

is perfect; and all was always perfect. There have been no "tentative miracles" in nature, no failures, nor trials. The graceful limbs of the beautiful tiger and the expanded pinions of the sweet albatross of Coleridge speak to the ear of reason in language that cannot be misunderstood,

"The hand that made us is Divine."

## LECTURE ON NATIONAL HEALTH.

DELIVERED AT

*The Royal College of Physicians of England.*

BY

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### I.—THE FOUNDATIONS OF NATIONAL HEALTH.

NO subject has received more impulse in this country within the last twenty-five years than the prevention of disease. We are ripe for comprehensive legislation. Mr. Göschen, taking a wide view of the question, has already embodied in a Bill provisions by which the relations of a large proportion of the medical profession to the public may be changed, and a new conception of the functions of medical men may be introduced into every corner of the country.

Though the exigencies of political affairs have forced the withdrawal of this Bill for the moment, I shall endeavour, in the observations which I am about to make, to sketch the intricate bearings of a subject of no small moment, from the point which seems to offer the fullest conception of the groundwork of national health. But I admit the all but impossibility of the task within the limits assigned to an ordinary lecture.

If there be a national health as distinguished from personal health, it is a problem of the last importance to know by what laws the standard of national health is raised, by what it is depressed. If national health be intimately connected with national virtue, and both with national prosperity—if all have their foundations in the very conditions of human life on the earth—then it will seem probable that national vice will be found linked with physical weakness and general decline, by the same correlative necessity.

These laws of our being are the expression of the fact, that nations, like individuals, placed in given conditions, must act within certain limits—limits admitted by all, whether they believe them to be bounded by the possible combinations of chance, or assigned by the intelligence of a Superior Will. National habits, good or bad; national licence and national self-restraint; national vice and national piety; national vigour or national indolence; are propagated through the individuals of which the nation is composed—being attached to individual character, and handed on from generation to generation, modified however by individual education, or those great catastrophes which, like subsoiling in a barren land, bring about fresh combinations, and give birth to products good or bad, better or worse, as the laws, moral and physical, which regulate the combination, may compel.

It may be alleged against these fundamental conceptions that national health is a fiction of the mind—that no such collective physical condition exists. The objection would be one of words. Family constitution and hereditary taint certainly exist; and a multitude of individuals forming one army may, by the operation of moral causes, go anywhere and do anything, or may be without power, without will, without hope.

We must not stop to discuss in full by what subtle links families are bound into peoples, peoples into races; but, limiting our view to our own immediate nation, which may serve as an instance for all, consider briefly how the physical condition of our people has been attained, and by what means it may be preserved or improved—our national health, in short, *What is it?* and, *What are the duties of the State towards it?*

The health of an individual is the balanced condition of organs best fitted for due performance of the functions of body and mind within the capacity of the individual. The national health is that condition of the individuals of the nation which enables the individuals of the nation to discharge rightly their respective functions in the state—"to do their duty in the state of life to which they are called"; the statesman to be in training for exercising the complex intellectual operations of his

high office; the artisan, the soldier, the abstract thinker, each for his; and if we regard the philosophic teaching of the great author of the *Republic*, parents of either sex, for the raising of the future citizens for the state (*The Republic of Plato*, Book iv).

The sole question which here seems open to cavil is, How far we can influence national health in the wide sense just hinted at? Can the abstract speculations of the *Republic* bear practical fruit? Can we influence all the factors which are contained in the elements of national health? Let us see what they are.

Take any given Englishman. What is his descent—Roman, Norman, Saxon, Dane, French? What influences have operated on him since his progenitors were among the number of workers in flint or in bone, or in bronze? Did they become farmers, warriors, chiefs? Intellectually accustomed to command or to obey? physically to endure or to shrink? morally thrifty, contented, peaceful or turbulent, drunkards and dissolute? Were they in later times exposed to the diseases of hot climates? Were any syphilitic? Did they intermarry in close relationship, or seek far a-field the partners of their lives? What would be the qualities which, like the now famous Black Bar of the Rock Pigeon, might reappear on their scutcheons—pride, pugnacity, syphilis, gout, phthisis? Terrible questions these which the third and fourth generations ask of the sins of their forefathers and of their own. There is much to be said for the squire who never passed the picture of his great-grandfather but he shook his stick at him with an oath, and said, "Your drink brought gout down upon us all".\*

Philosophically, indeed, this most anxious inquiry might, we now know, be pursued, and is being, with rare practical discernment, pursued into the very origin of our race. But I forbear, in a question of great practical import, to do more than remark, that Darwin's discussion has a direct bearing on the conception of national health. It tends to confirm the conviction that acquired habits, whether of body or mind, may be very permanent in a race. That acquired increments for good may be permanent for good we cannot doubt, with the qualification that they must be maintained by each individual of each generation. The potential good being inherited, may, by moral or physical struggle, be retained, and the potential evil be to some extent eradicated. But in every case we must believe that the inherited good attained, perhaps by generations of valour or virtue, may be in a moment shattered like some lovely work of fictile art that was produced only after years of education and months of applied skill.

These general reflections bear mainly on bodily characters, but not wholly so. A woof of mind runs through the web of all animal organisation; and the view we take of the elements of national health is coloured by our conception of the respective relations of body and spirit. When we look abroad on the animal world, we perceive such union of mental and bodily functions, that we are at a loss to say whether the matter, of which the organism is composed, and by which alone the bundle of mental qualities which it possesses can operate in the world, is primarily set in motion by mind, or is itself the *primum mobile*, the basis and very essence of mind. The difficulty of solving this question, so fundamental to all speculation on the organised world, has increased with time; and so the principles on which the education of man shall be conducted have become a subject of yet keener debate. He who believes that we are but what we see, and handle, and measure, and weigh; he who looks not beyond the present chemical concurrence of some half-hundred elements, combined within themselves; and he who says in his heart "There is no God"; all these can look on education and on health as problems only of physical science, to be settled by material measures. But, without pursuing a subject far too long for our present opportunity, let it be said that this hard material view which has once and again cropped up in history, since culture and literature began, cannot be accepted as other than an hypothesis for settling the insoluble problem of the nature of man and his co-tenants of our planet. Look out and see every spot of earth, of water, of air, occupied by beings fitted, if you will, for their place by natural selection; adorned, if you please, by the sexual impulse to display; and what do you find?—material organism fitted to perform certain material functions, bundles of mental powers fitted to put that adapted machinery in operation. Machinery and mind are alike inherited; their qualities improvable, and transmitted; the temper, so to say, of progenitors lost and reappearing. Shall any one presume to say that as yet the genesis or pangensis of this complicated organisation of earth is so known to him that he can declare that matter alone

\* The Chinese have very strict notions as to hereditary taint; chiefly, however, on moral grounds. The children of actors, among others, for three generations are excluded from the greatest privileges of citizenship, and capital punishments may follow unlawful attempts to exercise them. Not long since, thirty examiners, including an ex-Chancellor, were put to death for admitting an actor to a competitive examination.

rules mind? and that mind, whence it is and what it is, is so understood by him that he can say it does not and cannot exist alone—does not and cannot act upon what we call matter—can have no independent being? Does the denizen of air, of water, of earth, who is ferocious, attack ferociously, solely because his weapons make him desire to attack? Does he who flees and is timid, flee because his limbs impel him to dive, or to burrow, or to run away? Do you not think he flees for that he is timid, or fights for that he is ferocious? Have his bundle of mental qualities no real existence? Hopeless questions!

If we cannot, with Malebranche, assert that in an understood and understandable manner, "God is in all things, and all things in God", we at all events cannot, as scientific men, allow that it is proved that blind chance has made us; and may on this safely appeal to the unprejudiced witness of Darwin, who shows by hundreds of instances the coercive powers of purpose. Moreover, by whatever road man has reached his present state, freedom of action, moral responsibility, are his; and now, at all events, he possesses the will and the reason by which he is mainly distinguished from the varied animal world about him. Throughout the animal world we find skill and power, as in the ant, in the dog, in the tiger; but skill and power little, if ever, improved, because the reason to mould the conditions of existence, and compel nature to be their servant, is absent, or applicable only to single instances. With man, on the contrary—with educated, moral, and progressive man—the skill and the power are becoming evidently correlative with the powers which are locked up in nature, and are attainable by him; and they are, on the whole, transmitted unlost from generation to generation.

Slight and imperfect as is this sketch of the relations of man, in his bodily and his spiritual nature, to the world in which he is placed, the thoughts to which it invites must be present to us, if we are to take a true survey of the ground of national health.

The conclusion to which they point is this—that the soul of man is not the abject slave of mechanical organisation; that in some way which science cannot at present ascertain it acts on, as well as is acted upon by, the physical structure through which alone it here exists; and that the groundwork of sound national health lies as much in mental as in physical training and guidance. Thus, a task of the highest importance is imposed on the profession of medicine. They and they only can be at present expected to be able to measure fairly the strain which the nervous system of the human animal at various ages can bear; and they only can say what bodily training may be most conducive to mental development, and mental activity. But the problem involves questions far beyond the reach of average men worn by the strife of daily life. Philosophers and poets have spent some of their greatest efforts on this subject—Milton and Locke in their essays on Education, Rousseau in his *Emile*, Herbert Spencer in his treatises, and a host of minor thinkers in theirs, have endeavoured to grapple with the question of the relation between mental and bodily discipline, and, viewing the question from the psychological side, have insisted on guiding the development of the body in order to furnish a fit organism for the mind. A caution must be entered, as public opinion heaves to and fro, lest the physician lay too much stress on material agency, and claim too much value for mechanical appliances in aiding the public health. The union of moral with intellectual and physical health (if, indeed, they can be separated), can alone save a people entered on the struggle of so-called civilisation. True, indeed, is it that without good sewers and healthy dwellings the poor can neither labour well nor reasonably enjoy their being; but as true that without a pure state of the moral sentiments, no material improvements will insure to a people present happiness or permanent stability. Material comfort and material luxury are apt to engender, even in a noble race, meanness of soul, and woe and destruction wait on its fall.

Physicians, therefore, in discussing the grounds of national health, must compass the whole bearings of this question, if they wish to be followed by a sagacious and toiling people. A large-minded promoter of sanitary measures says, in a letter to the people of India, "There is so constant a relation between the health of a people and their social civilisation, that, alas! one of the best indications of the social state of populations is afforded by the number who die year by year."\* The education of the younger portion of the people in this country is proceeding so rapidly, and the knowledge and conception of material laws, thanks to a periodical literature, which is, on the whole, noble and enlightened, is becoming so much enlarged, that no health measures which are deficient either by reason of inattention to material wants, or of inattention to moral and intellectual aspirations, or based on the old views of medicine as a purely curative as distinguished from a pre-

ventive art, will find public acceptance. To prove this, it is sufficient to note the growth of resolute conviction among the people with respect to the abuse of alcohol, and with regard to the necessity of great engineering works for sanitary purposes, such as those carried out in Lancashire under the Poor-law Board during the cotton famine.

Shortly after the existing Poor-law had come into operation in England, a noble controversy arose in Scotland between Chalmers and William Alison, as to whether the care of the sick poor and of the destitute should be left to the voluntary exertions of the charitable, or be placed under the strict eye of the law. The two men were equals in Christian goodness and philanthropy; their experience and their knowledge of the poor was the same. But the science and logic of Alison prevailed. He showed, once for all, that whatever might have been the evils engendered in England by the Poor-law, the evils of destitution left to charity were greater both to the nation and to the individuals.

The ideas of legal claims to relief on the part of the destitute, and to cure on the part of the sick, are so familiar to this generation, that the early contest against the establishment of these ideas can now be scarcely credited. We are fast reaching a further social conception, that *prevention* of sickness is a yet more rational course, and therefore a yet more sacred duty than its *cure*. But the nation requires further familiarity with the proposition before it will accept it; and that familiarity cannot come until the community at large, as well as the medical profession, have fully realised the obvious proposition, that *prevention* of all disease that is not surgical, and of much disease that is surgical, is as strictly a department of medicine as *treatment*. They appreciate this in vaccination and small-pox. They do not appreciate the efforts of the younger labourers, who are striving to discover new protection against other scourges of man.

But no medical knowledge, no sanitary provisions, and no sanitary legislation, can make head against laws of nature, physical or moral. If population increases beyond the means of healthy subsistence, disaster must follow. It seems to me that at present sufficient attention is not paid by sanitary writers to the fundamental truths advanced by Malthus, but often overlooked or misunderstood. While we have been honestly endeavouring, for the last twenty-five years, to abate the general torpor and selfishness of the previous century, and to stop the growth of further sanitary evils, the average mind of England has not sufficiently heeded the coming, nay, the present, difficulties of over-population. We are too apt to look on the East of London, or the growth of manufacturing towns, as exceptional instances. They are the necessary consequences of unthriftiness in marriage, of limited area, of difficulty in emigration, and of working and trading for the world.

The reality of our difficulty about population is told in a very few words—England and Wales are increasing by about 200,000 annually. This number will, of course, increase by a small increment. Since A.D. 1810, the population, which was 10,000,000, has become 22,000,000, and, at the same rate, will become by A.D. 1920, over 45,000,000. The acres in England and Wales are about 37,325,000, including waste ground. There are now, therefore, nearly two acres per man; there will be in fifty years not one; in Glasgow, there are already 94 inhabitants to an acre, and in Liverpool, 103. No single arrangement can meet the necessities, therefore, of every district. The urban and rural districts have each respectively their sanitary difficulties. The land question presses in one shape in the towns, in another in the country. Here, as in America, or in every manufacturing country, causes suddenly operate to convert rural into urban lands; and to import, into wholly unprepared country districts, all the troubles of an urban population. Of this, a striking instance is seen in the coal districts of Durham and Northumberland, many more in Lancashire and Yorkshire. The danger of all these circumstances in relation to national health is admirably stated by Professor Fawcett:—"It will, therefore, be well distinctly to appreciate what is implied in bringing into operation causes which will produce greater mortality; some definite idea may be formed on the subject, by considering the results involved in the present high death-rate prevailing amongst the children of the poor. Assume that there are 1,000 of these children, that 500 of them die before the age of five, whereas if they were as well cared for as the children of more wealthy parents, only 200 of them would die before this age. The death, therefore, of 300 is to be traced to defects in our social and economic condition. These children are literally slaughtered, and in a manner, moreover, which indicates prolonged suffering. But this is only a part, and perhaps the smaller part of the mischief which is done; the causes which produce this excessive mortality do not alone affect the children who die; all those who survive are also brought under the same blighting influence. Consequently, to all the struggle for existence becomes more severe, the more weakly succumb; even the stronger who survive, in passing through the trying ordeal, often con-

\* Miss Nightingale, remarkable letter to the Bengal Social Science Association.—See *Report on Improvements in India, 1870*, p. 250.

tract the germs of future disease, their constitutions being, in too many cases, undermined. Physical deterioration ensues, and a whole people may thus become gradually stunted and enfeebled.\*

It is not possible to reflect on this subject without recognising the truth of the proposition that, making every allowance for the action of counteracting causes, excessive development of a population on a limited area like Great Britain, must, in the end, be disastrous to the nation, unless, first, the population can be kept healthy, and, secondly, the commodities of life are obtainable to a commensurate extent. The arithmetical bearings of this point have been worked out by Mr. Samuel Ruggles, in a Report to the President of the United States.†

The conclusion, then, seems almost forced upon us, that whenever our population increases beyond the power of our area to maintain it, two effects will follow, more especially in times of commotion—increased pauperism, increased disease among the adults. If philanthropic or legislative efforts succeed, there will be added the rearing of wretched children, incapable in body and mind; multiplication of lunatic asylums, reformatories, and workhouse schools, and crushing taxation of the industrious, capable, and healthy.

Conversely, if the preventive checks of Malthus, and especially education (in which I place, first, moral culture, however attained), can be brought into operation, two results might be expected; first, that the population may be kept in some check; and, secondly, that the internal administration of the country may be greatly improved by the political sense of the masses. Through these two causes there may be hope for the nation. It is doubtless true, first, that in the history of the world we have seen nations almost brought to a stand by epidemics, as, for instance, in various parts of Europe during the fourteenth century by the astonishing ravages of black death; secondly, some check is induced by wars; and, thirdly, an excessive mortality of children produces the same results. The operation of these natural checks is eminently uncertain; and to count upon them as substitutes for self-control, prudence in marriage, and good political administration, is deliberately to substitute the instinctive life of brutes or savages for the progressive experience, the reason and morality of the human race, and to accept the destiny which such life brings with it. When savages and brutes meet in conflict with civilised man, that destiny has usually been extinction.

Moreover, whatever opinion there may be at present as to the origin, first of species, and secondarily of race, constitution, and individual temperament, there can be none as to the effect of food, climate, habits of life, and culture, either upon the individual or the progeny. It is sufficient here to remark on the feebleness of the descendants of Europeans in India, notwithstanding the vigour of the first generation, and on the rapidity with which the Anglo-Saxon race has changed in North America. Doubtless the limits of variation of man, or of any race of men, have not yet been determined; but we are rapidly approaching precise knowledge on the subject. Life insurance-offices will, ere long, furnish a fund of information; and the labours of our great statisticians, when they include sickness returns from the public health authorities, will give all attainable scientific information of the causes and nature of health fluctuations in this country, in comparison with the same in other countries. To say truth, the accumulating knowledge of the facts of humanity is becoming more marvellous than the fancies of Utopia. The newspapers tell us weekly—thanks to the sagacity of Major Graham and of Dr. William Farr—the comparative death-rates of great towns not only in England but on the continent of Europe, in India, and at New York. We are enabled to judge what the energy and determination of one man can do in controlling the health-destiny of vast populations, by studying the admirable results of the work of Dr. Hewlett (*Quarterly Reports on Bombay*) in Bombay, and the sanitary progress in Calcutta. India bids fair to set us an example of accomplished sanitary administration, which will be fruitful alike of knowledge and of practical benefit to the people.‡ Nor is this all: Quetelet (*Anthropometrie de l'Homme*, 1870, and *Essai de Physique Sociale*, edit. 2, 1869) and Galton (*Hereditary Genius*, 1869) have opened a mine of precise knowledge regarding the finer causes of "limits of variation" which have been just touched upon. Quetelet, indeed, has proved what, *à priori*, might have been safely inferred, that the limits of the factors of human nature, whether mental or bodily, may be fairly expressed in terms of mathematical formula and curves; so that, indeed, the average proportion out of a given number of persons possessing

any mental quality may be as directly predicated as their heights or their weights. It is true that this is only the expression of a fact which it does not explain. But Francis Galton has with great skill, in his work on *Hereditary Genius* (1869, p. 373), shown some of the consequences of this fact or law. They are startling. Just "as a cook combines or creates a dinner, the fish director can create", he says, "a particular sort of fish according to a predetermined pattern"; then, he adds, "the reflections raised by what has been stated of fish are equally applicable to the life of man". "The entire human race, or any one of its varieties, may indefinitely increase its number by a system of early marriages, or it may wholly annihilate itself by the observance of celibacy. It may also introduce new human forms by means of the intermarriage of varieties, and of a change in the conditions of life". Galton's speculations—I ought rather to say, his logical and precise discussion—should be carefully weighed by every thinker on public health, because, in one sense, it is directly opposed to the conclusions of Malthus. He has worked out the effects of early and late marriages in respect of progeny, and has shown that, given certain conditions to two races, M or N—one, M, marrying early, and N marrying late—at the end of one century the mature men of M will be four times as numerous as those of N; at the end of two centuries, ten times; and at the end of three centuries, twenty-seven times as numerous. Now, if M were reckless and imprudent, and N careful and prudent, all else being equal (which, however, would not be the case), the prudent race would be driven out of the field. A terrible disaster! "It may seem monstrous that the weak should be crowded out by the strong, but it is still more monstrous that the races best fitted to play their part on the stage of life should be crowded out by the incompetent, the ailing, and the desponding." In forming a fair estimate of the whole of this question, many other causes would have to be considered, and their effects calculated. But reason tells us that there must be some relative value in lives, though the human eye may fail to count it right. There is a moral in the tale of the fowlers in the northern seas. As the three egg-hunters are, one by one, drawn up along the face of the cliff by the same rope, highest is fastened the lad, the father next, and last the grandsire. If the strain be over great, the lowest, least worth, is to cut the rope and fall into the abyss; next, if need be, the father; so that the chafing strands may perchance save that life which may be longest and is youngest. So is it in nature. We have our being under just and necessary laws, moulded by hidden causes we cannot see nor understand. [To be continued.]

## CLINICAL ILLUSTRATIONS OF CUTANEOUS DISEASE.

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*Phlyctenous Eruption affecting the Hands, Ankles, and Buccal Mucous Membrane; recurrent thrice yearly; repeated for several years.*—April 6th, 1871.—A young man aged 21, engaged in a wholesale warehouse in the City of London, is affected with blisters on the hands. The blisters are hemispherical in figure, raised on a thickened base, without redness, with no tendency to burst, and about a quarter of an inch in diameter. On the wrist, they are flattened; several are coherent and confluent; the cuticle is but slightly raised; and they are purplish in the centre, from slight extravasation of blood. The patient mentions that he has a few similar vesicles on each ankle, and the buccal mucous membrane is studded with aphthæ. He states that he has no forewarning of the attack; that he is unaware of any exciting cause; that there is little and only occasional pruritus; and that the eruption recurs three or four times a year, the more constant periods being Christmas, Easter, and Midsummer.

It is evident that the cause of the eruption must be looked for in a lowered tone of the system occurring at those periods. He is thin, somewhat pallid and languid; but nothing else presents itself to mark debility. Nevertheless, the therapeutical indication would seem to be a tonic medication and regimen.

The chief point of interest in this very peculiar affection is the sympathy of lesion of the skin and mucous membrane. The eruption is altogether unlike eczema; neither does it resemble herpes. Its nearest correlative is pemphigus; and its alliance with pemphigus is shown not only by the phlyctenous development of the eruption, but also by the slightly hæmorrhagic tendency evinced by the spots on the wrists.

*Prurigo Mitis, from simple Debility.*—April 7th, 1871. A young lady, aged 21, complains of spots on the skin which are so intensely pruritic that she is unable to resist scratching them, although, as she states, she knows that they are aggravated by frequent "picking".

† \* Professor Fawcett, *Pauperism, its Causes and Remedies*, p. 108. London: 1871. A book which cannot be too widely read.

‡ See an abstract of his paper in the *Times*, May 17th, 1871. John Lambert, Esq., C.B., has referred me to an interesting work on the condition of the poor, by another Mr. Ruggles, viz., *The History of the Poor and the Laws respecting them*, by Thomas Ruggles, Esq., 1797. The work contains many thoughts of permanent value.

† See various reports on health of India for the last five years.