results are obtained. They are deduced from the whole of the figures employed, and not from a part of them only. It is not out of every forty-five persons living in England and Wales in one year that one death happens. We could not undertake to say that, out of forty-five persons occupying some large country mansion, or some school, or some small group of houses, throughout a year, one would die. We should prove very bad prophets if we did. Our assertion that one in forty-five of the living population dies annually applies to the whole population of England and Wales, of both sexes, and all ages, but not to every group of five and forty persons, and especially not to every group of forty-five infants or forty-five aged men or women. It must be obvious to the meanest capacity that this large truth, expressed in numbers, has no practical application whatever to any individual man, woman, or child; and that it could not even be safely applied to any single group of forty-five persons, though closely resembling, in the sexes and ages of the persons of whom it consists, the population of England and Wales of which it forms a part.

The same observation applies to facts of variable numerical value. If I count the pulses of fifty persons, add the numbers together, and obtain an average result, my average is that of the whole fifty facts, and not of any smaller number of facts. I could neither undertake to state the average of five pulses, or of ten pulses, nor the number of the pulse of any person whom I had not seen before. All that it would be at all reasonable to expect is, that the pulse of this person would have the same frequency as that of some one person, or possibly two persons, out of the fifty from which I obtained my average. But, even in this not unreasonable expectation, I might be deceived; for this pulse might chance to be of that rare exceptional order which does not occur once in fifty, or even in one hundred or one thousand times—a pulse of forty, for instance.

The true nature of the case is, perhaps, better seen when we deal with instances in which the fractional result obtained is larger than in the case of the mortality of England and Wales to which I have just referred. Take, as a good and instructive example, the mortality in hospitals, or the deaths from pulmonary consumption occurring among the adult male population of England and Wales. Say that the mortality of a general hospital is *one in ten* of its inmates; and the deaths from pulmonary consumption *one in five* of the adult male population. Every man with a grain of sense in his composition will see that it is not one out of every ten patients in the hospital, or one out of every five of the male population, that perishes, but simply at the rate of one in ten, and one in five. The proportions—one in ten, and one in five—were the results of a large calculation, founded upon a large number of instances, and do not admit of application to small groups of persons.

These considerations are so obvious that you may, perhaps, think I ought not to have detained you with them. But the fact is that those persons who object to the use of the numerical method, or habitually underrate its value, really so far misunderstand those who practise the method as to accuse them of the very misconceptions which I am now endeavouring to remove. These remarks, therefore, are not uncalled for; nor is it unnecessary that I should tell you at once what kind and degree of importance the men who know most of the numerical method, theoretically and practically, really attach to it.

In the first place, they affirm that the numerical method admits of most useful application whenever we can reapply the results obtained from a considerable body of facts to a similar collection of facts of the same order. Such is the insurance of life and of health, and the insurance of property against fire or shipwreck. A large body of facts has been collected showing the mortality and liability to sickness at different ages, and the relative number of vessels destroyed or injured by shipwreck, and of houses injured or consumed by fire. We construct tables presenting the average results of these facts; we add a certain fraction for office expenses, and a certain fraction for possible inaccuracies in our calculations, and proceed to risk millions of money in insuring individual lives, ships, and houses; and our procedure is justified by experience. Though one man shall be knocked down by a carriage, and killed on the spot, as he leaves the insurance office, fresh from the payment of his first premium; though a vessel founder at sea, or a house be burnt to the ground, within a week of the act of insurance, the underwriters are not troubled. Such cases were comprised in the columns of the tables on which their calculations of risk were based; and it is reasonable to expect that these, as well as every possible variety of more favourable occurrence, should sooner or later take place.

In the second place, the advocates of the numerical method affirm that, subject to certain simple provisos (as that the individual facts shall be strictly comparable facts; that they shall be carefully and skilfully handled; that the calculations of average results shall be correctly made; and that the facts themselves shall be numerous), the averages obtained (and the same remark applies to the extreme values) are as useful, for all purposes of comparison and reasoning, as any other ascertained truths, whatever the shape which they may assume.

In the third place, the advocates of the numerical method do not claim for it any great amount of utility when directly applied in the service of the arts. They allege only on its behalf, that average values express tersely and concisely many of the facts with which the practitioner ought to be acquainted; but they admit that they cannot be safely applied to individual instances. It is otherwise with extreme values, which do admit of important practical applications. The engineer, for instance, having ascertained the maximum strength of some material which he is about to use in some important public structure, as a bridge or a ship, satisfies himself and the public by largely exceeding that maximum in his calculations, and providing the strength of his materials accordingly.

These, then, are the limits of the claims set up on behalf of the numerical method; and these are the limits within which its applications to the science and art of medicine are restricted. I shall consider further the rules and principles of the numerical method in my next.

Lectures

ON

THE HISTORY OF MEDICINE.

DELIVERED AT

THE GROSVENOR PLACE SCHOOL OF MEDICINE.

BY

ALEXANDER HENRY, M.D.

LECTURE III.

Circumstances favouring the Development of Philosophy among the Greeks. Character of early Grecian Philosophy. Pythagoras. Alcmaeon. Empedocles. Anaxagoras. Democritus. Heraclitus. Public Practice of Medicine: its Origin. Dispersion of the Crotona School. Democedes. Acron. Public Gymnasias: their influence on Medicine. Herodicus. Iccus. Summary.

[Concluded from page 390.]

HAVING given a fragmentary notice of the opinions of the philosophers who preceded Hippocrates or were contemporary with him, I will direct your attention to some facts in the history of the commencement of the practice of medicine in public.

The philosophic schools, especially that of Italy, at an early period produced men who began to deprive the Æsculapian priests of their monopoly of medical practice. For the purpose, however, of gaining and retaining the confidence of the people, they at first employed, like the priests, incantations, expiatory sacrifices, and other superstitious practices. Gradually, however, they threw off the mask of mystery, and openly avowed that disease was treated by natural means.

An event which contributed in no small degree to the emancipation of medicine from priestcraft and superstition, was the dispersion of the Pythagorean Society of Crotona. This, which was the result of a popular outbreak, broke the firm bonds which had hitherto held the members together, and diminished the religious feeling with which they had hitherto held inviolable the secrets of their order. Travelling into foreign states, they associated with the uninitiated, and revealed to them, with little or no scruple, their mysterious knowledge; and thus this, no longer a secret, became the common property of the public. Of these practitioners who thus emanated from the school of Crotona, several had the title of *Periosteuta*, or travellers; because they travelled from country to country, practising their art. By this proceeding they gained the enmity of the Æsculapian priests, who still desired to conceal their secrets under the veil of mystery; but, in the end, there is no doubt that they were mainly instrumental in bringing about, by the force of public opinion, a salutary revolution in the manner in which medicine was practised.

Among the most celebrated of the Pythagoreans who were obliged to fly from Italy, was Democedes of Crotona. A price being set on his head by the inhabitants of Crotona, he fled to Platea, and afterwards practised medicine at the court of Polycrates, tyrant of Samos. According to Herodotus, his reputation was so great that he was sent for to the court of Sardis, where he cured Darius Hystaspes of a sprained foot which had been unsuccessfully treated by the Egyptian priests, and healed the queen Atossa of what appears, from the description, to have been an obstinate ulcer of the breast. This account of Democedes is worthy of mark, as shewing the power which the open exercise of medicine was beginning to gain over the public mind.

Acron of Agrigentum, a contemporary of Empedocles, is reputed by some to have been the founder of the empiric sect. His tenets, indeed, much resembled those of this sect; but as it did not formally rise into existence until a much later period, it is best to consider him as a man *sui generis*; or rather, as one whose practice was simply Æsculapian, minus the mystery, and opposed to the speculative practice of the philosophers. He and Empedocles seem to have had a truly professional contempt for each other—as great as any theoretical and practical men of the present day feel. Empedocles, like most of the Pythagoreans, held himself in a measure divine. Acron, it is said, wished to have a monument erected to himself during this life, with an appropriate inscription. On his consulting his friends as to the best inscription, Empedocles recommended, in satire, the following:

"*Ἀκρον ἱγνῶν 'Ἀκρων' Ἀκραγάντανον πατρός ἄκρου
Κρύπτει κρήνους ἄκρος πατρίδος ἀκροτάτης.*"

Here is the translation:—"A craggy rock of his most eminent country hides Acron of Agrigentum, the most excellent physician, son of an eminent father."

As to his actual practice, we have not much related, except that, on the occasion of a great plague in Athens, he had large fires lighted in the streets with the object of purifying the air. He is said to have written, in the Doric dialect, some works on the art of healing and on dietetics.

Besides the adoption of medicine by the philosophers as a portion of their study, and the public practice of it by the disciples of the dispersed school of Crotona, the organisation of the public gymnasia had an influence on the practice of the art. These institutions were the places chosen by the philosophers for study and instruction; and they were often placed in the vicinity of the Æsculapian temples, so that the priests gradually were led to teach their art to those who were not initiated into their order. The directors and *employés* of the gymnasia, indeed, gradually became the popular practitioners; in a manner, probably, not unlike that in which chemists and druggists would take on themselves the office of practitioners of medicine. The directors (*γυμνασιάρχαι*) regulated the hygiene of the youth who frequented the gymnasia: the sub-directors (*γυμνασται*) treated diseases: and the attendants (*ἀλείπται* or *ἰατρολείπται*) bled, administered enemata, and dressed wounds, ulcers, and fractures.

Among the gymnasiarchs, who exercised the greatest influence on the practice of medicine, were Herodicus of Selymbria and Iecus of Tarentum.

Herodicus is said to have been a sophist, who, being in ill health—according to some accounts, affected with phthisis—cured himself by a course of gymnastics. Thereupon he became a teacher of the gymnastic art, and established an institution at Athens, where he specially devoted his attention to the application of gymnastics to medicine; not, however, that he is to be regarded as the first who recognised the importance of bodily exercise in the preservation of health. It is possible, however, that he was from the first the master of a gymnasium; at any rate, he is the reputed inventor of what is called gymnastic medicine. He perceived the possible division of gymnastic exercises into three kinds: the military, which were practised for the purpose of acquiring skill and power in the use of weapons of war; the athletic, the object of which was the training of competitors for the public games; and the medical. His practice, if we may judge from the remarks in one of the Hippocratic treatises, seems to have partaken much of the characters of the water-cure and kinesipathy of the present day, in so far as it was often an injurious or ridiculous exaggeration of a valuable means of treatment. He is said to have killed several who were ill of fevers, with excessive walking and wrestling. "Pretending to overcome the fatigue occasioned by sickness through the means of another fatigue, he drew upon his patients sometimes inflammations, sometimes pains on their side," etc. Among the pupils of Herodicus is

reckoned Hippocrates, who, if this be true, must have exercised his judgment with sufficient precision to distinguish those parts of the practice which he could adopt from those which were unsafe or absurd.

The Asclepiads of Cnidus in Asia Minor have the reputation of leading the way among their order in throwing off the veil of mystery which surrounded the practice of the art. Their system of studying disease—for they had established a system, such as it was—was based on a different plan from that of the priests of Cos. The Cnidians studied diagnosis; the Coans, semeiology and prognosis. To the subject of the difference in the doctrines of the schools, I shall have occasion to refer in the next lecture.

Ctesias, a Cnidian practitioner, is more celebrated as having been the author of a history of Persia than in relation to medicine. He is mentioned here, however, principally as an example of one of the Asclepiad order entering into public practice. According to Diodorus Siculus, he served in the war between Cyrus the younger and his brother Artaxerxes; and, being taken prisoner by the latter, was retained by this monarch, who appreciated his professional talents, as his physician during a period of sixteen years.

Having given an outline of the principal circumstances which had an influence in bringing about the institution of the public practice of medicine, I will now sum up and comment on the facts which have been brought forward in this lecture.

1. The circumstances which were chiefly operative in releasing the practice of medicine from the jealous grasp of the Æsculapian priests were, first, the adoption by the philosophers of medicine as a portion of general learning; and secondly, the usurpation of the functions of the practitioner by the managers and attendants of the gymnasia.

2. The philosophers both studied medicine as a branch of science, and also practised it as an art.

3. As a branch of general knowledge, the study of medicine was connected with that of nature. They sought to ascertain the influences which act on the body in disease as well as in health.

4. By their inquiries in the latter direction, they pointed out the necessity of a knowledge of anatomy to the comprehension of the functions of the body, and of physiology to the true comprehension of the phenomena of disease.

5. Their doctrines in physiology were derived in part from an application of their speculations regarding the elementary constituents of matter, and partly from dissections. That the latter formed a source of knowledge, is shewn both by the fact I have recorded of Democritus, and by the impossibility of otherwise explaining the notion of Alcmaeon that respiration takes place through the ears.

6. There is no evidence, however, that they ever dissected the human subject; indeed, we may regard it certain that they did not do so, but that all their examinations were made on the bodies of animals.

7. We are therefore indebted for our earliest notions of anatomy and physiology, not to the Asclepiads, for they do not seem to have studied these, but to the philosophers. Empirical medicine and physiology thus arose from distinct sources; and although they have more and more approximated, yet their union is not even now perfect.

8. As a sort of counterpoise to the benefit conferred on medicine by the philosophers in introducing the study of physiology, must be adduced the crude speculations which they also introduced. I mean their doctrines of hot and cold, dry and moist, etc.; doctrines which tinge the writings of Hippocrates, though he was far from being altogether led by them; and which prevailed, in senseless application to diseases and their remedies, down to a late period.

9. There does not appear to have been any positive application made of the study of physiology to the practice of medicine by the philosophers. In their hands, actual practice was nearly the same as that of the Æsculapian and Egyptian priests, conjoined possibly with greater surgical skill. Having to deal with a public not ripe for the divulgence of a mystery, and desirous moreover of maintaining their own influence, the philosophers made their practice to consist ostensibly in attention to dietetic rules, in incantations, and in expiatory sacrifices.

10. The dispersion of the Pythagorean Society of Crotona, about 500 B.C., was the means of furnishing to Greece and the neighbouring countries a class of practitioners, by whom mystery was removed from the art of medicine.

11. The application of gymnastic exercises to medicine was a step from which both good and evil plainly arose. It was good, inasmuch as it drew attention to a valuable remedial

agent; but it was also productive of evil, as it gave rise to the abuse of the system in a manner precisely analogous to that in which various systems of charlatanism have been carried out in modern times.

12. The state of medical matters at which we are now arrived shows four influences at work, directly or indirectly, on the science of medicine. These are, (a) the empirical knowledge of the Æsculapian priests, and their study of disease *per se* in regard to its diagnosis, as at Cnidos, and in regard to its semeiology and prognosis, as at Cos; (b) the introduction of hypothesis by the philosophers; (c) the introduction of anatomy and physiology; (d) the application, more closely and extensively than hitherto, of a system of hygiene, consisting principally in dietetics and gymnastics.

Original Communications.

CASES OF IDIOPATHIC PNEUMOTHORAX, WITH REMARKABLE ABSENCE OF BAD SYMPTOMS: RECOVERY.

By JOHN THORBURN, M.D., Manchester.

THE first of the following two cases was read before the Medical Section of the Royal Manchester Institution, on February 1st, 1860, and the members expressed a wish that it should be published, on account of its remarkable character and of its bearings on the diagnosis and prognosis of a malady so commonly fatal. The second case was alluded to in the ensuing conversation by Dr. Noble, and was kindly communicated to me from memory by Mr. Walsh.

Pneumothorax is very properly held to be one of the gravest forms of affection to which the chest is liable, producing most violent symptoms at its onset, and ending, sooner or later, in a fatal result. We consider our patient's case as nearly hopeless from the outset; and even in those few instances where recovery ensues, we almost invariably see some other organic lesion which must independently lead to the same fatal termination. The following case is in every way exceptional.

CASE I. Mr. J. C., aged 22, was in perfect health up to the date of the present attack; that is to say, he was not himself conscious of any ailment, bodily weakness, or wasting; he had had no cough, hæmoptysis, pain, or other recognisable symptom of internal disease, and, being an intimate personal acquaintance of my own, I had every reason to consider him up to that time as of sound constitution. My reason for thus insisting on this point must be evident. His only previous illness had been a severe fever about ten years ago. He was on the eve of a voyage to America, and had consequently for some days had rather more exertion than usual. He had also, three days previously, indulged freely in rowing, to which he was not recently accustomed, though in former years he had been; he felt, however, little or no inconvenience at the time.

July 19th, 1859. Early in the morning he was awakened from a sound sleep by a sharp pain in the right side, accompanied by dyspnœa. It continued thus for two or three hours, and then, becoming less severe, he rose, dressed, and went to business in the City. In the afternoon, he first called upon me, and stated that he still felt considerable pain in the right breast and shoulder. It was experienced chiefly on deep inspiration. He had no cough, nor, when sitting in my consulting-room, any apparent dyspnœa, though he had rather a feeling of breathlessness. The pulse was quiet and regular (76). The skin was cool and moist; the tongue very slightly furred. As there seemed to be no evidence whatever of any acute inflammatory disease, I merely auscultated the top of the chest anteriorly. The percussion was fair on both sides; the respiration rather weak on the right, but without other alteration of quality or rhythm. Everything pointed to a simple attack of pleurodynia, consequent perhaps on the heat and exercise of rowing three days before. I prescribed a saline aperient, and a sinapism to the seat of pain.

July 20th. He called again, and expressed himself as a good deal better. The pain had moved about, and was now felt somewhat on the left side.

July 21st. I called on him in the morning, and found him almost quite free from pain, and considering himself well

again. He had just come down stairs however, and his breathing seemed to me to be much too hurried. Bearing in mind the comparatively feeble respiration at the right apex, which might possibly be of tubercular origin, though a pleurodynic pain in the side could equally account for it, and knowing of his intended voyage, I desired him to allow me carefully to examine his chest. On doing so, I found to my intense surprise the following conditions. The left side was perfectly normal, except that the respiratory sounds were rather exaggerated. On the right side the percussion-sound in front was at the apex comparatively, though not to a marked degree, more resonant; lower down, it was very evidently so, and the increased resonance extended quite to the border of the false ribs. Behind and laterally the percussion note was quite tympanitic, and the tympanicity completely obscured the natural dullness of the hepatic region. On auscultation, the vesicular breathing was completely lost over the whole side, and was replaced at the apex by a clear hollow tone, with an equality of the inspiratory and expiratory periods; lower down, it gradually merged into a clear amphoric ring. The same loud amphoric sound was evident over the whole back and side. In addition there was audible with almost every inspiration a clear ringing click, as of water dropping into a deep well—the most beautifully marked *tintement métallique* imaginable. The impulse of the heart was also occasionally accompanied by the same sound, audible chiefly at the right back. The vocal resonance was perfectly amphoric, both spoken and whispering. Change of posture made no difference either in the percussion or auscultation. It was clear that he was labouring under complete pneumothorax of the right side, although, nevertheless, the pulse was not above 76, either now or at any other time; the tongue was clean and moist; the skin cool; there was no apparent dyspnœa when in bed; not a trace of cough; and hardly the slightest personal discomfort. I at once advised a second opinion; and Sir James Bardsley saw him with me in the afternoon. In spite of his long experience, he was equally astonished with myself at the great clearness of the physical signs and the total absence of concomitant bad symptoms.

The subsequent history may be given very briefly. Any active treatment was out of the question; and the only and self-evident measure consisted in preventing all unnecessary action of the part. This was done, and slight counterirritation was applied by means of iodine.

For a day or two the signs continued much the same, and the chest became a little bulged, as if the accumulation of air in the pleural cavity was increasing. In ten days, however, the metallic tinkling had quite disappeared, the percussion note also becoming less tympanitic gradually, commencing *from above*. The respiration and vocal resonance became *pari passu* less amphoric. He had never during this time one bad general symptom; and I may state again, that he was not aware of having once coughed during his whole illness.

August 31st. It was deemed advisable for him to go down to Scotland, having been going about a little for a fortnight without injury. At this time, the tympanitic percussion was quite confined to the lower and lateral part of the side. The rest was still rather comparatively over-resonant, and the breathing was nowhere yet quite normal. At some points it was faint and distant, though vesicular; at others it had still rather a blowing character. He came now under Dr. W. T. Gairdner's care, at Edinburgh, who kindly informed me from time to time of his straightforward progress. By

Nov. 8th. Dr. Gairdner became convinced that the lung was almost everywhere again in contact with the chest-wall, except perhaps at the extreme base; and that, in spite of the improbability, there was no perceptible evidence of tubercle whatsoever.

Jan. 20th, 1860. He had come back to Manchester, and I examined him very carefully. I must say that, if unaware of his previous history, I should have set his chest down as a very healthy one, rather better than the average. As it is, I can discern nothing more than a slight faintness of respiration at the base, and a rather too low extension of the thoracic resonance when in the recumbent position. He is strong and well, has gained flesh, can go through a long day's shooting without resting or fatigue, and may therefore, I think, safely be set down as perfectly recovered.

REMARKS. There are several points of interest in this case to which I may briefly allude. In every way it is a remarkable one, whether we consider its origin, symptoms, or termination. The usual cause of pneumothorax, setting aside traumatic cases, is undoubtedly the rupture of a tubercular softening;