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AN ADDRESS ON THE GEOGRAPHICAL DISTRIBUTION OF DISEASE, AND THE PRESERVATION OF HEALTH IN VARIOUS CLIMATES.

*Delivered at the Annual Meeting of the Metropolitan Counties Branch,
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GENTLEMEN,—I beg leave to return you my most sincere thanks for the very great honour you have been pleased to confer on me by advancing me to the distinguished post of president of this, the most numerous Branch of our great and important Association. I feel that this distinction is mainly due to my having taken a lively interest in the work of the Branch, and to my having held, for some years, through your kindly recognition, the offices of councillor and honorary treasurer. Although I have had the advantage of observing the conduct of your business by the eminent men who have preceded me, and more especially by the most able, zealous, and energetic president who has just retired, I fear I must claim your indulgence for many shortcomings in my year of office; but be assured, gentlemen, that my best endeavours will be made to promote, so far as in me lies, the welfare and prosperity of the branch, and thereby evince my most grateful acknowledgment of your kindness. When this high honour was at first and unexpectedly proposed, I preferred to accept it in that year when, in the usual rotation, it should be held by a general practitioner; inasmuch as, during an active professional life of more than forty years, almost equally divided between foreign and home service, my practice has been as much surgical as medical, the former preponderating in my earlier, the latter in my more recent years.

Having entered the Royal Navy at an early age, I was destined to spend eighteen years in active foreign service. I have therefore ventured to take as the main subject of this address, the geographical distribution and the numerical proportion of disease as they have come under my personal observation; subjects with which, in a continuous and varied service and much statistical labour, I have necessarily become familiar, and which, from their comparative novelty to the members of the branch, may perhaps possess some interest.

I was deeply impressed with the importance of these matters during my first and only home-appointment at Haslar Hospital, then, as now, the chief dépôt of the sick and wounded of the Fleet. Here also were to be found many interesting cases from distant stations—gun-shot wounds from Syria and China, which had been recently the scene of warlike operations; and numerous instances of tropical disease, and notably of dysentery of extreme severity, with intestinal ulceration so extensive as to excite astonishment that they should have survived the then long voyage, under sail, from China round the Cape of Good Hope, at a time when the modern luxuries of fresh and preserved provisions were comparatively unknown. The ships in port and the garrison of Marines afforded ample opportunities of surgical practice, and of treating indigenous as well as foreign types of disease. Of the surgical patients, nearly half consisted of various forms of venereal disease, and included, during the few months I was at Haslar Hospital, about three hundred cases of syphilis and cognate maladies, besides many severe accidental injuries from the fleet and the dockyard. And herein is one essential difference betwixt naval and military medicine. In the army, the surgeon has few opportunities of seeing cases of severe injury, or requiring operative procedure; while,

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in the navy, accidents of the gravest character are of frequent occurrence. Both, however, see a great deal of tropical and home disease, as developed in young subjects; of local inflammations, ulcers, etc.; and, as a matter of course, of what is termed enthetic disease. It is a matter of deep regret that, in deference to a small and ignorant, but clamorous, section of the community, the well attested benefits of the Contagious Diseases Acts have been withdrawn in great measure from those young men—compulsorily celibates—who form our fleets and armies, and whose inefficiency through these diseases is a serious loss to their country. One leading argument of the opponents of the Acts has been over and over again disproved; for, to all who know anything of our dockyard and garrison towns, it is a truism that the only chance of reaching or reclaiming the unhappy women in question was through the salutary care and discipline provided for them by beneficent legislation and control.

In my first voyage, in the flag-ship, to the Cape of Good Hope, the same prevalence of venereal disease was manifested; twenty per cent. of the whole number disabled in a crew of five hundred men having been cases of syphilis and orchitis, requiring withdrawal from duty, besides many minor cases not demanding such withdrawal. It was observed that, in those instances where mercurial treatment was not employed at all, or not carried sufficiently far, the cure of the local affection was retarded, and the risk of secondary constitutional disease much increased. The disease in all these cases had been contracted at Portsmouth, our stay at Madeira and Rio Janeiro, on the outward voyage, having been too brief for general leave to the ship's company.

At the Cape of Good Hope, the flag-ship was chiefly stationed at Simon's Bay, and the health of her crew was most satisfactory. The sick-list rarely exceeded three per cent. on strength, and the surgical cases greatly preponderated, chiefly wounds and other injuries. Circumstances were highly conducive to perfect health, such as a temperate and delightful climate, regular food, and duties just sufficient for the due exercise of the body, conjoined with the scrupulous cleanliness, order, and discipline characteristic of ships of war. Rheumatism and quinsy were the more severe forms of disease, due, doubtless, to the great vicissitudes of temperature (20° in twenty-four hours) that were often encountered; while disorders of the abdominal viscera were exceedingly rare. In December, 1845, the beginning of the hot season, but in cooler weather than usual, a singular epidemic prevailed, of the nature of pleurodynia, characterised by intense paroxysmal pain in the parietes of the chest, shoulders, and upper arms, without embarrassment of the respiration, and very little constitutional disturbance, but accompanied by great lassitude. The average duration of the attack was six days, and it yielded readily to simple diaphoretic treatment. Twelve cases occurred on board the flag-ship, and several others in other ships of the squadron and on shore. Occasional voyages were made to Mauritius, to St. Helena, and to the South-West Coast of Africa; and, on the latter station, the great increase of temperature (never under 80° Fahr.) had a marked effect on the health of the crew. The sick-list rose from three to six per cent. Many cases of febricula from insolation occurred, but only three cases of malarious fever in the boats' crews of fifty-two men, employed on detached service, chasing slavers; none terminated fatally. The amount of mortality and invaliding was extremely small in this ship, whether in temperate or tropical Africa.

An interesting episode in my service there, was the Antarctic Expedition of 1844-45, of which I had sole medical charge, as well as a share in the scientific observations. Proceeding South to 70° S. latitude, where impenetrable packs of ice prevented any further progress, and traversing five thousand miles of ocean, thickly studded with enormous icebergs, we were absent from the Cape of Good Hope during the whole of the Antarctic summer, making magnetic and meteorological observations in these remote and hitherto unexplored latitudes. Notwithstanding the laborious duties of a difficult and most hazardous navigation, and the stormy inclement weather we encountered, the crew of the *Pagoda* enjoyed excellent health, the sick-list not exceeding three per cent. during the whole South polar voyage. It was only when visiting West Australia

and Mauritius, returning through the milder latitudes of the Indian Ocean, that any medical cases at all occurred, and those unimportant. No trace of scurvy was manifested, antiscorbutics having been liberally used throughout the voyage, which possessed little medical but high scientific interest, as demonstrating, by innumerable icebergs of the largest dimensions known, the existence of great uninhabitable and inaccessible Alpine lands in the far south, and solving some important problems in Antarctic Meteorology and Terrestrial Magnetism, which will be found in the *Transactions of the Royal Society* for 1846.

My next service was on the West Coast of Spain and Portugal, first in the flag-ship at Lisbon, and afterwards in charge of a steamer stationed chiefly in the rivers Lima, Douro, and Tagus. In all these, and more especially on the left or southern bank, malaria prevails at certain seasons, with its results, ague and dysentery; but, although not far from the shore, the intervening space of water protected the vessel, which suffered but little. The climate was temperate and agreeable north of the Tagus, with much humidity at times from the strong Atlantic gales. South of the Tagus the summer heat was intense, but drier, and the atmosphere more African in character. Rheumatism and catarrh were the prevalent maladies. Bowel-complaints were rare; and although the sick list was high—seven per cent. on strength—it was chiefly made up of surgical cases, more especially venereal, contracted in the cities of Lisbon and Oporto, sometimes of unusual malignancy and tedious in recovery. It has been sometimes assumed that these phagedenic sores are due to a scorbutic taint, as they are often met with among seamen; but in this instance there was no lack of fresh fruit and vegetables, oranges and other fruits being exceedingly cheap, and consumed in abundance.

The same remarks will apply to my next service in the Mediterranean, chiefly in Sicily and Italy, where I spent about a year, mostly in the vicinity of Naples. With the exception of twenty cases of endemic malarious fever at the classic anchorage of Baia, the crew, nine hundred in number, enjoyed excellent health, the sick list rarely exceeding three per cent., chiefly made up of surgical cases; and the mortality from disease was very small. The ship, at that time the largest in the English Navy, was very spacious between decks, in admirable order, and her sanitary condition was excellent. The climate was highly favourable, the only exception being in the case of a few men whose lungs were undergoing consolidation and decay with progressive wasting of the body. Contrary to expectation, phthisical patients seemed to deteriorate more rapidly than in a less genial climate, or in the tropics, where in my experience the disease is rarely developed and kept long in abeyance.

My next station was very different—the West Coast of Africa—where, in charge of a steamer with a hundred Europeans, most of the rivers and coasts for 4,000 miles were visited during three years' constant and harassing service in the suppression of the slave trade. A high state of discipline and a more than usually rigid sanitation were observed, and with the best results; for in these three years only one death from disease occurred, and that from malarious fever, aggravated by intemperance. Endemic remittent fever was frequently met with, chiefly in the river Congo, in which the vessel once lay continuously for eight months. Here the boats were often away on detached service in pursuit of slavers, and from their nearer proximity to the banks and occasional landing were much more exposed to terrestrial poisonous emanations than the ship, which was seldom anchored at less than half a mile from the shore. The proportion of the boats' crews affected was generally one-third of the number of men employed in the service, and the period of incubation from the time of exposure to the malarious poison to the date of the febrile attack ranged from seven to fifteen days. Several of the cases were of great severity, with protracted convalescence. The treatment found to be most successful was the administration of moderate mercurial purgatives, and of quinine, ten or twelve grains daily for several days. The solitary fatal case was the only one which showed in its last stage yellowness of the skin and black vomit, but otherwise it seemed to differ in no respect from the other cases which recovered satisfactorily. The various forms of intermittent, remittent, and ephemeral fever occurred in considerable proportion, constituting thirteen per cent. of the whole amount of sickness. Next in importance and frequency were diseases of the bowels and abdominal viscera, comprising a few cases of dysentery and one of sporadic cholera of great intensity; but no mortality occurred from this cause. The ratio of this class of disease on the coast was twelve per cent. Diseases of the respiratory organs are little known on the West Coast of Africa among Europeans, but the natives suffer from them much, and of our twenty Kroomen (native seamen for local service) several were affected with pulmonary inflammation, and one died. There is necessarily a very great variety of climate in so extensive a line of coast, and those spots which are found

to be less inimical to Europeans are often, from comparative coolness and dryness, injurious to the indigenous races. The ratio of sick from all causes on this station did not exceed seven per cent., of whom more than half were surgical cases. Although the climate of tropical Africa must always impair, more or less, the European constitution, this and other instances have conclusively shown that, with due vigilance, mortality and invaliding may be reduced to as low a figure as in any station in the world; and this notwithstanding the very harassing nature of blockade duty and the privation necessarily involved. This may be understood when it is considered that salt and preserved meat, with lime-juice, was the chief aliment of all, that fresh provisions could only be issued on fifty days of each of these three years, and that leave on shore was only permitted on a very few occasions at St. Helena or Ascension. Yet no scurvy was in any way manifested, a sufficient proof that it is the privation of vegetable acid and not of fresh meat that causes that scourge of seamen.

During the whole period of commission, the daily sick list averaged six per cent. on strength, and the time lost by disease or accident was twenty-two days per man in each year on the station. Of the whole amount of incapacitating illness surgical cases constituted 54 per cent.; fever, in its various forms, 12 per cent.; diseases of the digestive organs, 16 per cent.; rheumatism, 10 per cent.; while diseases of the respiratory organs amounted to only 8 per cent., and chiefly among the Africans. The mortality-rate was 10 per thousand, and the invaliding rate for non-fatal disease was 30 per thousand, chiefly by reason of rheumatism, dysentery, ulcer and accidents, and in a few instances of debility after fever.

The scene now changes to a widely different region. War with Russia was proclaimed in 1854, and a fleet was hurriedly prepared for service in the Baltic. I was in medical charge of a steam corvette, with a crew of two hundred men, employed for the next two years in the northern inland sea, blockading the ports, and otherwise harassing and injuring the enemy. Almost continuously on the move, and often in very bad weather, with an indifferent crew, hastily got together, the ship, imperfectly fitted for a cold climate, was at first far from healthy, the sick-list being 12 or 15 per cent. on strength, and including some severe cases. The only endemic disease of this region is ague, but of this we saw but little. The outbreak of cholera which devastated Europe in 1854 reached Memel, in East Prussia, in September. We were in frequent communication with that port; and several of our men, who had landed, were attacked with diarrhoea, in two cases advancing into fatal cholera. A third fatal case occurred in a man who had not been on shore, or come into contact with those affected; while those who had sedulously attended the sick, rubbing their cramped limbs, escaped. Ulcer and abscess were common, and, with a low temperature, whitlow and frost-bite. When the Baltic was frozen, we annually returned to England for a few weeks, to refit. The extreme cold, as well as the brief summer of two months, was found to be more favourable to health than the raw humid climate that prevails in that inland brackish sea for half the year. Rheumatism and pulmonary inflammations were the natural result in those much exposed. In the second year of the war, our cruising was in the more sheltered Gulfs of Finland and Riga, and the ship's company had improved in health and discipline. The sick-list fell to 5 or 6 per cent., one-half of the average of the first year; while the time lost by sickness and accident diminished from thirty days to nineteen days per man. The mortality and invaliding rates can only be given approximately; but the former was probably not less than 35 per 1,000, and the latter 70 per 1,000, a fourth part being caused by accidental injuries incident to war-service. Of the total amount of incapacitating illness, 2 per cent. was caused by febrile disease, 18 per cent. by respiratory and 18 per cent. by digestive diseases, 11 per cent. by rheumatism, and 50 per cent. by surgical affections.

On the termination of the Russian war, the ship was ordered to the West Indies and Central America, and at once the great change of climate made itself apparent, less in the amount than the nature of the sick-list. We arrived on the station at the height of the rainy season, when the heat is most oppressive, the diurnal average being 85°. For some months we lay in the river San Juan de Nicaragua, where malarious fever (chiefly quotidian and tertian) was at that time prevalent; and, as the ship was in close proximity to the shore, several cases occurred. Ephemeral fever, or, as it is officially styled, febricula, was also rife, due, doubtless, to the high temperature; and at Belize, in British Honduras, during our brief visit, one case occurred, which assumed, in the last stage, the pathognomonic symptoms of yellow fever, as in the case I described in the river Congo. But a marked difference was found to exist betwixt the malarious fever of Western Africa and of Central America; the African, even when mild in its course, being accompanied by much debility and a

slow convalescence; while the American cases, though sharp, were brief, and followed by less prostration, and soon recovered. Febrile diseases at this time constituted 20 per cent. of the sickness, instead of, as in the Baltic, 2 per cent. Disorders of the respiration formed only 6 per cent. of the whole sickness, instead of 18 per cent., as in the northern climate. Disorders of the bowels were, at one period of our sojourn at Nicaragua, exceedingly prevalent; while the adjacent province of Costa Rica, whose waters fall into the river San Juan, was ravaged by cholera, which, however, did not reach us, except in the minor form of choleraic diarrhoea. Rheumatism was in half the proportion of Europe, though the rains were heavy and incessant. Abscesses and boils, due to hyperemia of the skin, were very common; as also obstinate ulcers, the result of mosquito-bites and slight wounds of the lower extremities. The proportion of surgical cases was 66 per cent., or two-thirds of the whole. On the Spanish Main and Central America, the mean daily number incapacitated was 6 per cent.; the time lost per man was at the rate of twenty-one days in the year; the mortality-rate was 30 per 1,000, and the invaliding-rate 45 per 1,000.

The winter months of 1856-57 were spent in a large frigate, with a crew of 500 men, in the West Indies, chiefly in the great Antilles, Jamaica, Cuba, and Hayti, and for a short time in the Gulf of Mexico. The climate at this season is comparatively cool and healthy, and the safety of the crew was further insured by great attention to ventilation, and prohibition of leave on shore. The results were most satisfactory. Although yellow fever was known to exist in or near the ports we visited, very few cases of febrile disease occurred on board, and those of a mild type. The amount of daily sickness did not exceed 4 per cent. (3.8), and the time lost by disease or accident was in the ratio of fourteen days *per annum* for each person. The proportion of surgical to medical cases was also very different from that which usually obtains in ships in the tropics, being 70 per cent. of the former, to 30 per cent. of the latter. Zymotic and febrile disease occurred in the insignificant ratio of 4 per cent., and bowel-disorders of 6 per cent., while respiratory and rheumatic affections did not exceed 20 per cent. of the total of sickness. Catarrhs were not uncommon at Vera Cruz, where, in February, cold northerly gales reduce the thermometric mean from 80° to 72°. Nearly all the cases of disease were unimportant, the surgical cases of the usual description; accidental injuries, abscesses, ulcers of the legs, etc., did well, and the mortality and invaliding were trivial, far less than they would have been on the home-station.

The very high state of health this ship's company enjoyed was the more remarkable, as they were physically inferior to the average crews of men of war, being composed mostly of landmen picked up in the emergency of the Russian war, and many had suffered from syphilis contracted in England before coming to the West Indies. The constant scrupulous attention to cleanliness and ventilation; their good and regular, and, at the same time, varied diet; the lightness of their work, the ship being much in harbour; and the privation of all opportunity of dissipation on shore, chiefly contributed to the singular and exceptional immunity which the crew of this vessel enjoyed from tropical, and, indeed, all other serious disease during her sojourn in the West Indies.

As favourable a sanitary condition attended my next charge, that of a steam-frigate of 50 guns and 550 men, the flag-ship in India. The news of the formidable mutiny of the Indian army in the summer of 1857 had startled the country, and the ship was fitted out with great dispatch; scrupulous care, however, being taken to examine the crew as to their physical fitness for the trying work and climate they had to encounter. To the surgeon, this was an onerous duty, but the labour was found to be amply repaid by the superior material obtained both for resisting disease and for recovering from it. The voyage was circuitous, round the Cape of Good Hope, the Suez Canal being not yet in existence; but the ship arrived in the beginning of winter at Calcutta, in time to render essential service in garrisoning the capital, and, by its powerful armament, to inspire with confidence the alarmed European inhabitants. We remained in the Hooghly during that anxious and exciting time; and although, on the approach of hot weather, much sickness and mortality broke out among the shipping in the river from cholera and cognate diseases, we almost entirely escaped. This immunity was due, doubtless, in part to the fine physique of our crew, their high state of order and discipline, and the sedulous attention that was paid to their well-being in all respects; and also, I think, to our avoiding all water for drinking except that which we obtained by distillation on board. Only one fatal case of cholera occurred in a man who was taking colchicum for rheumatic gout; catharsis was induced, soon running into cholera, with speedy death. I have observed several similar instances, both in England and

abroad, where, during cholera-epidemics, the disease seemed to be caused by any irritant of the bowels, at other times innocuous, and irrespective, apparently, of any specific germ or contagium.

In February, at Calcutta, the diurnal temperature ranges from 80° or 90° in the day, to 60° or under at night; and epidemic catarrh prevailed, fifty cases and several others of quinsy being placed on the sick-list in one week; while some who, in other climates, had suffered from ague, were now affected with that form of fever, but other forms of malarious fever were unknown. Afterwards, when the heat on the Hooghly became excessive, 90° to 100°, fever from insolation and bowel-complaints were prevalent; and even more numerous were ulcers, abscesses, and skin-eruption, often the result of slight wounds, mosquito-bites, etc., and extremely tedious to cure. In fact, during the first year we were on the Indian station, surgical cases greatly preponderated, constituting two-thirds of the whole. The men were occupied for part of the time in very arduous labour, recovering treasure from a wrecked and submerged steamer on the coast of Ceylon. Immersed all day in salt water, under a vertical sun, with extremities exposed to accidental injuries, it was no wonder that they suffered in this way, although singularly exempt from ordinary climatic disease.

Soon after, in June, 1858, a massacre of all the Christians at Djeddah, in Arabia, demanded a naval force to avenge it. We therefore proceeded to the Red Sea, and there spent the winter months of 1858 and 1859. We found it a monotonous but particularly healthy station, hot in the daytime, but the atmosphere so dry as to make a great heat endurable. The sick-list was only half of that in India and Ceylon. The only climatic disease was dysentery, but the cases were few and tractable. The excessive temperature was moderated by occasional tornadoes of wind and rain, leaving the air bracing and exhilarating, and I know of few climates to compare in salubrity and pleasantness with that of Arabia at this season.

The exigencies of the service required visits to Aden and the Somaui Coast, to compose differences that had arisen among the native tribes at Berberah, and to the Ajan coast, south of Cape Guardafui, to check piracy in that quarter. While at Aden we lost two men by cholera, contracted on shore. A few other cases occurred, which recovered. At Berberah, celebrated for its great fair, and at Djeddah, where thousands of Moslems assemble to make the pilgrimage to the holy cities, we had the interesting spectacle of many races from afar, as well as those Arab and African tribes with whom, unfortunately, we have recently become too well acquainted. We had now been eighteen months in India and Arabia, with sometimes very harassing and laborious duty, and a trying variety of climate and heavy sick-list; but, for the whole period, the mean number incapacitated for duty by disease and accident did not exceed six and a half per cent. The time thus lost per man amounted to 26 days in the year. The proportion of medical to surgical cases was as 40 to 60. The mortality from disease was only at the annual rate of 6 per 1,000, and the amount of invaliding was inconsiderable—30 per 1,000, and scarcely in any case from climatic or fatal disease. But although these results show a health condition unexampled, so far as I am aware, on that station, yet there was evidence that the vital force and energy of the crew were beginning to be impaired, and the change of climate we now made, on becoming the flag-ship in China, soon proved that endemic diseases, on that most trying station, asserted a firmer grasp, and were less amenable to treatment than in our fresher tropical experience of Bengal, Ceylon, and Arabia.

After an interesting voyage through the Straits of Malacca and Sunda, and a brief stay at Penang and Singapore, notable for a humid but healthy climate, we arrived at Hong Kong in May, 1859, the advent of the hot season. In June, we were in the North of China, forming the expeditionary force which, in an ineffectual effort to pass up the river Peiho, had to sustain a murderous fire from the heavily armed forts which commanded its entrance. In this disastrous attack, we suffered enormous loss, one-third of our whole attacking force being killed or wounded. The firing of the Chinese was accurate and destructive. Eighty of our men were slain by round shot or bullet, or drowned in the trenches in the attempt to storm the forts; and, of the 320 more or less severely wounded who were received on board, 7 per cent. subsequently died. During the few hours of the bombardment, about twenty amputations and other operations were performed, and, except in a few cases, who succumbed to shock, hemorrhage, or tetanus, with satisfactory results. To ensure ventilation in our overcrowded decks was no easy matter, and temporary hospital-ships had to be improvised and organised as soon as practicable. Of the hundred or thereabouts of wounded of the flag-ship and the tenders and gun-boats attached to her, who remained on board for some weeks, the progress was very gratifying; a few succumbed to

climatic disease, but no case of gangrene occurred among them. It was before the carbolic antiseptic period had set in with such good result to modern surgery; but I employed, and I think with great advantage, the only antiseptic then easily procurable, namely, chloride of zinc, and I can strongly recommend a weak solution of it as a valuable dressing for gun-shot and other wounds and ulcers. But this is a digression, although not without a bearing on our subject, inasmuch as the overcrowded state of the ship, and the mental depression incident to the heavy and unexpected loss in battle of so many gallant comrades, probably conduced to predispose to and intensify the climatic maladies that now began to assail us. For strategic reasons, and in order to obtain supplies, we were compelled to leave the Gulf of Pecheli, which in summer has a salubrious climate, for the coast of Central China and the mouth of the great river Yangtse, where malarious and enteric diseases have at that season much power and malignancy.

But, in addition to essentially climatic disease, two epidemics invaded us a few weeks after the action. Forty-four cases of small-pox appeared in the ship, all but one in men protected by vaccination. One-fourth of these were confluent and severe, with two deaths. In the others, the eruption was sparse and discreet, and pyrexia moderate. Simultaneous with this outbreak occurred a remarkable epidemic of conjunctivitis, formidable only by the great number of the crew affected. Within a week, nearly three hundred persons on board were blinded by inflammation, most of one eye only, but many of both eyes. A few days' simple treatment sufficed for recovery; but, as nearly half of the crew were simultaneously afflicted, the inconvenience of so disabling a malady may be imagined—at a time, too, when many were prostrated by wounds and disease. The importation of these epidemics could not be distinctly traced. We were cruising at the time, some distance from land, for the benefit of cooler and purer air; but communication by boats, etc., for provisions, water, washing of clothing, etc., was occasionally necessary. If this form of ophthalmia were contagious, it is remarkable that so many escaped. My assistants being disabled, I had to examine and treat nearly all these cases, and suffered no personal inconvenience. The same malady was found to exist at the time at various places on the coast, and in vessels at sea near it. But far more formidable were the malarious and enteric fevers, the diarrhoea, cholera, and dysentery, that infest the coast of Central China from June to October. These diseases seem to be attributable partly to climate, partly, I think, in our case, to impurity of water, the laudable practice of using only distilled water, to which I have referred as so salutary in our Indian experience, having been, from motives of economy, discontinued. For the remaining cool months of the year, the climate of this part of China is salubrious for Europeans; and in Northern China, where we spent all the summer of 1860, in co-operation with the military expedition to Peking, the climate was found to be agreeable, and the health of the force, both ashore and afloat, all that could be desired. In winter, it was extremely cold, the thermometer falling nearly to zero, and the sea, in the Gulf of Pecheli, was partially frozen round the ships. In Southern China, chiefly at Hong Kong, where we spent at various times twelve months, we had a considerable amount of sickness and mortality, mainly from bowel-complaints, culminating in dysentery, with its formidable concomitants of organic disease, intestinal, peritoneal, and hepatic.

In the winter months, the great alternations of temperature from hot days to chilly nights, and the very heavy labour the men had to undergo in connection with the expedition of the army to the North, told heavily on their health and vigour. Equally prejudicial, perhaps, was the dissipation into which they plunged on being allowed leave on shore, with abundance of money, after a long privation from such indulgence. The first fruits of this was a large accession of venereal cases, of which three hundred and twenty-two occurred in twelve months; but the number was greatly reduced so soon as the excellent sanitary regulations in the colony were enforced, but which, I fear, have lately, like similar sanitary measures in our garrison and dockyard towns at home, unfortunately fallen into disuse, to the great and serious detriment of our military and naval strength. In the cases of enthetic disease to which I have referred, there was no climatic peculiarity, and, with few exceptions, they yielded to the ordinary local and mercurial treatment. Subsequently, in some instances, cold and wet weather seemed to induce chronic rheumatism; but the normal secondary affections were rare, occurring in the ratio of only 7 per cent., and seemed to follow on simple soft sores quite as often as on the circumscribed and indurated Hunterian ulcers; and such has been my experience in the many cases that have come under my observation in many parts of the world.

Intestinal disease in China, leading to ulceration, is often, like

enteric fever in this country, exceedingly obscure in its origin and insidious in its progress, unattended with much pain; and even when medical attendance, as in the public service, is always at hand, the patient has concealed his ailment till profuse diarrhoea, mucosanguineous flux, or tenesmus, has aroused him to a sense of his danger, much intensified by his persistence in unsuitable diet or exhausting labour. It was no uncommon occurrence for the severest forms of illness and rapid death to befall men in the midst of their vocations or their pleasures. That the mode of living plays an important part in the causation of these maladies, is manifest by the almost total exemption (in my experience) of officers, whose exposure to general atmospheric influences was the same. Dysentery was by far the most fatal form of illness, causing seventeen deaths and twenty-nine invalidings, in thirty months, out of 185 cases. Of diarrhoea, 606 cases of severity occurred. Cholera was rare; only four instances occurred, two of which recovered, all contracted on shore, and not spreading on board, although most assiduously nursed by their ship-mates, who often rubbed the cramped limbs of the sufferers with hands polluted by the rush of liquid excreta. Destruction of all soiled bedding and clothing, disinfection by chloride of zinc, and such separation as can be partially effected in the limited area of a ship, were enforced, with perfect cleanliness and ventilation; and so successfully that, but for the indulgence of leave and the laborious nature of their duty in time of war, the crew, even in that climate, would have suffered little more than in our former experience of tropical and subtropical climates. We found the results better when it was possible to retain the sick on board the frigate, or in some of our improvised ship-hospitals, than when they were sent to the general hospital, then an old line-of-battle ship, in the most perfect order and apparent cleanliness, but whose timbers must have been permeated and saturated with the morbid poisons accumulated during some years of occupancy.

The coast of China is so extensive as to afford every variety of climate, and during the two years we spent there, the amount of sickness varied very much, and it would seem by reason of locality as well as of temperature. At Hong Kong, for example, there was more disease, even of the bowels, in the colder months extending from November to February, than in the warmer months of March and April, when the sick-rate and death-rate did not exceed our English standard. In Central China, it is in the three oppressively hot summer months that disease and death are rife; while in Northern China there does not seem to be any undue morbid influence affecting Europeans. With a body of from 800 to 1,000 men in my medical charge, and a general supervision as flag-surgeon of the sick-returns of the fleet, I had ample means of estimating the meteorological and topographical bearings on the Englishman's constitution, in the different localities which were the scene of operations.

In my own immediate experience, the mean number daily incapacitated by sickness or injury was 8 per cent., of whom 53 per cent. were medical cases, and 47 per cent. surgical; but the extremes were great. At one time, the sick-list, by reason of the epidemics I have described, and the number of gunshot and other wounds received in action, was swelled to 50 per cent. of the force, while at other times it did not exceed 3 per cent. The mean time lost per man was twenty-seven days *per annum*, of which fifteen days were from internal disease, twelve days from surgical ailments, and wound or accident. The mortality was at the annual rate of 41 per 1,000, of which 23 per 1,000 were from disease, and 18 per 1,000 from injury. There were invalided, that is, sent home by reason of physical incapacity, at the annual rate of 76 per 1,000—54 per 1,000 for disease, and 22 per 1,000 for injury.

The proportional incidence of the various classes of disease may be thus briefly stated.

Febrile diseases, including exanthem, occurred in the ratio of 13 per cent. of the whole amount of sickness. Rheumatism showed a ratio of 10 per cent.; respiratory diseases of 7 per cent.; digestive diseases of 25 per cent.; nervous diseases of 2 per cent.; venereal diseases of 10 per cent.; cutaneous and cellular tissue 15 per cent.; wounds and accidental injuries 16 per cent.

Of the annual death-rate of 23 per 1,000, 70 per cent. was caused by digestive maladies; and of the annual invaliding rate of 54 per 1,000 for disease, the proportion was 40 per cent. from such affections.

I trust I have shown in these remarks, based exclusively on personal experience, and embracing many climates and various conditions of life, that a high average of health and efficiency can be maintained by Europeans for a time in every kind of geographical position and variety of surroundings.

On board ship, at all events, from the Pole to the Equator, there need not be a greater ratio of sickness and mortality than in one's own

country, provided hygienic principles be carefully applied to the important matters of air, water, food, clothing, exercise and rest, employment and amusement, so far as these can be regulated with due regard to the exigencies and necessary discipline of the public service. We have seen how, not only in such favoured climates as the Cape of Good Hope and Mediterranean, but in remote regions, as the highest Antarctic latitudes, in the Red Sea, the West Indies, and in Northern China, the very highest standard of health and lowest mortality can be maintained for considerable periods, while even on such trying stations as the West Coast of Africa, Central America, Bengal, Ceylon, and Southern China, sickness may be kept down to as low a figure, and mortality and invaliding to even a less ratio than is found in the home service.

The chief exceptions I have had occasion to note as occurring in the Baltic in the first year of the Russian war, and in Central and Southern China in our last war with that empire, could be fairly accounted for. In the first instance, the physical character of the men was far below the average. Hurriedly recruited on the sudden outbreak of hostilities, often of unsound constitution, and not inured to hardship, they were exposed to incessant and most laborious duty in keeping the sea and blockading the Russian ports in the most inclement season of a wretched climate. Most of these men were ill-fitted to bear the fatigues and perils of war, which are always more trying in the form of sickness than of combat; and, in the first Baltic campaign, they suffered greatly from disease.

In the second instance, in China, a body of men who had been originally of exceptionally good physique, but tried by two years' continuous service in the tropics, and still more by the dissipations of Hong Kong, made a sudden and disastrous plunge into war with more than its usual horrors. They were immediately after exposed to the deadly climate of the Yangtse in the hot season, with spirits depressed by our heavy losses in action, and were less able to encounter the epidemic diseases which assailed them. To this may be added various privations, to some extent unavoidable, and one of the most important of which was that of the pure distilled water they had been so long in the habit of using, both for drink and ablution, and with so much advantage before their arrival on the China station.

Too much attention cannot be paid to such details, all important in maintaining the health and efficiency of mariners. The Royal Navy of England has been a grand school of public hygiene for more than two centuries. Nowhere can experiments of the life-saving class be carried out more perfectly, and on a larger scale, than afloat, where all are circumstanced alike in regard to climate, food, clothing, exercise, and discipline. As the terrible scourges of typhus, dysentery, malignant ulcers, gangrene, and scurvy have long been banished from our home-fleets, so we may look confidently forward to the time when such minor evils as still exist, chiefly on foreign service, shall also disappear, and when that important section of our countrymen who form the first line of our national defence, and protect our world-wide colonies and commerce, shall enjoy as perfect a sanitary condition as can possibly fall to the lot of humanity.

Had time permitted, it was my intention to conclude, by way of contrast, with a short summary of professional work in London during the last twenty-three years, among a body of men differing from seamen in being of maturer age, averaging thirty-seven years, and in having the comforts of home life in our temperate climate, with not more exposure to the weather than falls to the lot of most middle-class citizens actively engaged in out-door employment between the ages of 20 and 65. Some years ago, in 1875, I presented, at the meeting of the Association at Edinburgh, a statistical paper on this subject, with reference chiefly to the important matter of mutual insurance against pecuniary loss from sickness, a matter ably handled by Sir James Paget, in his admirable address at the opening of the Health Exhibition last year, and which now possesses very considerable interest to our Association in connection with the well-matured scheme lately launched, and making, I rejoice to hear, very satisfactory progress. My experience is necessarily limited to a small section of the population; but the personal observation and records of 15,000 cases of illness have enabled me thus to summarise the ratios of disease as occurring among adult males in this metropolis.

Of 1,000 men, such as I have indicated, you may expect 40, or 4 per cent. to be daily incapacitated by sickness, accident, or infirmity; 12 annually to die, and 16 to become permanently incapacitated by age or chronic illness; and a loss of time, for each individual, from all kinds of incapacitating ailments, of 12 days *per annum*.

Of the various classes of disease, those of the respiratory organs were found to constitute 28 per cent. of the whole amount of sickness, rheumatism and gout, 14 per cent.; disorders of the digestive organs, 17 per cent.; nervous diseases, 9 per cent.; accidental injuries, sin-

gularly uniform in their proportion, 10 per cent. Disorders of the skin and cellular tissues, and other so-called surgical maladies combined with accidents, form 25 per cent. of the whole.

Zymotic diseases, comprising the various forms of fever, contribute the very small annual average of 6 per cent.; and, although many of these officers spend much of their lives on board vessels arriving in this great port from all parts of the world, no instance has occurred, in all these years, of any of them contracting disease of infectious character on board.

TWO LECTURES

ON

CHRONIC LARYNGITIS AND CHRONIC PHARYNGITIS: THEIR PATHOLOGY, SYMPTOMS, AND TREATMENT.

Selected from a Course of Lectures delivered during the Winter Session of 1885, at the Glasgow Royal Infirmary.

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LECTURE I.

GENTLEMEN,—In my last lecture, I called your attention to some of the acute diseases affecting the larynx and pharynx, and pointed out to you that not unfrequently, if proper treatment be not adopted during the earlier stages of the disease, acute or subacute inflammatory conditions may be followed by certain chronic histological changes in the mucous membrane and other structures of the parts. But, while it is true that chronic affections of the upper air-passages may be the sequel of previous more or less acute attacks, in the great majority of cases their commencement is insidious, and cannot be easily referred to such causes.

In their etiology and pathological anatomy, chronic pharyngitis and chronic laryngitis are so intimately connected with one another, and the diseases are so frequently associated together, that they may be very conveniently considered under one heading, while the symptoms, prognosis, and treatment will be illustrated by cases, and discussed separately.

I will, in the first place, occupy a few moments in the consideration of the etiology of chronic laryngitis and pharyngitis. You will meet with these diseases most frequently in adult males; females and children are not so commonly affected. They are less likely to be exposed to vicissitudes of weather, irritating gases, etc.; and, as a rule, greater demands are made upon the vocal organs of men, many of whom, such as clergymen, public speakers, schoolmasters, street-criers, etc., require habitually to overexert their voices.

Amongst the patients suffering from chronic catarrh who apply for relief at the out-door department for diseases of the throat at this hospital, the cause of the disease is, in many cases, easily traced to their occupation. Persons who are required to work in impure atmospheres, such as steel-workers, coal-miners, bone-grinders, or persons who are exposed to irritating gases, or who require to work in badly ventilated apartments, are very liable to the diseases we are at present discussing. Their etiology is also intimately connected with certain climatic conditions. At one season of the year, the symptoms may entirely disappear, while at another they may become greatly aggravated. With the return of summer, and a visit to the country or the seaside, the symptoms may remain in abeyance, only again to reappear when the patient, neglectful of former experiences, returns to his old mode of life. It may require but the first fogs of autumn to remind him of his former ills, either by an acute attack, or by an exacerbation of the symptoms. By every relapse, the liability to another attack is increased. I think it is undoubted that the structural changes produced by one attack of catarrh predispose to another: that is to say, the hyperamia, swelling, and increased secretion which essentially constitute the phenomena which we call catarrh, after they have reached a certain pitch, tend to remain constant; the power of resistance of the mucous membrane is diminished thereby, so that, when it is submitted to the influence of an irritant, they are easily