announced as about to take place, for the purpose of petitioning both Houses of Parliament.

The Central Council of the Association have determined to assemble the profession residing in the city and county of Worcester, as will be seen by their resolutions published at p. 178; and if any of the Councils of the District Branches have not yet moved in a similar manner, we trust that they will no longer defer following the advice which has been issued from head-quarters. There is absolutely no time left for delay. The voice of the profession, if it is to be effective, must be not only unanimous and earnest, but it must be immediately spoken.

We would repeat the words of Dr. SMITH, published in our last number (p. 157):—"Let the period between this and Easter be employed in getting up influential meetings and numerous signed petitions; and during the recess, when members of Parliament return to the country, let them be waited upon, and urged to help our just cause."

Dr. NANKIVELL's suggestion (p. 178), as to adopting or adapting the form of petition employed by the practitioners of Torquay, may save a good deal of trouble, as that petition is correctly expressed and thoroughly *ad rem*.

NAVAL ASSISTANT-SURGEONS.

IN no department of the national service is so much money expended for so little purpose as in the Royal Navy. Ships are built and immediately taken to pieces in the most wanton way, just as if the main object of the dockyard authorities was to use up a certain amount of public money: at all events, so it is, that the value which the country receives in the shape of effective war ships, is very far from proportionate to the treasure absorbed by the shipwrights. Then again, with the proverbial obstinacy of incompetence and adherence to routine, a British admiral rarely enters upon his office till he has become physically and mentally unfitted by old age for his high and responsible command. The common sailors too are so badly treated, that the navy of the United States, and our own mercantile navy, completely absorb the best seamen; and recruiting for the royal navy, in place of being, as it ought to be, very easy, is always extremely difficult; so difficult indeed that we constantly read in the newspapers of ships being detained in harbour for want of men.

The surgical department, which ought to be formed from the very *élite* of the surgical talent of the nation, is systematically insulted, the assistant-surgeons being precluded from all opportunities of study and self-instruction, by being denied cabins and being obliged to spend their time amid the puerilities, tricks, and noise of the midshipmen. As Mr. HUME well remarked on Monday night in the House of Commons, when the navy estimates were under discussion:—"The question was whether the navy ought not to obtain as able and efficient medical assistance as the army. For his own part he could see no reason why both officers and men in the navy should not receive the best medical talent that was to be had, which, however, was impossible so long as the assistant-surgeons were treated as at present." As a question concerning the honour and status of our profession, the ill-treatment of the naval assistant-surgeons is one of vast importance, but as regards the public its bearings are of greater magnitude. How many lives may be saved after action, and how much disease and pestilence avoided in unhealthy climates, by a talented medical staff! but how can

such ever be hoped for in the royal navy till those who enter the service as assistant-surgeons are treated as gentlemen and men of science? It appears to us that the whimsical carpentry of our dockyards, the senility of our admirals, and the way in which talented surgeons are discouraged from accepting commissions in the royal navy, present topics for discussion of far higher moment than any which are involved in mere party disputes; and we feel assured that the day is not far distant when patriot-statesmen of all political parties will cooperate on behalf of the nation, in removing the abuses to which we have now adverted. Here, we may remark, is one of the many mixed questions in which medical members of Parliament might speak with authority, and by so doing serve their profession and their country.*

We must not leave this subject without stating our belief that, among the superior officers of the navy, the feeling is decidedly in favour of a wiser policy being adopted towards the assistant-surgeons. It is with much pleasure that we copy the following from the *Times* of February 16th:—

"*Sheerness, 14th Feb.* The *Espiègle*, 12, Commander, George Hancock. Under the present Admiralty regulations for the accommodation of officers, no provision has been made for the Assistant-Surgeon appointed. Captain Hancock has given up one of his own cabins for the entire use of the Assistant-Surgeon, otherwise he must have been without a cabin for his personal comfort."

The kindness and good sense of Captain Hancock convey a severe censure to the parliamentary partisans of Admiralty routine.

ORIGINAL COMMUNICATIONS.

INFLUENCE OF NOXIOUS EFFLUVIA ON THE ORIGIN AND PROPAGATION OF EPIDEMIC DISEASES.

By R. D. GRAINGER, Esq., Lecturer on Physiology at St. Thomas's Hospital.

(Read before the Epidemiological Society.)

HAVING in the course of my official inquiries received, through the kindness of my professional brethren, a large amount of valuable evidence illustrative of the noxious influence of overcrowding, defective ventilation, etc., I have thought that it might not be unprofitable if some of the facts which have fallen under my observation, both as regards the causation of, and the exemption from epidemic disease, were laid before the profession.

Within the limits of this paper, it will be possible only to make a selection of the conditions affecting the health of large masses of the people; I therefore propose to direct attention to two of the many deleterious agents prevalent in populous localities: namely, to human effluvia, and to the emanations generated by privies and cesspools. But before entering upon the more immediate subject matter here traced out, a few remarks may be offered on the predisposing causes of epidemic disease, and especially on the circumstances which explain the vast influence they exert in its diffusion.† The extended inquiries of late years have abundantly shown, that the same deleterious agents operate as predisposing causes in regard to the whole class of zymotic diseases; that what will develop the exciting or efficient cause of fever, will also develop scarlatina, small-pox, diarrhoea, or cholera. So certain and notorious is this

* At p. 180 will be found an account of what took place on Monday night in the House of Commons with reference to the present treatment of naval assistant-surgeons.

† This subject is ably discussed by Dr. Carpenter, in a valuable paper on the Predisposing Causes of Epidemics.—*British and Foreign Medico-Chirurgical Review*, January 1859, p. 159.

to those who practise among the poor, that before the outbreak of any epidemic, knowing where the predisposing causes are rife, they could foretell the precise localities where it would occur; or even name the alley, or point to the exact house which would suffer.

Another circumstance which extends the influence of these causes is that, if concentrated, any one of the number—overcrowding, privy effluvia, foul evaporations—will often suffice to induce any of the principal members of the zymotic class, according as the exciting cause of one or other of the number happens to be present.

The only other point to which I would allude, is that these predisposing causes have not only this wide range in multiplying the number of attacks, but they invariably, as the rule, give intensity to every form of epidemic disease, and thus increase enormously the general mortality.

These and other considerations have long induced me to conclude that, in regard to zymotic affections, the predisposing are infinitely more important than what are called the immediate or exciting causes. In regard to low fevers, for example, it is certain that its efficient cause—the *materia morbi*—is never absent from London and other large towns; and yet it is rarely—many would say never—developed unless there be superadded to it some predisposing cause. So true is this, that we not only daily see in the metropolis and elsewhere, hundreds and thousands of persons living in the front streets exempt, as to the rule, from typhoid fever, whilst the inhabitants of the wretched courts behind are scarcely ever free from it; but if, by chance, a given number of persons are planted in the very centre of an epidemic district, but freed from the recognised predisposing causes of zymotic affection, they also, as the rule, will still escape. At the conclusion of this paper, some marked examples of such exemptions, both in regard to cholera and fever, will be adduced. It is facts like these that hold out so much encouragement for sanitary ameliorations, by which it may be reasonably anticipated that in the ratio in which these predisposing causes are reduced as to number and intensity, epidemic diseases, wanting one of the elements necessary to their development, will be diminished. With these prefatory remarks, I proceed to the subjects selected for consideration.

I. INFLUENCE OF HUMAN EFFLUVIA.

According to my own opportunities of observation, the most injurious of all the causes operating in the diffusion of epidemic diseases, are the effluvia proceeding from the human body, and especially from the lungs and the skin. The special deleterious agent consists of the effete and, as it has been proved experimentally, highly putrescent organic matter, mingled with the expired air. That it is, when reintroduced into the living body, liable to be highly injurious, may be inferred from the fact of the careful provision made by nature for its incessant elimination from the system. That it is small in amount, is no objection to the intensity of its action; for to the physiologist it is well known that a minute quantity of a powerful agent—the putrid matter introduced on the point of a needle in the inspection of a dead body—a single drop of concentrated prussic acid placed in the mouth of an animal—is sufficient to destroy life. It is in overcrowded bed-rooms, in unventilated schools, workhouse dormitories, etc., that this effete matter taints the air, and, entering the blood, poisons the system. That the remarkable diminution in the amount of carbonic acid evolved from the lungs, where persons, as in crowded and unventilated apartments, breathe an impure atmosphere, acts in such cases injuriously, admits of no doubt; but the evil, *quoad* the development of fever, scarlatina, cholera, and so forth, depends on the organic, and not on the chemical products of respiration. As one indication of this, it may be explained that it is possible, under certain circumstances, to observe the action of the former when separated from the latter. As soon as the expired air quits the body, the matters of which it consists have a tendency to separate; and as regards the two substances under consideration, the carbonic acid mixes with the at-

mosphere on the principle of diffusion; whilst the animal excretion, no longer held in solution by the colder external air, is deposited, and particularly clings to woollen articles, as bedding and clothes, which last, as it is well known to medical men, clergy, and others, will often retain for hours, or even longer, a foul smell from this cause alone. When this matter, from neglect, is allowed to accumulate, it will affect the health. An instance of this was mentioned to me by the surgeon of a large pauper school, where the health of the boys was decidedly improved by substituting, for the usual dress, clothes capable of being readily washed.

It is, however, familiar to all practitioners, that human effluvia especially exhibit their poisonous influence when either multitudes of human beings are crowded together, or where a smaller number are placed in confined and unventilated sleeping places. Many instances of the influence thus excited on all kinds of epidemic disease have come under my notice; but only a few illustrative examples can here be adduced. In making these selections, it will be my object to present instances which, as far as possible, display the operation of some one individual agent; for when, as usually happens among the poor, a multitude of unfavourable conditions are present, it is extremely difficult to define and demonstrate the deleterious agency of each.

The following case illustrates the effects of overcrowding, in respect to cholera. During the epidemic of 1849, the inmates of a reformatory establishment for young women suffered intensely from the pestilence; 40, out of a total of 96, being attacked, and 15, or rather more than 15 per cent., dying. Now, these poor sufferers were previously in perfect health: they were well fed, well clothed, and, in short, carefully tended; but the dormitories were low, and much crowded; the windows, for the sake of seclusion, were partly blocked up, which greatly interfered with the ventilation. After a careful examination, I could detect no other cause than this for the sudden outbreak, occurring at a period when there was little cholera in the neighbourhood.

As regards the influence of overcrowding on the development of low fever, I may appeal to the experience of every medical practitioner whose duties call him much among the poor. It matters not whether we speak of the closely-packed common lodging-house; of rows of houses built back to back; of the small, unventilated, and often single sleeping apartment of the mechanic; or of the ill-built cottages in rural districts, with their one bed-room, overhanging thatch, and small lattice; wherever, either from numbers or the want of ventilation, we have the fetid, sickening air, generated by human effluvia, there assuredly we shall find fever. Although observed especially among the poor, fever, as it occurs in this country, is not, however, essentially dependent on poverty and destitution: want may, indeed, aggravate the evil, and actual famine (as we unhappily saw a few years ago in Ireland, and in the inhabitants of Ireland who fled to the manufacturing districts of England) may give immense development to typhus; but that persons well fed, living in comfort, and in strong health, may suffer severely from low fever, is shown by a large experience.

One of the best illustrations, perhaps, is furnished by the sailors belonging to the collier vessels frequenting the Thames. These men, as a body, are in the prime of life, robust, and well fed; but, as I found by examining many of these vessels, the place where they sleep, the fore-castle, is excessively small and confined; with this serious additional evil, that, as the hatchway is usually flush with the deck, it becomes necessary, whenever there is much sea, to close it down, when the unfortunate sailors must be without any window, as if shut up in a close box. When, too, the vessels come to London, as only one man is required to keep watch at night, all the sailors are crowded at the same time into their closely packed berths. Some years ago, the attention of Mr. Busk, the distinguished surgeon of the Seamen's Hospital Ship, was attracted to the large number of typhus cases which were admitted, amounting in 1841 to 147, and in 1842 to 167; and to the fact that, of all the vessels in the Thames, the colliers were most subject to

fever. In investigating this question, I could detect no other cause than the polluted air which these men must have breathed in the confined fore-castle. That there is nothing connected with a sailor's mode of life to expose him to typhus, is proved by the experience of well managed vessels; and, as one among the many proofs which might be adduced, I may mention, that Mr. Clark, who made ten voyages to India as surgeon in Messrs. Green's fine vessels, never had a single case of typhus.

To those who are practically acquainted with the poorer parts of populous towns, it would be needless to point out that the common lodging-houses, and especially those occupied by the Irish, inflict an almost incredible amount of evil on the community: they are the common foci of all epidemic diseases; they frequently are the means of introducing small-pox into the locality where they are situated; and they are a never-failing source of expenditure to the parochial authorities. Although other sources of sickness may prevail, filth, neglect, and destitution—this last, however, by no means so often as supposed—the one prevailing evil and special characteristic is enormous overcrowding, carried to an extent which those unacquainted with the subject can scarcely, even in idea, realize. In the valuable recent report of Captain Hay, the Commissioner of Police appointed to superintend the carrying out of the Common Lodging-House Act in the metropolis, and to whom so much credit is due for carrying into operation a difficult and novel measure, some remarkable illustrations are given. In one eight-roomed house, one hundred and three persons, the population of a hamlet, were herded together; in one room, 14 feet 6 inches square, thirty-seven people were found lying huddled together on the floor. In many of these instances, the space for each inmate could not have been more than forty cubic feet; whilst the lowest amount required for health in a sleeping room is 500 cubic feet, or twelve times the amount.

My own experience corroborates these statements of Capt. Hay. On entering some of these deplorable places, I have found every possible space occupied by men, women, and children; and an atmosphere so fetid as to be almost overpowering to a stranger; causing, indeed, in some instances, nausea and actual vomiting.

That persons habitually breathing an air thus polluted by poisonous exhalations, should become the victims of zymotic disease, can excite no surprise. As to low fever, the amount is enormous. I had occasion, two years since, to examine some of the courts in Gray's Inn Lane; and in one of them was an Irish lodging-house, in which alone twenty cases of fever had occurred in two months.* Another and more marked instance was lately mentioned to me at Leeds, in which seventeen cases of typhoid fever were, about two years since, received in one week at the House of Recovery, from two of these lodging houses; the cost to the parish for this week's work being £50.

It is satisfactory to learn that the Act of Parliament for regulating common lodging houses, for which the community is indebted to the Earl of Shaftesbury, has been extensively put into operation in London and the provinces, with the best results, both moral and physical. At Portsmouth, where there are not fewer than five hundred of these dwellings, I was informed by Dr. Slight, the Inspector, and by Mr. Piercy, the medical officer of the district, that in those houses placed under regulation, there had been a general reduction of disease, especially of fever; and it was particularly stated, that no second case of fever had occurred; whereas, in ordinary circumstances, as shown above, where typhus once breaks out, the rule is that it spreads among the inmates, many of whom often fall victims to the pestilence.

[To be continued.]

MORTIFICATION EXTENDING FROM THE HEAD OF THE FIBULA TO THE CREST OF THE ILIUM. RECOVERY.

By RICHARD ALFORD, M.R.C.S.

CASE. On the 16th of June, 1852, W. B., a carpenter, aged 61, knelt accidentally on a nail when about to clinch the nails of a door. The puncture was three-fourths of an inch deep, just below the right patella; but gave him very little inconvenience at the time. He continued his work until the 19th; and on this evening walked eleven miles. His wife now fomented and poulticed the knee, which had become inflamed and painful; and on the 21st, medical advice was procured and leeches, etc., applied.

I first saw him on June 25th, and found an abscess over the ligamentum patellæ; and, on lancing it, about half a teacupful of tolerably healthy pus escaped. Outside the knee and thigh gangrene had commenced, and extended upwards to about the length of the hand; and the outside of the thigh was red and swelled up to the hip: the inside of the thigh and the leg below the knee were not affected. My patient's general appearance was by no means good; his powers seemed sinking, and altogether the case was unpromising. I ordered him to have as much port wine as he could take, with light nourishment, beef-tea, eggs, etc.; and a mixture of quina, opium, and dilute sulphuric acid, with an occasional alterative aperient pill. A lotion of chlorinated soda was applied to the gangrenous part, and covered with linseed meal and barm poultice. A poultice was also applied over the abscess; and six leeches to the upper and outside of the thigh. For the next day, a cooling lotion of acetate of lead to this part was prescribed.

July 1st. The mortification was creeping up the thigh, and redness was extending across the loins. The case appeared hopeless; the patient was extremely prostrated, and took a bottle of wine daily, but very little else.

July 12th. To my great surprise, my patient kept up, and threw off the dead parts. Sphacelus had extended to the crest of the ilium; a spot of the size of a crown piece had turned black opposite the sacrum, and redness and swelling extended up to the false ribs. He had a pint of port wine and a quart of porter daily, and continued his mixture.

July 16th. I procured a horse-shoe water cushion* for him, from which he experienced great comfort. The ulcer outside the thigh extended from the head of the fibula to rather beyond the crest of the ilium, and was two feet long and eight inches wide at the top, its widest point, the average width being about six inches. Mortification had penetrated deeply in the fleshy part of the thigh at some points.

Aug. 6th. The poultice was omitted, and the lotion of chlorinated soda was continued, and covered with gutta percha sheeting. The dead parts had all come away; the back was sound, and the general health vastly improved. The abscess over the ligamentum patellæ still discharged, and another had formed and burst over the upper end of the fibula, a little below the ulcer. The leg was somewhat swollen, but the inside of the thigh was quite healthy.

Aug. 17th. Water dressing had been used a few days; the granulations were flabby, large, and disposed to bleed; the discharge was very profuse. Lotion of sulphate of zinc was now used, at first weak, but gradually increased in strength, and nitrate of silver was occasionally applied to the edges of the ulcer. From this time the healing process rapidly went on, and his general health improved.

Sept. 4th. The stimulants had been gradually decreased, and were now altogether omitted. A mild saline was ordered to be taken occasionally to relieve head symptoms, resulting doubtless from the decrease of the discharge, and consequent overflow of blood.

* Report on the present state of certain parts of the Metropolis, and on the Model Lodging-Houses of London. By H. D. Grainger, Esq. Ordered to be printed by the House of Commons, 1851.

* No. 6 of Mr. Hooper's cushions.