minutes the attendant rubbed me down with hot sheets. I then dressed and returned to the hotel. I then undressed again, went to bed, and stayed there for an hour, going to sleep if possible, but at any rate lying quiet, and if I read at all it was contrary to orders. It was hardly worth while to dress again, so as a rule I simply lay quiet for an hour or more, and then the masseur came, who after massage put me through a number of resistance exercises. It was then time for lunch, so that the whole forenoon had been taken up with the treatment. After lunch I read a little, wrote a letter or two, took a short stroll in the park, and then returned to dinner at the hotel, and then went very early to bed. The effect of the baths was first of all to somewhat slow the pulse and to dilate the peripheral vessels, as was shown by the skin under water becoming of a rosy colour, while that which was out of the water remained white. The effect upon the blood pressure was not constant, and I was unable always to take it under similar conditions. The effect of abdominal massage was rather to raise the tension, probably by driving blood out of the splanchnic area, while the effect of the resistance exercises was somewhat to lower it. Of course as far as regards the good effect of the treatment in my own case there can be no doubt whatever. It may be said that I might have got the same good results by having it carried out at home, but this is just the point. I could not have had it at home. I might have had the baths, I might have had the exercises, but most certainly I could not have had the rest. I have advised a Weir Mitchell rest cure in a good many cases, and in several of them I have been persuaded by the patients and the patients' friends to allow the cure to be carried out at home, but these cases have all failed with one exception, which was that of a married lady without children. The whole of the first floor was given up to her, and she was as completely isolated there as she would have been in any nursing home, and the same is the case with Nauheim. At present I know of no other place where you can get the same complete combination of treatment with rest and arrangements for gentle exercise as there, and it is this that makes the treatment so successful. The rationale of it is that it accelerates the circulation and eases the heart by dilating the vessels, while the heart itself is reflexly slowed by the baths. At the same time the mental and bodily rest which is insisted upon is the greatest of all the factors, and is the one that is the most difficult to obtain at home.

The best treatment for an exhausted heart as for an exhausted body is rest.

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THE late Mr. John Langton, Consulting Surgeon to St. Bartholomew's Hospital, has left estate valued at £6,731 10s. 7d.

At an extraordinary meeting of the Court of Governors of the Middlesex Hospital, held on October 28th, it was unanimously resolved that the President, Vice-Presidents, Treasurers, Weekly Board of Governors, Medical Staff, Governors, and officials of the Middlesex Hospital, desire respectfully to express their deep sympathy with His Serene Highness the Duke of Teck and the members of His Serene Highness's Family in the sad loss which they have sustained by the death of Major His late Serene Highness the Prince Francis of Teck. They wish to place on record their most grateful appreciation of the valuable services His late Serene Highness rendered to the hospital, first as a member of the Weekly Board of Governors, then as a Vice-President and Deputy Chairman, and, finally, as Chairman. His late Serene Highness exerted all his talents and unsparingly devoted his time, to the furtherance of the hospital's welfare; the fruits of his labours in the cause of suffering humanity will remain as a lasting memorial to his name, which is revered and honoured by all who had the privilege of being associated with him in this work.

The FitzPatrick Lectures ON GREEK MEDICINE IN ROME.

DELIVERED AT THE ROYAL COLLEGE OF PHYSICIANS
OF LONDON,

BY
SIR T. CLIFFORD ALLBUTT, K.C.B., M.D., F.R.S.,
REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE.

LECTURE I.

PRESIDENT AND FELLOWS,—My last lecture* ended with the name of Soranus, and concerning obstetrics.

SORANUS.

Soranus was of the sect of the Methodists, but was far too great a man to be enthralled in any sect. Galen, who angrily repudiated Methodism, yet spoke of Soranus with unwonted respect. The renown of this great physician, from the centuries of Tertullian and Augustine through the Middle Ages, rested chiefly in this field of medicine; but to confine his distinction to any one part of medicine would do him less than justice. Soranus, who received his medical training in the later Alexandria, was a great physician in all Medicine; and, as many of my colleagues are well aware, no inconsiderable part of his notable work on "Acute and Chronic Diseases" has survived in the transcript of Caelius Aurelianus, who lived some 300 years later. Still upon the gynaecology we may tarry for a moment, as upon this side of his work Ilberg has recently published an interesting essay,† an essay which forms a part of the large and scholarly work upon medical classics undertaken by the school of Diels.

The enormous ascendancy of Galen, his vast output in which he even surpassed that which amazes us in the writers on many subjects in the first two centuries of the Empire; his intricate and ardent dialectic, which endeared him to the logicians and rhetoricians of his own and many later centuries; his teleological philosophy, which endeared him to the Church; and, above all, the brilliancy and fertility of his genius, by overshadowing obscured and even effaced the traditions and documents of his predecessors. Lost in the glamour of Galen, in the Middle Ages even the invaluable Celsus was forgotten. Not only so, but the animosity of Galen against Methodism threw the work of this school into the greater neglect. Thus it was, as again in the time of the discovery of printing, that a turn of fashion brought destruction to many a precious manuscript. Yet if in the obliteration of his works Soranus was almost as unfortunate as Asclepiades, he was more fortunate in the upholding of his good name; in all later times he has been regarded as a great if half-forgotten physician. If then we have to appreciate the work of Soranus, we have not to refurbish his character.

FRAGMENTS OF SORANUS ON GYNAECOLOGY.

Of his important work on gynaecology but little survives, nothing directly; but by a Cuvierian process of piecing together fossil fragments Ilberg has attempted, not unsuccessfully, to discern and to rectify some farther part of the relics of Soranus concerning this subject.

In the Bibl. Nationale is a manuscript, dating from the end of the fifteenth century (*Parisinus graecus*, 2153) of a kind of Handbook or Articulæ, a compilation without author's name, the middle or gynaecological part of which is a document of sixty-seven leaves, upon which is written in a rough hand "*Σωρανός ἔστιν*." On the several attributions of the constituent parts of this handbook, which in the fifteenth and sixteenth centuries had a great vogue in the practice of midwifery, I cannot here dwell in detail; suffice it to say that their distribution is now more explicit. The first critical edition of the *Parisinus*, by Dietz, was posthumously published, without the advantage of the editor's own care, in 1833, as being the whole of it, from

* BRITISH MEDICAL JOURNAL, November 27th, 1909, p. 1515.

† Die Überlieferung der Gynäkologie des Soranus von Ephesus, von Johannes Ilberg. Leipzig: Teubner, 1910. (Das xxviii Bd. der Abhndl. d. Phil.-hist. Klasse d. K. Sach. Geschlft. d. Wissenschaften. No. II, mi sechs Lichtdrucktafeln. The appendix contains photographs of two pages of the *Parisinus* MS., and seven of the illustrations from the Brussels MS. of the uterus in normal and abnormal conditions of pregnancy.

the *Περὶ γυναικείων πάθων* of Soranus. But the part attributable to the master himself was less than half of it. *Ermerins* did something to discriminate its contents, especially in comparison with those excerpts of Soranus which are imbedded in the XVIth or Gynaecological Book of the *Ἱατρικὰ* of Aetius, a compiler of the sixth century as yet imperfectly edited. But the Parisinus contains additions, both of sentences and of chapters, which are significant as to authenticity, and are also of substantial importance; especially those on diseases of children, and on anatomy and physiology. The Aetius chapters (XVI, 50-87) seem to have been, as it were, a canvas upon which certain "Soranea" were worked in.

The next important step in the reconstruction of Soranus was taken by Valentine Rose. In the fifteenth and sixteenth centuries a certain Latin book was familiarly known to obstetricians as the *Gynaecia Muscionis*. Its history is a curious one, for it is the Latin form of it which proves to be the original work, the earliest known copy being an illustrated MS. of the ninth to tenth century now at Brussels.* The Greek rendering, under the fancy ("mundgerecht") title of "Moschion," falsely supposed to be based on the "Genetia" of Caelius Aurelianus, and to be of the eighth to ninth century, is much later. It was the erroneous notion of its antiquity which Valentine Rose corrected in an able study (Soranus, 1882) wherein he proved the "Moschion" to be but a translation of Muscio, and—as Moschion—to have a pedigree not older than the fifteenth century; and moreover to be of very subordinate value. Many of the ignorances and errors of this "Græculus" are set forth by Ilberg. Getting rid, then, of the Greek pastiche, it is on the Latin midwives' book that we are to fall back for such light as it may throw collaterally upon the Soranus from whose hands it was supposed to have come. Thus to verify the Soranus relics these connexions had to be made clear.

Now "Muscio" professes to have had before him two works of Soranus, a brief and catechetical, and an ampler work. He followed in the main the briefer and more didactic of the two, but also he padded out his rendering from the larger treatise. Soranus, in what we know of him, was prone to be sententious, to utter maxims to be learned by rote; this we perceive, for instance, in the substantial fragments of the "Acute and Chronic Diseases" preserved by Caelius Aurelianus. There are similar reasons to suppose also that, after writing his larger books, he drew up a book of Responsiones, or catechism.† Now, in these features of composition Muscio coincides likewise with Soranus as we know him from other sources. The illustrations probably belonged originally to the smaller or catechetical book of Soranus, and were reproduced to facilitate the abbreviation.‡ They have been carefully studied by many commentators, recently by Sudhoff.§

The outcome of this farther study of the Parisinus compilation Ilberg sums up as follows: Of the original date of it there is no evidence; the Byzantine physician put in nothing characteristic of himself or of his period. A tag from Meletius may well have been inserted later. It may have been written in the decadence of the seventh or in the awakening of the ninth century. The anonymous author had before him in its two forms the work of Soranus—*Περὶ γυναικείων πάθων*, and also the XVIth Book of Aetius; and these he undertook to blend into a new book. Passing over alteration of chapters, the scissors of the compiler were applied to what were probably four books of the original Soranus. Book I, though with some modification of form, he reproduced nearly in full. Book II was also preserved and its order better retained. Book III was more destructively dealt with, and moreover, after the example of Aetius, suffered interpolations and corruptions. Book IV suffered still worse things ("traurig ruinirt"); it was reduced for the most part to perverted scraps. On the whole, it would seem that the Aetius book was the framework of the compilation, and supplied, indeed, the greater part of it; and, as Ilberg remarks, compilers were far less scrupulous than transcribers.

* *Bibl. Roy.*, 3701-3715. (Muscio occupies the second part of it.)

† Cf. the *Interrogationes* of C. A.

‡ There is no difficulty about the date of such illustrations. There were illustrations in Vitruvius. At an earlier date Aristotle refers to *σχήματα* and *διαγραφὰς* in the *History of Animals*; and at a later Galen seems to have produced diagrams (*ὑποδείξεις διὰ γραμμῶν*) of the muscles and nerves of the arm, and of optical phenomena. The Alexandrians produced many illustrations.

§ *Studien d. Gesch. d. Med.* IV

Up to the time of Oribasius the texts of Soranus seem to have been in fair presentation; so that from this valuable compiler many smaller emendations and additions have been obtained. Probably Oribasius contains also more of Soranus, portions at present beyond identification, though some passages of the common Alexandrian tradition may have passed to Oribasius directly from Philumenos.

SORANUS AS PHYSICIAN AND SURGEON.

Of the traditions which attached Soranus to the earlier Alexandria, one of the chief was the works of Demetrius of Apamea, a disciple of Herophilus who flourished about 250 B. C., whose teaching, especially in respect of etiology, Soranus cites with admiration. It was the boast of the Methodists indeed, especially of the more empirical section of them, that they looked *μόνον πρὸς τὸ πάρων*, for in their opinion to pry into causes led off to alien curiosity; while the only anatomy they required for clinical purposes (*χρηστομαθείας ἕνεκα*) was the state of constriction or relaxation of the tissues affected (*χαλᾶν ἢ στεγνοῦν*); thus for them immediate clinical observation was all in all, and normal physiology a matter of indifference. But it would have been surprising if, methodist as he was, one standing in the following of Herophilus should have accepted the arid universals of that sect, regarded anatomy as *ἄχρηστος*, as ministering to mere curiosity, and dismissed the study of causes as otiose. In these respects, as in many others, Soranus, as Galen perceived, was greater than his school. The larger idea of molecular biology, and that of disease as a deflexion from the normal, were being degraded into the arid formulas of the later methodists, a sterility which justly provoked the ire of Galen; and from their shackles Soranus did not shake himself free. He was, I think, more of a captive than Ilberg seems fully to admit—to these empty abstractions, the *κοινότητες of strictum* and *laxum*, under which clinical diagnosis fell into little more than the dilemma of *στεγνοπαθεῖν καὶ βρευματιζόμενον ὁξέως ἢ χρονίως*. Still it is no less true that these views—these concentrations on *τὸ πάρων*—fastened attention upon the masterly clinical observations in which Celsus, Soranus, and Archigenes excelled. The capacity of Soranus as a surgeon we may recognize in his teaching on fractures and luxations as preserved in Aetius and Niketas. In Ilberg's words, then, Soranus "ist kein Toter"; both in learning and practice and in loyal regard to tradition he stands on the heights of ancient medicine. His disciples were taught not only "*claudere librum ut cogitent*," but also, and yet more, *claudere librum ut videant et curent*.

It is in his therapeutics that the methodist doctrines betray themselves unmistakably, as in the ingenuity of local applications to command the permeability of the tissues of the parts affected. In his surgery we find Soranus cautious and conservative; he did not betake himself to operation until other means had failed.

As to his ethical attitude, which was honourable, Ilberg refers us to a paper of his own||—one to which I have not ready access—on *φθόρα*, that is, the decision between the life of mother and child, as illustrated by the maxims of Soranus and Aetius.

PNEUMATISM.

Passing, as needs must, by leaps from period to period, in the next place I propose to invite your consideration of the sect known as the Pneumatists, and of the doctrine and idealism of the Pneuma. I separate the history of the sect from the history of the idea, because as a sect the phase was brief and its doctrines inconsistent, though the idea is one which in manifold forms has dominated and animated the minds of men beyond the domination and beyond the inspiration of any other idea in physiology, and this with a fervency which has penetrated far beyond the limits of the biological sciences. Indeed, as we utter the word "inspiration" we feel that the glow of the spirit, which from the ancient legends of the creation of life to the messages of our modern ethereal telegraphy, from the hauntings of the Great Spirit in primeval man through the storms of superstition to the haven of the soul in his purer communion with the Divine, has moulded the whole story of man, and embedded itself even in his tongue. Inspiration is just air; but what air? What in air, or of it, can be fraught with creative power? and how

|| "Zur gynäkologischen Ethik der Griechen" in the *Archiv für Religionswissenschaft*, xiii, 1910.

can it endow the tabernacle of clay with energy, life, motion, and thought?

One of the most touching aspects of human life is the perennial warfare, the rage between the idealist and the man of affairs; nay, it is even of this war that tragedy and comedy are begotten. It is a materialist prophet of to-day who bewails "the untameable wildness of the good." This is the story of Paul before Festus; of Francis before Elias and the Pope; of the "Lady Helen of Troy pacing to and fro with a nosegay in her golden shawl" before Mrs. Elizabeth Fry; of Garibaldi before Cavour; and in comedy of Quixote before Sancho, or the modern curate preaching Tolstoy before his country rector. "Church," said Mr. Tulliver, "was one thing, common sense was another, and he wanted nobody to tell him what common sense was." The dilemma is *ambulando insoluble*.

And of this kind is the story of the great Ionian idealists, the philosophic dreamers before Hippocrates and Aristotle; and the story of the Greek speculative reason, touched with an oriental mysticism, before imperious Rome. A distinguished modern author of the extremest Western variety has lately reiterated with uncompromising emphasis that in the sphere of ideas we owe all we are worth to the Greeks, a claim, however, which cannot be admitted without profound qualification. The Greek was the prophet of the "*Via Media*"; but to the idealist the *via media* has always been detestable, as detestable to John Knox as to John Henry Newman. The achievement of the Greek was loftiness of the plane on which the seer of both blended and integrated the ideal with the actual; that his *via media* was so high a mean between the imperative categories of the idealist and of the materialist. By an exquisite insight and tact he renounced not only much of the uses of the comfortable and pragmatic kind, but, as we perceive in Plato as well as in Aristotle, he definitely relinquished also the vision of some of the elements pertaining to the ideal society. The Greek saw "the untameable wildness of the good," saw it even with sympathy; but he saw also how much of it would not come into his picture.

The "Practical" Nature of Roman Thought.—Now we observed last year that toward these horizons of blended material and spiritual discernment Rome had not a lofty outlook. We are told, and not without some congratulation, that Rome was too "practical" for such issues; that the average Roman was above all things the practical man. Well, were he as audaciously satisfied as Dr. Archimedes Silverpump of the Lycurgus House Academy, he had notwithstanding his enormous place in the world's history. Still it is true that his work, fundamentally necessary as it was, the necessary foundation upon which modern Europe should be built, was yet but a substructure, and the Roman a labourer to be dismissed when this task was done. And, as we observed also in last year's lectures, while the Roman pavior was wielding his beetle, while with plumb and square he was shaping and laying the great blocks for the edifice upon which we are designing and are building the superstructure, even then ideas could not sleep. We have seen how the leaven of alien minds in Rome was fermenting, expanding, and penetrating to the joints and marrow of her work; and, as if in mockery, displaying upon her sullen atmosphere phantoms of what after her was to be: even then Rome was not permitted to forget that man cannot live by bread alone; not even if the loaf be protected by the policeman. It is this untameableness of ideas, this unconquerable mind of man, which makes the fascination of our story of the Greeks in Rome, as it does of the history of the Jews, or of the ideas of the Jew, in barbarian and in modern Europe. For, if under other guises, the conflict of Pagan, of Jew, of Christian, and of Mammon was never keener or more searching than it is to-day.

Now, as in our own land we often congratulate ourselves—too often perhaps—on being above all things "practical" men, and as in respect of the function of Rome this term is often used as sufficient for all explanation, may we tarry for a moment to ask for some notion of its meaning? For instance, is Euston terminus more "practical" than the Pantheon? or the Pantheon more "practical" than Santa Sophia or the Parthenon? And if so, why and how so? To answer this question must we not consider which of these achievements will have the most abiding use for mankind?

Furthermore, we might ask if the ideas of the order of Euston, or of an Atlantic steamship, exist for the sake of the ideas of the Parthenon, of Canterbury, or of William Wordsworth? Or conversely? We cannot pursue this train of thought, but we perceive that by "practical" in the Roman sense we mean the immediate needs, the things and devices of to-day as contrasted with things to come; or as an adept calculation and encountering of transient contingencies as contrasted with larger, future, and more consummate ends. While we admit, then, that Rome was laying the material bases of social order and culture, we perceive that with the issue of this material function her civic life began to decay; for to ends she had contributed little. And we are not surprised then to hear that the Greek too, not Aristotle only but Plato likewise, regarded himself as above all men practical; that in all the schools of ramifying philosophy the conscious, deliberate, and prophetic purpose of each was the art of life. Shall we not, then, consider how we defer to the Roman as conclusively the "practical" person? may we not have to describe him rather as the artisan of a material office, as the pioneer before the architect?

The Prophetic Genius of Ionia.—Now to return to the philosophers of the Homeric land: no work, ardent as it was, inspired as it was, could have seemed more visionary and less practical than theirs. In the later Attic reaction, the restraint of a more measured harmony, their exorbitant speculations seemed overwrought and in the void; Socrates explicitly repudiated their physics, and to this day they are too often regarded as vacuous combinations. Yet to the prophetic genius of Ionia, the *sapientia poetica* of Vico's happy phrase,* we owe at least four cardinal ideas, ideas which lifted the earth into the universe, revealed the universal spirit, the creative process, and the universal order, the four master ideas which within my present limits I must indicate nominally as the Cosmic idea, the Dynamic idea of a Continuum of streaming and indestructible energy, the Atomic hypothesis, and the compound idea of Natural Law and of Evolution. And to these I might almost venture to add the idea of gravitation. As we glance at this childhood of science, idly noting, perhaps, little more than its obvious puerilities, we are apt to forget the ironical question, What is the use of a baby? Yet some further reflection will make manifest to us, behind this inexperience, an insight and a grip of essential principles which 2000 years have enormously developed in principle but hardly regenerated. It is startling to feel how near us these great thinkers are; how much nearer than Abélard and Aquinas, when they unfurl the canopy of heaven into the air of infinity, when they prophesy of celestial and terrestrial physics, of natural law, of evolution from rudiments, of condensation and attenuation, of molecular energy, of formative combustion, and even of mind-stuff.

But to bring these radiant visions under some measure of realization (*ποιήσις*), and to vindicate the values of medicine and natural science independent of philosophy, in the fifth and fourth centuries respectively two men as great, but of other gifts, arose—namely, Hippocrates and Aristotle. The reader of the greater Hippocratic treatises will find, as Gomperz has generously maintained, the door opened upon a way which to us has become so familiar that we find it difficult to understand how in its own day it revealed the growth of a method of thought and discovery wholly new to the world—namely, the scientific method, as contrasted with scientific imagination.†

Now, who was this great Hippocrates, this prodigious man, and was it by the power of medicine that he was fashioned thus out of the visionaries of the age? That he did not stand alone, that he must himself have been the product of a great school and of a great tradition, our historical sense would bear witness. It is no barren fancy to associate the Father of Medicine in our

* For an interesting and discerning comparison of rational analysis with the instinctive, impersonal insight of myth and poetic tradition, often of deep intrinsic philosophical meaning, see Flint, *Study of Vico*, 1884.

† There is no writing extant which brings this new temper so impressively before us as the Hippocratic treatise on Ancient Medicine. Herein is set forth the way of experience, of careful observation of facts. And somewhat sharply controversial as it is against unbridled speculation, and the deductive application of philosophical ideas to the interpretation of natural phenomena, it is yet interesting to note that this treatise is also of Ionian origin.

imagination with the Father of History. Both inherited the luminous Ionian mind; and the author of *Airs, Waters, and Places*, cradled on the same enticing seas, had likewise travelled widely and observed shrewdly; both saw common things under the species of a large humanity. Indeed, the Hippocratic scriptures themselves also testify to a great school and a great tradition of medicine which, if sown and watered in a forgotten past, bore its golden fruit in Hippocrates, in Aristotle, and in the scientific schools of Alexandria.

In the anonymous Menonian MS. of London, it would seem that Aristotle attributed a certain book of this heterogeneous Hippocratic collection—namely, the *Περὶ φύσων*—to Hippocrates himself; and it is evident that if we could fasten any one of these books upon Hippocrates we should have therein a clew to his personality, and to the authenticity of other books of the canon. Hitherto, as I said last year, we have assumed that certain works marked by breadth of view, scientific temper, and sagacity seemed by these very qualities to proclaim themselves as from the hand of the great master himself. And perhaps this is not altogether to reason in a circle, for such qualities, by the witness of his contemporaries, were his. But, unhappily, these are not the qualities which mark the treatise *Περὶ φύσων*—a title difficult to translate into English, but which may be rendered *Concerning Airs*. Far, indeed, from breadth, precision, and wisdom, the *Περὶ φύσων* is a popular oration as windy in its rhetoric as in its subject-matter. We recognize in its affectations the rules of phrase, trope, antithesis, and cadence, which with a finer art were observed by all Greek rhetoricians, as, for example, in that masterly treatise of the fifth century, the *Περὶ τέχνης* of the same collection.* It is, in fact, an inferior product of the stoical physiology afterwards, as a school in Rome, known as Pneumatism; and if Aristotle really did attribute it to Hippocrates—well, says Ilberg, so much the worse for the medicine he was taught in Stagira. But I must not occupy you with the pretentious banalities of the *Π. φύσων*;† I have alluded to this tract, as I might allude also to some sentences in the *Περὶ τέχνης*, only to indicate the prevalence through the Hippocratic period of the doctrines recognized still later as a school under the title of Pneumatism, doctrines which in Rome were taught by the interesting physician Athenaeus of whom I am to speak.

The Origin of the Idea of Pneumatism.—In my remarks on this school I must begin by acknowledging the debt which, in common with all students of the subject, I owe to Wellmann's essay on "Pneumatism and the Pneumatists."‡ Yet I trust that, although without it my own would have been very defective, this sketch may be no mere reproduction of Wellmann's work. Amid the manifold aspects and schisms of Roman medicine I have chosen to solicit your attention at somewhat greater length upon Pneumatism, because among other qualities of interest its central idea seems to me to shadow forth what I have elsewhere ventured to describe as the pathetic quest for oxygen. In the history of opinion we have to beware not only of shaping the opinions of the past by our own, but also to take heed lest, while thus detaching ourselves as critics, and thus desiring to attribute to each of our ancient forerunners just his own uncoloured ideas, we discriminate them with distinctions to which he was a stranger. The ancients had not distinguished, disentangled, or differentiated concepts, or principles, so as to argue within and around them with the precision and discernment of later generations. In those times ideas were not so much mingled as inchoate, and still implicit together; their rudiments had not extricated themselves into separable strands. Ideas were nebulous, approximate, and blended. Logic came afterwards, only too soon, only too systematically; for many a century only to deprive the earlier speculations of their spontaneity and of their naïveté, while masking with its wire grille the vacuity of fact and the lack of verification.

The origins of the idea known for a while as Pneumatism are lost in the backward of time. The soul itself was an air or vapour. Mr. Barnard Cook tells me that the goddess which escaped from the cleft skull of Zeus may be regarded

as his soul. In early Indo-European religions the soul in both sexes was conceived as feminine; as, for instance, the Sirens, the Harpies, the Eumenides, and so forth. Thus from Zeus we move immediately to Ether (*Ἄιθήρ*), or ethereal essence, a dynamic conception having many qualities,§ or developing into many; for the pneuma—if I may anticipate the use of this term—was imagined as a yet more primeval substance (*Urkörper*) out of which when fertilized by a seminal principle (*σπερματικός λόγος*) particulars emerged. Thus the idea of the pneuma contained more than the several notions of air, of vapour, of fire; it was a world force, a Divine reason. And being in "conciliation" with nature, its works were interpreted teleologically; it was in this connexion that pneumatism became allied to stoicism, an alliance at first sight unlikely, as one without radical coherence; but in consistency stoic physical teaching as a whole was lacking, being rather an eclectic array, a syncretism for pragmatic ends, than an organized philosophy.

It is to Galen, whose value as a source of medical history cannot in our dearth of sources be overestimated, that we owe most of our knowledge of Pneumatism in its more developed doctrine. Our knowledge of the system is also enlarged by a pseudo-Galenic handbook, *Ὅροι ἱατρικοί*, supposed by Rose and by Diels to represent Athenaeus, as it observes his arrangement. But, being of later date—probably of the third century A.D., it contains more than this, and throws some light upon Agathinus, Archigenes—of whom I have more to say hereafter—Leonides, and Heliodorus; and in the manner of the second century is a fusion or tessellation of pneumatism, methodism, and eclecticism. This treatise deals also with the pulse lore with which, as we shall see, the Pneumatists made great play.

The Doctrines of Pneumatism.—To set forth the doctrines of Pneumatism, from their primeval sources to their completion, chronologically, and with due regard to their several exponents, would within our limits be impossible. I will try to sketch the history succinctly. In advancing, then, from the primeval ethereal essence (*Σεὺς-ἄιθήρ*), we have glanced at an early division into active and passive, into primary force and primary substance, the conjugation and products of which opposites played a large part in much of the later philosophy, without as well as within pneumatist circles. And passing on to the farther evolution of these vaporuous essences, we find them elaborated in Plato and Aristotle,|| from whom the dynamic view of life was carried forward to Alexandria rather through Diocles¶ and the Sicilian school by which Plato was especially influenced, than on the Hippocratean tradition, which indeed was soon to petrify into maxims or "dogmatics." Now it is of peculiar interest to us as physiologists that an effort was made by these medical philosophers to conceive of a dynamic essence "between air and fire"; for here it is that we note the beginning of the pathetic quest for oxygen which, from Empedocles to Lavoisier, drove physicists, chemists, animists, and vitalists, like a gadfly.

I have already reminded you of the rapturous idea of flux revealed by Heraclitus. Worlds away was his rushing, teeming, manifold, many-coloured torrent of life from the grey motionless shadows of the Parmenidean unity. But we must drift down on these subtle airs to the Timaeus, whence, and from other sources, we learn that the whole apparatus of breathing was regarded as independent of the animal organization; the "*ζῶον*" was already "*πλάσθην*"—moulded into form—when this dynamic function was added to it.** The structure of the whole body being pervious to both air and fire, as the most subtle of all

§ The element was not active primarily, it was but *ποσότης*; it was on its quickening into a quality (*ποιότης*) that it became creative. And it is to the qualities, says Wilamowitz, that the platonic term *τα στοιχεῖα* is properly applicable. The pneuma provided, as it were, the λόγος of this conversion. And, as if this were not ingenious enough, the pneuma was itself regarded as consisting in three phases: *εἰς* the grossest, *φύσις* the generative, and *ψύχη* the finest—sensation and thought. And above these was the *ἡγεμονικόν*, or ruling quality placed by Aristotle, Chrysippus, and Athenaeus in the heart; but by some Pneumatists this will or mastery was placed in the brain; but how, said the rest, could it energize in the coolest part of the body?

¶ On this period I am indebted to conversations with Professor Henry Jackson and to Mr. Barnard Cook's *Metaphysical Basis of Plato's Ethics*, 1895.

¶ Personally I am disposed to attribute the *Περὶ φύσων* to some follower of Diocles.

** Tim. 78, c., etc. Body, matter, or substance is perhaps most readily defined for this argument as resistance—inertia; it lay between "void" on the one hand and "form" on the other.

* Vide Theodor Gomperz, *Die Apologie d. Heilkunst*, Second Edition, 1910.

† I have written more fully of this treatise in the *Classical Review* for 1910.

‡ *Philologische Untersuchungen*, xivtes Heft, Die Pneumatistich Schule bis auf Archigenes; von Max Wellmann. Berlin, 1895.

created things (πάντων γενῶν μικρομερέστατον), fire drives the air through its pores; wherein we find an early allusion to respiration through the pores of the skin (διὰ μανῶν τῶν σαρκῶν), an ancient doctrine at least as old as Empedocles and probably older. Without going tediously into detail, Plato's conception was of a double cage of net or wicker, the outer containing air, the inner containing fire (as it were cages of carbonic acid and oxygen) with inlets to the bodily orifices, so that those agents by alternate inflation and depletion (ἐκπνύειν and ἀναπνύειν) should palpitate through the body. We start full; then the air, heated by the fiery envelope, drives by the nearest way through mouth and nostrils; then again, to avoid a vacuum, comes a compression (περίωσις), so that the air escapes through the tenuous interstices of the flesh (inspiration), and so onwards by oscillation (αἴωρα) through the blood vessels (φλέβας) and the cavities διὰ τῆς κοιλίας: "Making its course from the inwards to the parts extreme." The corpse differs from the plastic but not yet breathing body in that both soul and "form" have escaped to their refuge (ὑποδοχή), and left the "matter," which they had temporarily impressed, inanimate. "To die is to be a counterfeit; for he is but the counterfeit of a man who hath not the life of a man": said another authority. Such in rough outline was the remarkable contemplation of these great thinkers upon that primeval miracle the respiration, the inhalation of life from the invisible circumambient ether, essence, air, spirit, soul. "And He breathed into his nostrils the breath of life, and man became a living soul."*

The next considerable step in medical pneumatism was the fusion or adaptation of this dynamic idea with that of the four elements, fire, air, water, earth—termed the τὰ ἀπλά or rational units, and taken by Empedocles as radical substances (ρίζωματα), the creative qualities of which (ποιότητες) were hot, cold, moist, dry. This reconciliation seems to have been due chiefly to a certain Chrysippus, a younger contemporary of Aristotle, who may be taken as the philosophical founder of explicit pneumatism, as interpreted long afterwards for medicine in Rome by Athenaeus. Although the very obscure treatise Περὶ πνεύματος is not authentic as a work of Aristotle himself, yet no inconsiderable portion of the doctrine, as we may note by the terminology, is Aristotelian.† Galen‡ speaks of Chrysippus as the father of the sect (πρόπαππος τῆς αἰρέσεως), but he attributes no small share of it also to the direct influence of Aristotle. The Chrysippus of whom I am speaking was clearly not Chrysippus the Stoic, who lived a century earlier; but this distinction does not quite satisfy for the identification of this renowned physician so frequently quoted by Galen. For it seems probable that in the later fourth and earlier third century there were in Alexandria at least two of the name, father and son. However, merging the lesser in the greater, the greater Chrysippus, who may have been the master of both Herophilus and Erasistratus—of Erasistratus, if not directly yet at any rate indirectly through Metrodorus—was himself of the Cnidian school of medicine, and a disciple of Eudoxus.§ Although he had travelled much and learnt of many, he seems to have retained the Cnidian habit of minute observation of instant detail, of indifference to Coan reasoning upon remoter causes—such, for example, as on "airs, waters, and places"—and of academic logic. This sedulous obedience to fact may have fortified in Alexandria the bent inherited from Aristotle to anatomy, surgery, and symptomatology; and sowed there, moreover, the seeds of the subsequent empiricism and scepticism to which I have more than once referred. By tacking on many little points of agreement,|| on some of which I shall touch incidentally, as well as by the new ideas with which he enriched medicine, we shall be able

to trace the influence of Chrysippus into later times; as, for instance, in the use of herbs and in other notes of therapeutics, especially concerning venesection, on which practice, as I shall show presently, Chrysippus set himself against the whole of ancient medicine, and with the effect on later generations down to Galen, to which, in the history of Asclepiades, we gave some consideration last year. "Chrysippus the Cnidian," says Galen (XI, 150 and 252), "who displaced (ἐξέλεον) phlebotomy altogether from our means of cure."¶ But to this important matter I shall return hereafter in some reflections upon the story of the pulse. The works of Chrysippus were still extant in the time of Celsus.

Now I will pass quickly over most of the interminable stoical and more or less pneumatist dialectic, worthy of medieval times, recorded by Sextus Empiricus, D'ogenes Laertius and otherwise, as to modes of generation from those units; how on the dominant idea of generation earth and water were passive substances (παθητικά), fire and air (δραστικά) were powers (δυνάμεις), and so forth; over much logic also as to fire, heat, air, and pneuma; as to rarity and density (Zeus); as to heat in organic and inorganic bodies respectively; how far—and this is most interesting—fire (or pneuma) was not always a separating agent, but, as in the technical arts (θερμὸν τὸ ἐργαζόμενον), might fuse, temper, construct, and modulate them (make rhythm); passages which remind us of the lofty vaunt of Prometheus—

... in the fiery flame that lends
Its aid to every art.**

Fire, that is, might work either as an element (or substance, ὕλη) or as a tool (ὄργανον). And if with some thinkers pneuma was regarded as a kind of fire, with others it was regarded as a fifth element or ἀπλόν; in either case by their various mingling and the formative fire the several main tissues of the body (ὁμοιομερῆ)—that is, bones, flesh, blood vessels, etc., were evolved.†† It was generally agreed, at any rate, that heat, to which at least pneuma could attach itself, was the demiurgic power, and thus that the innate pneuma (σύμφυτον) ‡‡ by movement kindled the inward heat (θερμὸν ἑμφυτον); and by its penetration fused the whole into integration, or uniform harmony (ἕξις), promoted growth and propagation (φύσις) by way of which thinking comes, "for vapour cannot think," and awakened thought (ψύχη); the heat being constantly moderated by respiration. The Sicilians, on the Pythagorean tradition, regarded the heart as the seat of this inner or governing (ἡγεμονικόν) fire, an attribution which I need scarcely say was accepted in the main by Aristotle, and thence was handed down to medieval Europe. It is peculiarly interesting to us thus to trace the fifth element or quintessence through Aristotle to Harvey, who still conceived it as the universal principle of motion §§ animating all things from the starry sphere of the heavens to the tireless orbit of the heart. For of life the Aristotelian doctrine was that of the three spirits—the vegetative, the animal, and the vital—"the vital is begotten of the purest heart's blood, and conveys the glow of life through the other members, which gives them all the capabilities of action which emanate from the heart's vitality, the arteries serving for the transmission of this spirit to all the members"—

"Spiritus intus alit, totamque infusus per artus
Mens agitat molem, et magno se corpore miscet."
—Aeneid, VI, 726.

We perceive, then, that pneumatism was a much larger idea than animism, which in its peripatetic doctrine contemplated the vital principle under three particular forms. Pneuma is nearly identical with the primeval principle of νοῦς (Anaxagoras), an energizing principle;

* Neustadt, loc. cit.

** XO. καὶ νῦν φλογωπὸν πῦρ ἔχοντα ἐφήμεροι;

†† P. ἀφ' οὗ γε πολλάς ἐκμαθήσονται τέχνους (261-2).

‡‡ On the Homomeria, or kinds of structure, cf. Anaxagoras, vide Lucrēt., I, 830 et seq.

§§ The Pneumatists proper (Athenaeus) identified the pneuma with the innate heat (ἑμφυτον θερμὸν) as a single entity, and also, with Aristotle, accepted the heart as the seat of it (τὸ ἡγεμονικόν).

¶¶ In their several orbits or spheres (circular as being the most perfect form) whirled the sun, moon, and planets, while the outermost sphere of the fixed stars whirled round the others with an enormous velocity animated by the quintessence of ethereal fire. This universe, a plenum, spun in the infinite void. The expansive elements (fire, air), being centrifugal, and the heavier elements (water, earth), centripetal, the whole was balanced, though it is interesting to note that ultimately all things (even fire itself) tended towards the centre of the earth (gravitation).

* It is worthy of remark that Laurence Oliphant said, "The sense of union with Christ, of His living in us, was manifested, or became perceptible, in a physical sense, chiefly in changes of the natural respiration."

† On this part of the subject I am indebted to an essay by Neustadt: Ps-Aristoteles, Περὶ πνεύματος, Hermes, 1909.

‡ IV, 160; and five or six other passages noted by Neustadt.

§ In his earlier paper in Hermes (1900) Wellmann exposes a certain "chronologische Ungeheuerlichkeit," due to the confusion of the Alexandrian teacher with namesakes; and to his aid I am here again indebted. I may add that Wellmann regards Chrysippus as directly the teacher also of Erasistratus.

|| Vide Wellmann's useful lists in Rusemihl (loc. cit.)

yet no metaphysical hypostasis, but something physical the finest matter (ether) vibrating in and through all things, but most vivid in living things.

When Aristotle says, and says truly, that cold condenses (*πυκνύει*) and heat makes more permeable (*μανέρον*), we seem to be hovering about the edges of Methodism, and to apprehend how and where these outgrowths of doctrine branched away from each other. To the academic student it may seem perverse that with such features in common the various sects of which we are speaking kept so bitterly aloof, each within its own conventional palisade; but in our own day, with far less excuse, are not these tribal animosities still as fierce, almost as stubborn, as they were in certain pneumatists who, according to Galen, put their sect before their country? Many of them, poor things, had no country; and the pneumatists, in the breadth of their ruling idea, seem to us to have been more disposed than men of other sects to sympathize with alien opinion. Thus it was that many of the pneumatist school approached, or indeed joined hands with the Eclectics; but in no period of culture has a consciously eclectic school found the inspiration of life; in all times the doctrines of such schools, like compromises in practical affairs, have formed a mosaic rather than an organic body or synthesis, and have proved therefore to be temporary accommodations, and, seminally impotent.

Relations of Pneumatism to Other Doctrines.—So far I have pursued the general story of these ideas without arranging them formally in medical schools, or attributing them exactly to their respective teachers, in order to set forth an explication of so much of the pneumatist doctrine as, with some considerable peripatetic infusion, brought this school of medicine into alliance with the philosophy of the Porch.* For, as I have hinted, it is rather surprising to us to find the quickening leaven of the *pneuma* so actively at work in association with the Stoics, for whom all emotion was a perversion or a defect of virtue. This inconsistency was not only felt by such later Stoics as Panaetius and Posidonius, but became a subject of apologetic. Diels, however, in his essay on the physical system of Straton, suggests, or rather points out, that the pneumatic doctrine descended to Medicine more directly through this peripatetic teacher to Erasistratus of Alexandria, and thence to Rome. It is in the pseudo-Aristotelian *Περὶ πνεύματος* that we first find the *pneuma* definitely accepted as a fifth elemental quality.† And we have seen that the undoubted influence of Chrysippus in the Alexandrian schools pointed to him as the moulder of the theory of Pneumatism. The testimony of Galen, as cited by Neustadt and others, is not inconsistent with this attribution to the Peripatetics, for he says repeatedly that Athenæus drew freely upon Aristotle. Another most interesting link of the tradition we find again in Diogenes of Apollonia‡—namely, that both Aristotle and Theophrastus avoided any radical distinction between *pneuma*, as the original or even as the one primary element, in which thinking stuff was implicit, and out of which accordingly came order in the universe, and common air; though they soon entered into refinements, notably as concerning that vague but penetrating apprehension of oxygen—the “substance between air and fire”—on which I have already dwelt. More fancifully, airs might be drier or damper, hotter or colder, more attenuated (spirit) or condensing into phenomena; and so on. Thus Diogenes no doubt contributed to the rhetorical sophistry of which the pseudo-Hippocratic treatise *Περὶ φύσων*, and others like it, consist; a degradation of lofty and prophetic ideas into coarser notions of blasts and tensions of air compressing,

* I cannot dwell here on the points of difference: such as that for the Peripatetics heat and cold were drastic, and dryness and moisture passive; that Athenæus regarded these substances variably as sometimes matter, sometimes as forces; that substances or elements, as *ποσότητες*, were often confounded by the Stoics with their active qualities (*ποιότητες*)—for example, water with moisture, earth with dryness, and so on. Indeed, the Stoic hair-splittings amidst these permanent or interchangeable logical entities—as between *ποσότης* and *ποιότης*, for example—are to us intolerable, and were in respect even of their own time as vain as for his time the logomachies of Duns Scotus.

† In Galen's words (quoted Neustadt, loc. cit.): “Περὶ τὸν παρὰ τοὺς Στωικοὺς τὸ διῆκον διὰ πάντων πνεῦμα.”

‡ Recently well edited, with Introductory Essay, by Krause, Posen, 1908-9. This Diogenes is to be distinguished, of course, from the (later) Stoic. Vid. et Diels. *Fragmenta in Ed. of Excerpta Menonia and Axon Nelson, Berlin, 1893. Περὶ φύσων*, Upsala, 1909, p. 101.

expanding, shaping, or disintegrating an inert matter. Thus by ruder and coarser minds two great dynamic ideas—the pneumatic and atomic hypotheses—were debased; while the sagacious and prudent clinics of Hippocrates were frittered away in frothy rhetoric, barren methodism, or formal and arid dogmatics. In the absence of sufficient tests of premisses and of sources this lapse into sterility was perhaps inevitable; moreover, the Roman temper was for such thumb-rule formulas as Themison and the empirics provided. It is true notwithstanding, as we shall see for instance in Aretæus (or Archigenes), in Heliodorus, and in Galen, that beneath all this sophistry a substantial medical and surgical art was making its way, propagated in the main by the stream of Alexandrian science from Empedocles, Hippocrates, and Aristotle.

THE ARISTOTELIAN INFLUENCE IN ALEXANDRIA.

In endeavouring to elucidate this propagation and course of scientific ideas after Polybus, Diocles, and Praxagoræ through the schools of Alexandria to Rome, I have mentioned the name of Straton. Unfortunately for the historian, the name of Straton, like that of Chrysippus, was attached to several individuals. Of these, one, namely Straton son of Arcesilaus, of Lampsacus, tutor of Ptolemy Philadelphus, succeeded Theophrastus (B.C. 288) as head of the Peripatetic school, and held this position for 18 years, when he was followed by Lycon. Now this was the Straton who devoted himself so assiduously to natural knowledge as to receive the cognomen of Physicus. And Cicero (*Quæst. Acad.*) upbraids him for so giving himself up to nature as to neglect the study of virtue. But there was also a Straton, the same or another, an eminent physician of the third century, who was associated with Erasistratus. He is important enough to receive frequent mention over the centuries from Themison and Soranus (who quotes him on prolapsus uteri) to Oribasius and Galen, and to Alexander and Aetius. He opposed venesection after the manner of his alleged pupil Erasistratus; he was the first physician, so far as we know, to describe elephantiasis; and Erotian quotes him as author of a lexicon of Hippocrates. Haeser seems to identify these two persons; Fuchs (in Puschmann) separates them. The unity or duality of person may be of no great importance, for, if two, they were both in the line of the same tradition; but the force and direction of Aristotelian influence is a question of the keenest interest.

The Sicilian tradition was never free from magical bias, and the Platonic school, which was impressed by it, set back the inductive side of learning. If, like Bacon, Aristotle may seem never to have apprehended, as the Ionians seem to have done, the infinity of the scope and subjects of knowledge, yet by virtue of this very concentration he restored the method of research by the serial order of facts; and like John Hunter two thousand years later, he brought together a vast collection of facts, acquired in great part by personal experience, but also by cautious inquiry, not of philosophers but of practical men, such as fishermen and huntsmen. Now this, we learn, was the very influence which the efficient, if ambiguous, Straton carried to Alexandria. In his own work Straton attempted to base science on experiment, and, in particular, we learn that he made systematic experiments on a “vacuum.” So also Aristotle's extensive dissections of animals must have forwarded the study of anatomy in Alexandria. Furthermore, we know that Aristotle collected a large library, and that it probably became the foundation of the Alexandrian. We know also that in collecting these books he did so with a view to a historical co-ordination of knowledge, for which end he organized writers in several departments—Endemus was editor-in-chief; Menon compiled the medical literature; Theophrastus that of minerals, of physics, and of botany; Aristoxenus that of music. Sadly we deplore the utter destruction of all these documents. By certain words and phrases we may trace the passage of these ideas through the Alexandrian schools, especially through Erasistratus down to Athenæus, the last physician, as we have seen, to build directly upon Aristotle—for example, in the meaning of nature (*φύσις*), concerning which Athenæus definitely cites Straton; in the several kinds of the soul; in the hegemony of the heart; and in the theory of generation we recognize Aristotle.

Unfortunately, hitherto the discoveries of papyri in Egypt have brought forth new ancient records of

Alexandrian medicine.* However, in the British Museum is a papyrus, apparently of just pre-Galenic date (noted by Mr. Kenyon in the *Classical Review* for 1892), which deals with certain points in dispute between the followers of Herophilus and Erasistratus. And Karl Sudhoff (Leipzig, 1909) has recently collected many interesting notes concerning drugs, customs, diet, and baths; and on temple and hospital matters: but no fragment of any great writer, nor any illumination of the history of ideas, has turned up as yet. From such sources as we have, we learn that in the period of comparative peace which ensued in Alexandria after the internecine strife of the Diadochi until the expulsion of the physicians and the *savants* to the islands and Asia Minor from Alexandria by Ptolemy VII (Physkon), a strange contrast to his predecessors, and before the diversion of the main stream of culture from Alexandria to Rome, burst forth that brilliant school of which we know so much by the glory of its notable achievements and so little by its documents. Moreover, under the Empire, and even in the later years of the Republic, the intercourse between the two cities both in trade and culture had become easy and continual. Celsus, for instance, in his therapeutical advice to consumptives, speaks of the voyage from Italy to Alexandria, even in the petty craft of those days, as "aptissime." In Alexandria, then, Hellenism had its fling, touched, however, more and more by Oriental influences, especially of that learned and ingenious race the Jews† and Syrians, of whom even then there were many in the city; influences which a little later, in the Neo-Platonic and Christian schools, became potent, and even ascendant, down to the second great fire of the Alexandrian libraries in the fourth century.

We have seen, then, that the powerful and insatiable mind of the Greek from Anaximander to Plato, before the discipline of observation and analysis initiated by Hippocrates and Aristotle, had achieved certain general ideas of cosmic scope and significance. These ideas once apprehended, the framework of orderly knowledge had to be built up by more laborious methods. The difficulty then lay in the gearing of this tremendous thinking engine to practical work. While unharnessed, it spun about itself with enormous velocity, weaving out of its own dust what Francis Bacon called its cobwebs. These buzzing and ineffectual revolutions are almost more audible to us in the first centuries after Christ than in the thirteenth. For a season in Alexandria this tremendous energy was buckled to the real work of spinning webs, not of notions only, but of facts—of things, that is, which had happened, which were happening, and which experimentally might be made to happen. And in the Aristotelian tradition we know how brilliant were the results of these Alexandrian scientists, not only in celestial and terrestrial physics, but also in biology. For in this college the names of the great anatomists Herophilus and Erasistratus are even more familiar to us than those of Hipparchus, Archimedes, and Heron.

ALEXANDRIAN MEDICINE.

But to proceed with the sketch, so far as relics and fragments enable us, of those features of Alexandrian medicine which appear in Roman medicine, and in our present concern with the pneumatists. Speaking very generally of the two great anatomists, Herophilus—one of whose masters was the Coan Praxagoras—led more directly from the Hippocrateans to Galen; Erasistratus from Cnidists to the Methodists and Pneumatists. And we can get a little nearer, perhaps, to the facts than this, though the respective disciples, or nominal disciples, of these masters perplex the modern historian by their manifold inconsistencies, vagaries in which the Herophileans particularly erred, even forfeiting the birthright of their school by shirking its anatomy and, with the frowardness of the Christians after them, dissipating the master's teaching in sophistries, and elaborating a wiredrawn dogmatic system upon the flimsy foundation of glosses and commentaries on the texts then intact in the vast libraries of their

city.‡ The Erasistrateans were more steadfast; they kept closer to their doctrine, and seem to have adopted much of the teaching of Straton the Aristotelian; they kept up at any rate some anatomy, even down to the second century A.D. (Galen), and on their empirical side did better service than their dogmatizing rivals.§ And accordingly the Erasistratean school on the whole prevailed.

Herophilus, born at Chalcedon, lived and worked in Alexandria under the first, and perhaps in part under the second, Ptolemy. In the eastward expansion of Greek scientific culture his doctrines were carried to Pergamon, and later to Laodicea. It is worth noting, in respect of the tradition leading down to Galen, that under the Attalid kings Pergamon was, at some interval, comparable in culture even with Alexandria; and schools were perpetuated there till Galen's time, although apparently with some decline; for we are told that when in Caesar's campaign the library of the museum—not of the Serapeum—was burned, the Pergamene library was brought to Alexandria, only at a later time to be destroyed, with the Serapeum, by religious fanatics. The school of Smyrna, on the other hand, by way of which, as we shall see, the prescription of wine as a medicine probably reached Asclepiades and Athenaeus, was founded, as we learn on the contemporary authority of Strabo, in the first century B.C., by Hikesios, and he was an Erasistratean.|| But to return to Herophilus; Haeser reminds us that, great as were his researches in anatomy, especially as regards the nervous system, yet before him Praxagoras seems to have made no inconsiderable advances in this study. He had distinguished, for instance, between the motor and the sensory nerves, although he presumed that the sensory nerves arose "in the centre of feeling—the heart." But over the earlier schools,¶ as also over Galen and the later, the Alexandrians had the incalculable advantage of dissecting the body of man.*** Herophilus advanced to the demonstration of the origin and course of the nerves from the brain and spinal cord,†† and described many of the parts of the brain, including the meninges; and he it was who recognized this noble member—hitherto regarded merely as a refrigerator for the inward heat—as the source of sensation and of volition. On his description of the liver, pancreas, chyle-vessels, and many other members—descriptions, new in part, in part enlargements of previous knowledge—I cannot now dwell; but to his views of the circulation I shall return presently, when we come to discuss the pulse lore of this period and of the Roman pneumatists. Herophilus probably described the anatomy of the eye, as we know from Aetius that he wrote a treatise *Περὶ ὀφθαλμῶν*. To this great and precise observer Galen was deeply indebted; yet these Alexandrian anatomists never cleared up the confusion under the name *νεύρα*. They still regarded nerves and tendons as varieties of one kind; varieties because they perceived that the nerves came from the brain and spine, but the tendons from the bones and muscles.‡‡ As a physician Herophilus, in opposition to Erasistratus, clung to the four humours of Hippocratic tradition, and opposed him furthermore in matters of pharmacy, dietetics, and hygiene; subjects with which he dealt at large in a work *Περὶ αἰτῶν*.§§

It would have been well if medical science could have continued patiently on these more positive, although it

† The name of Dogmatists was given to this school, if I remember right, by Galen. In working rather by the letter than in the spirit of their great founder, Hippocrates, they became the Pharisees of Ancient Medicine, as in after time were the Galenists.

§ Besides the historical treatises already cited I am, in what follows, indebted also to Susenhihl's *Gesch. d. Griech. Litt. in der Alexandrinischen Zeit*, Leipzig, 1891. This scholar at any rate perceived that from a history of culture Medicine could not be omitted. The medical sections are in great part from the pen of Wellmann.

|| Strabo, xii, 580.

¶ That is speaking generally. Galen credits Diocles with some knowledge of anatomy, and there is reason to suppose that both this physician and Praxagoras, and so presumably some others, had dissected the human body. But in Alexandria there was an Anatomical Institute in which human bodies, as Galen says plainly concerning Herophilus, were dissected. (II, 895: "οὐκ ἐπὶ ἀλόγων ζώων καθάπερ οἱ πολλοί, ἀλλ' ἐπ' αὐτῶν τῶν ἀνθρώπων πεπονημένος.")

*** Much more evidence would be necessary to compel us to believe the malignant insinuation of Tertullian that these anatomists opened the bodies of living men (criminals). Such brutality, not alien to the Roman, was foreign to the Greek.

†† Galen, vii, 212.

‡‡ Cf. Daremberg's edition of Rufus.

§§ A certain Heracleides Erythraeus, lauded by Galen, a contemporary of Strabo about the Christian Era (placed by error in Haeser I see in the third century B.C.; there were three or four physicians of the name), wrote a long treatise on the "sect" (*αἵρεσις*) of Herophilus, but unfortunately nothing of it remains.

* Even of later date the medical finds are scanty. Meyerhof and Pfitzer discovered in a library in Cairo some unknown MSS. on eye diseases of Arabian origin, and Meyerhof adverts to such relics in Damascus and Constantinople. These may prove to be translations of older treatises.

† It is said that in the reign of Augustus there were a million Jews in Alexandria; and we know there were Jewish physicians in the first century A.D.

must be confessed still somewhat nugatory, methods. It has been the trial of Medicine that while, as compared on the one hand with the no less complex but far more accessible phenomena of politics, and on the other with the far less complex phenomena of the physical sciences, it has stood in respect of the difficulty and inaccessibility of its knowledge, and stands still, at an enormous disadvantage; yet, in no unnatural impatience with these perennial bafflings and obscurities, the moan of suffering men and women and the poignant misery of the child have ever driven us into action, however blind, however premature. Remedies, orthodox, empirical, or quackish, remedies one way or another, and by whatsoever means, have always been imperiously demanded of us. And, as nowadays the modern physician cannot wait for pharmacology, which seems to him, and not untruly, to be the tortoise behind the hare of empirical practice, so after a like manner we may imagine the impatience of Alexandrian physicians and sick with the pursuit of anatomy. Except in respect of surgery, the lost anatomical treatises of Herophilus himself could have contained but little of any immediate application to inner medicine. Such, then, in the middle of the third century B.C. was the ground in which, in spite of its scientific spirit, or perhaps engendered by it, empiricism and medical infidelity would readily spring up, and, gyrating in the void of positive knowledge, would, and did, give rise to weary and endless disputes and logomachies—*Federkriege*, as Susemihl calls them. Professing much reverence for Hippocrates, physicians broke loose not only from anatomy but also from the Hippocratic rational sagacity. In the third century B.C., as we learn from that earliest essay in medical criticism the Preface of Celsus, and from other sources, Philinus of Cos,* the reputed founder in Alexandria of the Empirical school, and Serapion, who harshly straightened it, instituted the schism in which walked with more or less discernment their eminent successors, such as Apollonius of Antioch, Herakleides of Tarentum (whom Soranus calls the most persuasive of them all), Menodotus, and Sextus Empiricus.

Towards the end of the second century B.C., under the evil rule of Ptolemy Physkon, Alexandrian science began to dwindle. Hipparchus, who had flourished about the middle of that century, was the last of the great originating minds. Then the disinterested search after knowledge for its own sake dropped into an industrious and respectable assiduity; as into the technical furtherance of the crafts, especially of agriculture. Accordingly, we find then the beginnings of those summaries and compilations which, admirable as they were in Varro and Celsus—two of the most scientific of the Romans—dogged the retreating footsteps of Urania. Thus the field was left open for astrological phantasies and for marvels of zoology which began to creep in from the East, and, flourishing in Aelian, spread themselves through the bestiaries and herbals of the Middle Ages.

After this introduction concerning the history of the pneumatist idea, it is convenient to illustrate its application to Medicine by some story of the chief medical teachers of the pneumatist school, so far as we know them. However far-reaching, even perennial, as was the pneumatic doctrine, I repeat that pneumatism, as a medical sect, was of brief duration; and for the most part its adherents are now no more than names to us. I propose, therefore, to speak more particularly of two only—of Athenaeus, the formal founder of this school in Rome, and Archigenes, who, if an Eclectic, came forth from the Pneumatist school.

ATHENAEUS.

Athenaeus was one of the most interesting of the Romano-Greek physicians; Diels, in his essay on the physical system of Straton, emphasizes the doxographical importance of Athenaeus, who nevertheless adopted and formed his opinions with critical judgement. As to his date, Athenaeus of Attalia, who, like most of the Roman physicians, emigrated thither from the colleges

of the wealthy Hellenic cities of Asia Minor, was unknown to Celsus, who lived in the days of Tiberius and to whom Methodism was known; but his works were well known to Galen, who cites him frequently and in terms of much respect as an author and *savant*. We may assume, then, if perhaps he was born under Tiberius, that he flourished in the reign of Claudius. Athenaeus seems to have perceived how Methodism, in the sense of the atomic physiology, was even then withering; in practice it had dried up into two or three abstract maxims or common rules (*κοινότητες*); whilst its Epicurean philosophy was giving way in Rome to Stoicism. Thus intelligent men felt something more was wanted, and pneumatism, coming as it did in the tradition of the elder medicine—Sicilian, as we have seen, as well as Coan and Alexandrian—and in alliance with the ascendant stoicism, offered to fill the want. Athenaeus, therefore, had a large school or following in Rome. Indeed, pneumatism, as we have seen, represented a physiological idea of a kind so attractive that, under the phases of many schools, it survived in its essence until the eighteenth century. Athenaeus wrote a large and important work, *Περὶ βοηθημάτων*, which probably dealt with all departments of medicine. Unfortunately, this work has almost wholly perished; for what we know of Athenaeus we are dependent upon some fragments surviving in Oribasius, and upon some allusions by other authors. These relics suffice, however, to indicate that Athenaeus was a clear and accurate observer, apt in reflection and criticism, and wise in philosophy. To these gifts he added a large and various learning spiced with a shrewd irony. Athenaeus, like such later pneumatists, or eclectic pneumatists, as Herodotus, Archigenes, Leonides, Heliodorus, was a good surgeon. Moreover, the school was not clinical only. Besides its considerable therapeutical content, it taught also (as in the *Π. βοηθημάτων*) an elaborate physiology and pathology which, within my present limits, I may be able to illustrate by a few references, especially by its teaching concerning the pulse.†

Athenaeus, who did much to weld together philosophy and practical medicine, apportioned the sphere or faculty of medicine into five divisions. The first was physiology, which for him was the essential foundation; and therein he made a great advance upon the methodists and empirics. Of his next or second division, that of pathology, but little is known directly; yet we incur little error in interpreting the pathology of the master by that of his successor Archigenes. The main feature of his pathology, that upon which I would dwell for a moment, was the study of the causes of disease; for herein the school returned to the sounder tradition of Hippocrates, avoiding on the one hand the facile and jejune etiology of the Methodists and on the other the narrow concentration of the Empirics upon superficial and immediate antecedents. Of the logical classification of causes we read in Galen enough and to spare; and we of to-day in our array of causes are still somewhat given to outworn categories, such as the *predisposing*, the *exciting*, and so on. In Rome, from the time of Asclepiades, the sects which did not ignore the wider causes with moderation divided them into three classes at least, according to their nearness or remoteness in the series of antecedents. Thus Athenaeus did not expatiate in a wilderness of logical but unnatural categories. But the pneumatists conveniently distinguished *airia* from *δαίμονες*, by which they signified all which pertains to the conditions of the disease in the individual. Disease (*νόσος*) was the dyscrasia; *πάθος* was used variably as the lesion or as the functional disarray, fever, for instance, as abstracted from symptoms of fever.‡ *Συμπτώματα* were the consequences of the dyscrasia. The dyscrasia, a perversion of health (eucrasia)—the ancients perceived in these rhetorical antitheses substantial as well as verbal values—was for the genuine pneumatist a failing or taint of the pneuma, and to be counteracted by marshalling against it the contrary quality—as cold against fever, and

* We have to regret our ignorance concerning this considerable person; almost all else we know is that he wrote glosses on his distinguished compatriot before Erotian. The Empirics boasted of an heretical descent from Akron of Arigentum (fifth century B.C.), an eminent physician contemporary with Empedocles. It is not impossible that the hazy science of the Sicilian school may have instigated such a reaction, but we have no evidence of it.

† In what follows I am indebted especially to Daremberg's Oribasius and Rufus, Wellmann's article on "Philumenos," Hermes, 1908, and on "Ancient Medical History," Hermes, 1900, and continually, of course, to his "Essay on the Pneumatists." Nor must our general debt to Diels be forgotten.

‡ Herophilus pointed out that certain *πάθος* might be natural (*κατὰ φύσιν*), such as childbirth or the secretion of milk; others unnatural (*παρὰ φύσιν*), such as fever. Still *πάθος* was often used in equivalence with *νόσος*, especially perhaps by the methodists (for example, *ἡ παθητικὴ ἀσθένεια*, etc.).

so on; so that, as we shall see, physical means of cure prevailed with this school, such as diet adapted to the several seasons, clothing, exercises, waters, and so on. The fusion of their vitalistic pathology with the humoral, which for clearness' sake we are disregarding in this lecture,* was in its completion the task of Galen. By him the soul, or vital dynamic, in its three kinds—the natural, the animal, and the psychical soul—and the qualities of the elements were harmonized so far as logic could harmonize them; for instance, phlegm was akin to moisture, yellow bile to fire, black bile (spleen) to earth, and so on, the qualities being mixed in the blood. But it would be futile to enter farther into these logical permutations; I have said enough to give a notion of their method. It is, perhaps, more interesting to perceive how in certain ways Athenaeus and the pneumatists went back to Hippocrates. Thus I have touched upon their observation of climates and waters. The third pneumatist division was Dietetics; then came *Materia Medica*; and fifthly and lastly Therapeutics, a title with a larger content than is usual with us, and almost comprehending clinical practice.

GROWTH OF POLYPHARMACY.

The vast commerce of the Ptolemies, and in some measure no doubt the lore of the Pharaonic Egypt, had flooded the markets of Alexandria with quantities of new drugs. One writes to a friend to send him good quality of drugs "lest he do otherwise and send him stale stuff which will not pass muster in Alexandria";† and the keen inquiry for them was far more than the legitimate demand of the medical practitioner. For with the treatise of Theophrastus *Περὶ τῶν δακρυῶν καὶ βλητικῶν*, as one may approximately say, began the prodigious and diabolical literature on the art and mystery of poisons and antidotes in which, not always without the aid of medical accomplices, kings and nobles of the empire and its principalities, and after them popes and cardinals of the Church and their vassals, were the experts. And, indeed, the bent of the Herophileans, onward to Galen himself and the Galenists (Andreas, Krateuas, Apollonius Mys, Zopyrus), was to polypharmacy. In the decadence of Alexandrian science and society this gross or baleful propensity increased and multiplied; and under the influence of perfidious potentates, such as Mithridates,‡ Nicomedes, and Attalus, attained to an almost grotesque infamy. Under the foul accumulations of panaceas, mithridatics, and cosmetics, elaborated with a perverse and loathsome ingenuity,§ medicine was oppressed and almost suffocated; and the habit of heaping up ingredients degraded or defiled the legitimate prescriptions. Thus to build up a huge and conglomerate bolus or potion became the ambition of the doctor, and the faith and consolation of the patient. "If your liver is getting impatient," writes Juvenal in the XIIIth Satire, "seek Archigenes as fast as you can, and buy of him the composition of Mithridates, and you will live to eat figs and gather roses another year."||

* We find the humoral pathology as far back as Herodotus, who tells how (IV. 187) the Lybian shepherds used to burn the veins on the vertex or temples of their children to prevent fluxions of rheum (κατάρρεον φλέγμα).

† Milligan, *Sel. Greek Papyri*, 1910, p. 58.

‡ The locus classicus of this treacherous lore is the twenty-fifth chapter of Pliny (N.H.). Krateuas probably worked under the patronage of Mithridates (cf. new ed. by Wellmann, 1897).

§ Among many other such books see recently *Das Gift in der antiken Literatur*. By Dr. Erich Harnack, of Halle. Leipzig, 1908.

|| We note here that Archigenes sold the remedies himself.

THE number of medical students in Italy shows a steady decrease from a total of 6,648 in 1899-1900 to 4,441 in 1908-9.

LORD SOUTHWARK, as President and Chairman of the South London Institute for the Blind Poor, appeals for funds for the support of that institution. A sum of £2,000, he says, is required immediately. The honorary secretary is the Rev. St. Clare Hill; the offices are at 83, Borough Road, London, S.E.

AN interesting instance of a marked family leaning towards medicine as a profession was recently brought to our notice by Dr. H. S. Royds of St. Mary Bourne, Hampshire. The name of the family is Baird, the head of it being a clergyman. No less than five of his children are members of the medical profession, two of them being medical women. Moreover, nearly all of them have taken not only degrees in medicine but also either in science or arts. The family is resident in New Zealand, but all its medical members received their medical education in Great Britain.

A BAD CASE OF STRANGULATED OMENTAL HERNIA, WITH VERY FEW SYMPTOMS.*

BY

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THE following case is of interest in showing what a grave state of things can occur without the patient thinking much is the matter: A man of 60 years called to see me on Friday evening, February 25th. He complained of pain all over the lower abdomen like gripes, the pain was general, not tender near the appendix. He had been sick once, his tongue was clean, and his bowels open twice that day.

On Saturday, February 26th, he called to say he would like to go on his club, and went away again. On Sunday night his friends called to ask me to see him the next morning, but refused to let me go to him that night.

On Monday, February 28th, I called, and on looking at the abdomen at once saw a large swelling in the left inguinal region the size of my fist, solid and hard, tender and no impulse. It had been there all the time, and he only thought it was his old rupture down again, and would go back presently.

I told him that if he was not operated on without delay he would die, so he consented, and was removed to the hospital, and at 8.30 p.m. I cut down on the mass. It was indurated, and showed no landmarks. Presently a black mass came in view, and slitting up the cavity in which it lay I laid bare as much as three fingers of gangrenous omentum. Freeing the internal ring, and passing my finger into the abdomen, I felt a large hard mass extending as far as the middle line like a sausage. With difficulty freeing this I got it through the opening, and this was a mass of gangrenous omentum as big as my two fists. Having freed it all round, it was ligatured off close to the bowel; his left testicle and cord were removed. The wound was sewn up in three layers, and a big tube left to drain the abdomen; the operation took seventy-five minutes. He was put back to bed, and passed a good night.

On looking up my authorities I found very little on the subject, but was very surprised to read the following paragraph in Treves's *System of Surgery* for 1898:

The existence of strangulated omental hernia attended by the usual strangulated symptoms was at one time questioned, but its reality has been placed beyond doubt.

It looks as though a strangulated pure omental hernia was rare.

Take the symptoms of strangulated hernia: irreducibility of the hernia; pain about the neck of the sac; sickness and faintness; pain in the abdomen, especially around the umbilicus, colicky in character; vomiting appears early; depression, cold sweats; temperature below normal; pulse rapid; constipation, and no flatus passed; subject to the usual variations.

Now, look at my case of to-day. A strangulated gangrenous omental hernia, pain in abdomen across the lower part; tenderness over hernia, which was hard, dull, and no impulse; temperature normal; pulse not affected; only sick once; bowels open even more than once a day; patient walking about three days out of the four.

And yet I think you will all agree that the man would not have lived very much longer unrelieved.

In Jacobson's and Stewart's *Operations in Surgery*, 1902, they quote Sir W. H. Bennett as describing a case of strangulated omental hernia with commencing gangrene—

No interference with the action of the bowels; constipation and vomiting are both absent; but the symptoms which conclusively called for operation was the entire absence of real hernial impulse.

He does not mention the pulse and temperature, which in my case were unaffected.

One point is strongly brought out in my case, and that is, that when an omental hernia does get strangulated, it is certain to be fatal if unrelieved, as the gangrene does not stop at the stricture, it passes on into the abdomen. He went out of hospital under four weeks without a truss. The case healed by primary union, and did well.

* Read before the Croydon Division of the South-Eastern Branch.