perfect faith in the preventive influence of quinine, and trusting to its well-known antagonism to the recurrence of periodic diseases, in the above-mentioned report I suggested that "quinine being less nauseous than bark, and therefore less likely to be refused by seamen, it should be used as a prophylactic instead of the latter, and that its use should be continued, not only while the men were exposed in unhealthy localities, but for at least fourteen days after they returned on board, in order that the antagonistic influence of the medicine might be kept up until the incubative period of the disease had expired."^(a) The suggestion was adopted, and the results, upon the whole, are most satisfactory.

A strong, spirituous solution of amorphous quinine was mixed with several pipes of wine, in the proportion of four grains of the salt to an ounce of the wine; a number of cases, or boxes, was then made, capable of holding a certain number of bottles; these, on being filled with the medicated wine, one or two boxes, according to the size of the vessel, were supplied to each cruiser employed on the African station. The object in supplying the cruisers with medicated wine-chests was, that they might at all times be ready and at hand to put into boats suddenly required to proceed on detached service. Thus the quinine—which, when carried in paper, or bottles, was not only apt to be lost or blown away, but had to be given in uncertain doses, and therefore could not be husbanded—was secured, and the wine was effectually destroyed for any other purpose. Instructions

(a) Report on the African Station, p. 49.

(b) Report on African Station, p. 218.

(a) Report on the African Station, p. 219.

of the administration of the wine according to the above plan were placed in each box, and the medical officers were requested to try it and report on its effects. The following extracts will show the estimation in which it is held by the medical officers on the African station:—

"I found bark and rum given to the men going away on duty of the greatest benefit; but, from the bulk of the bark, and the small quantity of the rum, if the men were not watched closely, they would not take the draught at all. All that could be desired is now obtained in the medicated wine." (a)

"Eighteen men were detached in the pinnace and whaler to cruise off Banda Point and Mayamba Bay, in the months of February and March. They were absent for twenty-four days. I directed an ounce of quinine wine to be given daily to each person, and it is satisfactory to state that no sickness whatever occurred." (b)

"Two boats' crews have been constantly on detached service, digge in shore, where the effluvia, wafted from the land by the morning breeze, is very offensive, and highly pregnant with the odour of decomposing vegetable matter. The immunity from disease of those engaged in this service, I attribute chiefly to the regular use of quinine wine and bark together with protection by good awnings." (c)

"The boats remained in the Pongas one night, and the crews, officers and men amounting to twenty-four in number,—were exposed to the sun the greater part of two days. Quinine wine was given in ounce doses for eight days afterwards, and I attribute the exemption of the greater part of the people from fever to its use." (d)

It may be stated, that these extracts afford no proof of the preventive influence either of bark or quinine beyond the opinion expressed by the several reporters; but when taken in connexion with those which follow they appear in a different light, and form a kind of presumptive evidence which cannot well be rejected.

"During the time the boats were up the Scarcies, I gave an ounce of the solution of quinine to each man daily, and continued it for ten days afterwards; and, although the rains were commencing, and the men were often wetted through, I had not a case of illness."

"The boats were frequently away cruising in the mouths of the rivers, or else blockading the coast between Delagoa Bay and Mozambique. I had frequent opportunities of observing the prophylactic effect of the quinine wine. In only one instance did fever follow its use, and that was of a mild character. This contrasts strongly with the seizure of a whole boat's crew with fever in March, 1851, when no wine was administered, as it was lost in crossing the bar of the river. The men greatly prefer it to the bark." (e)

"The gig was detached in the Boom-kittan; quinine wine, in the usual dose, was given night and morning, and continued for fourteen days after its return. A boy (Wm. Roberts), from dislike to the quinine, took at most but three doses. He was the only one of the boat's crew that suffered from fever, which occurred ten days after leaving the river." (f)

"While coaling at Sierra Leone, the weather was very wet, and on their several duties both men and officers were unavoidably much exposed to the rain. An extra allowance of grog and quinine was given to each man, and continued afterwards for a day or two to such as seemed to require it. Mr. —, however, placed no faith in its preventive influence, and would not take it, and he alone suffered an attack of fever, which proved fatal." (g)

"A boat's crew, belonging to the Pluto, were employed for twenty-five days up the Congo. The wine was regularly supplied, but it caused one of the men to vomit, and therefore he discontinued its use; he was the first to suffer from fever. Only one other case occurred among the crew."

"During our stay in the river Lagos quinine wine was regularly offered to the men morning and evening,—all took it, I believe, except two midshipmen and two seamen belonging to the galley. These four persons subsequently each suffered a severe attack of fever." (h) While, in the whole force, consisting of upwards of 220 men, there occurred only a few other cases of trifling importance. (i)

"When in the river Lagos the men had more than an ounce of quinine wine morning and evening, and not a case of fever occurred, though the vessel was nine days in the river. (j)

"Thirty-six men belonging to the Water Witch were em-

ployed at the attack on Lagos; they were in the river four or five days, and, with the exception of three, all took quinine wine while there, and for fourteen days after they left it. Of the whole number, five only were attacked with fever, namely, the three men who did not take the wine, and other two, who most imprudently exposed themselves to the sun, and bathed while much heated by violent exercise." (a)

"On the morning of the 25th of November, seventy-seven men from this ship went up the river Lagos, to attack the town. Before starting, every officer and man were ordered to take a glass of quinine wine; and a sufficient quantity was put into the boats to repeat the same at night. All, to the best of my knowledge, took it, with the exception of Mr. D., Master's Assistant, who rather plumed himself on having escaped taking a dose of physic. This young gentleman, on the 10th of December, just a fortnight after, was seized with a violent attack of remittent fever; and of the whole number who entered the river, he is the only one who, up to this date (the 7th of Jan.), has been attacked." (b)

Among the reports received from the African coast, there are a few which mention the failure of quinine wine as a preventive of fever; but by far the greater number affirm, that already it has been of most essential service, especially when administered according to the instructions; and that it should invariably prove effective against long-continued exposure in open boats, by night and day, amid the effluvia arising from the rotting slime of a Mangrove swamp, is surely more than ought to be expected. There are bounds or limits to most things in this world of ours, at least so we are led to believe. The failure of quinine, therefore, in cases similar to the above, particularly if accompanied by inebriation, need not excite astonishment. But, after all, on carefully examining the reports which mention its failure, it appears that, with hardly an exception, there was some error committed in administering the medicated wine; it was either not given in sufficiently large doses during the exposure to miasmata, or its use was discontinued long before the incubative period of the fever had expired; and though it was supposed to have failed, or to have been only partially effective, it is nevertheless admitted, that the fevers which took place were far less severe and less fatal than usually happens when no quinine has been administered.

One remarkable fact remains to be stated. By an interesting and ably drawn up report received from Dr. Burton, the Surgeon of the flag-ship on the African station, it appears, that the number of deaths among the Europeans in the squadron has for several years past been gradually diminishing, until it has come down to an equality with that observed on the more healthy stations. During the preceding year, the ratio of deaths from disease to the 1000 of mean force, only amounted to 6.9! A result so unexpected must necessarily afford the most unqualified pleasure to those who take an interest in the abolition of that "horrid trade" which has brutalised some of the fairest portions of the globe, and rendered the coast of Africa a kind of Pandemonium, fit only to be inhabited by the offscourings of civilized society. Still, though the general use of quinine-wine as a preventive of fever has most unquestionably been productive of much good, it is not intended to claim for it a title of the credit which is due for the improved state of health in the protective squadron; the great diminution in the ratio of mortality from fever is mainly, if not entirely due to the admirable mode in which the duties of the station have been carried out by the justly esteemed Commander-in-Chief, Rear-Admiral Bruce, who, in driving the slave-dealers from their strongholds has never forgotten the necessity of providing for the welfare of the white men entrusted to his care.

In conclusion, I may be permitted to observe, that I have been reminded by an obliging communication which I received only two days ago from Mr. Hickman, Secretary to the Commander-in-Chief, of the necessity there is for adopting some measures different from those which now exist for the preservation of the health of the seamen employed in merchant-vessels on the coast of Africa. Vast numbers of these men, in the very prime of life, die every year of fevers contracted on the coast, and yet no one seems to know anything about them. As these vessels generally carry (for the prevention of scorbutic disease) a supply of lemon-juice, which, in consequence of the great abundance of yams and fruit, is nearly if not entirely useless, I would venture to submit, that, instead of the lemon-juice, they ought to carry a sufficiency of quinine-wine for the use of the crew, which should be administered in the same manner as in the men-of-war on the station.

(a) Dr. J. Walsh.

(b) Thomas Pickthorn, Esq., Assistant Surgeon.

(c) William Wobber, Esq.

(d) J. A. Corbett, Esq.

(e) Mr. Beaumont.

(f) Return from Teazer, March, 1853.

(g) A. Hibbald, Esq.

(h) Mr. Henth, Surgeon.

(i) Mr. Carpenter.

(j) Journal of the Teazer.

(a) J. Henderson, Esq., M.D.

(b) F. Stupart, Esq., Surgeon.