

cases of sporadic cholera might on occasions be so explained that no apprehension need exist of its being the harbinger of an epidemic.

Begging you will excuse this intrusion on your valuable space.

I am,  
Dear Sir,  
Yours faithfully,  
A. K. REED.

DEBROOGURH, ASSAM, 18th April 1874.

## Selections.

### THE HYGIENE OF MALARIA.

By C. A. GORDON, M.D., C.B., *Deputy Surgeon-General.*

THAT malaria is more active at night than during the day is a generally acknowledged fact. In India travellers, when traversing such tracts, are careful to do so only some time after sunrise and between that time and sunset, unless the exigencies of the service render it impossible for them to observe this precaution. The circumstance has also an important bearing in regard to the period of the day most suited for parades of troops. Thus, in the south of China and on the west coast of Africa, not to mention other places, the residents learn from personal experience that exposure to the terrestrial vapours before and immediately after sunrise is productive of more or less severe illness, and in such places the habit of taking out-door exercise, so general in India, is avoided. It has, further, an important bearing in regard to the earliest occupants of certain colonies. In Algeria, for example, when the French first began to clear that country for purposes of colonisation, experience soon taught them that it was injurious to health to commence the daily work of clearance until some time after the sun had risen; the other precautions necessary to be taken being generous diet, careful selection of drinking-water, good clothing, ablution and change of dress after the day's work was over, the use of coffee, and not to reside in the vicinity of the works on which they were engaged.

The direct height above the earth's surface to which malaria ascends is usually considered to be thirty feet. Hence it is that in malarious districts it is recommended that sleeping rooms shall always be in upper stories; hence also the theory of the advantages of the double-storeyed barracks lately erected in India. But, as with regard to almost every rule supposed to be applicable to malaria, there are exceptions to this, instances being not unfrequent of the greater prevalence of the disease in upper rooms than in those upon the ground floor. A striking example occurred within my own knowledge. In 1863 cholera prevailed among the troops at Benares, and then a building, formerly used as a mint by the rajah of that place, was temporarily taken into occupation so as to relieve the numbers of men in barracks. It consisted of two storeys, and was separated from the adjoining town by an enclosure and high wall. Cholera advanced in a direct line through the town; it reached the building in question, attacking the men occupying the upper rooms, but leaving those on the ground floor absolutely free. It seemed to have leaped, as it were, over the wall, and thence alighted in the rooms on the nearest level to its summit. The effects of malaria, even when dwelling rooms must from circumstances be near the surface of the ground, may be considerably modified by a somewhat simple arrangement. In such localities, buildings erected upon stakes of no more than a few feet above the surface are said to enjoy a considerable immunity in this respect, and hence we may believe that the inhabitants of prehistoric and modern lacustrine dwellings suffered less in this respect than might at first be supposed.

The altitude above sea level to which malaria extends is less easily ascertained than the height above the surface of the earth. The altitude to which it may extend depends upon latitude, and doubtless also upon some other circumstances, and under certain conditions its effects may even be more severe in certain elevated positions than they are nearer to the sea level. At some of the stations in the Himalayas cholera has prevailed in epidemic form at an altitude of 6,000 feet and upwards. In the West India Islands, in latitude 25° N., an

altitude of 2,510 feet is said to ensure an immunity from the effects of malaria; but the circumstance is not to be forgotten that in 1860 yellow fever prevailed at Newcastle, situated 4,000 feet above the sea. In Italy, in latitude 44° N., an altitude of 1,500 feet is considered to secure an exemption from paludal disease. At Gibraltar, in latitude 36° N., however, yellow fever has prevailed at an altitude of 1,439 feet. A marsh at Erzeroum, in Turkey in Asia, in latitude 39° N., and 6,000 feet high, has been found to produce fevers; and one in Puebla, in New Mexico, in latitude 19° N., and 5,000 feet high, has been found similarly malarious, so that, taking all these circumstances into account, besides numerous others, that could be named, it appears that no definite limits can yet be named beyond which malaria may not extend if certain undefined conditions be favorable.

Of the greater unhealthiness of some elevated positions than of lower-lying districts, many examples present themselves. In Sicily, out of seventy unhealthy towns and villages, thirty-five are situated upon hills or the faces of declivities. In England the inhabitants of Greenhithe and Northfleet are nearly exempt from intermittent fever, while the residents on the hills beyond suffer much from that disease; and a similar remark holds good in reference to Weymouth and the marshy districts of Sussex, near Littlehampton. In Jamaica the promontory on which Fort Haldane, Port Maria, is erected, has an elevation above the sea of 150 feet. It consists of chalk; its faces are perpendicular; yet, while at the base, to leeward, among mangrove swamps, the inhabitants are healthy, the troops in the fort suffered so severely from malarious disease that the post had to be abandoned. In India several examples of the same kind are recorded, and besides those already mentioned, the hill of Paresnath may be named. It rises to a height of about 4,000 feet from an undulating country, covered with thick brushwood. Its sides are rent by deep gorges, the sides of which produce dense jungle. A *sanatorium* was in 1864-65 tried on its summit, but with the result that malarious disease prevailed among the troops sent to a far greater extent than among those occupying stations in the plains, and hence the place was abandoned. In China the natives have for ages known that low hills that rise abruptly from plains are far more unhealthy than plains themselves, and our troops suffered terribly, because on at least one occasion the circumstance was ignored by "authorities" on the spot. In the first China War our troops were with every good intention encamped on the higher part of the island of Chusan instead of the lower level occupied by Chinese. Fearful mortality occurred among them, the dead being interred in such numbers that the position was long known under the name of Cameronian Hill. Such circumstances had many years ago attracted the notice of Dr. Robert Jackson, and he gave what must to a certain degree be considered an explanation of them. Writing of Gibraltar in 1819\* he noticed that "a part of the site at the north is alluvial, and not exempt from exhalation; the broken and irregular surface of the south exposes it to vicissitudes of temperature and currents of air that strike with force, and are liable to act injuriously on the body," and he makes similar observations relative to other places in the neighbourhood, as San Roque, Algeiras, &c. He also observes, with reference to the prevalence of malaria at some stations having considerable elevation, "that the noxious cause or exhalation in which it (malaria) ascends as it traverses the adjacent plain, and that its impression is augmented by the adventitious force with which it strikes the subject of its action." "It is thus," he adds, "that a position of three hundred paces from the margin of swamps is less unhealthy than one at six hundred in the same line of direction on an exposed height."

It has been shown that the spread of malaria, or at least that which produces intermittent fever, is interrupted by hills and forests. It is also interrupted by towns, and hence it is that Rome and some cities of America, situated in malarious localities, are more healthy than the country districts around them. With regard to malaria producing yellow fever and cholera, however, no such influence is exerted by cities and towns. In them, as also in barracks, or wherever human beings are densely crowded together, the effects of the poison are most severely exerted so long as what has been called the epidemic wave remains upon the particular place. The presence of an inconsiderable breadth of water has always an important

\* "Organisation of Armies," p. 47.

influence in preventing the spread of malaria, the presence of a river being, in some instances, a complete barrier against the extension of the most severe epidemics, and according to some authors, sea water acts more effectually as a barrier than an equal expanse of fresh, whether as river or lake. This is no new discovery. The circumstance was well known to Sir Gilbert Blane, who had "known a hundred yards in a road make a difference in the health of a ship at anchor." Numerous illustrations of a similar occurrence occur in works on naval and army hygiene. They have been remarked, among other instances, in the bay of Rio de Janeiro, in the bay of Panama and at Malta; in the two former in the case of yellow fever; in the latter of cholera. At Walcheren troops on board a vessel anchored at a distance of 6,000 feet from the shore were exempt from the fever that prevailed on land; and at Hong-Kong, Amoy, and other places in China, troops anchored at a distance of 400 yards, that is, 1,200 feet from the shore were similarly exempt during the first China War.

The power exerted by forests and woods in preventing the extension of malaria deserves a special notice. The advantages of having a belt of forest between barracks and a malarious swamp have been acknowledged from ancient times. We learn that the Romans, whenever practicable, established their camps under the shelter of woods. In India it has from time immemorial been the custom of the natives of malarious districts to form villages in the denser parts of the jungles, where, according to recent observations, they are relatively exempt not only from intermittent fever but from cholera. In America the dismal swamp, where ague is never met with among the inhabitants, is covered with evergreen trees of large and lofty stature; where, on the other hand, there are numerous instances of districts having become unhealthy by the forests that had covered them being removed. Among such may be enumerated St. Stephano and Campo Salina in the Pontine marshes. American writers observe that encampments on land, the wood of which had just been cut down are, of all others, the most unhealthy, and add, "it is perhaps from this cause that new countries are generally fatal to the first settlers,"—a remark which I specially commend to the attention of those about to emigrate to the Far West. Dr. Cleghorn, writing of the forests of Southern India, makes somewhat similar allusion to the influence of woods upon health, and expresses his belief that the greater degree of sickness at Wellington than at Coonor, although only a couple of miles distant, is attributable to the scarcity of wood at the former place as compared with the latter. It seems almost unnecessary to observe that in order that woods and forests may prove beneficial as guards against malaria, it is necessary that they are composed of trees which are themselves in a healthy state, and are not of the description known to produce injurious emanations.

Fresh water is itself a ready vehicle for conveying "malaria," nor is the action of water thus rendered pernicious amenable to any tests yet known for the detection of the injurious principle. The literature of the profession has, in an actual as well as figurative sense, been of late years flooded with records of disease being conveyed through water, especially dysentery, typhoid fever, and cholera. It is a well-understood circumstance that chemical or other physical examination really fails to detect the presence in water of the poison that gives rise to cholera, although that poison may exist in sufficient quantity to render the use of the water dangerous. Nor do we possess any certain means of rendering such water innocuous or destroying the poison. Boiling will neither always nor certainly do so; the use of permanganate of potash and then filtering have no doubt the greatest effect yet obtained in this respect, but events as yet hardly justify us in stating that they are absolutely effectual. It is customary to observe that the noxious influence of cholera poison is increased by its solubility in water. It is also asserted that water at a temperature of 32° Fahr. dissolves scarcely any of it; at 40° Fahr. it is slightly soluble. It has been shown by experiment that the solubility of organic matter is increased by increase of temperature, and this circumstance explains to a certain extent the greater solubility of particular kinds of water in tropical than in temperate climates, and in the hot than in the cold season. With regard to water as a vehicle for ague-producing malaria, not only that which is stagnant, but in some instances that of rivulets impregnated with vegetable matter, fresh or decaying, may convey the poison, and there are numerous instances recorded

of streams in India having this property. That of stagnant pools and marshes has ever had a similar reputation, and in some instances it has been found that although health may not suffer in residents in such localities so long as they refrain from making use of the water, yet they become affected immediately they neglect this precaution. The ready explanation being that although malaria may not be given off by soil so long as it remains submerged, the overlying water may itself become saturated with the poison. A striking example occurred in Algeria. The French troops having been set to work to drain a lake, they made use of its stagnant water as drink, and although healthy before, yet no sooner did they do so then they suffered severely in consequence.

If, as already observed, there are plants—the presence of which in water renders it deleterious,—there are many others which act as purifiers, and render that which otherwise would be deleterious, wholesome; among such are *Hydrocharis* or frog-bit, *Stratiotes*, or water soldier, *Macrophyllum valisneria*, and *Anacharis alismastrum*, which, since 1834, when it is believed to have been introduced from North America, has flourished abundantly in marshes and canals in England. Among other plants which have a similar action are *Sagittaria*, or arrow-head, *Alisma plantago*, or water plantain, *Butomus umbellatus* or flowering rush, *Lemna*, or duckweed, *Pistia*, or gigantic duckweed, *Montia*, *Poaogeton*, or brookweed, *Callitriche*, or starwort, *Hippuris*, or mare's tail, *Equisetum*, or horse tail, besides various rushes, carices, grasses, flags, and cresses; while *Zizania*, although itself poisonous, purifies water in which it grows. Nor is the list complete with all these, and the enumeration shows, if any argument be necessary to do so, how essential is a measure of botanical knowledge on the part of the army medical officer, in order that he may efficiently fulfil the functions of his position in this as in many other respects. Notwithstanding the undoubted acid properties of the natural order *Ranunculaceæ* generally, there are at least four genera whose presence in water is beneficial, namely, the *R. aquatilis*, *Nelumbium*, *Victoria*, and *Nymphaea*, as are also the members of the natural orders *Ceratophylleæ* and *Podostemaceæ*, and some of the *Algae* among the cryptogamic plants. Some of these plants being provided with leaves which float upon the surface of the water, directly decompose the otherwise noxious vapours under the influence of the solar rays, and in their stead produce respirable air; others more submerged themselves give out a supply of oxygen, thus purifying the water and rendering it fit for the support of life.

Vegetable matter, whether in the fresh or dried state, exerts various effects in the propagation, absorption, or destruction of malaria. According to Dr. Hammond he contracted intermittent fever from inspecting musty hay, and symptoms of pyrexia from examining old books. Dr. Salisbury considers that measles and some other affections are readily conveyed by means of straw, and that epidemics may thus be propagated among troops in camp. Plants in a state of decay or decomposition give rise similarly to malaria, or at any rate produce in man the diseases usually attributed to such a cause. Old trees undergoing the process of *dry rot*, and some vegetables, more especially cruciferæ, and those generally of a succulent nature, have this effect. Dense vegetation, as low jungle, especially containing trailing plants and of a nature to interfere with free perflation of the locality, is conducive to the concentration of malaria.

Under other circumstances trees and growing plants are valuable as protectives against malaria. The existence of a belt of trees between a barrack and a pestiferous marsh is fully acknowledged, and the circumstance of planting a marsh with evergreen trees has, in many instances, converted a malarious into a healthy locality; while, on the other hand, as in the case of St. Stephano and Campo Salina in the Pontine marshes, places have become unhealthy by the forest upon them being cut down. The precise process by which these and some other plants exert their destructive effect upon the poison is as yet unascertained. Others, however, are known to cause a large increase of ozone during sunlight, and thus to purify the atmosphere. The *toolsee plant* or *Thymus capitatus* is in India held to exert this power to such a degree that it has become sacred to Vishnu, that is, the preserving principle. Other plants have more or less the same character as the cherry laurel (*Cerasus lauro-cerasus*), although both its flowers and fruit contain, as is well known, a poisonous principle, so also with cloves, lavender, mint, lemon, heliotrope, hyacinth

and narcissus, although the odour from the latter is, under certain circumstances, capable of producing unpleasant effects. Certain prepared perfumes, similarly exposed to the sunshine, add further to the atmospheric stock of ozone—the well-known eau-de-cologne, for instance, oil of bergamot, extract of mille-fleurs, essence of lavender, and some of the aromatic tinctures. The oxidation of certain essential oils obtained from plants and flowers, such as the oil of nutmeg, aniseed, thyme, and peppermint, is likewise indicated as a source of ozone, though the supply of this aerial condiment is, in the case of these, less considerable. Perhaps, indeed, the influence of such natural destroyers of malaria are less studied and willingly recognised at the present day than they were in former times. In past ages there appear to have been instances of a sort of instinctive resort to certain plants as disinfectants. Herodian relates that during a plague in Italy, in the second century, strangers crowding to Rome were directed by the physician to retreat to Laurentum (now San Lorenzo), a place so called from the abundance of *Laurus nobilis*, or sweet bay tree, which then grew there, and by inhaling the odour of which they would, in a certain measure, be guarded from infection. And long before the time alluded to, the disciples of Empedocles had been accustomed to plant aromatic and balsamic herbs in the neighbourhood of their dwellings, in the confident belief that by so doing they were providing means of defence against fevers, &c. To this day we have the name of "Fever-against fevers," as the appellation of one of the strongest-scented compositæ, with traditions of its abounding febrifugal powers; and, it may be added, "if we are wise we shall imitate the citizens of Laurentum, and promote the growth of bay trees wherever the soil and climate will allow them to flourish." Besides all these some resin-yielding and aromatic plants have the reputation of destroying malaria. There is reason to believe that several species of the natural order *Myrteaceæ* possess this property besides the *Eucalyptus globulus*. Of late years this plant has obtained a high reputation for its assigned power, and some writers have recommended its introduction with a similar object on the Gold Coast. Various examples of its success in Algeria are recorded. At Pandook, on the banks of the river Hamyza, fever was extremely prevalent. In 1867 several thousand plants of the eucalyptus were introduced with the immediate result of rendering the locality healthy. A similar result was obtained at Ben Machydon and Gue de Constantine, in the island of Corsica, in Cuba, in the Australian Colonies, at the Cape of Good Hope, and other places. Probably other trees which yield aromatic gum resins would have a similar effect, and it is not known that malarious diseases prevail in places where trees of the natural order *Conifereæ* grow abundantly.

Various other plants have obtained a reputation as being capable of destroying "malaria," or at any rate rendering that influence innocuous. Thistles had rendered some parts of the Campagna near Rome healthy, and on the plants being cut down, those districts became again "malarious." Sunflowers appear to have been first planted for a similar purpose in America, and in that country they are said to have been so successfully. Baron von Alsten, whose property was situated on the banks of the Scheldt, and liable to be flooded by that river, planted several patches of the sunflower (*Helianthus*) near his house, and with the result that for ten years his family continued exempt from fever, while in other properties, where no similar precaution was taken, this disease continued to prevail. The plant has of late years been sown in the Mauritius for a similar purpose, and in further recommendation of its good qualities, the observation has been made that it yields forty per cent. of good oil; that the leaves from it are excellent fodder, and the stems being rich in *saltpetre*, make good fuel. Marshes may also be rendered healthy by the presence of other plants. Among those that conduce to this happy result is the *Pistia stratiotes*. In India, the West Indies, and Africa, the power exerted by this plant in absorbing the deleterious gases of muddy marshes is well known, and probably it is on this account that in the latter country the plant is held sacred. The *Pistia* is believed to possess this power in a greater degree than any other plant, being capable in a few days of rendering stagnant water sufficiently pure for fish to live in, although it by no means follows that the water is thus rendered suitable for use by man. The contrary is indeed the case. In Jamaica water in which this plant grows acquires so acrid a character as to give rise to intestinal fluxes in those who use it.

Some trees and tree-like plants have, with greater or less reason, the reputation of themselves evolving malaria, and consequently the natives of the countries where they grow avoid sleeping or resting under them at night. Those that give off their branches at an inconsiderable distance from the ground, or the foliage of which is dense, have this reputation in the highest degree, and among them the tamarind and neem trees (*Melia azadarachta*). A similar influence is said to arise from the papaw tree (*Carica papaya*), and Dr. Livingstone states that in East Africa, near the Zambesi river, tracts are covered with the plant *Pæderia fetida*, a member of the *Guettaridæ* group of the *Rubiaceæ*. Many people suffer inconvenience in various ways from odours arising from certain plants, although the effects are not in the nature of disease of recognised malarial origin. In these cases the matter evolved, so far from being an invisible *aura*, is a substantial exhalation. Thus, besides the unknown effects of ipecacuanha in inducing sickness in certain persons, even when brought no nearer to them than an adjoining room, and flowering plants, in producing "hay-asthma," nausea, sickness, and even death, has been attributed to the odours of some, as the *Narcissus* and the *Cheiranthus*, or wallflower, not to mention the fraction of truth there no doubt is in the story of the Upas tree (*Antiarus toxicaria*). The Manchineel tree (*Hippomanë mancinella*, N. O. *Euphorbiaceæ*) of the West Indies, and certain American and Chinese species of *Rhus*, (N. O. *Anacardiaceæ*) not only produce severe irritant effects upon the skin, but affect very severely such persons as are predisposed to suffer from malaria. The flowers of the *Daphne mazerion* also evolve odours which are more or less injurious to particular persons, and a similar property is attributed to the Oleander, (*Nerium oleander*). The Mangrove, or *Rhizophora*, has ever had an unenviable notoriety on account of the malaria-producing properties assigned to it. As a rule, probably without exception, localities where this plant flourishes being for the most part marshes and low lying tracts, liable to inundation, are notoriously unhealthy, but in all probability this reputation arises altogether from paludal causes than upon the plant itself.

"Malaria," without doubt, exerts its effects in the greatest extent and most deadly degree in tropical and other countries where the range of temperature is high; yet paradoxical as it may appear, its effects only occur while the temperature remains within certain limits, those limits being from about 40° Fahr. to 90° Fahr., the latter assuming the hydrometric condition of the atmosphere to be low, as experience seems to indicate that, with great moisture, malaria exerts its power far beyond the degree of heat. It is destroyed by fire, and hence the practice followed in West Africa of burning charcoal in apartments where white men are about to sleep; and similarly in India this material is by *general orders* sanctioned to be burnt in barracks where soldiers reside during the rainy and damp seasons.

As guards against malaria the natives of South America successfully use veils with which they cover the mouth and nostrils. The light curtains used as protections against mosquitoes in India have the same effect, and in the absence of either, by simply covering the mouth and nostrils with a pocket handkerchief, a person may, in some measure at least, obtain protection. Respirators made of charcoal have been recommended with a similar view; also that troops or others encamped in malarious localities should keep the doors of their tents closed, while as additional guards against the influence they are recommended to use only filtered water, to have when possible a fire to windward of them, to smoke tobacco in moderation, use a little malt liquor, and each morning to take a cup of good and hot coffee before resuming their journey.

The advantages of hot coffee as a prophylactic against malaria have been for many years urged by medical officers of the public services. In 1805 Dr. Robert Jackson, with especial reference to the condition of the West Indies, observed that "it is not proper to enter upon exercise fasting lest the stomach become faint from emptiness. A cup of hot coffee is recommended as precautionary." The advantages of issuing to the men either a cup of hot coffee or their full breakfast before sending them to malarious localities were long since demonstrated on the West Coast of Africa. In 1824 it was found that those of the crew of the *Thetis*, then engaged in the defence of Cape Coast Castle, who had this meal before going on shore into the bush, were exempt from the fever which attacked those of their messmates who

had not breakfasted before landing. In 1827 a code of regulations in force on board H. M. S. *Sybilie*, then employed at Accra, directed that when any seamen went on shore for wood and water they are invariably allowed breakfast before starting. During the Niger Expedition all the crew of the vessel, while in that river, were supplied with a cup of coffee in the early morning, and with good results, taking the measure in connection of course with other precautions. Dr. Bryson further makes a remark which deserves special attention at the present time:—"It seems but reasonable to suppose," he says, "that if bark and quinine have the power of averting a paroxysm of argue consequent on marsh effluvia, they will also have the power of averting an attack of remittent fever the result of the same cause, although there may be conditions of the body in which their effects are rendered nugatory by others, the result of some powerful contingent circumstances, such as extreme physical prostration from long-continued muscular or mental exertions, inanition, the depressing passions cold, or a depraved condition of blood from causes that are not always obvious."

The prophylactic power of cinchona bark, and of its active agent quinine against malarious disease, has been generally accepted. The instructions issued to naval surgeons with regard to the administration of the latter are very explicit. They direct that the alkaloid having been found of great utility as a preventive of fever, it is to be given night and morning to those exposed to malaria, the dose being four grains. Two formulæ are in the same instructions given for the preparation of a dose; the first as an aqueous solution, the second as a vinous, namely:—

1. Disulphate of quinine, 4 grains;  
Dilute sulphuric acid, 10 drops;  
Water, 2 ounces.
2. Disulphate of quinine, 4 grains;  
Dilute sulphuric acid, 10 drops;  
White wine, 3 ounces.

Dr. Bryson gives the cases of two parties of sailors employed at the mouth of the river Benin, which at the present time deserves to be noticed. In the first the men were employed there from January till April, during which time they regularly used quinine as a prophylactic, and adopted other precautions against disease. The result was that they returned to the ship in more robust health than when they had left it. The second party was less careful. The result was that all except one man became attacked with fever, and a large proportion died. It is important to observe that with this party discipline was not maintained, cinchona bark ordered as a preventive was not regularly issued, nor coffee distributed to the men in the early morning, as in the case of the other party; in fine, a heedlessness of ordinary precautions had most likely caused a calamity which might have been avoided by a little care and forethought. In Algeria quinine was extensively used by the colonists and by the military, both as a prophylactic and to cut the attacks of fever short, and to its employment for both purposes the War Office Commissioners attribute in some respect the diminished rates of attacks and deaths among them. Dr. Hammond states that in America it was given with similar success, and moreover gives the receipt for a substitute, which, although perhaps less known, is according to his experience no less efficacious than the quinine. The substitute in question is prepared as follows:—Half a barrel of whiskey being drawn off into another cask, both were filled with a mixture of the bark of dog-wood (*Cornus circinata*), and wild cherry (*Cerasus serotina* ?); after they had been dried in the sun a few ounces of quinine were then added to each barrel, together with the dried peel of a dozen native oranges. One or two ounces of the mixture so prepared were given each morning and evening to each man, with the effect, it is stated, of lessening the relapses of fever and judging from its composition, it was doubtless by no means an unpalatable "bitter." For many years back the bark and active principle of one of the *Lauraceæ*, namely, the *Nectandra rodiei*, or green heart tree, have had great reputation as tonics and febrifuges; the latter, under the name of *Bebeeru*, furnishes the active ingredient of Warburg's drops, and would doubtless be equally useful as a prophylactic. A principle with somewhat similar name, namely *Berberin*, has similar prophylactic and curative properties. It is furnished by the *Berberis vulgaris* or common Barbary, and by the *Mahonia*, the latter growing in great abundance upon some mountain ranges in India, and there furnishing a much cheaper source of a valuable remedy than is provided by the cinchona

plantations. Besides these we have santonine, the active principle of *Artemisia santonica*, and other species of the same genus, salicine, the active principle of the salix or willow, and the bitter principle of the *Populus*, also a member of the *N. O. Salicaceæ*. Finally, I may observe that the use of quinine wine as a prophylactic is recognised and allowed to our troops at malarious station, its efficiency in this respect being acknowledged by even some who doubt its usefulness as a means of treatment in malarious diseases.—*Medical Press and Circular*.

## TREATMENT OF CANCER OF THE CERVIX UTERI BY THE GALVANIC CAUTERY.

DR. A. AMUSSAT, OF PARIS.

\* STATISTICS show clearly that the seat of predilection of cancer is the cervix uteri. In the early stage it is usually found on the surface or in the substance of one of the lips of the os; but this local invasion is only temporary, for the disease but too surely extends either to the body of the uterus, or to the walls of the vagina, the bladder, and the rectum; and death, attended by a number of painful and distressing symptoms, inevitably follows.

The importance of the study, and above all the treatment of this disease, may be appreciated by the fact that of the total number of fatal cases of cancer in both sexes one quarter are due to cancer of the uterus.

To the present day medicine has attempted in vain to arrest the invading progress of the disease, and to obviate its rapidly fatal tendency. Operative surgery seems to have given somewhat better results. But if even these have not been so brilliant as was anticipated, this must be ascribed to the difficulty of ascertaining the exact extent of the disease, and to the circumstance that patients rarely present themselves for treatment in the early stages of the disease.

In early times the knife was used to remove the disease. Tulpius, Monteggia, André de la Croix, Lapeyronie and others are reported to have used the bistouri for the removal of cancerous growth of the cervix. Oslander, for the first time, in 1801, amputated the cervix uteri, and repeated the operation with success on several subsequent occasions. His example has been followed by Dupuytren, Récamier, Hervez de Chegoin, Cazenave, Strachan, Hugnier, Simpson, Langenbeck, Scanzoni, and others; but above all, Lisfranc, in France, tried to bring the operation into repute by adopting no other kind of proceeding.

Dr. Amussat (senior) on several occasions amputated the cervix; but he abandoned this method when the powerful and easily-managed caustic, introduced by Dr. Filhos, came into use.

His own words, addressed in 1854 to the "Académie de Médecine" on this subject, may be given:—"One can attribute to cancerous affections of the cervix, whatever is applicable to the disease known as *noli me tangere (lupus exedens)*. Energetic and rapid action is indispensable. One must not hesitate to destroy the entire cervix, if necessary. To obtain this result cauterization from without inward, making a hole, so to say, with caustic potash and lime, has been most successful in my hand. I have by these means effected several cures in otherwise hopeless cases."

In his "*Traité des maladies de l'utérus*," Dr. Courty says:—"It seems to us beyond a doubt that epithelioma of the cervix can be removed with some hope of success, and that the course of the disease can be checked so as to add considerably to the life of the patient."

Jobert de Lamballe was very successful in the use of the actual cautery, and the following case establishes its superiority over the use of the bistouri:—

"A woman, aged 46, eight years previously had undergone, at the Pitié Hospital, amputation of the cervix uteri, for a disease probably cancerous; the operator being Samson. The disease reappeared within a few months, and the patient was re-admitted into the Pitié Hospital, under M. Gendrin. The patient stated that she again underwent an operation, but it was not clear whether M. Gendrin made use of caustics or the knife. Anyhow, she was discharged cured, but a relapse occurring she placed herself under the care of M. Ph. Boyer at the St. Louis Hospital.

Again the fungous masses, which had appeared on the cicatrices, were exercised by M. Boyer.