efficient solution must be devised before it can have any extensive application in surgical practice.

In concluding, I must thank Mr. A. E. Maylard, both for the opportunity of conducting this investigation, the interest he took in the experiments, and the scrutiny he kindly gave to many of my results.

ENDEMIC FEVERS AT BERMUDA.

By CHRISTOPHER HARVEY,
Staff-Surgeon Royal Navy.

[Communicated by THE DIRECTOR-GENERAL OF THE MEDICAL DEPARTMENT OF THE NAVY.]

THE following notes, made when I was a surgeon at the Royal Naval Hospital at Bermuda from 1876 to 1879, having never been published, may be of interest at the present time, now that public attention has been directed to that place by the circumstance of the Guards being sent there.

The islands consist almost entirely of dead and decayed coral rag, which is so porous that rain water can seldom lodge, surface evaporation is small, and the general aspect of the soil is dry. There are no running streams of water in the islands; the people rely upon rain water collected in tanks, or upon well water, which is usually brackish. There are numerous marshes or "ponds" as they are called in local language, many of them in direct communication with the sea. These swamps are frequently fringed by mangrove trees, among whose thick and tangled roots are vegetable matters undergoing chemical change.

These appear to be all the local materials necessary for the formation of miasmata and the propagation of those febrile diseases characterised by intermissions and remissions; but so far from these swampy districts being considered noxious, there is a prevailing opinion in the colony that those persons who reside in close proximity to them actually enjoy better health and live to a greater age than those who live at a distance from them or on higher ground. Analysis of the deposits in these swamps reveals a considerable proportion of tannates and a comparative absence of animal matter, which, with the fact that most of the trees and plants are non-deciduous, aided by the known purifying action of salt tidal water, must prevent excessive decomposition, and may not unreasonably be accepted as the causes of their negative qualities.

The absence of any authentic records of the causes of deaths in the islands prior to 1867 (from which period returns are available) gives to the reports of the Royal Naval Hospital a peculiar interest, as they continue there so far back as 1811 without a single break, before which date the diseases of Bermuda are known only by tradition. The state of the Royal Naval Hospital, as long as it continued to receive the sick from troops stationed throughout the islands, afforded a good indication of the general health of the colony, this advantage being greatly enhanced by the addition in 1824 of sick convicts, which class of patients continued to be admitted within its walls until 1848, whilst a portion of the troops enjoyed that privilege down to so recent a date as 1875.

Periodic Fevers.—Remittent fever, during the first half of the present century, was locally believed to be endemic in Bermuda, and was considered to be the only form of local fever prevailing there. It was thought to be the same as the common bilious remittent of tropical climates, and liable to become epidemic by sufficiently exciting causes. Many persons believe that its aggravated form constituted yellow fever, and that they were but types of the same disease. Beginning in the summer as a mild remittent, it became severe in proportion to the advance of the season, the increase of temperature and excess of rainfall over the average, and declined with the advent of cold weather. So marked was this that the first case rarely occurred until June, and few were heard of after the middle of December.

Intermittent Fever (Ague) has never been known to arise spontaneously in the islands; moreover, persons who have contracted malarial fever elsewhere often resort to Bermuda as a restorative. It is not a little striking that those who declare remittent fever to be endemic, also admit that the allied fever intermittent never occurs.

These fevers have no place in the modern returns of sickness in the islands, while the number of cases of enteric fever returned has vastly increased, and this word enteric (or typhoid) has now absorbed all or nearly all those fevers with varied names that were

formerly described. The records of the Naval Hospital indisputably prove that remittent fever does not occur in the islands. The first case on the books was in 1832; no other cases appear until 1846, and those recorded since were all received from vessels after their arrival from the West Indies, etc. Of intermittent fever, 93 cases only were treated between 1811 and 1879, not one of which was contracted in the islands.

Continued Fevers.—The continued fevers of Bermuda, excluding yellow fever and dengue, which are acknowledged exotics, have frequently been the subject of discussion, and until recent years the different forms had not been sufficiently defined to enable any practical deduction as to their nature to be drawn. There can be no doubt that fevers have always, more or less, prevailed at Bermuda. Historical records show that towards the end of the last century, at least as far back as 1780, when no Imperial Government establishments existed in the islands, a fever occurred every year during the summer and autumn months, which was termed typhus fever, a name it continued to bear until the early part of the present century, when it became known among the local practitioners as remittent fever, while at the Naval Hospital, even as early as 1812 it was recognised as a continued fever, and was returned as such with occasionally typhus. Thus in the returns of the Naval Hospital five cases of typhus fever are shown in the thirty-three years from 1811 to 1844 and none of enteric or typhoid during the same period, while no fewer than 872 cases of continued fever are entered under the various designations of fever, febricula, synochus and mixed fever. That a large proportion of these were cases of enteric fever is proved by reference to the records of the *post-mortem* examination made at the time. Thus in 1825 two cases of "mixed fever partaking of the nature of synochus and typhus, were characterised by the discharge of blood from the intestines." In 1844, on dissection of a man who died from "synochus, the ileum so far down as the ileo-cæcal valve presented one chain of extensive and deep excavations." In 1847 the cases revealed "ulceration of the cæcum," and again in 1848 two cases of synochus showed ulceration of the ileum, and in 1850 a case displayed several congested patches of the intestines, and these lesions were constantly observed until the year 1858, when five cases entered as continued fever are described in the remarks by Dr. Rees as typhoid, and this is the first distinct reference to the disease as such in the records to the hospital. In the following year a case died in which "Peyer's patches" were ulcerated. From that date to the present time typhoid or enteric fever frequently occurs in the returns. In 1862 six cases were entered as such from the ships of war, and since that year the disease has always been returned under its distinctive appellation.

In the year 1846 fever of a mild type prevailed generally throughout the islands during the summer and autumn months, causing 85 entries into the Naval Hospital from the naval, military, and convict establishments, with 3 deaths. The disease was returned as remittent fever, but no *post-mortem* notes could be found. Again, in 1849, many cases described as aggravated remittent by the local practitioners, appeared among the native inhabitants, and although it spread among them to such an extent as to amount to an epidemic, it did not extend to strangers—a fact of significance, as the latter belonged to the Government establishments, whose water supply was from a different source to the natives, and who were probably not allowed to mix with them during the progress of the fever. No account is given of its mortality, but the death-rate among the civil population rose from 15.8 per 1,000 of the year before to 21.2, falling to 12.3 the following year. No cases were treated at the Naval Hospital.

These examples are doubtless instances of localised epidemics of enteric fever, which in the olden days were described as remittent (as explained under that subject), but which now are classified correctly as a result of improved pathological and clinical knowledge; for we cannot doubt, from the evidence of the *post-mortem* examinations at the Naval Hospital, of the existence of typhoid in the colony as far back at least as 1825; the autumnal fever of Bermuda was in reality enteric. It must not, however, be overlooked that general practitioners in a place like Bermuda rarely have the opportunity of examining the bodies of persons dying from obvious diseases, while the naval and military medical officers nearly always hold a *post-mortem* examination on patients dying in hospital, and so would naturally be the first to discover the true nature of the fever in question. It is now a recognised fact that enteric fever manifests itself to some extent every summer and autumn among the civil population, sometimes even assuming the proportions of a localised epidemic.

Among the military population continued fevers have always been very common—much more so formerly than now. At one time the troops suffered so much from continued fevers that nearly half of the total number of deaths was caused by them. Dr. Parkes states that in the ten years 1837 to 1846 there were 1,004 cases of continued fever out of 11,224 men, or 88 per 1,000 of strength; while in 1859 there were only 11 cases out of 1,074 men. Many of these were unquestionably enteric fever; a large number of them were treated in the wards of the Naval Hospital, and several of the fatal cases revealed the typical bowel lesions of that disease. In 1874, out of a strength of 1,866 men, there were 13 cases of enteric fever, of which 3 were fatal; while of simple continued fever there were 63 admissions, without a death. In 1877 there were 12 cases of enteric fever treated during the summer months among the military people, but only 1 proved fatal. Similar statistics have continued to the present date. The sanitary arrangements among the troops are excellent; the water supply is good, consisting of rain water collected in tanks, with very small chance of becoming infected. Enteric fever among the troops I always believed was contracted at the grog shops and other native houses, where the well water is very frequently impregnated with fecal impurities percolated through the porous soil from adjacent cesspits.

Between 1862 and 1878 there were 72 cases of enteric fever treated at the Naval Hospital, of which 12 died, being a mortality at the rate of 16.6 per cent. Whereas in the same period of 301 cases admitted as simple continued fever only nine died, being at the rate of 0.3 per cent. only. On the other hand, of the total number of 1,261 cases admitted before 1862, and returned as continued fever, 119 died, being at the rate of 9.43 per cent., a difference in the mortality which can only be accounted for by the greater severity of the fever, and, as shown, that was due to a large proportion of them being really cases of enteric fever.

It is evident from the foregoing observations that enteric fever is the fever chiefly prevalent in Bermuda, and from the knowledge we now possess of the causation and diffusion of this disease, it is clear that it is kept going in the islands by a continuity of cases among the natives themselves, who use cesspits with porous walls, or throw their excreta on the surface of the ground around their dwellings, thus permitting the easy pollution of their wells, and rendering the water unfit for drinking purposes, but which is, nevertheless, largely used by soldiers and sailors at the grog shops and other native houses.

It is easy to understand that after long continued drought when tanks, casks, etc., become empty, and the inhabitants fall back upon the impure contents of their wells, enteric fever would follow. As these wells are at some distance from each other, and there are no running streams in the country, an epidemic of enteric fever could scarcely assume any but very limited proportions, and could easily be controlled by the most ordinary sanitary precautions with regard to the disposal of the ejecta of infected persons.

ARE MIDWIVES TO BE ABOLISHED OR BETTERED?

Read in the Section of Obstetric Medicine at the Annual Meeting of the British Medical Association, held in Birmingham, July, 1890.

By JAMES H. AVELING, M.D.,
Consulting Physician to the Chelsea Hospital for Women.

THIS is a question the solution of which becomes more necessary every year. It is a difficult one, and to answer it fairly and effectively it must be approached patiently and without partisanship.

As far back as the world's records reach we find midwives existing. Every European country except our own has given them a legal status. Until the middle of the last century our "sworn midwives" (as they were called) were licensed, and in cases of misbehaviour suspended, by the bishops. Now they may exercise their calling without restraint, and any old woman may impose upon the public by professing to be competent to attend confinements.

The recurrence of accidents and deaths in childbirth caused by these ignorant women has at length aroused attention, and the general public, the medical profession, and the better class of

midwives have determined to deal with the question in a prompt and efficient manner. It must now be decided whether midwives are to be done away with or improved.

Before considering these alternatives, I will give a few figures which I believe to be approximately correct. The probable number of women acting as midwives in England and Wales is from 10,000 to 15,000. The population is 30,000,000, and the number of births per annum, calculating them at 30 per 1,000, is 900,000. Of this number, midwives attend 60 per cent., that is, 540,000. Of the total number of women confined, 4,500 die each year in childbirth, that is, 2 out of every 100. The deaths of women in childbirth who are attended by skilled midwives and medical men amount to only 1 in 600. In unskilled hands these mothers die at the rate of 3 in 600. By educating midwives, therefore, the mortality in childbirth might be reduced from 4,500 to 1,500, effecting a saving annually of 3,000 valuable lives. No one who believes these figures to be any way near the truth could be so apathetic and heartless as to allow the deathful work they discover to continue without attempting to remedy it. Which is it to be, then, educate or eradicate? I have not yet heard of anyone suggesting the annihilation of midwives; wild schemes are often proposed, but the carrying out of these would probably be beyond the powers of Crown, Lords, and Commons. It would almost be as easy to abolish the process of parturition itself.

There always must be a demand for midwives among the poor. The midwives most required are those who, besides attending the confinement, will wash and dress the child, and perform the offices of a monthly nurse. Women of this sort can be no rivals to medical men. The paying classes will always prefer the services of a qualified practitioner. The cases attended by midwives he will always be better without. A good midwife will save him hours of tiresome waiting amid physical and social discomforts, and prove a blessing to him by relieving him of the most arduous and unremunerative part of his practice. The medical profession have always wished for a better class of midwives. The lying-in hospitals have for many years instructed midwives. The Obstetrical Society of London, which represents the midwifery interests of this country, and would naturally be jealous of any rivalry, have for a long time worked in every way to improve these women. The British Medical Association, through its Parliamentary Bills Committee, has devoted a large amount of its energies in the same direction. The editorial support of the medical papers has been given without stint and with no uncertain sound; and the movement has received the sanction and support of the General Medical Council. It must be conceded, therefore, that the preponderance of medical opinion is in favour of the betterment of midwives, and it only remains to decide how this can best be done.

1. We want a ready and inexpensive method of instructing women in elementary midwifery.
2. We want local examining boards.
3. We want licences granted to midwives.
4. We want these licences registered.

These can only be effected by an Act of Parliament, and many Bills have been drafted endeavouring to provide for these wants. The amended Bill now before Parliament is the most perfect yet produced, and, if it be passed, it will answer the question as to the betterment of midwives far more effectively than any words of mine. It provides for the examination, licensing, registration, and supervision of midwives. The examination is to be conducted upon rules framed by the General Medical Council. The licence is to entitle women to act as midwives "in cases of natural labour only," and the registration clause provides that "a person shall not be entitled to take or use the name of midwife, or any name, title, addition, or description implying that she is registered under the Act." Clause 4 of the Bill enables the Privy Council to provide for suspending or erasing from the *Midwives Register* the names of women who have been convicted of disgraceful conduct, malpraxis, or breach of regulations.

Public safety demands nothing less than is contained in this Bill. Without registration how is it possible for the humbler classes to tell by the card in the window, the board on the house, or the plate on the door, whether the owner is an efficient midwife or an ignorant pretender? The chemist, ship captain, and others who have lives dependent on their skill have to prove themselves competent before they are allowed to undertake their responsible work. Why should a midwife, who has at every confinement two lives dependent on her skill, be permitted to follow her calling without having previously given proof of her competency?