

A resumé of the history of hygiene : being the introductory lecture to a course on hygiene and public health, delivered at University College, London, May 10th, 1870 / by W.H. Corfield.

Contributors

Corfield, W. H. 1843-1903.
Royal College of Surgeons of England

Publication/Creation

London : H.K. Lewis, [1870]

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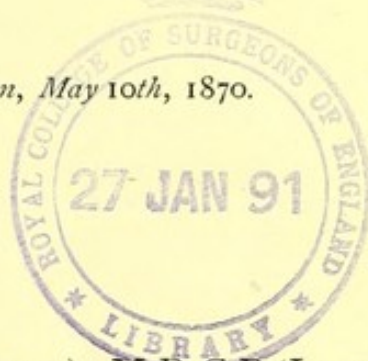
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A RESUMÉ
OF THE
HISTORY OF HYGIENE;
BEING THE
INTRODUCTORY LECTURE
TO A COURSE ON
HYGIENE AND PUBLIC HEALTH,

Delivered at University College, London, May 10th, 1870.

BY
W. H. CORFIELD, M.A., M.B.(Oxon.), M.R.C.P.(Lond.),
PROFESSOR OF HYGIENE IN THE COLLEGE.



WITH A SHORT SYLLABUS OF THE COURSE.

LONDON:
H. K. LEWIS, 136, GOWER STREET.

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THE HISTORY OF HYGIENE.

GENTLEMEN,—Last summer, in commencing my course of lectures, I considered myself called upon to make a kind of apology for the existence of a Chair of Hygiene at all, and to explain why it was “thought necessary to add another to the many courses of lectures which you already attend”; now, happily, this is no longer necessary, as the science of hygiene is gradually becoming recognised here, as it has long been in the continental schools, as one of the most necessary subjects of study in the medical curriculum.

What then are the objects of hygiene? How can we define it? The usual definition of it is—“Hygiene is the art of preserving the health.” But this explanation, comprehensive as it is, is yet hardly comprehensive enough, or rather does not sufficiently specify the means by which the end of the science is to be attained, and so leaves the mind in doubt as to what sort of researches have to be made in order to further the knowledge of the subject.

Londe, apparently from a dietetic point of view, proposed the following definition: “Hygiene is the science which has for its object the direction of the organs in the exercise of their functions.” But this limits the subject too much, and really excludes the most important and interesting part of it.

Oesterlen, a well-known German medical writer, recognises in his definition the two great divisions of hygiene; he calls it “that part of our knowledge which has to do with the preservation and furthering of the health of individuals on the one hand, and of the community at large on the other.”

Michel Lévy says that it is "the clinical study of healthy man", by which definition he wishes to individualise the more general one; but even here we do not find what we want; indeed we prefer the original definition to all these alterations of it. Dr. Parkes thinks so too, for he says "hygiene is the art of preserving health; that is, of obtaining the most perfect action of body and mind during as long a period as is consistent with the laws of life; in other words, it aims at rendering growth more perfect, decay less rapid, life more vigorous, death more remote."

And now we come to the extension which Bouchardat has given to the ordinary definition: "Hygiene is the art of preserving the health." But how can we preserve health? Plainly by doing our best to keep away disease. And how can we do this? By checking the causes of disease. To this end we must know these causes; and here we have the grand object of hygiene: it is the science which studies the *causes* of disease, and points out the means of avoiding them.

The knowledge of causes is the great aim of all science properly so called; and no subject ought to be honoured with that name which has not this end in view. "Prevention is better than cure" is an old proverb and a very true one; and it is prevention that we shall study here, prevention of disease of whatsoever kind by the removal of its causes.

Do I hear any one say, "That is not our business; we have to learn how to *cure* disease when it has arisen"? Quite true; but not the whole truth. Our business as medical men is to *cure* diseases ("if medicine means anything", as has been well said, "it means the art of healing"); but our duty as educated members of society, who by reason of our calling know more of the evils to which man is liable and of their causes than others do, is to do all that lies in our power to *prevent* disease; and it is therefore our duty to give special attention to the science which studies the causes of diseases, and shows how they are to be avoided. But beside this, there is another side of hygiene—the therapeutical side of it, if I may so call it—which is of the utmost practical importance to the medical man, and the neglect of which in our times has been attended with the most baneful effects to the medical profession as well here as abroad. Let us hear what Fonssagrives, the Professor of Hygiene at Montpellier and the Physician-in-Chief of the French Navy, says on this point: "It has cost very dear to rational medicine to be thus separated from hygiene. Two systems equally exclusive, and susceptible of impressing the vulgar mind by their extreme simplicity as much as by their paradoxical attractions, have found in

this way an excellent pretext for coming to light; and homœopathy as well as empirical hydropathy have come to remind it in an opportune manner, that if medicines have power to cure, moral influences and hygienic modifiers are also levers on which we must rely." He then goes on to say that methodical hydrotherapeutics, applied in a rational manner, have become a part of scientific medicine, to remain so for ever; but that homœopathy, with its irrational and utterly unscientific notions, is destined to remain for ever out of the domain of medical science.

Thus we see that hygiene, besides studying the causes of disease, and the methods of avoiding it, and of so preserving a state of perfect health, takes also into consideration the treatment of many forms of disease by methods other than the employment of pharmaceutical preparations. These methods are what the Professor above quoted calls "hygienic modifiers"; and are such as exercise, change of employment, sea-voyages, residence in a different climate, and, above all, regimen. Until within a few years, this last was the great object of hygienists; and the result is that most of the treatises on the subject contain nothing but innumerable empirical rules for the guidance of man during the different phases of his existence, and under the most diverse conditions, together with a mass of facts gathered from all directions among the physical sciences, and more or less connected with the subject. "Who does not see that there is not there anything like true science?" asks Royer-Collard; and again, "Who does not understand the urgent necessity of escaping from such a state of things, and of bringing back hygiene to the level of the other branches of medicine?"

What is it that has done this, and caused hygiene to become again one of the most important branches of medical science? It is the new direction that has been given to the science of health, by the recognition of the fact that its great object is to find out the *causes* of the maladies to which man is subject—and not only to find out those causes, but to make known the rational means of preventing or avoiding them, and thus to aid in prolonging the term of man's existence.

As the methods for the preservation of health are of the first importance to all human beings, we may expect to find provisions to this end among the writings of the ancients, especially in the codes of the law-givers; and such is the case. Take the writings of Moses: they teem with most excellent hygienic regulations, which the people for whom he legislated were obliged to observe under pain of severe penalties. Look at the methods given for the prevention of the spread of leprosy, and for

the purifications of persons and of dwellings. Why, many of them would do credit to any set of regulations on the subject that might be drawn up in the nineteenth century! Then the command not to eat swine's flesh; go into southern or eastern countries, and see what an infinitely disgusting creature the pig is in hot climates, and you will not fail to see the wisdom of that command. Indeed, it would be as well if such a law, or at any rate one to prohibit the sale of uncooked pig's flesh, existed in some countries not so far away from us as Arabia or Palestine. Consider, again, the prohibition of the marriage of near relations: how well the decline of the race—morally, intellectually, physically—is provided against by this regulation!

Besides these and many other important generalities, you will find the great Hebrew legislator descending to the inmost details of family life—giving a *régime* admirable in its adaptation to the climates of the countries for which it was intended, directing the burying of excrementa and refuse-matter of all sorts *in the earth*, fixing the laws of marriage, of concubinage, of servitude, and of all social relations.

Again, look at the custom of circumcision, one of the most salutary regulations that was ever imposed on a people, especially in an eastern country, where the difficulty as well as the necessity of scrupulous personal cleanliness is so much increased; a custom that had originated among the people before the time of their lawgiver, and one which, Herodotus tells us, was in vogue among the ancient Egyptians, and which, as is not very generally known, is still practised by the natives of the island of Madagascar. What wisdom was shown by Moses, and by Mahomet in later times, in retaining this wholesome custom as a religious rite, and thereby securing its perpetuation.

It is to the strict observation of these sanitary regulations, that one of the best known writers on hygiene of the present day (M. Michel Lévy) does not hesitate to ascribe the singular immunity of the Jewish race in the midst of fearfully fatal epidemics, which immunity was so marked in the middle ages that it brought upon them "accusations the most absurd, persecutions the most atrocious." And I think that, in spite of the counter-criticism of the great hygienist Halle, who could find nothing reasonable in the regimen ordered by Moses, except the prohibition of swine's flesh, and who could not see any salutary motive for the rite of circumcision, we shall come to the conclusion, the more we study the laws of health, that his regulations were on the whole most wise, and that the observance of them has contributed not a little to form the enduring character of that race, which, though scattered abroad on the

face of the earth, and subjected at various times to fierce persecutions, whether on account of its religion or of its proverbial wealth, still exists, and not only exists but flourishes, retaining its peculiar characteristics in all their freshness during a period of three thousand years, and remaining as distinct from the other tribes of mankind as it was in the days of its wise legislator.

What a magnificent proof we have here of the influence of the due observance of the laws of health upon whole nations, and of the immense importance of their study, and especially of their general practical application both by individuals and by the community at large.

We turn now for a moment to China, and find a people in many respects in a very high state of civilisation—a people who had used the mariner's compass ages before it was known in Europe, but a people who, from want of communication with other nations, have made no advance at all, perhaps for thousands of years—who have gone on increasing at such a rate that they now form one-third of the population of the whole world, so that their country is crowded to an extent hardly conceivable. Surely we can learn something from them which will be of service to us in the management of the health of our overgrown towns. Yes, in one thing at least they are our masters. They waste nothing; what they take from the earth they give back directly to the earth. Every atom of their sewage-matter is employed as manure; and how otherwise would it have been possible for so immense a population, without any external resources, to live on such a comparatively limited portion of the earth's surface, and to *keep it fertile* for so many centuries? Thus we see that this people had actually solved, ages ago, in a most practical, and in many respects highly satisfactory manner, one of the greatest questions in hygiene, and one about which we "western barbarians" cannot yet make up our minds.

One of the best instances of the power of cultivation in improving the condition of a country is to be found in Lower Egypt, in ancient times the centre of the civilisation of the world, now for the most part in an abject condition. The inundations of the Nile, while the country was peopled with intelligent races, were the great source of its fertility, but are now the cause of the insalubrious marshes that generate the plague, and make that country one of the most unhealthy spots on the face of the globe. This fearful epidemic appears to have been unknown in ancient Egypt; at any rate, we have no mention of its existence there until some time after the Roman occupation; and it is not likely that

so terrible a disease could have committed its ravages in a highly civilised country without any mention of it having been made.

To come nearer to our own country, let us see what were the hygienic conditions of ancient Greece and Rome. Had the practical application of the principles of public health anything to do with the high state of civilisation to which those countries rose, a state which in some respects, at any rate, has never since been equalled? Had it anything to do with the success which attended the Roman armies, and led to the formation of that enormous Roman Empire? Let the facts speak for themselves. In reading the classical authors of those countries, what strikes one most? Is it not the continual mention of gymnasia and of baths? A certain portion of time was set apart daily for exercise in the gymnasium, and thus a full development of the body was produced, and the greatest resistance given to those two great enemies of mankind, disease and death. It is true that all this training was part of a great military system, that the youths were thus encouraged to compete for the prizes in the Olympian games, and in the Roman gymnasium, that they might become good soldiers; but did this prevent the cultivation of mental acquirements? Again let the facts give the decision. Do you wish to see fine buildings—buildings so well constructed that they have lasted comparatively untouched by decay for centuries? Do you wish to study beautiful sculptures, statues anatomically perfect to the minutest details and of unsurpassed artistic elegance? You go to Athens! You go to Rome! Do not fancy that I am contending for bodily exercise against mental acquirements; I merely maintain that a sufficient daily exercise of the body is absolutely necessary for the proper performance of its functions, mental as well as physical, and that the best way of securing this amount in the smallest time is the employment of a regular system of gymnastics.

But we have not yet done with Rome. I have mentioned the baths of that city. How were they supplied with water? Ah! here we have need to hide our faces with shame. Surely we, with all the immense advantages of scientific methods, manage to supply our cities with water as well as the people of two thousand years ago and more—at any rate, with all our steam engines and manufactories, we require at least as much as they had. Turn to the pages of Frontinus, and what do you find? That, at the time at which he wrote (about A.D. 92), there were actually *nine* large aqueducts by which water was brought into Rome, beside some smaller channels; these aqueducts were in some instances entirely covered over throughout their whole length, and were placed

underground or supported by high arches, as occasion required. Several of them, as the Anio Vetus, the Claudian and the Anio Novus were from forty-two to forty-nine miles in length, and the total length of the Marcian was actually fifty-four miles. The water was brought by the two Anios from the river Anio, by the others from various springs and lakes around Rome; the two newest ones were made because "*seven aqueducts seemed scarcely sufficient* for public purposes and private amusements."

How much water was brought to the city by these beautiful constructions, the ruins of which form to this day so conspicuous and interesting a feature in the scenery of the Roman Campagna? We have fortunately very accurate measurements given us by Frontinus himself, who was, I should tell you, the controller of the aqueducts, by which we can calculate the amount approximately. We find that the sectional area of the water supplied by all the aqueducts was 24.805 quinaries, or about 120 square feet; and, says Mr. James Parker, "we can form some notion of the vast quantity if we picture to ourselves a stream 20 feet wide by 6 feet deep constantly pouring into Rome at a fall six times as rapid as that of the river Thames." The supply appears to have been equivalent to more than 332 millions of gallons per day, or (since the population was certainly not more than a million) at least 332 gallons per head per day—about ten times the amount that we have now in London or Paris.

Many of the other great cities of the Roman Empire were supplied with water in the same manner. Lugdunum (Lyons) had three fine aqueducts, of which one, underground during the greater part of its course, is even now probably almost intact, while another was constructed across so irregular a country that its remains fill our modern engineers with astonishment. Look at the Pont du Gard near Nîmes, the most perfect, and in some respects the most wonderful, Roman remain (I cannot call it ruin) in the world; what is it but a stupendous aqueduct, across a valley where it was not considered advisable to resort to the system of inverted syphons practised at Lugdunum?

Come with me along the north coast of Africa for a few moments, and we shall find remains of Roman aqueducts near to Tunis, where they have been rebuilt and are still used, at Bona (with fine cisterns), inland at Constantine, and at other places. What remains of the ancient splendour of mighty Carthage? Nothing but a series of magnificent water-cisterns, with the huge remnants of the aqueduct that supplied them.

I have gone thus far into the account of the water-supply of the ancient Roman cities, because it affords the solution to one of the greatest questions of the present day in London and in large towns generally. The only cities that are well supplied with pure water now, are those where the method is employed that was decided upon at Rome more than three hundred years before Christ.

But, beside the aqueducts, there was a capital system of sewers at Rome, consisting of the Cloaca Maxima and a series of smaller sewers running into it. The Cloaca Maxima ran (or rather *runs*) from the Forum to the Tiber, into which it discharged (or rather *discharges*) the sewage and other refuse matter of the city; while the sewage-matter of those parts of Rome not supplied with sewers was carried off in carts in the night, precisely as it is now in many parts of Paris by the only too well known Compagnie Richet. Of course this was another branch of the public service, and was given over to the "Curatores Cloacarum", as the charge of the aqueducts was to the "Curator Aquarum".

The above remarks will give you an idea of the admirable manner in which the means for the conservation of the public health were made a subject of State legislation in ancient Rome, and of the determined way in which all obstacles were vanquished in order that the city might be made as healthy as possible.

Not only have we the example of the ancients in these matters, but we have hygiene reduced to a system by Hippocrates. Read the first section of his *Aphorisms*, and you will be struck by the excellent dietetic regulations which he gives for the observance of gymnasts, and for the guidance of physicians in treating acute and chronic diseases. Read also his third section, on the Influence of the Seasons of the Year and of Age in the Production of diseases. In his other treatises, he gives the same importance to regimen, and accurately describes the effects of variations in the quantity and quality of different kinds of food and drink on healthy people. The very names of the works of Hippocrates show you how great a hygienist he was: "About Diet," "About Diet in Health," "About Diet in Acute Diseases," "About the Use of Liquids," "About Food," and especially the one on "Air, Water, and Localities." So that, when I claim him as the father of experimental hygiene, you see that I have good reason for doing so.

After Hippocrates comes Celsus, who gives up the first chapter of his first book *de Re Medicâ* to the exposition of rules concerning diet, and recommends avoidance of too great regularity by healthy persons. He also discusses the influence of temperaments and idiosyncrasies;

and points out that every one has a weak point in his constitution, to which he must especially attend, in order to ward off the diseases to which he is most liable.

But we must not omit to notice Galen, whose works exercised so enormous an influence on the medical practice of the whole world during many centuries. He was born at Pergamos, but travelled a great deal, and was appointed physician of the gymnasia at Rome. He is noted for his love of divisions and classifications. Thus he divides men into various classes, and assigns to each its diet. Therapeutic agents, too, he subdivides in a curious manner.

The doctrines of these fathers of medicine, mixed with the fancies of later times, were spread abroad over Europe by the Sicilian school, which was the offspring of the ancient Greek and Arabian medical schools. Its practice is handed down to us in a quaint Latin poem, in which a great deal of truth is mixed up with a great deal of trash, and in which we find bad therapeutics based upon faulty pathology. Thus we see that the experimental methods of Hippocrates and his successors were confused with a host of traditions derived from the Arabian alchemists, who had announced that they had found a substance that would cure all diseases and turn common metals into gold. This dangerous influence of the astrology and alchemy of the Arabian philosophers remained in the medical world up to the sixteenth century; and its effects continued much longer, so that the rational methods of treatment adopted by the ancient physicians were neglected, and diseases were treated, instead, by a number of supposed infallible remedies, of which the action was not at all investigated. And what do we find as the result of this change of practice? That epidemics raged with the most fearful intensity all over Europe—epidemics which were only known accidentally before, and which, finding favourable conditions for their spread in the utter neglect of hygienic observances, came from their natural seats in hot eastern countries, and committed unheard-of ravages in Europe. Look at the plague—that fearful epidemic of the eastern part of the Mediterranean: it is true that we have accounts of terrible visitations of it in Greece, and particularly of one which depopulated the city of Athens in the second year of the Peloponnesian war; but then remember that at this time the city was crowded to a fearful extent by the inhabitants of the country that Pericles had summoned into it; and it was at this juncture that the pest was introduced by a ship that entered the Piræus from Egypt. At various times, and particularly in the year of the city of Rome 389 (before the

building of the aqueducts), the Roman capital was visited with the same calamity. But all this is nothing to the fearful visitations with which the whole of Europe was inflicted during the fourteenth, fifteenth, sixteenth, and seventeenth centuries.

In 1348, the plague appeared in Asia, Africa, and Europe; and actually slew, according to Froissart, forty-three millions of human beings. From this time, it cannot be said to have permanently ceased in Europe for centuries; it merely changed its sphere of action from one country to another. Between the seventh and the seventeenth centuries, England was actually invaded twenty times by this disease. Was any class of the population less attacked than the rest? Yes, the only part of the people who by their religious belief were obliged to follow, more or less strictly, a code of excellent hygienic regulations—the Jews—experienced so singular an immunity from these epidemics, that they were actually accused of causing them by spreading poisons in the air, and were burnt as wizards in almost all the countries of Europe. The last appearance of the pest in Europe was in 1719, when it was introduced into Marseilles by a ship that had been refused admittance into the port of Cagliari, in Sardinia. Even then, its course might probably have been stopped, had its malignant nature been recognised soon enough; but this was not the case, and more than ninety thousand persons were killed by it. After this, most energetic measures were taken to prevent its reintroduction into Marseilles; and it has not yet reappeared there. Here we have a clear case of the value of prevention. Sardinia was saved because the king refused the admission of the ship into the harbour of Cagliari; Marseilles was ravaged because such preventive measures were not taken.

From this time, public hygiene received still more attention in France, where, however, as early as 1350, Jean le Bon had instituted a sort of system of officers of health; and we find, towards the end of the eighteenth century, the Royal Society of Medicine founded, the reports of which contain valuable collections of facts relating to various departments of public health. Later on, the Council of Salubrity of Paris was founded, and took under its cognisance all questions relating to hygiene. Similar societies were founded in the other large towns, and thus by their reports an accurate account of the sanitary state of France was obtained in 1851.

In England, we are accustomed to manage such affairs in a less official manner than they are done abroad; and the result is, that improvements, although more difficult of introduction, are often more surely

brought about with us than with our neighbours. It is certainly not because we are less hygienic in our habits than other nations, that we have so few books on hygiene, or that our medical schools have never looked upon it as a sister science with medicine ; but because it seemed to take no special line ; because it seemed to be so much everybody's business. Now, however, as we shall soon see, since the formation of the General Board of Health and of the Registrar-General's Office, such a mass of information with regard to the statistics and to the causes of disease has been obtained, that it seems necessary to make a special study of this science, and no longer to allow it to be taught accidentally, as an appendage to pathology or therapeutics.

The objects of our science we have described as being the especial study of the causes of disease and their prevention. To this end we must study all the agents of whatever kind which modify the health of man. We must study man himself as regards his constitution, age, sex, habits, professions, etc. And again, we must study all the modifications of the conditions in which man is placed, all alterations of the medium in which he lives, all the effects of various soils, of the proximity of seas, of the state of the water-supply, the action of the various kinds of food and drink, and of the narcotico-stimulants used so much all over the world ; of exercise, mental and bodily ; and, in fact, all the agencies by which the health of man may be impaired and his life shortened. We must, therefore, call in the aid of all the physical and natural sciences ; and, taking their data for axioms, proceed to the solution of the all-important and difficult problems which the study of the science of health presents to us.

We require, first—what all scientific investigators require in common—a knowledge of the mathematical methods, not only to aid us to make correct deductions from the facts before us, but to enable us to give a correct explanation of the true meaning of statistical figures, or we shall be led to make the error which has been made over and over again ; viz., to deduce from them the contrary to what they prove. We require the aid of physics and chemistry in order to study the effects of heat, light, electricity, the various conditions of the air, earth, and water, the composition of the excreta, and a host of other important matters. We cannot do without geology, for from it we learn the disposition of the rocks of the earth's crust, and so are able to study the conditions of water-supply in given localities, and even the mode of production and spread of such diseases as cholera, intermittent fever, and endemic goitre. But, above all, we must draw in the aid of physiology, the

science which studies the conditions of the existence of life while we study its preservation. It is by the exaltation or depression of one or more of the functions of the body or its parts that disease is produced and death brought nearer, and by the suppression of those functions that death is ultimately produced. It is therefore plain, that we who would study the means of avoiding disease, must know beforehand the normal condition of the functions of the economy. Natural history interests the hygienist in his study of the means of the prevention of parasitic diseases, but still more so in the more difficult researches into the means of the production of epidemic and endemic diseases. Every year adds several to the list of diseases, which appear to be caused by the presence of living organisms in the economy of man—organisms either generated *de novo* from unorganised materials, or produced from existing cells by the action of special chemical and physical conditions. The study of the conditions of the development of these ferments is one of the largest and most important branches of hygiene, and will lead to great results. It is only by knowing this that we can hope to prevent the formation and spread of diseases. Look at the goître, with its hideous congener cretinism. What could be done against them, before it was shown by Inglis and others that it was the presence of magnesian salts in the waters that caused the one, and the intermarriage of goïtrous people that caused the other? But this is not all. It is probable that it is not the mere fact of magnesian salts being present in the waters that causes goître in those who drink them, but the development of a particular ferment under those special conditions. The like may be said of intermittent fevers, of cholera, of typhoid fever, and probably of a host of diseases which we do not generally consider to be produced by living organisms.

But how to discover all this? By direct experimentation. We must only be content with demonstrated facts, and reject every thing that is not proved. It is the only way in which a science can be advanced.

Until we know where lies the true cause of cholera—whether it be conveyed by the excrements to the waters which we drink, as is generally believed, or whether suspended in the air, and subject to the laws of diffusion of gases, as Poznanski maintains—we work comparatively in the dark in trying to prevent its visitations; and the same is true of all other diseases. We must, therefore, take the facts given us by other sciences, and use them as levers with which to remove our medical difficulties, and throw light upon the obscure problems of medical science. Don't think that a man is a worse physician for being a good chemist,

or physicist, or mathematician. He who is well trained in these branches of science has his mind prepared to study the difficult problems of life and of disease; and depend upon it, he will make, in the long run, a far better practitioner than he who has neglected them. If this were not the case, the connection of schools of science with schools of medicine would be a farce, and the country would join in the retrograde cry of the great French clinician, Trousseau: "Gentlemen, let us have a little more art and a little *less science*."

It is on account of this need of the assistance of so many sciences, that most of the systematic works on hygiene are chiefly filled with explanations of scientific facts and methods which do not belong to hygiene, properly so called, at all, and which ought not to have found their way into works on the subject, where they can only be cursorily treated: they should be left to their proper places, and the hygienist should take them as data.

On the other hand, as we have already seen, hygiene assists very materially the most practical part of medicine; viz., therapeutics. Need I quote Donné to convince you that most of the diseases of infancy are best treated by regimen? Is not the same true of old age? How are such chronic diseases as glycosuria, phthisis, gravel, gout, obesity, and a host of others, best combated, and even prevented, if taken in hand as soon as their first indications present themselves? Is it not by regulation of diet, of exercise, of baths, etc.—in fact, by the employment of the various hygienic modifiers? Not only so, but in how many other cases which do not seem at first sight to come so especially under hygienic management—as for example the acute febrile diseases—how much is done by wise dietetic regulations! Above all, during convalescence from such diseases, we have recourse to hygiene—"où la maladie cesse, l'hygiène recommence" (Michel Lévy).

It is this therapeutic side of hygiene which has engrossed the attention of so many writers, from Hippocrates, who said: "I shall direct the diet of my patients to their advantage according to my power and my judgment", and from Herophilus, who divided medical science into three branches—(1) dietetics, (2) medicine, (3) surgery—down to the writers of the present day. But to what can we point as the result of the more general study of prophylactic measures owing to the revival of hygienic institutions during the present century? Have we nothing tangible to induce us to follow in the steps of those who have assisted or are assisting in the glorious work of emancipating the human race from the scourges of disease? Are no diseases

becoming less frequent owing to our knowledge of the means of preventing them, or less dangerous because we are more acquainted with their causes, and therefore with the means of combating them? How many of you have seen cases of scurvy? They are certainly not common now; and yet scurvy was one of the most redoubtable endemic diseases of the middle ages, especially in temperate and northern climates. In Holland, for example, it was always raging; our navies and those of other nations were never free from it; and yet it no longer exists in Holland and the Low Countries generally, and does not often show itself among sailors—never if they are properly cared for. How is this? It is because we understand better the conditions of its development. We know that it is always associated with bad hygienic conditions, and with a want of fresh vegetables as a part of the diet. It is since the damp, unwholesome dwellings of the Low Countries have been replaced by well-built, well-drained, and well-ventilated houses, and since the navy has been supplied with lime-juice to act the part of the fresh vegetables which cannot well be got at sea, that this disease has ceased to make its appearance.

Take some still more striking instances. We have already said that England was invaded twenty times in ten centuries by the pest or plague—that terrible disease which in one invasion (1348-1360) carried off one-third part of the inhabitants of the old world, killing thirteen millions of people in China alone—that fearful malady with which Europe was visited forty-five times during the seventeenth century, and which killed in London alone more than 68,500 people in one year, the memorable year 1665. Why is it that in Western Europe we have not seen the plague since 1720, the last time that it appeared at Marseilles? It is certainly not that our communication with eastern countries has decreased; obviously the reverse is the case. There are two excellent reasons. One is, that in Constantinople it has ceased to appear; since 1839, not a single case of it has been noticed in that city, once one of the greatest centres of it; and this immunity the Board of Health of Constantinople attributes, with justice, to the improved sanitary conditions of the city. The same is now true of Syria; so that the only great centre of the pest which now exists is Lower Egypt, a country in all respects, at the present day, one of the most insalubrious in the world—a country not only filled with marshes, from which offensive malaria continually arise, but inhabited by a people who do not try to make it better—a people formerly flourishing and independent, but now poverty-stricken and desponding—the once intelligent and active Arabian

race. Read Hamont's account of the Arab villages in Lower Egypt ; read how the small earth-huts of four feet square serve each for the habitation of a whole family, including the usually diseased domestic animals ; read how the villages, made up of such wretched hovels, are generally built in marshes, and how all the refuse matter lies about in front of the holes which do service for doors to the huts ; read how from abject poverty whole villages are sometimes without bread for a fortnight, and the people reduced to eat herbs of various sorts (even thistles), bread made of linseed-meal, young dogs, and indeed almost any thing that may serve to fill an empty stomach ; and then can you wonder that in such a country the pest still reigns, and that, whereas the mortality was only from 5 to 10 per cent. among the Europeans during the epidemic of 1834, it was as high as 84 per cent. among the wretchedly conditioned native races? ("Les trois fléaux"; Foissac). Does not this show us in a striking manner that it is not so much the type of the particular epidemic, but the soil that it finds—in other words, the good or bad hygienic condition in which the people are, that causes the virulence or the benignity of the attack?

The other great reason of our immunity from this awful scourge is to be found in our own improved condition. Note it as a remarkable fact, that the plague which raged in London in 1665, has never appeared there since 1666, the year of the "Great Fire of London", by which 13,000 houses were destroyed. Let us not, however, rest idle and think ourselves secure : our communication with Alexandria and Cairo increases every day ; and as long as the unhealthy conditions which engender the pest there continue, we may have it again brought among us ; and who is there who would dare to say that the over-populated quarters of our great metropolis are in such a perfect state as regards sanitary arrangements that the disease would no longer find here the soil congenial to it? Cholera and typhus fever still find the conditions suitable to their existence among us ; and why should not the plague do so too?

Look, again, at ergotism, which under the name of the black pest decimated the populations of many of the countries of Europe during the seventeenth and beginning of the eighteenth centuries, but which has now disappeared ; or at the goître, of which we now know the proximate cause at least, and the means of its prevention, and of which we may predict the disappearance with that of its hideous descendant, cretinism.

See the immense progress we have made in our knowledge of inter-

mittent malarious fevers, of which we now know the conditions of production, the means of prevention, and the cure; the means of prevention being the clearing of malarious districts and their drainage and tillage, as has been most abundantly proved in Algeria.

Are we as afraid of typhoid fever as we were? and is the mortality of it so great as formerly? Certainly not. Since the able researches of Mr. Simon, contained in the Public Health Reports; of Dr. Acland, in his "Report on Fevers in Agricultural Districts"; and of many other observers, we know so much more of the causes and modes of propagation of this fever, that we are now able by sanitary measures to diminish considerably the mortality of it. Let us take some figures. In Bristol, before the improvements in the water-supply, etc., the annual mortality from typhoid fever was 10 per 10,000 inhabitants; since those improvements, it has been only 6.5. At Merthyr Tydfil, a mortality of 21.33 has been reduced to 8.66; at Croydon, 15 to 5.5, etc. Here are tangible facts to which we can point as resulting from improvements in the sanitary condition of our great towns, especially as regards sewerage arrangements and water-supply. Not only so, but since heroic remedies and supposed "specifics" have been given up in its treatment, and reliance been placed on the more natural methods before enumerated, the mortality among those actually attacked has been diminished considerably.

We cannot pass from this subject without noticing the most remarkable prophylactic measure that medical science has ever produced—the great discovery of the power of vaccination as a preventive of small-pox by our immortal countryman, Jenner. The statistics on the subject are too well known to you all here to need any comment from me, so I will content myself with pointing out to you the fact that in countries where the vaccination of infants has been carried out more rigorously than in our own, the number of deaths from small-pox is reduced almost to nothing, showing that where people do not find out themselves what is best for them, a wise government does well to enforce the observation of sanitary regulations.

But with regard to that large class of diseases known as constitutional, can we do nothing for them? Are we powerless before the ravages of phthisis, of cancer, of scrofula? Must they go on blighting the existence of whole families; or can we hope, by wise advice, at any rate to modify their effects? Most certainly we can. A man is not necessarily obliged to be consumptive because his father died of phthisis, or scrofulous because there is scrofula in his family: he is only more

predisposed to tubercle or to scrofulous disease because the one or the other has occurred among his near relations ; and in many cases, by careful attention to his mode of life and avoidance of excesses, he may ward off indefinitely the fearful disease with which he is threatened. As yet we know little or nothing of the causes of such diseases ; but it is certain that bad hygienic conditions favour the development of several of them, and may in many cases be the direct causes of them. One point should be noted ; it is that the intermarriage of families in which one of these diseases exists, favours its development, and should therefore be avoided.

I should not fulfil my task to-day did I not refer to a class of diseases only too widely spread, unfortunately, among all ranks of society. Here is a wide field for wise preventive legislation ! I know that many well-meaning but misguided people would tell you that such diseases as syphilis and its congeners are the just punishment of immoral conduct, and that therefore, forsooth, they must be allowed to spread themselves, unchecked, among the population of our land. This is certainly not the hygienist's way of looking at it ; and, let us hope, not the law-giver's, for it is to him that we must look for the carrying out of such measures as may be considered necessary for the subjection of this formidable enemy of society.

In the civilised condition of man, new discoveries are made every day, and new methods for the employment of labour arise. Each of these entails a special kind of work, and exposes to particular dangers. Need I call to your minds the well-known instances of the special anæmia of miners, the phthisis of stonemasons, the jaw-carries of phosphorous-match makers, the palsies of workers with lead, with mercury, and with bisulphide of carbon ? And so hygiene, being the study of the prevention of disease, gets fresh branches added daily to its already enormous superstructure, and follows the arts in their progress, indicating at each step the precautions to be taken to avoid the spread of disease and death.

From its very nature, hygiene interests all classes of society ; but it is to those who are worst off, the poorest and most wretched, that it must direct its first attention. Civilisation has its evils as well as its advantages, as Bouchardat has well remarked ; and one of the greatest of them is the over-crowding of people in the great centres of population, with the misery and disease which are the results of it.

It is to better constructed houses for the working classes, to a free supply of good water, and to satisfactory sewerage arrangements, that

we must look for an amelioration in these respects ; and, I would hasten to add, to a wider spread among those classes of such an education as shall lead them to appreciate the means used for the improvement of their condition, and to lend a helping hand for the furtherance of those means.

Much has already been done in this way, but yet much remains to be done. Is it not a grand result to be able to announce that the average life of man has been steadily rising during the present century in most of the countries of Europe ? I will not quote numbers to you, because the various statistics, although agreeing in the main, differ greatly in their details, on account of the different ways in which they have been procured ; and some of them are little to be relied upon. No doubt many circumstances have contributed to this happy result ; but I think that I am justified in maintaining that the chief cause of it has been the great improvement that has been effected in the sanitary condition of the large towns.

Encouraged by these triumphs, already obtained by our science, let us march onward, looking confidently forward to new and still greater achievements, and keeping always in view the lines which we took last year as our motto—

“ *Ad cædes hominum prisca amphitheatra patebant*
Ut longum discant vivere, nostra patent. ”

SYLLABUS OF THE COURSE.

THE object of these Lectures is the study of the causes of diseases and of the methods for their prevention. The following arrangement will be adopted:

(1.) The *Subject* of Hygiene.—Man, considered (*a*) individually, as regards age, sex, temperaments, idiosyncracies, habits, hereditary tendencies, etc.; (*b*) collectively, as races, nations, families.

(2.) The *Principles* of Hygiene, which will be treated of very fully throughout the whole course, and upon which will be based

(3.) The *Applications* of Hygiene, including climates, soils, geology of hygiene, drainage, etc.; towns, water-supply, sewage and sewerage, paving, etc.; buildings, confined air, warming, lighting, ventilation, etc.; food, etc.; excretions, of skin, lungs, kidneys, digestive tract; disinfectants; baths, etc.; dress; work—bodily and mental; professions, arts and manufactures, etc.; fermentations; grave-yards, slaughter-houses, etc.; diseases—contagious, endemic, epidemic, etc.; movements of the population, colonisation, etc.; education, legislative enactments, etc.

The course will be illustrated by numerous specimens, diagrams, and models; hygienic instruments and apparatus will be exhibited from time to time, and their uses demonstrated.

The first of these is the fact that the population of the United States is increasing at a rapid rate. This is due to a number of causes, including immigration, a high birth rate, and a low death rate. The second cause is the fact that the population is becoming more concentrated in the eastern half of the country. This is due to the fact that the eastern half of the country has a more favorable climate, a more fertile soil, and a more developed industry. The third cause is the fact that the population is becoming more educated. This is due to the fact that the United States has a high level of literacy, and that the population is becoming more aware of the importance of education. The fourth cause is the fact that the population is becoming more mobile. This is due to the fact that the United States has a large and well-developed transportation system, which makes it easy for people to move from one part of the country to another. The fifth cause is the fact that the population is becoming more diverse. This is due to the fact that the United States has a long history of immigration, and that the population is becoming more aware of the value of diversity. The sixth cause is the fact that the population is becoming more health-conscious. This is due to the fact that the United States has a high level of medical care, and that the population is becoming more aware of the importance of good health. The seventh cause is the fact that the population is becoming more environmentally conscious. This is due to the fact that the United States has a long history of environmental protection, and that the population is becoming more aware of the importance of the environment. The eighth cause is the fact that the population is becoming more economically conscious. This is due to the fact that the United States has a high level of economic development, and that the population is becoming more aware of the importance of the economy. The ninth cause is the fact that the population is becoming more socially conscious. This is due to the fact that the United States has a long history of social reform, and that the population is becoming more aware of the importance of social justice. The tenth cause is the fact that the population is becoming more politically conscious. This is due to the fact that the United States has a long history of democratic government, and that the population is becoming more aware of the importance of the political system.