LECTURE ON NATIONAL HEALTH.

DELIVERED AT
The Royal College of Physicians of England.

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II.—HOW THE FOUNDATIONS ARE SAPPED.*

SUCH being the general conception of the foundations of national health, it would at first seem to be an easy task to describe the causes which may sap them. It would be easy if we were dealing with a social *tabula rasa*. In an old country, however, growing with unprecedented rapidity on a limited area, the questions involved touch every point of political economy. Theories concerning population, religion, liberty, existing privileges, and natural rights, are to be met, accepted, or denied, at every point. Ignorance and prejudice have to be dealt with among honest persons; self-interest with the unpatriotic. The haste to be rich among the unwise, the intolerance among the cultivated of opinions counted narrow, and inadequate appreciation of the extent to which our world lies under law (binding even the seeming free agency of man), all check the progress of popular knowledge as to the foundation of national health. Take the single illustration of the effect of mills on streams. How long, after the effect of damp subsoil in injuring the health of the people has been proved, is it just to a population that one man should keep up mill-dams to such a height as to swell his profits by some small percentage, and destroy his neighbour's health, when other arrangements might, with little loss to him, at once abate the evil? It is an instance of a thousand. The mill-owner, it is true, would have claim to compensation for his prior rights, earlier occupancy, and interests hitherto permitted, nay, protected, by law. But the human race and every civilised community are essentially progressive; and no society ought to shrink from dealing with rights which have produced consequences essentially different from anything that could have been contemplated when they were allowed to grow up. One main duty of the present age of the world, and in this country urgent, is to strive to prepare for coming generations.

The foundations of the national health may be sapped in so many ways, that the catalogue is as long as it is dismal. Bad air, bad food, bad clothing, deficient fuel, too long hours at work, intemperance, all excesses, excessive exercise, excessive study, fanaticism, gluttony, idleness, late hours, intermarriage among unfit persons, depressing passions (as gambling, whether in hells or on the Stock Market), overcrowding and bad lodgings, bad dwellings or dwellings on unfit sites, all engender disease and deteriorate the race. They produce struma, rickets, gout, hypochondriasis, and many other diseases, with consequent loss of power, imperfect work, moroseness, and misery to others besides those affected, in an ever expanding circle.

Again, bad water produces not only actual *fatal* disease in individuals, but, short of that, as was stated at length and with much acuteness long since by Hippocrates (in his treatise on *Air, Water, and Places*), engenders continuous feeble health, when acting either with or without the other causes above-named. These various mischief-bringing elements in the "pangenetic" structure of society may act either on a single person or on the masses. Some act on the poor, some on the rich, some equally on both. Time forbids me to analyse or extend the list, and show the precise way in which each member of the ghastly catalogue acts on the human constitution. I will only add one instance formerly quoted by me elsewhere. A girl, having been seduced, entered a workhouse. A female child was born. She was brought up in the union, and was there at school till nearly of age. She went out, straightway became first a prostitute, then syphilitic; returned to the workhouse, and brought forth a syphilitic infant, to be reared, like her mother, with difficulty. There she lives in misery, and may perhaps repeat the dismal tragedy of her grandparent and of her parent, at the cost of the nation.

But are we sure that the needless waste of the higher kind of life is not in other ways as reckless and as pitiful? I do not speak of death

by war or by avoidable accidents, of mad races against time by sea, or of wholly unnecessary speed by rail, though these imply mischievous wear and tear to individuals and to classes of men; but I allude to useless wear and tear of health imposed on public men, and the waste thereby of power valuable to the nation.

For instance, the House of Commons contains within it the picked executive of a free people, who have deliberately selected them from the whole nation for the decision of the greatest problems of the national life. Yet custom will allow that Ministers thus carefully selected for their special aptitude to do the finest work, are often occupied more than half the night on formal and unimportant discussions. Thus the real work of their office is done under unnecessary pressure, such as none but the most robust can bear, and their health fails perhaps at the moment of their highest administrative perfection.

Again—the buildings which public men occupy are often far less calculated for maintaining health than they might be; and, trifling as may seem the remark, it is to be doubted if they can always obtain with readiness food suited to the necessity of exhausted nerve-power. There can be no doubt that actual illnesses are often brought on from these two avoidable causes.

We cannot, however, now consider all the ways in which the habits or pressure of civilised life needlessly tend to waste the force, and crush the physical elasticity of the people. Instances of various kinds will occur to every mind. Let these, from the extremes of the social scale, suffice for illustration. Rather let us here seek, if means of prevention may be found such as will pervade the whole framework of the national life.

III.—HOW THE FOUNDATIONS ARE STRENGTHENED.

If the foundations of national health be of the kind we have stated, and the causes which may sap them so general, so diverse, and so engrained in the nature of things, then the principles which have to guide mankind in maintaining the physical stability of nations cannot be less fundamental and extensive. Now, we must not conceal from ourselves the fact that, if we except some eastern and some barbarian races, the whole history of mankind tells of two conditions—progress and decay. National hibernation is, in a low state of national life, perhaps possible; but the awakening is generally by the rude shock of a destroyer, who lives on the ashes of a race which he came professing to revive. In four short years, a whole tribe of North American Indians has died out under the advance of civilisation. There is nothing in history more solemn than this flowing and ebbing of nations. It were blindness not to see that civilised people, in the surging to and fro of modern material life, are bursting the barriers of all former experience. So entirely are the telegraph and facile transport modifying opinions, equalising the knowledge of distant states, and welding it into one world-wide public opinion, that the problems presented to the modern statesman are almost as new as when Roman law was being consolidated.

History would seem to teach that, as long as love of conquest follows possession of power, and as long as the human frame consists of an intricate combination of tender organic tissue, so long physical changes may be expected from violent political movement; and waves of disease, whether cholera, syphilis, small-pox, black death, fever, or the diseases that follow famine, may sweep over the denser masses of mankind. One can neither contemplate without admiration the order of great modern cities, nor look without anxiety on their danger. How instructive—materially, morally, intellectually—is now the great drama of Western Europe, in which almost every virtue and every crime has been flashed before our eyes, as though to show how unstable still is the fabric of society.

There are four classes of persons who have the physical conditions of the nation more or less in their power: first, the lawgivers; second, the physicians; third, the ministers of religion and teachers; fourth, the people.

The lawgivers in a free country are almost limited to legalising public opinion, but may promote a wide or a narrow conception of the State, according to the type of their own convictions. The physicians are the guardians of public health, bound as much to prevent as to cure disease. The ministers of religion and teachers are the instructors of the people, either knowing or not knowing what conduces to national health. The masses of the people modify their own conditions by good or bad habits, physical, moral, and intellectual.

It is certainly not too much to say that, before the present century, public opinion—as depending upon people, ministers of religion and teachers, physicians and lawgivers—was, as far as regards the public health, entirely below the necessities of mankind. This is at once proved by the alterations which we now know may be made to take place in the death-rate of armies and of towns by proper sanitary regulations, or the neglect of them. The question suggests itself—How the

* Concluded from page 608 of last number.

public opinion on this matter is to be raised to the best attainable standard? The modern answer is, By Education.

But education itself must have a definite aim, and be based on an intelligent conception of the end to be attained, and the means of attaining it, whether they be physical, moral, intellectual. One cannot contemplate without astonishment the spectacle of the three hundred millions of Chinese—a third of the human race—who have cohered, almost unaltered for some thousands of years, with the stability of the crystal, without the growth of a living organisation. Compulsory education of a low kind seems to have effected this.* Education by a stereotyped method, necessarily produces similar results in successive generations. In this western world we have seen feudal rule gradually giving way to self-regulation by the people; obedience to self-government; empiricism to positive science; and hypothesis to knowledge of facts. Some would say, superstition is being replaced by reason, emotion and instinct by intellect, moral self-discipline by scientific knowledge. Be this as it may, the conviction is gaining every day more strength, that, however true it may be that, as has been advanced above, the mind has influence over the body, it is as true that national health cannot be fully secured without strict attention to the material conditions in which the people are placed. This consideration has of late years occupied the attention of our statesman. Regulations affecting trades, workshops, mines, shipping, dwelling-houses, have within twenty-five years reached such dimensions as to have a literature of their own. We have not, therefore, so much to discuss the necessity of this attention, as the principles on which, in immensely widening circumstances, it should be directed into practical results. Those principles mainly rest on the following considerations:—

That no individual should for his own profit poison his neighbour;

That the State must, in certain things essential for health, assist the masses in what they cannot assist themselves;

That the cost of permanent sanitary improvements should be borne in some reasonable proportion by posterity;

That compulsion of the ignorant in sanitary matters, when their ignorance injures society, is justifiable;

That compulsion will, we hope, be unnecessary when scientific education is adequately extended;

That good conduct, based either on knowledge or on obedience, is as essential to health, as is any physical arrangement which is not an actual necessary of life;

That in the present state of the world, mischief-bringing ignorance in sanitary questions is especially inexcusable in the law-making classes;

That local government by the people, well informed by a central authority, is essential to the physical education of the nation.

For the practical working out of these principles, legislators have to devise education worthy the name. Education depends on very complex questions, affecting the whole nature of man and the very structure of society. It is now thoroughly understood that the emotions, the will, and the mere action of the reason, affect not only individual organs, but the whole frame and the general health. Not only may individuals, if ill-educated, become virtually of unsound mind, but so may whole masses of people.

There is a "glory in the determined will" which produces vigorous bodily as well as vigorous mental action. You see it in the contour of the man. A perfectly trained nation, morally, intellectually, and physically, will act in its sphere as an individual so trained. It will respect and be respected.

We have seen in the dancing mania of the fourteenth century the extent to which, in a superstitious age, masses may be moved to emotional madness. Is it certain that, unconsciously to themselves, there may not sweep over nations equally contagious intellectual errors depending upon faulty morality? It is mainly a question for the psychologist and statesman, but it is also a question for the thinker on public health—what manner of life in the several classes of men and women, what labour, what recreation, what personal habit of body, conduces most to that tone of the nervous system, which puts the nerve-power of each man at the best for the discharge of his duty as a citizen. The worn-out man, the speculator, the vicious man, and, still more, masses of such men, become, from physical causes, intellectually and morally unfit to form a sound public opinion.

Now, a people is educationally affected by indirect, nearly as much as by direct means. Take a single and minor instance—the indirect educational effect of music on the children of a rural district. Music, like other things, is of two kinds—bad and good. It may be a source of foulness, disorder, degradation, impiety—even the Christmas carol—

may lead to the public-house, to folly, and to drunkenness; or it may, in Wordsworth's words, though rude in its kind, be

"A true revival of the light
Which nature and these rustic powers
In simple childhood, spread through ours."

We know how, through ballads and songs such as the "Wacht am Rhein", vigour is thrown into the hearts of a nation. So, also, pure and good music is a sure and powerful instrument for refinement when superadded to other intellectual attainment. In one aspect it is purely sensuous, and may, as with some refined Tyrolean singer, be pursued as a dexterous art or accomplishment. But even as art it may not be undervalued. It excites feelings of the warmest sympathy and admiration to hear the attained results of Leslie's Choir, or such societies as now exist in many of our towns, where persons of every class and occupation show an advanced mastery and appreciation of the choice works of Handel, Mozart, Beethoven, Mendelssohn, and acquire a pure culture unalloyed by eating or drinking, or other frivolous ways; culture, moreover, not of a light kind, but one which ensures the development of certain mental qualities of accuracy, attention, precision, and refinement, which may be equalled but not surpassed by the exercise of other of our faculties.

The right care of the body is, therefore, such a management of the instrument by whose agency mental actions are alone possible here, as that the body shall obey the inner spirit in its higher impulses. To this all philosophy tends, whether expressed by the conceptions of the "Republic" of Plato, the "Utopia" of More, or the "Atlantis" of Bacon. For this, the Apostle of the Gentiles taught the duty of "keeping the body in subjection"; this was the aim of the mistaken self-tortures of the astonishing Ascetics of Alexandria; of the yearnings of Comte, the manly teaching of the great English Physiological Text-Book; of the labour of all labourers for public health, of Chadwick, of Southwood Smith, Shaftesbury, Farr, Rumsey, both the Trevellyans, Mathew. These all seek, in bettering the conditions of the body, to give free play to the divine element that is in the mind of men. We must not let ourselves be diverted from our great practical aim by the fascination of philosophic inquiry into the causes of things. What is the past history of man as compared with the well-doing of the present, for the sake, not of ourselves alone, but of those that are yet to come? What avail to us the virtues of feudal days, if we neglect to cultivate their virtues in our own? Were the Crusades, indeed, a worthier end for man than the redeeming from destruction the bodies and the souls of the struggling millions of Ireland or London? Was there ever a nobler task for the energy of noble or prince than the harmonising relief by law with willing relief from the charitable heart? * than discussions on the terrible question now before the nation, whether it is best for the moral and physical health of the people that the law of Elizabeth should continue, though it annually cost nearly seven millions annually to maintain it; or whether it is best, with Chalmers, to throw on the voluntary alms of the rich the care of the poor? Do we concede the moral obligation of maintenance assumed by Elizabeth, and refuse to carry it into effect by law? or shall we divide the healthy from the sick, and grant to the sick what we withhold from the sound? If so, do we reasonably protect the sound from becoming sick, when we leave them unaided in matters in which they cannot aid themselves?

Or, again: Germany, and now England, have practically decided that their millions ought to be compulsorily educated—i.e., that their minds shall be disciplined. Have they yet concluded that, on the same broad principle, the body shall be cared for in all essentials for health, so as to give to the school a reasonable chance of doing its work? Take the case of the three essentials of life—Food, Air, Water (clothing, habitations, fuel, and work, being minor necessities, depending chiefly on the exigencies of climate, may be omitted). Is there yet a country which systematically punishes a man for wilfully or negligently poisoning another's food, air, and water, as well as for stealing his brushwood, turnips, or wild fowl? But all old countries are being forced again to consider what are the elementary conditions of life, and are revising from various points the methods of adjusting them to the necessities of complicated civilisation; drawing lessons from all past experience, from the village communities of India to the land tenures of Scandinavia (see *Village Communities in the East and the West*, by Henry Sumner

* There is no stranger chapter in statecraft than the history and practice of the competitive examinations in China. Sir Bartle Frere was so kind as to direct me to a photographic account of this in *Social Life of the Chinese*, by Justus Doolittle, vol. ii. New York; 1865.

* Almost all the practical thinkers in this country seem to look at the relation of relief, whether legal or voluntary, to labour, as a most urgent question. Notwithstanding the wise labours of Lord Derby, Sir Charles Trevelyan, Mr. G. M. Hicks, with a host of coadjutors, we must despair of any permanent work in this direction, until the Ministry of Health and Relief has been established, as the pivot for combined operation. Sir Charles Trevelyan truly writes:—"I am convinced more strongly than ever that there is no single specific for London pauperism, and that if our metropolitan population is ever to be restored to an industrious, provident, independent character, it must be by a whole cycle of measures directed against all the influences which have reduced it to its present state." This remark equally applies to national health.

Maine, 1871), and applying them to the new and yet undeveloped conditions in which we find ourselves placed.

So, when we come to consider what is to be reasonably required of the Legislature under the circumstances which have been now stated, it would seem as though we had to describe what should be the whole internal economy of the State.

There is scarce a department of the State which is not connected with the public health. Wherever there is army or marine, school or factory, workshop or prison; wherever a town, a village, or a hospital—there the State has to decide in what particulars the employer or the worker under him, the landlord or the tenant, the owner or the occupier, the vendor or the purchaser, the manufacturer or the consumer, shall lose his free agency, and be forced to subject his will to that of the majority in the State. Legislation has been steadily progressive, though the progress in this country has been made under needless difficulty, and at unjustifiable expense. Local acts for every conceivable purpose, voluntary associations for innumerable ends, have, after much agitation and labour, obtained remedies for evils, some of which ought not to have existed at all; some which, existing lawfully, ought, on due compensation, to be abated. The authorities who should abate them are numerous, and often conflicting.

Much time was lost in the period from Howard to Shaftesbury, and from Pringle to Sidney Herbert. The laws, the arts, and the sciences on which the preservation of health depend, are growing up under the eyes of the present generation. If we are living on the verge of an epoch of great social difficulty, we are also living at a moment when there was never so great knowledge, never so bright a light, and never more patient desire in every class to set aside injustice, and discover the means by which opportunity may be given to the capable and industrious, help to the weak, and knowledge to the ignorant. Whoever has had experience of the public work of the country, must know that the offices of our Government, concerned in these questions, have the hearty services of men whose labours and characters should be no less our admiration than our example. To omit to say this much would be unworthy and ungrateful; to name the persons would not become me. What, then, remains to be done? Two things, and two only: First, to continue to interest, intelligently, the mass of the people in sanitary progress, and to interest them more systematically: Second, to establish such a health department in the metropolis, as shall with certainty appreciate the growing wants of the people, as shall bring in Bills to meet their wants, and shall disseminate information and advice without stint to every part of the country.

England must rule herself in this as in all other matters. The time is gone when people can be dragged into cleanliness and virtue. We hear that the middle class of England is inefficient, the guardians of the poor bad, and the working classes ignorant. If so, still they are the people; they and their children pay the penalty of disease and of vice. Show them, truly and without exaggeration, the source of avoidable disease and of destructive vice—they will abate it. Bring the knowledge to their doors—they have the heart and will; give the power by enactment, and the work is done.

Jeremy Bentham saw clearly the necessity of a Health Minister. The "talents specially required of him and his various subordinates" were to be—Medical Art and Science in all its branches; Chemical Art and Science, all its branches; Mechanical Art and Science, various branches; Natural History, most of its branches; Geography, in so far as regards climate and temperature, of countries which members of the community may have occasion to visit, either for war or trade (*Jeremy Bentham's Works*, by Bowring, vol. ix, p. 273).

To him were to belong (*Ibid.*, p. 443) all duties with respect to the medical functionaries serving under the *Indigence Relief Minister*; to the regulation of hospitals, lazarettos, and public laboratories; the medical inspection of prisons, madhouses, edifices belonging to the service of the Indigence Minister, and the Education Minister; of all "shops and storehouses, in which drugs designed to be employed for medical purposes are kept for sale, or otherwise for distribution; more particularly with reference to the precautionary arrangements directed to be observed by the *Preventive Minister* relating to the sale of poisons"; so, also, as to the contents of all shops for surgical purposes, and "all medicines and drugs designed to be employed for medical purposes", and to be conveyed to the army service, navy service, or the Indigence Relief Hospital Service.

He was also to see to the water-supply of towns, and to have "consideration of their extent and the density of their population", including the "quantity, quality, and proportionality of distribution." He was to have under review all such "situations as are liable to harbour or give rise to exhalations detrimental to health", such as "lands which, to whatsoever proprietors belonging, are habitually or occasionally covered with stagnant water"; mines, considered in respect of such

dangerous gases as they are liable to contain; common sewers and drains; theatres, and other similarly crowded places of entertainment, and places of interment; manufacturing establishments, as far as regards health. He will superintend the bills of mortality. He will report on mortality and diseases in the hospitals and establishments under the management of the army, navy, preventive service, indigence relief, and education ministers. Also, he will elicit and record "from the several different places, registers of the weather, in so far as habitually framed and preserved in the record establishments above-mentioned; also, from any other public sources from whence they may conveniently be procured, and from private sources, so far as procurable from those sources, with the free consent of the individuals interested." He is also to have "instructional" museums for showing the registrars' reports above referred to, and other objects. Moreover, the Health Minister is to be responsible for all examinations of aspirants "to those offices, the functions of which are exercises of the art of medicine in any of its several branches, and to whatsoever subject applied." To him "it will especially belong to be upon the watch against all injury to the health of the community, by the operation of particular interests in the breasts of medical practitioners at the expense of public interest; and, as occasion calls, to make report accordingly." To the result of the exercise of these functions, he is to give the utmost publicity that can be given consistently with a due regard to public economy and the feelings of persons subject to the exercise of his functions.

Since Bentham's time, the arrangements for the relief of the poor have become far more complete. A fashion now prevails among irresponsible persons of attacking this department of the State. The officials are hard, the laws are inefficient; or, on the other side, the officials are lax, and the laws breed pauperism. Instances are produced on each side. The fact is, the circumstance that every person in England is safe from starvation, is a safety-valve in the working of a machine under high pressure; and the ubiquity of the staff of the Poor-law, acquainted with every lodging of the poorest, gives in the present day an organisation which is unequalled. Time would fail, nor is it needful, to state in detail the value of this machinery, if we are in earnest to secure prevention, as well as cure, of disease. Invest the guardians of rural districts with adequate power, give them the requisite knowledge, appoint persons to the office with special qualifications, and trust them, on behalf of the people, to do all that can be done for maintaining the national health in their district. Keep the medical officers informed of all established knowledge bearing on health-functions; give them, in the eyes of their fellow-men, an honourable office; and a scientific and trained staff is at once to your hand in every corner of the nation. The arrangements for the great centres of population must be different. Special officers, still in connexion with the relief staff, must be retained, and relieved of all curative functions. Their number, and the conditions of their appointment, will vary with the wants of their district. They will be centres of all existing knowledge of preventive measures, and a means thereby of maintaining an interest in sound progressive scientific knowledge. They will, in this department, be as the parochial clergy of the middle ages, who were the local centres of the knowledge and culture of their day. In a Memorandum contained in the second volume of the Report of the Royal Sanitary Commission, which I cannot name without recording the debt which is due to the energy, skill, and patience of Sir Charles Adderley, its Chairman, is contained a sketch of the possible functions of such medical officers. They may seem to some excessive, and what once were called impractical; but it is not hard to foresee the value of them, and what pleasure the discharge of them would bring to the neighbourhood, as well as to a medical man of culture in rural districts. He also would know that his public work was appreciated, and, that being part of a great national system, it would never be wasted. It is non-appreciation and sense of wasted effort, as well as want of guidance, which has made many a youth entering life discard the culture and aspirations of his student days, and let down his tastes, and sometimes his habits, to the level of the most uncultivated of his neighbours. In considering the bearings of this subject, the medical profession has to remember, that however indebted the world has been in past time to it for a large portion of its physical science, the day of exclusive possession by any class of the Ark of natural knowledge is gone by. The medical practitioner will often find, and every year more and more, a worthy match in biology among the laymen and ministers of his district. These will be his coadjutors or his critics, just as his own attainments and habits may decide. The modern student of medicine has little to dread from the competition.

I would refer to the report of the Sanitary Commission for details as to the medical officers of health, and their official coadjutors, as well for discussions concerning the area over which they should act. The good working of the *local authorities* does not depend entirely upon their constitution. Bentham evidently relied on the *central authority* for

regulating and instructing the local executive. The Bill introduced by Mr. Goschen arrived at the same result. By Part VI and a few clauses in Part VIII of that Bill, the central authority was to consist of a Minister, who should preside over the public health, relief of the poor, and all local government connected therewith. The subjects now distributed through various offices, would be united under the direction of this Minister. It is a misfortune that, in consequence of being linked with the complex and difficult cognate question of incidence of local taxation, the clauses which would have made the strong central health-office were withdrawn with the fiscal portions. They were not necessarily connected. The executive, indeed, once remodelled, would have fresh powers to adjust further detail. It would be wholly premature, if it were becoming, here to inquire into the detailed construction of the office of the Health Minister. Suffice it that, when that portion of the Bill has passed, the prevention of disease and the promotion of national health will take equal rank with the first preservative functions of the State, and everything else connected with the office and its executive will fall into place.

The office will start with a staff connected with every spot in the country. The kind of complementary aid, and the extent of aid which the office may require, will be quickly discovered, and all that is valuable in the functions described in Bentham's crabbed system will be performed. In connection with these functions it may not be out of place to quote from the memorandum of the Sanitary Commission the following details.

Under the minister there would be subdepartments for—

"a. Law of local government; b. Engineering; c. Registration and statistics; d. Relief of poor; e. Medical care of public health and poor; f. Legislation bearing on the profession of medicine.

"111. A body of inspectors attached to the Health Office. These are to be of two kinds, as at present, with a third body of consulting experts. 1st. General inspectors attached to, and generally residing in the 'registration divisions', 'Poor-law districts', or (as they will also be) 'public health areas'; 2nd. Special inspectors; viz., legal, engineering, scientific, and medical; 3rd. Special experts, whose names should be attached to the office, and who should advise professionally on special points for special fees, such persons to be appointed for five years and re-eligible; 4th. Then will be required local clerks of unions, and of town councils, local surveyors under local boards and unions, local public health (medical) officers of local boards, unions, parishes, subordinate executive officers.

"No office now existing need be destroyed. Some will be amplified. A few more clerks will be required at the central office, and an arrangement made for obtaining special advice when needed, in aid of the permanent staff of the office, and of the inspectors.

"The advantages are many. Not only will the plan be efficient and complete, but it will be economical. The work of the local government, law, and engineering departments, of the Registrar-General, of the Poor-law Board, of the medical adviser of the Privy Council, will be harmonised, and will never be chargeable either with unnecessary repetitions or with omission, as at present. So also, neither money nor skill will be wasted.

"All reports bearing on public health will be connected one with the other, mutually illustrating each other. They will cover the whole ground of the science of prevention of disease, which has become both so important and serious for the well-being of old and densely peopled countries. The connection of the office of the Minister of Health with the medical profession, 4000 members of which would be in direct relation to him, would in itself be beneficial to the whole country. It would disseminate established scientific knowledge uniformly through the country districts, affecting not the medical man only, but the clergy and the schools, doing in that way alone as much at least as direct legislation for the same purpose could do. It would bring to light in every corner all that could be advanced as bearing on the physical condition of the masses of the people, while all crude theories or impracticable plans would instantly fade before the experience of the central office.

"The publications of the statistical department would exhibit what could be shown of the progress of sickness. They might give also useful deductions from local meteorological and scientific observations, in connection with those of Kew, the Government Meteorological Office, the Meteorological Society of Scotland, and such private enterprises as those of Mr. George Symonds on rainfall. They would furnish data for sanitary maps, which can only be of any worth when carefully constructed on rigorous local knowledge; and they would in time get rid of the fallacious application of conclusions deduced from averages, and erroneously applied to particular places or instances. In this way the real causes of variation in death-rate would be more surely ascertained than at present.

"Great encouragement should be given to the local public health officers to send in any observations which would promote the progress of accurate knowledge.

"The British public health reports thus constructed, printed in an uniform 8vo. form, stitched in five parts (legal, statistical, engineering, medical—including medico-legal—and general papers of inspectors), would be a series of great value. The central office should immediately on the first issue of the collected series make arrangement for regular interchange with all foreign countries of similar reports, according to the established usages of academies. These documents should be accessible for reference in the public health library of the minister, to all persons connected with the department.

"Public health laboratories should be maintained or aided by grants from time to time. In them not only points bearing on the general pathology of man and animals, would be from time to time investigated under the best guidance, but persons would be trained to be thoroughly qualified in all medico-legal questions. Hereby some of the scandal of *ex parte* scientific witnesses might be checked or removed. Such laboratories should be aided or maintained as well in the metropolis as in some of the great towns where scientific institutions and medical schools exist; e.g., Oxford, Cambridge, Birmingham, Leeds, Newcastle, Bristol. These centres are conveniently situated for various sections of the kingdom. From the state-aided laboratories the inspectors would obtain analyses of waters, or, in disputed cases, of any substances requiring examination."

The following passage also demands special consideration.

"In giving a judgment on the question of State organisation relative to public health, much of the general tenor of modern legislation with respect to our internal economy should be present to the mind. It must, therefore, be remembered that those who will be responsible for local sanitary administration will have collectively, if not individually, to administer Acts bearing on the following subjects:

"10. 1. Plans bearing on sanitary engineering or on local government; i.e., drainage, sewerage, water-supply, baths and washhouses, nuisances, offensive trades, smoke, public places of recreation, streets and roads, buildings, cellars, and lodgings, burial-grounds, mortuaries, appointments of officers, artisans' dwellings, labourers' dwellings.

"2. Care of personal health and safety; i.e., health in factories and workshops, mines, bakehouses, dangerous occupations.

"3. Regulations of quality of food; i.e., adulterations, markets, diseased cattle, slaughter-houses.

"4. Medical; i.e., prevention of disease, epidemics, endemics, syphilitic disease, small-pox (vaccination), quarantine, lunacy, hospitals, whether, first, rate-supported, such as workhouse-hospitals, or hospitals under local boards; or secondly, voluntary, whether general or special; endowed or subscriptional, county or small village hospitals, or hospitals for the insane, and prisons, sale and adulteration of drugs, poisons, supervision of reports of officers of health.

"5. To which must be added medico-legal arbitrations."

An important step has been recently taken by Dr. Stokes, the Regius Professor of Medicine in Dublin, and his colleagues. They have instituted an examination with the view of granting a diploma in the subjects bearing on national health, or, as it is sometimes called, State Medicine. This examination, of which full particulars are given at the end of the present essay, will comprise certain parts of law, engineering, pathology, vital and sanitary statistics, chemistry, meteorology, and medical jurisprudence. That such opportunity of systematically learning what is essential to the maintenance of the national health should be now given by Trinity College, Dublin, does great honour to that enlightened body. It is to be hoped that, ere long, a learned compendium of the required knowledge will issue from the Irish press. Any one who has studied this subject knows that in consequence of the labours of Parkes(a), Simon(b), Farr(c), Seaton(d), Glen(e), Rumsey(f), Rawlinson(g), Stewart(h), Tom Taylor(i), A. S. Taylor(j), Christison, Miss Nightingale(k), the London, Liverpool, and Glasgow medical

a Parkes, E. A., "A Manual of Practical Hygiene, prepared especially for use in the Medical Service of the Army." 3rd edit. (London, 1869.)

b Simon, J., "Reports of the Medical Officer of the Privy Council. 1858-70."

c Farr, W., "Yearly Reports" in Registrar-General's Reports.

d Seaton, E. C., "A Handbook of Vaccination." (London, 1868.)

e Glen, W. C., "The Law Relating to the Public Health and Local Government in Relation to Sanitary and other Matters." 5th edit. (London, 1869.)

f Rumsey, H. W., "On State Medicine in Great Britain and Ireland." (London, 1867.)

g Rawlinson, R., Various Government Reports.

h Stewart, Dr. A. P., and E. Jenkins. "The Medical and Legal Aspects of Sanitary Reform."

i Taylor, Tom, Various Government Reports.

j Taylor, A. S., "Principles and Practice of Medical Jurisprudence." (London, 1865.)

k Nightingale, Florence, various Sanitary Works, especially India.

officers of health, and in other countries, Quetelet(*l*), Pettenkofer(*m*), Michel Lévy(*n*), Hammond(*o*), Bowditch and Derby(*p*), and other persons, there has been amassed so much valuable matter, that the time is come when selection and abridgment are indispensable for the guidance of the student.

I must apologise for the length to which these simple thoughts have led me. They are uttered now because the time is certainly come when we must all endeavour, in our yearnings for the material improvement of our people, thoroughly to comprehend the fundamental and combined laws of physiological and social science on which our nature rests. Their complexity depends chiefly on the mutual action or reaction of matter and of mind in individuals, together with some superadded perturbation of civilised life, from which the savage is exempt. (See Ruggles, *op. cit.*, Letter I). The laws of our material nature are as absolute as those of the unreasoning brutes. But, in some particulars, they are entirely subject to our will, which is not the case with any other creatures. It cannot be said, indeed, of the past life of the human race,—

"Old age and experience, hand in hand,
Lead it to death, and make it understand,
After a season so painful and so long,
That all our life we have been in the wrong."

but this nevertheless is true, that historical and political experience, combined with the intercommunication of ideas by telegraph, and of persons by steam, is changing the conception, the conditions, and future of humanity, whether for good or for evil, with wholly unprecedented rapidity; and this is so, not in one country, but surely and steadily through the whole world. It is quite certain that education, acting with political causes, will modify the structure of old countries. It is quite certain that education, if possible without due attention to the material conditions of the people, will add mental suffering to physical. The modifications in the material state of man will be happily effected, in proportion as they coincide with the laws of the universe, or run athwart them. Every attempted rebellion against their spiritual or material conditions will necessarily end in certain and deep disaster to the rebellious race. Our sanitary regulations must be based on a right comprehension of these laws; on a conviction that material advantages, though essential for man, are not all; that material comforts will not remedy the results of immorality; and that, widely devised sanitary arrangements, the attainment of which, even by compulsion, has not yet been achieved, would in all probability be spontaneously carried out by an educated, free, and God-fearing people.

RECOLLECTIONS OF THE MEDICAL SCHOOL OF BERLIN.

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III.

THE necropsies of all cases which die in the Charité are conducted at the Pathological Institution either by Virchow or by one of his two assistants. If the case have been one of more than ordinary interest, the physician or surgeon under whose care it has been is usually present with his class to see the diagnosis confirmed, or the reverse. The examination is made with a view to the greatest accuracy and in a most methodical way; the different organs being investigated in the same rotation in every instance, and their appearances dictated to a junior assistant and noted down by him in a book kept for the purpose. Those viscera or other parts which demand a microscopical examination are laid aside. Once a week Virchow performs a necropsy, for the purpose of demonstrating his mode of making these all-important examinations, and on these occasions it is indeed a sight well worth seeing. The elegance with which Virchow makes a *post mortem* examination is not excelled by any other operative proceeding with which the writer is acquainted. His clearness in bringing out all the important points, his accuracy of language and powers of description, mingled with gleams of brilliant wit and sarcasm, all tend to make the *séance* most charming and instructive. Virchow delivers three courses. One of these is

very celebrated, and is popularly known as the "Railway Course". It is that one to which the professor himself gives most attention, and which, for this and other reasons, is the most profitable to foreigners. Here all the interesting preparations which have been obtained in the *post mortem* room are brought under the more special notice of the student. The room in which the lectures are held is provided with a fixed table about two feet in width, running in a zigzag direction from one end of it to the other; on this a miniature railway is laid down for the conveyance of microscopes on little trucks from one part of the class to another. (I believe a somewhat similar arrangement to this exists at St. Bartholomew's Hospital). Virchow describes in their turn the microscopical appearances of the various diseased organs which may be on the table, and then sends round microscopical preparations for observation. The lecture, which lasts two hours, is listened to with breathless attention, and at its conclusion the lecturer is besieged by a number of his listeners, who desire to have certain points cleared up. To these the professor gives willing answers, provided only the inquiries be pertinent. There is no one more approachable than Virchow, and he has a wonderful power of divining what the difficulty experienced is, although the student himself may often find it not easy to convey what it is that he wants. At the second course the student chooses whatever specimen he wishes from those on the table; and, when he has made a microscopical section of it, and investigated it to the best of his ability, the professor comes round to him in turn and demonstrates any points concerning the object about which he may have doubts. With such a tutor this is a most profitable exercise, and it is only to be regretted that Virchow does not attend to it with more regularity. The third course is also very interesting, being usually devoted to the pathology of some one or two organs, which receive a thorough sifting from the professor.

As a member of Parliament, much of Virchow's time, during those years which I spent in Berlin, was occupied with politics; and often did he appear late in the lecture-room, with the excuse that he had just been delivering a speech in the house (for there they have only morning sittings) in defence of some fresh liberal principle. Besides being in the house, Virchow is a town councillor, and takes an active part in the hygienic arrangements of Berlin. He is also an accomplished archaeologist, and spends his vacations in investigating those ancient remains with which North Germany abounds. There is some hope that medical science will now have the benefit of more of his time than has of late years been the case, as, in consequence of the ascendancy which Bismarck and his party have gained through the late war, Virchow is said to have declared that he will retire from political life, seeing no hope for the Liberal cause in Prussia for years to come. We may then look forward to the completion of that wonderful book on tumours, and to the issuing of a new edition of his *Cellular Pathology*, which is much wanted and which has long been promised.

The pathological laboratory is intended for those who wish to attain a practical knowledge of microscopical pathology, or to make original investigations. Microscopes, reagents, etc., are supplied, and a place in the laboratory is allotted to each student, for which no charge is made. The opportunity is here given of still further pursuing the investigation of those specimens which have been first seen in the *post mortem* room, and then lectured upon by Virchow. Virchow himself and his assistants are ready to give any reasonable amount of aid to those studying in the laboratory, although as no fee is charged discretion on the part of the student in this respect is necessary. In each session the senior assistant delivers several courses, of six weeks' duration each, on microscopical histology, with practical demonstrations.

The laboratory for physiological chemistry is under the direction of Professor Virchow's special assistant for this purpose, the post being at present filled by Dr. Oscar Liebreich, whose name has been made famous by the discovery of chloral. Dr. Liebreich is most assiduous in his attention to all those who place themselves under him. The chemistry of all the tissues, secretions, and excretions, both normal and pathological, may be studied here most satisfactorily; and indeed I am not aware of any laboratory of the kind which affords similar advantages.

The physiological laboratory is in the University buildings. It is very much frequented in consequence of the splendid instruction afforded by Professor Rosenthal (coadjutor of Professor du Bois Reymond), and on account of his great amiability. The laboratory is provided with all the appliances for experimentation, as Professor Rosenthal pays special attention to this branch. I regret to say that Englishmen are rarely found among those studying in this laboratory, although most other nations are constantly represented. Whether this is to be accounted for by our countrymen taking less interest in this subject, or by their ignorance of the existence of such a place and its advantages, I cannot say. I feel assured, however, that if some of them would give Professor Rosenthal and the physiological laboratory a trial, they would highly

l Quetelet, A., "Physique sociale, ou essai sur le développement des facultés de l'homme," 2 vols. (Bruxelles, 1869.) "Anthropométrie ou mesure des différentes facultés de l'homme." (Bruxelles, 1870.)

m Pettenkofer, M., "Die Cholera und die Bodenbeschaffenheit in der k.k. österreichischen Provinz Krain." (München, 1861.)

n Michel Lévy, "Traité d'hygiène publique et privée," 5th edit. (Paris, 1869.)

o Hammond, W. A., "A Treatise on Hygiene, with special reference to the Military Service." (Philadelphia, 1863.)

p Bowditch and Derby, "Reports of the State Board of Health of Massachusetts."

Many of these authors have contributed far more than is here named.