THE FIRST PRINTED DOCUMENTS RELATING TO MODERN SUGICAL ANÆSTHESIA

By SIR WILLIAM OSLER, M.D., F. R. S.


The story of surgical anaesthesia illustrates how long it takes an idea to become effective. The idea of producing insensibility to pain during a cutting operation is of great antiquity, e.g., in Chapter II, 21, of the Book of Genesis. Nor is the word anaesthesia modern, as is sometimes said, and invented by Oliver Wendell Holmes. It occurs, Withington tells me, first in Plato (Timeus) and is used by Dioscorides in the modern sense.

The extraordinary controversy which has raged, and which re-rages every few years, on the question as to whom the world is indebted for the introduction of anaesthesia, illustrates the absence of true historical perspective and a failure to realize just what priority means in the case of a great discovery.

Why do we not give the credit to Dioscorides, who described both general and local anaesthesia, or to Pliny, or Apuleius or to Hiotho, the Chinaman, who seems to be next in order, or to the inventor of the spongia somnifera, or to Master Mazzeo Montagna, in Boccaccio, or to any one of the score or more of men in the Middle Ages who are known to have operated on patients made insensible by drugs or vapors? Why do we not give the credit to Davy, who had the idea, or to Hickman, who had both idea and practice, or to Esdaile, who operated on hundreds of patients in the hypnotic state, or to Elliotson, who did the same; or to Wells, who, in 1844, operated under nitrous oxide, or to Long, who frequently practised ether anaesthesia? Why? Because time out of mind, patients had been rendered insensible by potions

1 Remarks made on presenting Morton's original papers to the Royal Society of Medicine, London, May 15, 1918.
or vapors, or by other methods, without any one man forcing any one method into general acceptance, or influencing in any way surgical practice.

Before October 16, 1846, surgical anaesthesia did not exist—within a few months it became a world-wide procedure; and the full credit for its introduction must be given to William Thomas Green Morton, who, on the date mentioned, demonstrated at the Massachusetts General Hospital the simplicity and safety of ether anaesthesia. On the priority question let me quote two appropriate paragraphs—"He becomes the true discoverer who establishes the truth; and the sign of the truth is the general acceptance. Whoever, therefore, resumes the investigation of neglected or repudiated doctrine, elicits its true demonstration, and discovers and explains the nature of the errors which have led to its tacit or declared rejection, may certainly and confidently await the acknowledgements of his right in its discovery." (Owen, "On the Archetype and Homologies of the Vertebrate Skeleton," p. 26.) "In science the credit goes to the man who convinces the world, not to the man to whom the idea first occurs" (Francis Darwin, The Eugenics Review, 1914). Morton convinced the world: the credit is his.

Morton's original essays are among the rarissima not existing, so far as I can ascertain, in any of the general or special libraries of this country. I have been looking for them in vain for many years. In a parcel of his father's papers recently received from William J. Morton of New York there were duplicates of "Letheon" and "Remarks on the Proper Mode of Administering Sulphuric Ether by Inhalation," which I have great pleasure in presenting to the Library. Also a duplicate copy of The Boston Medical and Surgical Journal of November 18, 1846, which contains the first printed account of the new procedure, by Dr. Henry J. Bigelow. In the same journal for December 9th, Dr. J. Collins Warren (Primus) gives an account of the first operation at the Massachusetts General Hospital. These four papers stand out in the literature of surgical anaesthesia as fundamental, and truly epoch-making.

Morton called the drug *letheon* and applied for letters patent to secure his rights—not an unethical procedure in the dental profession of America. This led to the publication of his first pamphlet called "Letheon," the bibliography of which some one should undertake. "The medium through which Dr. Morton communicated the results of experiments on etherization to the public, was a 'circular' which he had printed, at his own expense, almost every week. It was at first, as its name imports, a mere letter of advice; but, as it became the receptacle of newspaper articles, and correspondence from every portion of the Union, announcing the success of etherization, it was necessarily enlarged into a large and closely-printed sheet of four pages. Soon this 'Circular' became a pamphlet, and of this five different editions were published, under Dr. Morton's immediate supervision, embodying a digest of all the authentic information, both from Europe and America, on Anaesthesia." (Rice, "Trials of a Public Benefactor," 1859, p. 114.)

The Index Catalogue of the Surgeon General's Library only mentions a fourteen-page pamphlet, 1846, printed by Dutton and Wentworth, Boston. The early form of the circular may be seen on the back page of The Boston Medical and Surgical Journal, for December 9th. In the number for November 18th with Bigelow's paper, there is only an advertisement of Morton's courses of instruction in dentistry. The circular appeared first November 26th, and is copied on pages 14-15 of the Letheon pamphlet, fifth edition. This pamphlet is made up of more than eighty
short articles from medical journals and newspapers, and is of special value in giving the popular first-hand impressions relating to the great discovery. There is very little of Morton's—only the circular already referred to, and on page 16 the terms for the “Apparatus, a bottle of the Preparation, instruction, etc.”

In 1847 Morton published a forty-four page pamphlet on “The Proper Mode of Administering Sulphuric Ether by Inhalation,” Boston, Dutton and Wentworth, printers, in which the original apparatus (now a treasured relic at the Massachusetts General Hospital) is described. In the early part of April he found that a sponge would serve the same purpose and was less dangerous. The greater part of the pamphlet is taken up with general directions, the outcome of the author's experience.

The claims of Morton were very fully stated in a pamphlet published in Paris in 1847 with the title “Mémoire sur la découverte du novel emploi de l'ether Sulphurique.”

In 1859 he published a small work “On the Physiological Effects of Sulphuric Ether and its Superiority to Chloroform,” Boston. So far as I can ascertain, this is his complete output on the subject of anaesthesia, except a posthumous pamphlet on “The Use of Ether as an Anaesthetic at the Battle of the Wilderness.” (Journal of the American Medical Association, April 23, 1904.)

The third item is No. 16 of Vol. xxxv of The Boston Medical and Surgical Journal (then as now, issued weekly) for November 18th, which introduces to the profession modern surgical anaesthesia. Henry J. Bigelow, the distinguished surgeon, had been interested in Morton's private dental cases, and read a paper before the American Academy of Sciences, November 3rd, and at the Boston Society of Medical Improvement, November 9th. It was called “Insensibility during Surgical Operation Produced by Inhalation,” and after referring to the early cases of Warren and of Hayward at the Massachusetts General Hospital, he gives fuller details of the dental cases which he had seen with Dr. Morton. No small share of the early confidence inspired in the profession is due to this temperate statement by Dr. Bigelow, who fully realized the enormous value of the discovery.

In the literature of anaesthesia these are the three fundamental contributions. With them should be placed Collins Warren's account of the first operation, The Boston Medical and Surgical Journal, December 9th, and Vol. xxxv of this publication, which contains some twenty-two papers on the subject, illustrating the rapid spread of the practice.

The opportunity here offers to suggest the arrangement of certain subjects in our libraries on an educational basis. For example, why should not the members of the Section on Anaesthesia of this Society undertake to collect and classify their literature on historical lines? Start with the documents that magnetized into life an antique practice, these pamphlets of Morton, Bigelow's paper, Warren's paper, and Volume xxxv of The Boston Medical and Surgical Journal. Put these together—all in vellum and lettered in gold!—as the blastoderm from which the enormous literature has developed, which might be arranged on the shelves in ten or more sections. The Index Catalogue of the Surgeon General's Library has a good classification, but for my own collection I have used the following:

I. The general story, as given in such publications as the Jubilee numbers of the British Medical Journal and The Boston Medical and Surgical Journal; and the text books in which the history of the subject is well given, as Snow, Foy, and so forth.

II. Pre-ether period. On cards, references to Gurlt's “Geschichte der Chirurgie,” Bd.
III, p. 621; and Volume I of Simpson's works, from which sources most of the textbook and other descriptions are taken; and to Dioscorides, Pliny, and Apuleius, to the spongia somnifera, to Boccaccio and the numerous other early writers. Brief descriptions could be written on the cards. Then, in order, would follow the words of Davy, of Beddoes, the tragic story of Hickman, the remarkable documents relating to anaesthesia produced by compression of arteries, veins, and nerves, Bartholinus' use of cold for local anaesthesia, and the section would conclude with the writings of Esdaile and of Elliotson on hypnotism in surgery. What an education, even to glance at this literature in due sequence on the shelves!

III. The modern period, beginning with Morton, Wells and Jackson; the story of the miserable priority claims, the congressional reports, the publications of the Morton association, the topical literature, showing the introduction of the practice into different countries, the Long literature, and so forth.

IV. In chronological order the subject of anaesthesia in midwifery, embracing everything from Simpson's original pamphlet to the latest popular magazine article on twilight sleep.

V. Chloroform and its introduction. The papers of the discoveries, Guthrie, and so forth, the Simpson pamphlets—his famous British Encyclopaedia article, dealing with the subject of anaesthesia under the word chloroform, which led to the sharp Bigelow-Simpson controversy—the Hyderabad Reports, the B. M. A. and other reports and documents.

VI. Local anaesthesia from Dioscorides and Bartholinus to Kohler, Corning, Halsted, Cushing, and others.

VII. Agents other than ether and chloroform used for inducing anaesthesia, arranged in order of introduction.

VIII. Technique, including the various methods of administration—intravenous, intratracheal—and the literature of apparatus.

IX. Physiology.

X. Pathology.

I speak as an amateur. Doubtless experts could easily arrange a more comprehensive scheme. To separate in literature the quick from the dead is one of the functions of a well-ordered library; but much that we carelessly regard as dead is magnetized into life when put in its historical relation. The plan here suggested—which could be applied in other directions—sustains that continuity, to the study of which this Section is devoted. You remember the rings of Lucretius—well, there is a vis et vincula librorum, binding together books, a force just as potent as the Vis et vincula lapidis, which supports the rings, and in the literature of anaesthesia this force is derived from the works here presented to the Library.
UNDER the title of Byzantine Medical Fragments we propose to publish in these pages a series of short texts in later Greek dialects. Each will be accompanied by a translation as literal as possible and by brief notes.

Of late years there has been a widespread revival of interest in the Middle Ages, and a considerable part of the energies of medical historians has been directed to collecting the material for a consecutive and coherent history of mediaeval medicine. Except for the purely astrological material, Byzantine sources have, however, been largely neglected. A great store of medical fragments must still lie in the monastic libraries of the East, where enthusiastic collectors have for centuries been seeking the more fairly written and valuable copies of known writers, rejecting those scribbled fragments of medical lore which yet give us a far truer view of the real contemporary outlook than the magnificent volumes of Dioscorides or Galen that are among the treasures of the great European libraries. It is to be hoped that in future more copies or photographs of such fragments may be secured.

The expert palaeographer in his just scientific desire to demonstrate continuity has tended always to reproduce the handwriting of the professional scribe rather than the more careless and less typical work of the monastic scribbler. The reading and dating of our fragments may thus often present special difficulty. In view of this and of the scarcity of facsimiles of Byzantine medical palaeography, we shall in each case reproduce a photograph of the transcribed text.

1. A GREEK FOURTEENTH-CENTURY PROGNOSTIC FROM THE BLOOD

A large part of mediaeval medical lore, both Eastern and Western, was made up of prognosis, the methods of which were drawn from the most diverse sources. Scraps of the genuine science of antiquity, sentences and aphorisms, frequently modified and misunderstood, from the writings of Hippocrates and Galen, often stand side by side with astrological precepts, with the ridiculous mechanical devices of Hermetism or with fragments of primitive folk medicine.

Among the most favorite forms of prognosis were the examination of the urine and of the blood. Urinoscopy and hsematoscopy occupied a large part of the attention of the physician, and perhaps even more that of the partially trained or untrained pretenders to whose guardianship the people largely trusted its health. Urinoscopy was frequently a specialist’s occupation and figures illustrating it are common enough in the MSS. and have been frequently reproduced. Blood-letting was no less specialized and the barber, having performed his venesection, was frequently called upon to give an opinion as to the patient’s health and prospects of life from the appearance and behavior of the shed blood. The formation of buffy coat, the separation of serum and clot, the distinction between arterial and venous blood, the alteration in color after exposure to and mixture with air, the process of laking, the rate and character of putrefaction, all phenomena now easily distinguished from one another, were then confused together and the resultant held to indicate the present and future nosological state of the patient. Curiously enough figures illustrating hsematoscopy appear to be much rarer in
The text here transcribed gives a fair idea of the kind of opinion that would thus be formed. It consists of a single page and was written in the late fourteenth or early fifteenth century, probably in the monastery of the Holy Trinity in Chalchis, whence it was brought to the Bodleian Library. The language is that of a well-instructed writer but it is sometimes confused, and in places inaccurate. Thus αἵμα is written for αἷμα, σανθραχλίζων for σανθραχλίζων and πράσινος for πράσινος. The iota subscript is usually omitted. The handwriting is regular but considerably contracted and there is a peculiar tendency to insert letters above the line without otherwise abbreviating. We would especially point to the word Βίβλος in lines 19, 26, 28 and 29 where the letters are written in three vertical rows thus Βιβλος, although the scribe is not pressed for space.

Perhaps the only doubtful reading in the MS. is in the rubricated title, in a hand different to that of the text. The natural reading of the third word of the title is the impossible σεκίον, but the author of the Bodleian catalogue would seem correct in giving σωτρίζων, that is σ(ωτρίζων, the ρ having lost its tail.

At the end of the MS., in the same hand-writing and red ink as the title are the words τέλος ὡς ἡ γιγού! “Don’t think this the end.” We are inclined to differ from the anonymous scribe and to think that this is really the end and that the little text is complete in itself.

The initial letter of each paragraph has been rubricated, probably by the scribe who inserted the title and the three final words.

1 The only figure of a true haematoscopy that we can recall is in a fifteenth-century German astrological calendar in the British Museum, MS. additional 17987, folio 101 recto.

We may conclude with a few notes on our English rendering of the contents of the MS.

ἵρος we have left as “ichor.” It refers to a puslike appearance in the blood and is probably used to denote the buffy coat. δύο, which here implies some form of continued fever with chills and not a mere rigor, we have here translated by the indefinite term “ague.”

χολή we render “choler” rather than attribute a conception of modern medicine to a writer immersed in the humoral pathology by translating it as “bile.”

The debatable word ἐλκώδες on line 23 we have rendered “abscess” or “pus,” according to the sense of the passage.

αἵμα ἐλκώδες on line 23 we have rendered “blood as though from an abscess,” and αἵμα ῥόον μη ἐχεῖ ἐλκώδεσις on line 12 we translate “blood running as though from an uncured abscess.”

Line 9. αἵμα . . . μαύρον σπηκτόν ὡς τό τῆς χελώνης “Blood black-clotted like that of the tortoise.” In Greece there are two species of tortoise, the land tortoise, *Testudo graeca*, and the fresh-water tortoise, *Testudo clemmys caspica*. We have experimented with the blood of both these animals and find that it clots much more rapidly than normal human blood. On the other hand it contains considerably less haemoglobin than human blood so that the epithet μαύρον, black or dark, is inapplicable. The sense would therefore be improved by the insertion of some separative word such as ἀλλα giving the meaning “blood dark but clotted like that of the tortoise.”

Line 17, σανθραχλίζων must be for σανθραχλίζων, a participle of a verb formed from σανθραχλίζων, realgar (arsenic disulphide, As₂S₂), the red color of which is comparable to blood.

Lines 18 and 26, "blood like a shell," refers doubtless to accidentally coiled or twisted clots which may bear some resemblance to the spiral coils of univalve mollusca.

Translation, Bodleian Library MS., Roe 15, f. 104v

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Concerning safe and dangerous bloods.

In Spring, in March, April, or June if one should be bled and the blood flow, having on the surface a color like to the sea, to such a one death comes at the beginning of the winter. At the same season if bloods are whitish and have ichors, they denote agues and various sicknesses. If they should flow
cleanly and [then] form ichors and throw out a moderate amount of choler, they will be healthy.

In right or left pleurisy, if the blood is found purple or greenish or like smoke, he dies. If whitish and with a thick coat, yet remaining red within, the belly being relaxed, the patient survives.

If any one being thin and very dry, as in those who have wasted, should be bled and his blood run dark [but] clotted like that of the tortoise, he quickly ends.

If any one should be pleuritic, or lethargic, or nephritic, and he be bled, and greenish congealed choler should run instead of blood, he quickly ends.

If blood should run very dark and should form ichor, it is well.

Blood running from an uncured abscess denotes deliverance from the coming disease.

Blood running all purple, not having the appearance of blood in any part of the vessel, denotes a life of six months or at most a year. If the appearance of the blood should be found greenish, in five or seven days he dies. If they have found as though streaks of choler upon the blood, like branches of a candelabrum, it denotes a great pleurisy. But if it run like pus or is turbid it denotes putrefaction.

Blood like realgar—he goes for a month in disease.

Blood like a shell is fatal.

Blood like foam denotes peripneumonia and cough.

Blood flowing half pus and half blood denotes a quick recovery.

Blood as though clotted and whitish like milk and having a bad odor denotes nephritis.

Blood thick as honey and malodorous, having streaks like an oyster shell, denotes a gradual death or in six months.

The blood from a phlebotomy, if it is dark and does not produce ichor, denotes ague. But if it make ichor it is good.

Blood as though from an abscess denotes deliverance from the coming disease. But if it appear purple and not resembling blood, it denotes a life of six months' time. But if the appearance of the blood should seem to be greenish, he who has it dies in five or seven days.

If it has separated off a yellowish color it brings forth death. But if it should run like pitch it denotes a hectic fever.

If pus should flow whitish and turbid it denotes putrefaction. But if it should appear like a shell, it is fatal.

If half pus and half blood, he is quickly healed.

If it has a cavity in the midst it denotes death.

If dark, thick and malodorous, having streaks like an oyster shell, it denotes a gradual death or in six months.

If it has a purple color it denotes a long disease.

[In another hand]

Don't think this the end.

II. A LATE GREEK NUMERICAL PROGNOSTIC

The text here printed is from a MS. on Mount Athos in the monastery of St. Gregory. In the catalogue of that monastery it is numbered 105 (12), and it occupies folios 187 verso to 189 recto. In the catalogue of Professor Lambros it is numbered 652. I have to thank the Abbot George, the present Ἐλεκτρόπουλος, who with great courtesy presented me with the photograph of the MS. on which I have worked. From the character of the handwriting and of the paper there can be little doubt that it is of the eighteenth century. It was probably written in the monastery where it now lies.

The characteristic of Byzantine science, as of other aspects of Byzantine civilization, has been its extraordinarily uniform char-

acter. From the period when independent Greek thought was finally submerged and Greek Orthodox Christianity had been irrevocably set adrift from the Western Church, the Greek intellect became practically stationary. There were, indeed, local resuscitations of learning, there were times of names and numbers than that which is here fathered on the proto-scientist, Pythagoras.

Our MS. is illiterate, sufficiently illiterate to puzzle and shock one trained in classical Hellenic standards, yet not more illiterate than is to be expected in a document of the last years of Greek degradation, emanating from that stronghold of ignorance and fanaticism, the Holy Mountain, where the sole attempt at reform—the foundation of a monastic academy—so disturbed opinion that it was abandoned as too revolutionary. But though illiterate, our MS. is of Greek degradation, where the sole attempt at reform—the foundation of a monastic academy—so disturbed opinion that it was abandoned as too revolutionary. But though illiterate, our MS. is of the past. Our MS. represents one of these disordered and incoherent dreams of antiquity in the last troubled sleep of Hellas before she awoke to reality and to reason at the voice of Adamantios Koraes. There could be no more naive and childish presentation of the age-old belief in the potency of the ancients; but there were no true intellectual revivals such as took place in the West in the twelfth century with the arrival of Arabian science, in the thirteenth century during that long process that resulted in the erection of the majestic edifice of Scholasticism, or in the fifteenth century with the great ferment of the Renaissance. The outlook of a Greek monk of the eighth century was in essence identical with that of his representative of the eighteenth. Less change was wrought by a thousand years of history in the Byzantine intellectual world than by a hundred years in the West.

During this long slumber of a thousand years the visions of Greece were always of the past. Our MS. represents one of these disordered and incoherent dreams of antiquity in the last troubled sleep of Hellas before she awoke to reality and to reason at the voice of Adamantios Koraes. There could be no more naive and childish presentation of the age-old belief in the potency and places, in the long monotonous history of the Byzantine world, in which there was a better comprehension of the wisdom of the ancients; but there were no true intellectual revivals such as took place in the West in the twelfth century with the arrival of Arabian science, in the thirteenth century during that long process that resulted in the erection of the majestic edifice of Scholasticism, or in the fifteenth century with the great ferment of the Renaissance. The outlook of a Greek monk of the eighth century was in essence identical with that of his representative of the eighteenth. Less change was wrought by a thousand years of history in the Byzantine intellectual world than by a hundred years in the West.

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not without linguistic interest. Thus for instance the curious Italianate word σωματίζειν (Italian summare) reflects for us the Venetian dominance in the fourteenth century.

Our MS. represents but one of the hundred forms in which the belief is expressed that simple mathematical relationships govern not only the phenomena of nature but also the events—both great and small—of human life. That idea, fathered frequently on Pythagoras, became especially popular with the spread of Hermetic and Neoplatonic doctrines. It was very widely held throughout the Dark and Middle Ages and, encouraged by all kinds of mystical and cabalistic writings, it is still commonly encountered among the ignorant and superstitious in every country. With the Greeks such ideas have ever been popular, and have become associated with that passion for prognosis that has always characterized their Medical Systems.

In the transcription I have sought to reproduce the document as it stands, and the original scribe is responsible for the faulty grammar as well as for the somewhat arbitrary use of accents. The script is difficult, and there still remain one or two doubtful readings. These I have indicated in the notes. For suggestions with reference to these I have to thank Dr. E. T. Withington, Mr. J. S. Scott of Emanuel College, Cambridge, and Mr. Peckham, till lately the British vice-consul at Uskub. In the translation I have been compelled to omit the last sentence of the text. The defective grammatical construction of that phrase makes a faithful rendering impossible, though its general meaning is clear from the context.

Transcription, Monastery of St. Gregory on Mt. Athos, MS. 105 (12), folio 187v

ϕήρος πιθαγόριος διαγωνικός ξωής τε καὶ θανάτου μάθε ποιαν ἡμέραν κατεκλήθη 3 ο ἀσθενής, καὶ πόσας ἡμέρας εἶχεν ἡ σελήνη, καὶ ψήριον αὐτῶν τὰ ὀνόματα, καὶ τοῦ ἄρρωστον πρόβατος 4 καὶ ψήρους δέκα, καὶ συνάψας ἤφιλε 5, καὶ βίου καὶ ἔχουσιν ὅλα τὰ τρία-

3 for κατεκλήθη.  
4 for πρόβατα.  
5 for ἤφιλον from ἦφισεν.
χοντα και τά ἐνοπλειθέντα χράτεσσων, και σπέτα εν τῷ ἀργάνῳ ὅπου εἶναι γραμματικά κάτωθεν, καὶ εἰ μὲν εὐρῆς ἐν τῷ ὑπογείῳ ᾐδή χή δὲ ἐν τῷ ὑπογείῳ ἀπολύσθηκεν τῆν δὲ πρώτην ἡμέραν του ἄροστου μὴν ψηφίσῃς, ἀλλὰ τὴν δευτέραν ἡ γὰρ πρώτη οὐ νόσος λέγεται ἀλλὰ καταχλυσία.

4ο Tὸ ἄρχανον ὑπέργειον.

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folio 188r

Ψήφοι δυσγραμμικοί περὶ ἀθεοσμηνίων ψηφίσων τῆς ἡμέρας καθ' ἢ ἐκλῆθη τὸ ἀρρωστος, ἢ ἡμείσσενεν 5 ἐς τίνας χρήσης αὐτοῦ, ἢ ἐγκεννήθη, ἢ ὡς τὸ ἀνθρώπου σούλεται πράξει, καὶ ψηφίσων ἀπὸ τῆς ἡμέρας 6 μνήμος μέχρι τῆς διάθεσις ἡμέρας, καὶ τὰς συναριθμήσες ἡμέρας συμφάροι 7 ἔποντας, καὶ ὑφάλον 10 ἀπὸ τῆς λύτης καὶ τὰς λυπατος χράτσθην ἐν τῷ ὄργανῳ, καὶ εἰ μὲν εὐρῆς ἐν τῷ ἠ λαι ἄνασθαι ἐστιν, εἰ δὲ ἐν τῷ μεσαίος, εἰ δὲ ἐν τῷ γ χαλεῖπν καὶ θανάσιμον κατὰ πάντα.

4ο for καταχλυσία.
5ο The reading of this word is difficult. I have regarded ἡμείσσενεν as equivalent to ἡμείσσεν derived from a hypothetical verb ἡμείσσω (cp ἡμεῖς) "to be in urgent need."
6ο The word that I transcribe as ἡμέρας seems in the original to be μαρ.

Note—The letter "θ" in this article should be in the archaic form, but the type is not procurable. Ed.
7ο συμφάροι doubtless from Italian summarre.
8ο ὑφάλον see note 5 ante.
9ο The reading γυθλῶν is doubtful. It is perhaps an adjective formed from γυθος. Another possibility is νικαλῶν.
Translation

Pythagorean Diagnostic Calculation of Life and also of Death.

Ascertain what day the patient took to his bed and how many days the moon had, and reckoning [the numerical value of] their names and that of the sick man, put them together and add ten. And having summed them up, subtract, take away and divide by thirty [lit. cast out all the thirties]. Then taking the remainder, look where [the number] is in the table written below. And if thou findest it in the super­ terranean section he lives, but if in the sub­ terranean he dies. But do not reckon the first day of the illness but the second; for the first is not regarded as [a day of the] disease but as [the day of] taking to bed.

Superterranean Table

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Subterranean

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Diagnostic calculation of those who have been taken sick.

Reckon the day in which the patient took to his bed, or fell into some urgent need, or [on which] he was born, or on which a man wishes to do something. Reckon also [the number of days] from the first day of the month until the given day. Then putting these days together add them all up and subtract from 36, and refer that which remaineth to the table [below]. Now if thou findest it in the 1 it is full well, if in the 2 of middling sort, but if in the 3 it is ill and mortal above all.

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If thou wishest to find or to know whether one unknown to thee [still] walks in life or is without lot among the living, do thus:

Cipher out their names, and having ci­ phered them divide them by nine [lit. cast out all the nines from the ciphers] and seek the remaining numbers of the two names among the aforesaid ciphers overleaf and if.................................. the one is alive, but the other is dead.

The table is overleaf and examine it well.

folios 188v and 18gr

1. The . . . (13) victory (hath) 1
   1 and 2. The 2 (hath) victory
   1 and 3. The 3 (hath) victory
   1 and 4. The 4 (hath) victory
   1 and 5. The 5 (hath) victory
   1 and 6. The 6 (hath) victory
   1 and 7. The 7 (hath) victory
   1 and 8. The 8 (hath) victory
   1 and 9. The 9 (hath) victory

2. The elder (is) 2
   2 and 3. The 3 (hath) victory
   2 and 4. The 4 (hath) victory
   2 and 5. The 5 (hath) victory
   2 and 6. The 6 (hath) victory
   2 and 7. The 7 (hath) victory
   2 and 8. The 8 (hath) victory
   2 and 9. The 9 (hath) victory

3. The younger (is) 3
   3 and 4. The 4 (hath) victory
   3 and 5. The 5 (hath) victory
   3 and 6. The 6 (hath) victory
   3 and 7. The 7 (hath) victory
   3 and 8. The 8 (hath) victory
   3 and 9. The 9 (hath) victory

4. The ancient (is) 4
   4 and 5. The 5 (hath) victory
   4 and 6. The 6 (hath) victory
   4 and 7. The 7 (hath) victory
   4 and 8. The 8 (hath) victory
   4 and 9. The 9 (hath) victory

5. The young (is) 5
   5 and 6. The 6 (hath) victory
   5 and 7. The 7 (hath) victory
   5 and 8. The 8 (hath) victory
   5 and 9. The 9 (hath) victory

6. The ancient (is) 6
   6 and 7. The 7 (hath) victory
   6 and 8. The 8 (hath) victory
   6 and 9. The 9 (hath) victory

7. The chief victor (is) 7
   7 and 8. The 8 (hath) victory
   7 and 9. The 9 (hath) victory

8. The ancient (is) 8
   8 and 9. The 9 (hath) victory

9. The younger
   9 and 9. The 9 (hath) victory

12 I am indebted to Dr. Withington for this interpretation, which fits in well with the tables.

13 See note 11 to text.
SECTION III

INTRODUCTION

THIS, the third installment of the history of the medical department during the revolutionary period, deals almost entirely with the establishment of hospitals, their personnel, and expenditures.

It is interesting to compare the conditions then existing with those obtaining in our time. The medical department does not seem to have been regularly incorporated with the Army until May 28, 1781, when the Medical Committee was discontinued and its business handled by the Board of War. It was even considered necessary as late as September 30, 1780, to state that hospital and medical officers "shall be subjected to trial by courts-martial for all offences, in the same manner as officers of the line of the army."

Those acquainted with the organization of the present military hospital, will read with interest the report of the Medical Committee for March 22, 1781.

Even in those days much red tape was required in the procuring of medicines and instruments, as evidenced by the resolution of July 23, 1782. However, the apothecary evidently held a more important position than under the present régime.

A strong contrast is struck in the salary of the nurses—four dollars per month and one ration per day. But how familiar is the motion of April 13, 1781, ordering that a certain sum of money be placed in the hands of one Nathan Brownson "to pay three months' salary and wages due to the officers and others employed in the hospital . . ."

The regulation under date of September 28, 1780, might well obtain in our own time: "That no person concerned in trade, on his own account, shall be suffered to act as an officer in the hospital or medical department of the army."

Upon dismissal of a soldier from the hospital there seems to have been difficulty in locating his proper clothing as evidenced by the following extract: "The Steward shall also receive the spare regimental arms and accoutrements and clothing of each soldier admitted into the Hospital keeping entries of and giving receipts for every article received, which when the soldier shall be discharged, shall be accounted for by the said Steward, with the Commanding Officer of the regiment to which such soldier belonged, or other proper person, and shall also take charge of the hospital clothing."

For the sake of comparison we might note under date of July 24, 1781, the mildness of the enemy's cruelty toward one Robert Henry who, on being taken prisoner by the enemy, was only "stripped of all his clothing."

Generous provision was made for the invalided by a resolution of May 1, 1783, and, by the order of September 30, 1780, medical officers were entitled to grants of land equal to those of officers in the army.

—EDITOR.
II. FROM JOURNALS OF THE CONTINENTAL
CONESS (1774-83) (Continued)

August 22, 1780. 755
A letter from Doctor W. Shippen, director general, was read:
Ordered, That it be referred to a committee of three:
August 28, 1780. 789-8
The committee, to whom was referred the letter, of 22d, from Doctor W. Shippen, D(irector)* G(en-

eral), brought in a report; Whereupon,
The Committee to whom, D. Shippen Direc1
Gen letter of the 22nd instant was referred, Re-

port.
That that part of the letter which respects sup-
plies of Forage for the Horses belonging to officers
of the Hospital Department, together with two let-
ters received by the Committee since, from the Di-
tector General, be referred to the Board of War to
take order.
The Committee ask leave to sit again.

Extract of a letter of D. Shippen Aug. 22nd 1780
"I am informed to day by the Dep't Quarter
Master of this State that he will not supply our de-
partment with any more Forage, unless he is au-
thorised so to do by an order of Congress, which
I flatter myself will be given immediately.”
Resolved, That that part of the letter, which re-
spects supplies of forage for the horses belonging to
officers of the hospital department, together with
two letters received by the committee from the
director general, be referred to the Board of War to
take order.

September 9, 1780. 814
The committee, to whom was referred the letter of 22 August, from Doctor Shippen, director general,
brought in a report, which was read:
Ordered, That a member be added to the Medical
Committee, in the room of Mr. (Samuel) Holton,
who is absent:
The member chosen, Mr. (Theodorick) Bland.
September 11, 1780. 819
Ordered, That Wednesday next be assigned for
the consideration of the report on the hospital com-
mittee.

Doctor W. Shippen, director general’s letter, re-

ferred, September 22, 1780. 847
Congress resumed the consideration of the report
of the committee on the hospital department, and
on the consideration of the following paragraph, viz.
"That the several officers whose pay is estab-
lished as above, except the clerks and stewards, shall
at the end of the war be entitled to a certain provi-
sion of land in the proportion following, viz.
The director to have the same quantity as a briga-
dier general. Chief physicians and surgeons and
appointed the same as a colonel. Physicians and
surgeons and apothecary the same as lieutenant
colonel. Regimental surgeons and assistants to the
purveyor and apothecary, the same as a major. Hos-
pital and regimental surgeons’ mates, the same as a
captain."
A motion was made by Mr. (Frederick A.) Muh-
lenberg, seconded by Mr. (Theodorick) Bland, to
amend the paragraph by inserting after the words,
“intitled to” the words following, viz. “half pay in
the same manner and under like restrictions as offi-
cers of the line”; and on the question to agree to
the amendment, the yeas and nays being required
by Mr. (John) Fell. 
So it was resolved in the affirmative.
September 23, 1780. 853
The committee, to whom was re-committed part
of the report on the hospital department, having
brought in a farther report, Congress resumed the
consideration thereof, and made some progress.
Ordered, That the director general report the
names of all the officers in the hospital depart-
ment, from the director to the junior surgeons inclusive,
with the dates of their respective commissions.109

September 25, 1780. 854
The director general, having made a return of
the officers of the hospital;109
Ordered, That it be referred to the Medical Com-
mittee.

September 28, 1780. 871
The Medical Committee, to whom was referred
the return made by Doctor Shippen, delivered in a
report.

September 30, 1780. 876-88
Congress resumed the consideration of the report
on the hospital department, when a motion was
made by Mr. (Roger) Sherman, seconded by Mr.
(Nicholas) Van Dyke, to reconsider that part of
the report, viz. “That the several officers whose pay is
established, except the stewards and ward masters,
be intitled to half pay, in the same manner and un-
der like restrictions as officers of the line;”
And on the question for reconsideration, the yeas
and nays being required by Mr. (Roger) Sherman,
So it was resolved in the affirmative.
A motion was made by Mr. (John) Fell, seconded
by Mr. (William Churchill) Houston, to strike out
the words, “half pay in the same manner and under
like restrictions as officers of the line.”
And on the question shall those words stand, the

* Material placed in parentheses appeared in brackets in the original MS.
107 This report, in the writing of Frederick A. Muhlenberg, is in the
Papers of the Continental Congress, No. 136, IV, folio 541.

109 Dr. Shippen’s letter transmitting the return is in the Papers of the Continental Congress, No. 78, XX, 507.
yeas and nays being required by Mr. (Roger) Sher-
man,........................
So it passed in the negative and the words were
struck out.

Congress proceeded in the consideration of the
report, and the same being amended, was agreed to,
as follows:100

Whereas, the late regulations for conducting the
affairs of the general hospital are in many respects
defective; and it is necessary that the same be re-
vised and amended, in order that the sick and
wounded may be properly provided for and attend-
ed, and the business of the hospitals conducted with
regularity and economy; therefore,

Resolved, That there be one director of the mili-
tary hospitals, who shall have the general direction
and superintendence of all the hospitals to the
northward of North Carolina; that, within the afore-
said limits, there be three chief hospital physicians,
who shall also be surgeons; one chief physician, who
shall also be a surgeon, to each separate army; fif-
ten hospital physicians, who shall also be surgeons;
twenty surgeons’ mates for the hospitals: one pur-
veyor, with one assistant; one apothecary; one as-
stant apothecary; [and to each hospital one clerk
who shall also be paymaster,]* a steward, matron,
ordey men, and nurses, as heretofore:

That the director, or, in his absence, one of the
chief hospital physicians, be empowered and re-
quired, with the advice and consent of the Com-
mander in Chief, or commander of a separate army,
to establish and regulate such a number of hospi-
tals, in proper places, for the reception of the sick
and wounded of the army, as may be found neces-
sary:

That the director be authorised and instructed to
enjoin the several chief hospital physicians, and
other officers of the hospitals under his superintend-
ance, to attend at such posts or stations as he may
judge proper, and also to attend and perform such
duties, at any post or place, as a change of the posi-
tion of the army, or other circumstances, may from
time to time make necessary, and shall be required
by the Commander in Chief; and that, in case of
any dispute concerning their seniority or precedence,
the director shall determine the same in the first
instance, the party supposing himself aggrieved be-
ing at liberty to appeal for redress to the Medical
Committee:

That in time of action, and on any other emer-
gency, when the regimental surgeons are not suffi-
cient in number to attend properly to the sick
and wounded that cannot be removed to the hospitals,
the director, or, in his absence, the nearest chief
hospital physician, be empowered and required, upon
request of the chief physician and surgeon of the
army, to send from the hospitals under his care, to
the assistance of such sick and wounded, as many
surgeons as can possibly be spared from the neces-
sary business of the hospitals:

That the director, or, in his absence, two of the
chief hospital physicians, shall make out and de-
liver, from time to time, to the purveyor, proper es-
timates of hospital stores, medicines, instruments,
dressings, and such other articles as may be judged
necessary for the use of the hospitals; also direct
the apothecary or his assistant, to prepare and de-
liver medicines, instruments, dressings, and other
articles in his possession to the hospitals and sur-
geons of the army and navy, as lie or they may
determine necessary:

That the director authorise and instruct the pur-
voyor and apothecary to supply, for the use of the
regimental surgeons, such medicines and refresh-
ments as may be proper for the relief of the sick and
wounded, before their removal to a general hospital,
and to be dispensed under the care, and at the di-
rection of the chief physician of the army:

That the director, or, in his absence, the chief
hospital physicians, respectively, be empowered oc-
casionally to employ second mates, when the num-
ber of the sick shall increase to as to make it neces-
sary, and to discharge them as soon as the circum-
stances of the sick will allow:

That the director, or, in his absence, the chief
hospital physicians, respectively, shall appoint a
ward master for each hospital, to receive the spare
regimental clothing, arms, and accoutrements of
each soldier, admitted therein, keeping estimates of
and giving receipts for every article received, which,
when the soldier shall be discharged, shall be ac-
counted for by the said ward master with the com-
manding officer of the regiment to which such sol-
dier belonged, or the officer directed to take charge
of the convalescents from the said hospital; or, in
case of the death of the soldier, shall be accounted
for with, and delivered to the quartermaster of the
regiment to which the said soldier belonged; and the
ward master shall receive and be accountable for
the hospital clothing, and perform such other ser-
vices as the chief hospital physician shall direct.

That the director shall make returns of all the
sick and wounded in the hospitals, once every
month, to the medical committee, together with the
names and ranks of all the officers and others em-
ployed in the several hospitals:

That the director be required to employ such part
of his time as may be spared from the duties before
pointed out to him, in visiting and prescribing for
the sick and wounded in the hospitals, and to pay
particular attention to the conduct of the sev-
eral officers in the hospital department, and arrest,
suspend and bring to trial, all delinquents within
the same:

That the duty of the chief hospital physician shall
be, to do and perform all the duties herein before en-
joined them to do in the absence of the director; to
receive and obey the orders of the director, made
and delivered to them in writing, to superintend the
practice of phisick and surgery in the hospitals put
under their particular care by the director, or which,
by the order of the commander in chief or the com-
mander of a separate army, may be by them estab-
lished; to see that the hospital physicians and other
officers attending the same, do their duty; and make
monthly returns to the director, of the state and
number of the sick and wounded in the hospitals
under their care; and also make to the director, and
to the medical committee, of all delinquent officers,
in order that they may be speedily removed or punished; and to take measures that all such sick and wounded as are recovered and fit for duty be delivered weekly to the officer of the guard, to be conducted to the army: when present at any hospital, to issue orders to the proper officers for supplying them with necessaries; and generally, in the absence of the director, to superintend and control the business of such hospitals, suspend delinquent and remove unnecessary non-commissioned officers, making report to the director; and, when in their power, to attend and perform or direct all capital operations:

That the hospital physicians shall take charge of such particular hospitals as may be assigned to them; They shall have power to suspend officers under them, and to confine other persons serving in the hospitals under their charge, for negligence or ill-behaviour, until the matter be regularly inquired into: They shall diligently attend to the cases of the sick and wounded of the hospitals under their care, administering at all times proper relief, as far as may be in their power: They shall respectively give orders, under their hands, to the assistant purveyor or steward at the hospital, for the issuing provisions and stores, as well as for the procuring any other articles that the exigencies of the hospital may require, and which the store is not provided with, having always a strict regard to economy, as well as the welfare of the sick then to be provided for: They shall make weekly returns to the nearest chief hospital physician, of the state of the hospitals under their respective care.

The mates shall each take charge of and attend the patients assigned them, and perform such other duties as shall be directed by the director, chief or other physicians and surgeons.

The chief physician and surgeon of the army shall be subject to the orders and control of the director: His duty shall be to superintend the regimental surgeons and their mates, and to see that they do their duty: To hear all complaints against the said regimental surgeons and mates, and make report of them to the director, or in his stead, the commander in Chief or commanding officer of a separate army, that they may be brought to trial by court-martial for misbehaviour: To draw for and receive from the purveyor a suitable number of large strong wagons and drivers; he shall have a steward, which he is to appoint, to receive and properly dispense such articles of diet and refreshment as shall be procured for the sick; and also shall appoint such a number of nurses and orderly men as may be necessary for the attendance of the sick and wounded under his care. He shall cause daily returns to be made to him of all the sick and wounded which have been removed to the hospitals, all that remain in the hospital tents, all that are become fit for duty, all that are convalescent, and all who may have died, specifying the particular maladies under which the sick and wounded labour, and shall make a monthly return thereof to the director, who shall add it to his general hospital returns, to be transmitted monthly to the Medical Committee.

That whenever any regimental surgeon or mate shall be absent from his regiment, without leave from the chief physician and surgeon or commander of the army where his duty lies, the said chief physician and surgeon shall have power to remove such surgeon or mate and forthwith appoint another in his stead.

That the provisor provide, or cause to be provided, all hospital stores, medicines, instruments, dressings, utensils, and such other articles as shall be prescribed by the written order of the director, or two of the chief hospital physicians, and deliver, or cause the same to be delivered, upon written orders of the director, chief hospital physician, or one of the hospital physicians, having the charge of a particular hospital, or of a chief physician and surgeon of the army, which, with receipts thereon for delivery of the same, shall be sufficient vouchers. He shall be allowed a clerk, and as many store keepers as occasion may require, and the director shall approve of. He shall also pay the salaries of the officers, and all other expenses of the hospitals. He shall render his accounts every three months to the Board of Treasury for settlement, and make application for money to the Medical Committee, before whom he shall lay estimates of articles necessary, which shall previously have been approved and signed by the director or two of the chief hospital physicians; at the same time he shall render to them an account of the expenditure of the last sum of money advanced to him; and the said Medical Committee shall lay such estimates before Congress, with their opinion thereon:

That the assistant purveyor shall procure such supplies, and do and perform such parts of the purveyor's duty as by him shall be particularly assigned to him.

That the apothecary and his assistant receive, prepare and deliver medicines, instruments and dressings, and such other articles of his department, to the hospitals and army, on orders in writing from the director, or either of the chief hospital physicians, or chief physician and surgeon of the army; and that he be allowed as many mates as occasion may require, and the director shall approve of:

That the director, or in his absence, the chief hospital physician, shall appoint a steward for each hospital, whose duty it shall be to purchase vegetables and other small articles, under the direction of the purveyor, and to receive hospital stores from the purveyor, and provisions from the commissary general, and issue the same for the use of the sick and wounded, agreeably to the order of the physician and surgeon attending such hospital; the steward to account with the purveyor for all such issues:

That the director, or, in his absence, the chief
hospital physician, appoint a proper number of matrons, nurses, and others, necessary for the regular management of the hospitals, and fix and ascertain their pay, not exceeding the sums heretofore allowed; and point out and prescribe their particular duties and employments, in writing, which they are enjoined to observe and obey:

That the director, with two chief hospital physicians, be empowered to fix the pay of second mates, and of such clerks, store keepers, and other persons, as may occasionally be employed; and also make such regulations, and point out and enjoin, in writing, such further particular duties for the several officers in the hospital department, as they may judge necessary for the regular management of the same; which duties shall always be consistent with, and in no wise contradictory to any of the duties herein before particularly enumerated, and which being reported to, and approved of by the Medical Committee, shall thereupon become obligatory to all those concerned:

That the quartermaster general furnish the hospital department, from time to time, as occasion may require, with such a number of horses and wagons as may be necessary for removing the sick and wounded, and for transporting the hospital stores; but that no other horses than those belonging to the officers of the department, for which forage may be herein allowed, be kept separately and at the expense of the department:

That no person concerned in trade, on his own account, shall be suffered to act as an officer in the hospital or medical department of the army:

That no officer or other person in the hospital department, except the sick and wounded, be permitted to use any of the stores provided for the sick:

That the director, chief hospital physicians, and the chief physicians and surgeons of the army, physicians and surgeons, purveyor, apothecary, assistant purveyor, and assistant apothecary, be appointed and commissioned by Congress; the regimental surgeons and mates to be appointed as heretofore:

That the director, with the advice and concurrence of two of the chief hospital physicians, appoint all hospital mates, which appointments shall be certified by warrants under the hand of the director; in which appointments no person shall be admitted under the age of twenty-one years:

That all the officers in the hospital or medical departments, shall be subjected to trial by courts-martial for all offences, in the same manner as officers of the line of the army.

Resolved, That the pay and establishment of the officers of the hospital department, and medical staff, be as follows:

Director, one hundred and fifty dollars per month, one ration per day, and forage for one horse:

Chief physicians and surgeons of the army and hospitals, each, one hundred and forty dollars per month, two rations per day, and forage for two horses:

Purveyor and apothecary, each, one hundred and thirty dollars per month:

Physicians and surgeons of the hospitals, each, one hundred and twenty dollars per month, one ration per day, and forage for one horse:

Assistant purveyors and apothecaries, each, seventy-five dollars per month:

Regimental surgeons, each, sixty-five dollars per month, one ration per day, and forage for one horse:

Surgeons' mates in the hospitals, fifty dollars per month, one ration per day:

Surgeons' mates in the army, forty-five dollars per month, one ration per day:

Steward for each hospital, thirty-five dollars per month, one ration per day:

Ward master for each hospital, twenty-five dollars per month, one ration per day:

Resolved, That none of the aforesaid officers, or other persons employed in any of the hospitals, be entitled to rations of provisions or forage when on furlough.

Resolved, That the chief physician of the army be allowed a two horse covered wagon for transporting his baggage:

That the several officers above mentioned shall receive their pay in the new currency, emitted pursuant to a resolution of Congress of the 18th day of March last; and that they be allowed and paid at the rate of five dollars of said currency per month for every retained ration; and shall each be entitled annually to draw clothing from the stores of the clothier general, in the same manner and under the same regulations as are established for officers of the line, by a resolution of Congress of the 25th November, 1779:

That the returns for clothing for officers in the medical staff (regimental surgeons and their mates, who are to draw with the regimental staff, excepted) be signed by the directors, or one of the chief hospital physicians; and such clothing shall be delivered either by the clothier general or any sub-clothier in the state in which the officer to receive clothing shall reside, in the same manner as is provided in the cases of other staff officers not taken from the line:

That the several officers whose pay is established as above (except the stewards and ward masters) shall at the end of the war be entitled to a certain provision of land, in the proportion following, viz.

The director to have the same quantity as a brigadier-general;

Chief physicians and purveyor, the same as a colonel;

Physicians and surgeons and apothecary, the same as a lieutenant colonel;

Regimental surgeons and assistants to the purveyor and apothecary, the same as a major;

Hospital and regimental surgeons' mates, the same as a captain;

That the former arrangements of the hospital department, and all resolutions heretofore passed touching the same, so far as they are inconsistent with the foregoing, be repealed, excepting that the hospitals in the southern department, from North Carolina to Georgia, inclusive, be continued under the same regulations as heretofore, until the further order of Congress.\footnote{Here Charles Thomson resumes the entries.}
October 2, 1780. 889

Congress took into consideration the report of the Medical Committee on the letter, of 24 September, from the director general, together with the returns of the officers in the hospital department; and thereupon,

The Medical Committee, to whom the Director General's letter of the 24th inst. together with the Return of the Officers in the Hospital Department was referred, beg leave to report:

That they have conferred with the Director General and other officers of the Department, and have made out a new Return, of the General Officers, the Senior and Junior Surgeons, together with the Dates of their respective Commissions, which they submit to Congress.

Resolved, That on Thursday next Congress will proceed to the election of the director, chief physicians, purveyor-apothecary and their respective assistants, and the physicians of the military hospitals.

October 6, 1780. 908

Congress proceeded to the election of officers in the hospital department, and the ballots being taken, Doctor William Shippen, jr. was elected director-general; Doctor John Cochran, chief physician and surgeon of the army; Doctor James Craik, Doctor Malachi Treat, Doctor Charles M'Knight, chief hospital physicians.

October 7, 1780. 909-10

Congress proceeded in the election of officers in the hospital department, and the ballots being taken, Thomas Bond, jun. was elected purveyor; Isaac Ledyard, assistant purveyor; Doctor Andrew Craigie, apothecary; William Johonot, assistant apothecary; Doctors James Tilton, Samuel Adams, David Townshend, Henry Latimer, Francis Hagan, Philip Turner, William Burnet, John Warren, Moses Scott, David Jackson, Bodo Otto, Moses Bloomfield, William Eustis, George Draper, Barnabas Binnery, hospital physicians and surgeons.

On motion of the medical committee,

Resolved, That Doctor Matthew Maus be appointed surgeon to the regiment of invalids commanded by Colonel L. Nicola, and that Colonel Nicola be authorised to appoint a proper surgeon's mate to the said regiment, when the number of sick shall make it necessary.

October 17, 1780. 935

On motion of the Medical Committee,

Ordered, That Doctor Isaac Forster and Doctor Jonathan Potts deliver all public stores in their possession to Doctor Thomas Bond, purveyor of the hospitals, or his order, taking duplicate receipts for the same, and transmitting one of each to the Board of Treasury.

October 21, 1780. 962

A letter, of 4, from W. Rickman, was read; Whereupon,

Ordered, That Dr. Rickman be informed, that pursuant to his former request, he is left out in the new arrangement of the hospital department.

October 30, 1780. 992

That as Major General Greene has expressed an earnest desire to have Doctor James McHenry as an aid de camp upon the southern command, the said Major General Greene be authorised to employ the said Doctor James McHenry as one of his aids, on his command in the southern department; and that the said Doctor McHenry while so employed be intitled to the rank of major by brevet.

November 1, 1780. 1002

The Medical Committee delivered in a report; Whereupon,

The Medical Committee beg leave to Report—

That they have had under consideration an estimate of Hospital Stores, laid before them by the Purveyor by order of the Director of the Hospital: of which estimate, such parts as are approved of by the Committee and in their opinion necessary to be procured they now lay before Congress, amounting by estimation to $476 2/3 dollars in specie: Whereupon they offer the following Resolution.

Ordered, That the sum of four thousand two hundred and seventy six dollars and sixty ninetieths of a dollar, in bills emitted pursuant to the resolution of the 18th of March last, be advanced to Thomas Bond, purveyor of the general hospital, to enable him to purchase the stores mentioned in an estimate approved by the Medical Committee; and that the Board of Treasury report a draught or draughts for that purpose.

November 6, 1780. 1024

Ordered, That a warrant issue on Joseph Borden, commissioner of the continental loan office in the State of New Jersey, in favour of Thomas Bond, purveyor of the general hospital, for four thousand two hundred and seventy six dollars and 60/90, in bills of credit emitted pursuant to the act of Congress of the 18 of March last; for which sum the said Thomas Bond is to be accountable.

November 13, 1780. 1049

A letter, of 5, from Doctor James Tilton was read.

A letter from Doctor James Fallon was laid before Congress;

Ordered, To lie on the table.

Ordered, That Dr. Rickman be informed, that

Letter of Fallon, dated November 3, 1780, is in the Papers of the Continental Congress, No. 78, IX, folio 347.

Note 112 This report is in the Papers of the Continental Congress, No. 22, folio 27.

Note 113 This letter is in the Papers of the Continental Congress, No. 78, XIX, folio 319.
that until the said Dep[7] Pay Master General renders his accounts, no account with Doctor Rickman can be settled at the Treasury.\footnote{116 This report is in the \textit{Papers of the Continental Congress}, No. 136, IV, folio 745.}

\section*{November 24, 1780. 1090-1}
The Medical Committee laid before Congress a letter of 21, from Doctor Shippen, director [general], which was read; Whereupon, [A motion was made by Mr. Duane, seconded by] Ordered, That Doctor Shippen, director of the hospitals, [be directed to] repair to head quarters and put himself under the orders of the Commander in Chief.\footnote{117 This motion is in the \textit{Papers of the Continental Congress}, No. 36, IV, folio 499.}

\section*{November 27, 1780. 1095}
A letter, of this day, from Doctor Shippen.\footnote{118 This letter is in the \textit{Papers of the Continental Congress}, No. 78, IV, folio 97.}

\section*{December 4, 1780. 1118}
A letter, of 30 November, from B. Binney, hospital surgeon; and
One, of this day, from M. Maus, surgeon of the invalid regiment, were read:\footnote{119 This report is in the \textit{Papers of the Continental Congress}, No. 136, IV, folio 745.}

\section*{December 5, 1780. 1120}
A letter, of 4, from D(avid) Jackson, hospital surgeon, was read, requesting leave to resign: Ordered, That leave be granted.

\section*{December 6, 1780. 1123-6}
The Medical Committee, to whom were referred the letters from Doctor Binney and Doctor Maus, delivered in a report:
The Medical Committee to whom was committed the letters from B. Binney and M. Maus beg leave to report—
That on the 21st day of July last a warrant issue on the Treasury in favor of Dr. Jonathan Potts, Purveyor of the Hospital for 200,000 dollars for procuring Hospital Stores, and paying the Physicians and surgeons in that Department, a part only of which Warrant, owing to a deficiency of money in the Treasury, hath been received—
That on the 6th November last a warrant issued on the Continental Loan Officer of the State of New Jersey in favor of Thomas Bond Jr. the present Purveyor for a certain sum of money for procuring supplies necessary for the hospital, no part of which the Purveyor informs the Committee he hath been able to receive. That on account of the failures in obtaining money, the sick are in a suffering condition; the physicians unable to proceed to their respective charges, and the business of the Department greatly impeeded in every part.

That in order to procure supplies immediately wanted for the relief of the sick and to enable the Physicians to perform their duty, it is necessary to furnish the Purveyor with a sum of money. That it be referred to the Treasury to report a Warrant without delay that will insure a speedy supply.\footnote{120 This report, in the writing of Theodorick Bland, is in the \textit{Papers of the Continental Congress}, No. 136, IV, folio 745.}

\section*{December 8, 1780. 1128}
That a warrant issue on Thomas Smith, commissioner of the continental loan office for the State of Pennsylvania, in favour of Thomas Bond, Junior, purveyor of the hospitals, on the recommendation of the Medical Committee, for fifteen thousand dollars, to be paid out of the proceeds of a bill of exchange for two hundred dollars, part of those here-tofore ordered to be drawn on the honorable Benjamin Franklin, minister plenipotentiary of the United States at the Court of Versailles, at ninety days' sight, to be placed in the hands of the commissioner aforesaid, by order of the Board of Treasury, to enable the said purveyor to make provision for some sick soldiers in immediate want in the barracks in this city; for which sum the said Thomas Bond is to be accountable.\footnote{121 This report, in the writing of Theodorick Bland, is in the \textit{Papers of the Continental Congress}, No. 78, IV, folio 83.}

Ordered, That it be referred to the Board of Treasury, and that they report without delay, a warrant that will ensure a speedy supply of necessities wanted for the sick and enable the physicians to perform their duty.

\section*{December 9, 1780. 1132}
On motion of Mr. (Theodorick) Bland, a member of the Medical Committee, Ordered, That the purveyor and apothecary be directed to issue medicines and refreshments necessary for the transient sick which may be, from time to time, under the care of Doctor Maus, as is done in the general hospital, he making returns of such sick in the manner directed in the hospital regulations to the director, and signing receipts for such stores as are issued to him.

Ordered, That Doctor Maus report to the commanding officer at the barracks such officers as are appointed to act under him as surgeon to the transient sick, in case of misdemeanor, in order that they be tried for misconduct or neglect of duty by a garrison court martial.\footnote{122 This letter is in the \textit{Papers of the Continental Congress}, No. 36, IV, folio 499.}

\section*{December 13, 1780. 1149}
A letter, of 6, from Doctor Bloomfield and Doctor Scott, two hospital physicians, was read, enclosing their commissions, and desiring that their resignations be accepted.\footnote{123 This letter is in the \textit{Papers of the Continental Congress}, No. 36, IV, folio 435.}

Ordered, That their resignations be accepted.

\section*{December 26, 1780. 1194}
A letter, of 7, from John Warren was read, signifying his acceptance of the office of hospital physician.\footnote{124 This letter, in the writing of Abraham Clark, is in the \textit{Papers of the Continental Congress}, No. 22, folio 31.}
EXPENDITURES FOR THE YEAR 1780

Hospital Department. Page 143. 260. 562. 380. 648. Jonathan Potts, purveyor general, &c. accountable: .............................................376,000
Page 330. Isaac Forster, deputy director general hospitals, eastern department, accountable: .............................................40,000
Page 1128 . . . . . . . .............................................15,000
And Page 1024, in new emission, 4,276 dollars. Thomas Bond, jun. purveyor general, &c. accountable: .............................................

Total 431,900

STANDING COMMITTEES

Medical

4 May, 1780. James Henry
7 July, 1780. Abraham Clark in place of Henry
9 September, 1780. Theodorick Bland in place of Holten
23 October, 1780. Isaac Motte

January 3, 1781. 15
A letter, of this day, from Doctor William Shippen, director general of the hospital, was read, requesting leave to resign. Ordered, That his resignation be accepted.
Two papers, signed Patrick Garvey, were laid before Congress and read:
Ordered, That the same be referred to the Medical Committee.

January 4, 1781. 20
. . . . A letter, of November 29, from Doctor Forster to the Medical Committee, were read: Ordered, That the same be referred to the Medical Committee.

January 11, 1781. 47–8
Resolved, That Monday next be assigned for electing a director [general] of the hospital, and a paymaster general to the army.
Doctor J. Cochran was nominated by Mr. (James Mitchell) Varnum for the office of director [general]; Doctor Brown, by Mr. (Joseph) Montgomery; Dr. Craig, by Mr. (Abraham) Clark.

January 13, 1781. 56
Doctor J. Morgan was nominated by Mr. (George) Walton, for the office of director of the hospitals.

January 17, 1781. 65, 68
Congress proceeded to the election of a director of the military hospital; and the ballots being taken, Dr. John Cochran was elected, having been previously nominated by Mr. (James Mitchell) Varnum.
Congress took into consideration the report of the committee on the letter of 5 of November last, from General Washington, enclosing a memorial from the officers in the hospital department; and, thereupon, came to the following resolutions:
Whereas, by the plan for conducting the hospital department, passed in Congress the 30th day of September last, no proper establishment is provided for the officers of the medical staff, after their dismission from public service, which, considering the custom of other nations and the late provision made for the officers of the army, after the conclusion of the war, they appear to have a just claim to; for remedy whereof, and also for amending several parts of the above mentioned plan:
Resolved, That all officers in the hospital department, and medical staff, hereinafter mentioned, who shall continue in service to the end of the war, or be reduced before that time as supernumeraries, shall be entitled to, and receive, during life, in lieu of half-pay, the following allowance, viz.

The director of the hospital equal to the half-pay of a lieutenant colonel:
Chief physicians and surgeons of the army and hospitals, [each equal to the half-pay of major] and hospital physicians and surgeons, purveyor, apothecary, and regimental surgeons, each equal to the half-pay of a [lieutenant] captain: [and regimental mates each equal to the half-pay of a] lieutenant.
That there be allowed to the purveyor, apothecary, and assistant purveyors, each, forage for one horse:
That the power given in the before-mentioned plan, to the chief physician and surgeon of the army, to remove regimental surgeons and mates in case of absence without leave, shall in future extend no further than a power of suspension, until such delinquent shall be reported to a proper officer for bringing him to trial by court martial:
That the apothecary may deliver medicines, instruments and dressings, and other articles of his department, to the hospitals, on orders in writing from a physician and surgeon having the care of any particular hospital, where the director or one of the chief physicians and surgeons shall not be present to give the same:
That the power given to the director and chief hospital physicians, with respect to the appointment of matrons, nurses, and other persons necessary for the regular management of the hospitals, be extended to each of the physicians and surgeons of the hospitals, in the absence of the director and chief physicians and surgeons.
[That notwithstanding the prohibition against officers of the hospitals using any of the Stores provided for the sick, the said officers may occasionally draw out of the hospital Stores under their particular direction by written orders on the Stewards of the same, such small articles for their comfortable subsistence as they may stand in need of, provided such articles are not immediately wanted for the use of the sick: of which articles so issued, the Stewards shall keep regular accounts, charging each officer with the articles drawn at the current price the same bears at that time, which shall be deducted out of his pay in the settlement of his account, copies of which accounts, each
respective Steward, under obligation of his oath of Office, shall transmit every six months to the Purveyor, Which being charged in a general account by him, shall be lodged in the Treasury Office—

That the Director, Chief Physicians of the army and hospitals, and other Physicians and officers in the hospital department, as well those lately dismissed from service, as those re-appointed in the last arrangement who were in office between the first day of Sept. 1777, and the 30th day of September last, shall have the depreciation of money made good to them on their pay for such part of the above mentioned time as they were actually employed in public service.] 128

January 25, 1781. 86
A letter, from Doctor Gould, was read: 129
Ordered, That it be referred to the Medical Committee.

February 1, 1781. 103-4
A letter, of 31 January, from Doctor Gould, was read: 129

On motion of the medical committee, Resolved, That the purveyor of the hospital be, and hereby is empowered and directed to collect, or cause to be collected and secured under care, until properly issued, all public hospital stores and medicines in Virginia, late under the direction of Dr. Rickman, or others acting under the United States, and all persons in possession of such public stores or medicines, are hereby required to deliver the same to the said purveyor, or his order, upon demand. [That the medical committee be authorised during the absence of the director to direct a number of the hospital physicians and mates to repair immediately to Virginia and take the charge of the hospitals in that state.] 130

A motion was made by Mr. (Theodorick) Bland, seconded by (Mr. George) Walton, respecting the hospitals for the southern army: Ordered, That it be referred to the Medical Committee.

February 5, 1781. 115
A letter, of 3, from Doctor B. Binney, was read; 131

February 6, 1781. 118
On motion of Mr. (Theodorick) Bland, Resolved, That Thomas Bond, jun., purveyor to the general hospital, be, and hereby is, authorised to settle the accounts for salaries, and pay the officers of the hospital established in Virginia, under the direction of Dr. Gould, which have accrued since the new arrangement of the medical department; and that Dr. William Rickman, late deputy director, settle and return the accounts of salaries due the officers of the said hospital, prior to that date, to the present purveyor. 132

February 8, 1781. 130
A letter, of 7, from B. Otto, physician and surgeon, was read; Whereupon, Ordered, That the letter of Doctor Otto be referred to the Board of War to take measures for preventing any interruption being given to the hospital at the yellow springs, the same being provided solely for the reception of proper hospital subjects.

February 16, 1781. 155
The Medical Committee laid before Congress a letter, of January 12, from Doctor J. Browne, acting as surgeon general in the southern army, which was read:
Ordered, That it be referred to the Medical Committee.

Ordered, That Mr. (William) Burnett be added to the Medical Committee.

February 19, 1781. 160
A letter, of 3, from J. Cochran, was read, signifying his acceptance of the office of director general of the hospital. 133
A memorial of John Bartlet was read: 133
Ordered, That it be referred to the Medical Committee.

February 22, 1781. 187
A letter, from Doctor B. Binney, was read: 134
Ordered, That it be referred to a committee of three.

February 24, 1781. 191
On motion of the Medical Committee:
Ordered, That a warrant issue on Thomas Smith, commissioner of the continental loan office for the State of Pennsylvania, in favour of Doctor Thomas Bond, purveyor of the hospital, for forty thousand dollars of the old emissions, to be applied towards paying the officers of the medical department in part of their salaries due since their appointment under the present arrangement, for which sum the said purveyor to be accountable.

February 27, 1781. 199
A letter, of 10, from James Craig, chief hospital physician, was read: 135
Ordered, That it be referred to the Medical Committee.

March 3, 1781. 230
The report of the committee on the letter of the 28th February from Dr. W. Burnet, was taken into consideration; Whereupon, Ordered, That Dr. James Craik, chief hospital physician and surgeon, be, and is hereby appointed chief physician and surgeon of the army, in the room of Dr. J. Cochran, elected director of the hospital; and that Monday next be assigned for electing a chief hospital physician and surgeon, in the room of Dr. Craik, removed to the army. 136

This report, in the writing of Abraham Clark, is in the Papers of the Continental Congress, No. 19, VI, folio 331.

This letter is in the Papers of the Continental Congress, No. 78, X, folio 286.

This motion, in the writing of Abraham Clark, is in the Papers of the Continental Congress, No. 36, I, folio 121.

Binney’s letter is in the Papers of the Continental Congress, No. 78, IV, folio 93.

128 This report, in the writing of Abraham Clark, is in the Papers of the Continental Congress, No. 78, X, folio 285.

129 This letter is in the Papers of the Continental Congress, No. 78, VI, folio 11.

130 Bartlett’s memorial is in No. 19, I, folio 241.

131 This letter, dated February 20, 1781, is in the Papers of the Continental Congress, No. 78, IV, folio 89.

132 This report, in the writing of Abraham Clark, is in the Papers of the Continental Congress, No. 19, I, folio 473.
March 5, 1781. 233
According to the order of the day, Congress proceeded to the election of a chief physician and surgeon of the hospital, in the room of Dr. Craik, removed to the army; and, the ballots being taken, Dr. William Burnet was elected, having been previously nominated by Mr. (John) Witherspoon.

March 7, 1781. 237
A memorial of Francis Hagan, a physician and surgeon in the hospital, was read; 136

March 14, 1781. 259
The committee on Doctor B. Binney's letter, of 20 February:
The Committee to whom was referred the letter of Doctor B. Binney on the 22d Febry. report, That Doctor Binney's services are useful and necessary in the medical department, and that he ought to be retained in that department,

That it is the opinion of the Committee Doctor Binney should immediately repair to the State of Virginia, according to the order he hath received from the Director General of the hospitals; and that an order issue to the Treasury to furnish on account the sum of forty thousand dollars of the old emissions of Congress, to enable him to bear the expenses of himself and two Mates, and to establish and furnish hospitals in the said State. 137

March 16, 1781. 273
The Medical Committee also delivered in a report for arranging the hospital for the southern army.
The Medical Committee, to whom was referred the memorial of Doctor J. Bartlet: delivered in their several reports.

March 19, 1781. 275-7
The report of the Medical Committee on the memorial of Dr. John Bartlett, late physician and surgeon general of the army in the northern department, was taken into consideration; and it appearing,
The medical committee to whom was referred the memorial of Dr. John Bartlett late Physic and Surgeon General of the army in the northern department, beg leave to lay before Congress the following State of Facts respecting the memorialist.

That on the 11th of April 1777 he was appointed Physic and Surgeon General of the army in the northern department, to which he repaired some time in July following and with which he continued until the 23d of October following when he was permitted by Gen' Gates to return home on account of his inability to perform the duties belonging to that office by reason of the infirmities of age and more especially on account of an accidental injury received in his arm, That it appears to your committee that at the time Dr. Bartlett left the army it was generally understood that he had no design of returning to that post, he having before he received the hurt in his arm declared repeatedly to the other officers of that department that he was too old and infirm to perform the duties belonging to that office and at his particular request exchanged with Dr. Thomas Tillotson an Hospital Surgeon, That before he went home he obtained a certificate from Dr. Potts and Dr. Treat recommending him for an appointment to any hospital that might be established near his own home. That this notwithstanding, he repaired to the army at the White Plains some time in the year 1778, but was not considered or treated as Physician and Surgeon General nor did he do any of the duties of that office, Dr. Tillotson having been appointed by Gen' Gates in his room and being then with the army and doing the duties of that office.

That on the first of July 1779 Dr. Shippen the late Director General at the particular request of Doctor Bartlett's friends directed him to repair to Fish Kill and superintend the Hospital at that place, where he accordingly came and the officers of that Hospital refusing to do duty under him he requested and obtained permission from Dr. Shippen on the 28th September 1779 to return home,

That he received pay for the time he was with the northern army in 1777 and six months pay besides after he went home and also that he received three months pay for the time he was at Fish Kill in 1779. Since which time your Committee cannot find that Dr. Bartlett hath either done duty or received pay. Upon which State of facts your Committee beg leave to report,

That Dr. John Bartlett, at his own request, and with the consent of the commanding officer of the department, and the deputy director and other officers thereof belonging, left the service to which he was appointed, in a manner which clearly indicated his intention of relinquishing his office; and having received pay for all the time he spent with the army, and six months while he was at home, cannot be entitled to any farther pay or allowance. 138

March 22, 1781. 292-4
A letter, of January 14, from Major General Greene, was read, with sundry papers enclosed:
Ordered, That it be referred to the Medical Committee.
The report of the Medical Committee, delivered the 15, was taken into consideration, and it was thereupon resolved as follows:
Whereas the late regulations for conducting the medical department and military hospitals passed the 30th day of September last, and amended by several subsequent acts of Congress, extends no further southward than to include the State of Virginia; and whereas the present operations of the war to the southward, make it necessary that the hospital department, in that district, be rendered as uniform to that in the northern army as circumstances will permit, that no inconveniences may arise to the army in general from different and opposite systems, as its operations may eventually be interchangeable from one district to another in a short space of time; therefore,

Hagan's memorial is in the Papers of the Continental Congress, No. 41, IV, folio 173.

This report, in the writing of Meriwether Smith, is in the Papers of the Continental Congress, No. 19, I, folio 301. It is endorsed: "Aug. 24, 1781, not to be acted upon."
Resolved, That there be one deputy director of the military hospitals, [in the Southern district subject to the general control of the director] who shall, in the absence of the director, have the general control and management of all the military hospitals that are or may be established [to the Southward of Virginia] under the orders of the commander of the southern army for the time being.

When the foregoing resolution was under debate, a motion was made by Mr. (John) Mathews, seconded by Mr. (Thomas) Bee, after the words "the director," to insert "for the southern army;" and on the question, shall those words be inserted? the yeas and nays being required by Mr. (Thomas) Bee.

So it passed in the negative.

Resolved, That [within the] for the army aforesaid, [district] there shall be one chief physician of the hospital, who shall also be a surgeon; one chief physician to the said army, who shall also be a surgeon; two hospital physicians, who shall also be surgeons; and four surgeons' mates for the hospitals; one deputy purveyor with an assistant, one deputy apothecary with an assistant; and to each hospital, a steward, matron, orderly men and nurses as is directed in the arrangement of the [northern] hospital, passed the 30 day of September aforesaid.

That the deputy director, deputy purveyor and deputy apothecary, have and exercise the same powers which are exercised by the director, purveyor and apothecary respectively, agreeably to the arrangement above-mentioned:

That the pay of the deputy director be one hundred and forty dollars per month, that of the deputy purveyor and deputy apothecary, each one hundred and twenty dollars per month; and they shall severally be entitled to the same emoluments, and subject to the same regulations and restrictions as their respective principals are entitled or subjected to by the above-mentioned arrangement and the amendments thereto:

That all the other officers of the hospital and medical staff for the southern [district] army, exercise the same powers, perform the same duties, receive the same pay and emoluments, and be subject to the regulations and restrictions laid down in the aforesaid arrangement for officers of like description:

Provided nevertheless, that the powers therein directed to be exercised by the director, and any two chief physicians and surgeons of the hospital, shall, in the absence of the deputy director, be vested in and exercised by the next officer in the hospital department for the southern army, and so on in succession, in conjunction with the two next seniors.

March 27, 1781. 316

The United States in Congress assembled proceeded to the election of a deputy purveyor of the hospital for the southern army, and, the ballots being taken and counted, Dr. Nathan Brownson was elected, he having been previously nominated by Mr. (Samuel) Adams.

April 12, 1781. 375

On motion of the Medical Committee:

Ordered, That a warrant issue on Thomas Smith, commissioner of the continental loan office for the State of Pensylvania, in favour of Thomas Bond, jun., purveyor of the hospital, for thirty thousand dollars of the old emissions, twenty thousand dollars of which to be delivered to Nathan Brownson, deputy purveyor, to be applied to the use of the hospitals established for the southern army and the remaining ten thousand to be applied by the purveyor towards the paying persons necessarily employed in the general hospital northward of Virginia, for which sum of thirty thousand dollars the purveyor to be accountable.

April 13, 1781. 388

On motion of the Medical Committee:

Ordered, That a warrant issue on John Hopkins, commissioner of the continental loan office for the State of Virginia, in favor of Thomas Bond, Jun't., purveyor of the hospital, for five thousand dollars of the new emission, to be by him put into the hands of Nathan Brownson, deputy purveyor, to pay three months' salary and wages due to the officers and others employed in the hospital established for the southern army and to procure supplies for said hospital, for which sum the said purveyor is to be accountable.

April 30, 1781. 404

A memorial of sundry officers late of the hospital staff was read:

Ordered, That it be referred to a committee of three:

The members, Mr. (James) Duane, Mr. (William Churchill) Houston, Mr. (Isaac) Motte.

May 2, 1781. 467

Treasury Office, May 1st, 1781

The Board of Treasury upon the petition of Lieut-tenant Andrew Lee of Col. Hazen's regiment referred to them 27th ultimo, beg leave to report to the United States in Congress Assembled, That for the payment of the said L'. Lee's account (inclosed in the said petition) of expences incurred, from the time he was wounded at Springfield New Jersey in June 1780 to the 3rd of January 1781 to the amount of 3820 dollars old emissions, a warrant issue on Thomas Smith Esq. Commissioner of the Continental Loan Office for the State of Pennsylvania in favour of Dr. Thomas Bond purveyor of the General Hospital for 3820 dollars of the old emissions to enable him to pay the account of the said lieut'. Lee, for which sum the said Dr. Thos. Bond is to be accountable.

Ordered, That a warrant issue on Thomas Smith, commissioner aforesaid, in favour of Thomas Bond, purveyor of the general hospital, for fifty dollars and eighty-four ninetyths of a dollar of the new emission.

139 This report, in the writing of Abraham Clark, is in the Papers of the Continental Congress, No. 22, folio 33.

140 This report, in the writing of Theodorick Bland, is in the Papers of the Continental Congress, No. 41, VII, folio 292.

141 This report, in the writing of Theodorick Bland, is in the Papers of the Continental Congress, No. 136, V, folio 289.
sion, to enable him to discharge the account of Lieu-
tenant Lee for expenses incurred from the time he
was wounded at Springfield, New Jersey, in June,
1780, to the 3 January, 1781, for which sum the
said Thomas Bond, purveyor, is to be accountable.

May 4, 1781. 475
Ordered, That Mr. (John) Witherspoon be added
to the committee on the memorial of sundry officers
late of the hospital staff;

May 23, 1781. 529
The report from the Medical Committee was read;
Whereupon,
The Medical Committee report,
That the Purveyor has certified to them that
there is due to Dr. Peter Fayssoux for his pay as
Physician and Surgeon General of the Hospitals in
the Southern Department, a balance of 2599 dollars
therefore submit the following resolve:

Ordered, That a warrant issue in favour of Thomas
Bond, purveyor of the hospitals, for one thousand
dollars of the new emission to be by him paid to
Doctor Peter Fayssoux in part of his arrearages of
pay, to enable the said Doctor P. Fayssoux to re-
pair to the southern army [to take charge of the
hospital].

May 25, 1781. 534
That so much of the letter, of 25, from J. Coch-
ran, director general, as respects the hospital sur-
geons, stores and farther appointments, be referred
to the Medical Committee;
That such parts of the same as respects depreci-
ation and the pay of surgeons be referred to the
Board of War; and
That such parts of the same as respects the post-
age of letters to and from surgeons be referred to
the committee on the Post Office;
That the resignation of Doctor Hagan be accept-
ed;

May 25, 1781. 541
Resolved, That Dr. James Henry receive the commis-
sion of major in the army of the United
States, to take rank from the 30th of October last:

May 26, 1781. 544
The Medical Committee; delivered in their re-
spective reports.
The Medical Committee report that from a Cer-
tified account of Joseph Eaker, Surgeon's Mate,
under the hands of Doctor William Shippen, late
Director General and Thomas Bond Purveyor, and
a letter from the said Joseph Eaker, referred to
them, it appears to your Committee that the said
Eaker has been lately released from captivity where
he had remained for seven months, that he is in
much distress, and that there is due to him the said
Eaker on account of pay and rations £444- 13s- 3d
—Your Committee therefore report, that a warrant
issue in favour of Dr. Tho? Bond, Purveyor of Gen-
eral Hospital for a sum equal to £444- 13s- 3d to be
paid to Joseph Eaker late Surgeons Mate to the
Hospital on discharge of the pay and rations due
the said Eaker as appears by the aforesaid Certified
acct.

May 28, 1781. 570
Ordered, That the Medical Committee be discon-
tinued, and that the Committee lodge with the
Board of War all the returns and papers in their pos-
session, and then be discharged; and that the busi-
ness heretofore entrusted to them, and the powers
with which they were invested, be transferred to the
Board.

July 11, 1781. 624—5
A report from the Board of War, on the letter from
the director (of the hospitals, was read; Whereupon,
Ordered, That the sum of eight thousand five
hundred and forty five dollars and one-third of a
dollar in specie or [Bills of the new Emissions] other
money equivalent, be immediately put into the
hands of the purveyor of the military hospitals
in part of the estimate laid before Congress by the
medical committee, to enable him to purchase an
immediate supply for the use of the sick, and to
prepare for the immediate exigencies of the cam-
paign in the hospital department:
That the sum of sixteen thousand one hundred
and sixteen dollars, in specie or [Bills of the new
Emissions] other money equivalent, be advanced to
the said purveyor, for three months' pay, to be
paid by him on account to the officers of the medical
department:
That a warrant be drawn on the treasurer of the
State of New York, for six thousand dollars, and
another warrant on the treasurer of Virginia for four
thousand dollars, in specie or [Bills of the new
Emissions] other money equivalent, in part of the above
sum of sixteen thousand one hundred and sixteen dol-

144 This report, in the writing of Theodorick Bland, is in the
Papers of the Continental Congress, No. 19, II, folio 287.
145 Copies of extracts from Cochran's letter are in the Papers of
the Continental Congress, No. 78, VI, folios 33-35.
146 This report, in the writing of Theodorick Bland, is in the
147 The portion in parentheses was entered in the Journal by
George Bond.
Mates happening in regiments or Corps not belonging to the Line of any State be filled up by the Director or Deputy Director of the Hospitals with the Army in which such regiments or Corps shall serve the said Director or Deputy Director reporting the same to the Commander in Chief or commanding General of a separate Army that information thereof may be given to the Board of War who shall fill up Commissions accordingly.

The filling up the vacancies in the Medical Department we leave to the wisdom of Congress with this observation that the Director represents to us that this measure is necessary.147

June 18, 1781. 668

Ordered, That the Board of War report a plan of succession to vacancies in the hospital and medical lines of the army.

June 22, 1781. 690

The Committee of the Week report,

That the memorial of G. Glentworth, Wm Smith and James Fallon, supernumerary senior physicians and surgeons of the general hospital for themselves and in behalf of other supernumeraries praying “That Congress will please to grant them, in common with supernumerary judges advocate, regimental surgeons and chaplains, their depreciation and half pay” ought to be referred to a special Committee.148

July 3, 1781. 718

The committee of the week made report; Whereupon, Ordered, That a letter of this day from Doctor James Tilton be referred to the Board of Treasury to take order thereon to settle depreciation and grant a certificate as prayed; 149

July 17, 1781. 756

A report from the Board of War was read; Whereupon, Resolved, That the Board of War be authorised to draw on the paymaster general in favour of Captain Patrick Carns of Lieutenant Colonel Lee's legion, for two hundred and ten dollars in bills of the new emission;150 and of Doctor Morris, surgeon of Colonel Armand's legion, for two hundred and twenty-five dollars in bills aforesaid in part of their pay, and for which sums they are respectively to be accountable,151

July 24, 1781. 785

A report from the Board of War was read; Whereupon, War Office, July 24, 1781

Sir,

Robert Henry, Surgeon of the 2nd New Hampshire Regiment hath represented to the Board, that he was taken prisoner by the enemy (at the time Col. Greene was killed) and stripped of all his clothing. He hath since obtained his parole, for a limited time to procure some necessaries. He further represents that he hath received but two months' pay in twenty, that before he belonged to this regiment he was mate in the General Hospital, and there appears due to him by Doctor Bond's certificate for that service £101.5. specie, which sum there is no provision made to pay, and he further saith, that he is at this time destitute of cash. Upon considering the foregoing representation, the Board submit the following resolution:

Ordered, That the Board of War draw on the paymaster general in favour of Robert Henry, surgeon of the second New Hampshire regiment for one hundred and ninety-five dollars of the new emissions on account of his pay;152 and . . . . . .

September 20, 1781. 979–81

The report of the Board of War respecting the hospital department was taken into consideration; and Thereupon, At a Board of War September 17th, 1781

Present Mr. Peters Mr. Cornell

The Board do themselves the honor to report to Congress on the medical department, and beg leave to observe that they have taken every measure in their power to procure the necessary information to enable them to do justice to the United States as well as individuals.

First. For settling the line of promotions in the medical staff they have obtained a plan fixed by a Board of General Officers under the orders of the Commander in Chief with his approbation, Copies of which No. 1 and 2 are enclosed, the plan they beg to have the power to procure the necessary information to settle on account of his pay;153 a n d

Secondly. In consequence of General Greene's Request for assistance in the Medical Department, they have consulted the Commander in Chief on the propriety of filling up the vacancies under the Director General and requesting him to send the necessary assistance to the Southern Army. He was not able to determine the question, but on his arrival at the head of Elk he obtained Dr. Craik's opinion on that subject which is contained in the enclosed paper No. 3, but as it appears from the tenor of Dr. Cochran's letter to the Board (an extract of which is enclosed in No. 4) that he entertains different sentiments, the Board take the liberty to recommend to Congress that appointments be made agreeable to Dr. Cochran's recommendation contained in the enclosed paper No. 5 to serve with the main army and its dependencies. And those contained in Doctor Oliphant's recommendation contained in the enclosed paper No. 6, to be appointed for the Southern Army under the Command of General Greene.

The Board are the more induced to recommend the appointment of those Gentlemen to the Southern Army under the Command of General Greene.

147 This report is in the Papers of the Continental Congress, No. 147, V, folio 278. It is indorsed: “August 23, 1781, not to be acted upon.”
148 This report, in the writing of Thomas Rodney, is in the Papers of the Continental Congress, No. 32, folio 177.
149 This report, in the writing of Samuel Livermore, is in the Papers of the Continental Congress, No. 32, folio 185.
150 This clause is in the Papers of the Continental Congress, No. 145, II, folio 40.
151 This clause is in the Papers of the Continental Congress, No. 148, II, folio 55.
152 This report is in the Papers of the Continental Congress, No. 148, II, folio 85.
they should be with the army immediately and
could they possibly be spared from their quarter a
considerable sum of money must be advanced to
defray their travelling Expences which it is to be
feared would cause a considerable delay.153
Resolved, That the present vacancies of hospital
physicians and surgeons be filled up by the senior
surgeons of the hospital lately deranged, the eldest
hospital mates or regimental surgeons, as shall be
recommended by the director and chief physician
and surgeon to the army:
That all future vacancies of hospital physicians
and surgeons be filled by the eldest regimental sur-
geons and hospital mates, who shall be reckoned of
equal grades, who shall upon examination be found
qualified and obtain a certificate of recommendation
from the director and chief physician and surgeon of
the army, or of the deputy-director and chief
physician in a separate department:
That the persons requisite to fill the higher grades
in the hospital and medical departments, be ap-
pointed, from time to time, by Congress, according
to merit and abilities:
[That the states shall nominate regimental surgeons
to the regiments of their respective lines, who shall be
examined by the director and chief physician and
surgeon to the army and one of the chief
hospital physicians or of the senior surgeon, and of
the chief Physician in a separate department, and
upon their certificates of approbation shall receive
the appointment.]
That all surgeons to regiments or corps not be-
longing to the line of any particular State, be nomi-
nated by the director of the hospitals, and the chief
physician and surgeon of the army, subject to the
approbation of the Commander in Chief, and shall
be equally entitled to promotion to hospital physi-
cians and surgeons with the regimental surgeons of
states lines.154
On recommendation of the director approved by
the Board of War:
Resolved, That Dr. Joseph Young, a deranged
senior surgeon, and Doctors Goodwin Wilson, Daniel
Jenifer, Samuel Edmondson and George Campbell,
eldest surgeon's-mates, be promoted to the rank of
hospital physicians and surgeons, to fill the vacant-
cioncy occasioned by the resignations of doctors Bloom-
field, Scott, Hagan and Jackson, and the promotion
of Dr. Burnet.
On the recommendation of the deputy director,
approved by the Board of War:
Resolved, That doctors Thomas Tudor Tucker,
and Vickars, be appointed physicians and surgeons
in the hospital for the southern department:
That Daniel Smith be appointed assistant deputy
purveyor, and John Carns assistant deputy apo-
cary, in the southern department.155

55 This report is in the Papers of the Continental Congress, No. 148, II, folio 259.
154 A copy of this report of the Board of General Officers, refer-
ted to, in the Board of War report, as No. 2, is in the Papers
153 A copy of the recommendation of the director (John Coch-
race) dated June 4, 1781, is in the Papers of the Continental
Congress, No. 148, II, folio 263; a copy of the recommendation
of the deputy director (David Oliphant) is on folio 263.

October 16, 1781. 1055
Ordered, That Thursday next be assigned for
electing a deputy purveyor for the military hospi-
tal, in the room of Doct Brownson, who is elected
governor of Georgia.

October 25, 1781. 1072
A report from the committee of the week was
read; Whereupon,
The Committee of the week report,
That a letter of Roht. Johnson Deputy Purveyor
of the Southern Department requesting relief for
the Gentlemen of his Department; the Petition of
Capt. Joseph Traversier praying for the pay and
subsistance due to him; the letter of R. G. Liveing-
ston praying for so much pay as will enable him to
join his Regt.; the Petition of Thomas Bond and
others officers of the medical Department; the Peti-
tion of John Dealy praying for a discharge from the
army; the Letter from Doctor Halling requesting
the pay due to him, and to know whether he is con-
sidered as retiring from the service; be referred to
the Board of War.

November 3, 1781. 1092, 3-8
A memorial and petition of Barn: Binney was
read.156
The committee to whom the letters from the su-
perintendent of finance relative to the hospital de-
partment; and
The committee to whom the letters from the Su-
perintendent of Finance relating to the Hospital De-
partment was referred do report that they have fully
considered the present state of the Hospital or Medi-
cal Department in the Army, and the several papers
referred to them, and having taken the best advice
and information in their power are of opinion that
great economical advantages to the public and very
useful alterations to the sick and wounded, may be
obtained by a regulation of the said Department in
the following principles.
By destroying all distinctions between Hospitals
and forming the whole Medical Department into
one uniform Corps.
By establishing the direction of practice and Pur-
veyorship entirely distinct and separate vesting it
in different hands.
By establishing the Superintendance of the De-
partment in a Board of Surgeons, properly organized
for that purpose and not in a single person.
By the promoting the use of regimental Hospitals,
and preventing the crowding the sick together in
General Hospitals.
By preventing every person concerned in Hospi-
tals from trading and speculating in any manner
whatever for private advantage and emolument.
By reducing the number of Surgeons and Mates
of the General Hospitals.
Under the influence of these principles your Com-
mittee beg leave to Report the following Ordinance
for constituting and arranging the Hospital De-
partment.
An Ordinance for regulating the General Hospital,
and Surgeons of the Army.

155 This memorial and petition, dated November 3, 1781, is in
the Papers of the Continental Congress, No. 41, I, folio 375.
Be it ordained by the United States in Congress Assembled, That there shall be one Physician in Chief to the Army and Director of the Military Hospitals: [Thirteen] Twelve Surgeons and twenty [six] four Mates, for the General Hospital, a Surgeon and one Mate to every regiment; an Apothecary and two Assistants; and a Purveyor and one assistant.

The Physician in Chief and the hospital Surgeons or any three of such Surgeons shall make a Medical Board, of which a field Officer to be appointed in the usual form shall sit as President; it shall meet regularly once a month, by General order, or oftener if requisite. They shall examine regimental and hospital practice, and shall examine and recommend the [regimental and] hospital Surgeons, [and none but those recommended by the Board shall be appointed by Congress to vacancies,] and no person under the age of 21 years shall be appointed a Mate: It shall be the special duty of the said Board from time to time, to settle the proportions of regimental and hospital practice, and to make regulations accordingly. They shall prescribe the measures for supplying the sick effectually with medicines, stores, provisions &c. It shall also be their duty to make out proper estimates for the Purveyor, inspect his accounts and transactions, and regulate his plan of issues so as to prevent waste and extravagance. As often as required, the Director shall report to the Board a full state of all the Hospitals under his direction, and receive their Instructions. This Board shall enquire into all complaints brought against Officers of the Department: and present to a Court Martial, such as they may think deserving of censure. And this Board shall be authorized to digest rules and carry into execution every thing relative to the Medical Department: Provided nevertheless, that no regulation of theirs be valid and take effect until issued in orders, with the consent and approbation of the Commander in Chief or the Commanding Officer of a separate Department.

The Physician in Chief and Director shall have a general Superintendency and direction of practice, both in Camp and in hospitals. He shall always maintain an office near Head Quarters, so as to be ready, at all times, to consult and advise with the Commander in Chief; and to distribute the necessary advice and direction to the Surgeons with whom it shall be his duty to correspond. With the concurrence of the Commander in Chief he may establish such Hospitals as service requires: and he shall dispose of the officers necessary to conduct them. In time of engagement or any emergency, he shall call into the field as many hospital Surgeons as the occasion requires; and by order of the General, may have assistance in hospitals, from the regimental Surgeons.

It shall also be the special duty of the Director, frequently to inspect all the hospitals under his direction; to see that they are managed with economy and success; to correct all abuses; to suspend and bring to trial, delinquent Officers: and to make monthly returns of the sick to the Commander.

In the absence of the Director from Camp, the Surgeon eldest in appointment, who is present, shall do his duty.

Every Surgeon shall direct his own hospital agreeable to the regulations, from time to time adopted by Congress or the Medical Board, and communicated to him by the Director. He is hereby authorized to order from the Purveyor or his Assistant, or from the Commissaries and Quarter Masters of the Army, or to be purchased from the neighborhood, whatever is necessary and convenient for the sick: and shall be accountable for his conduct and success in practice, to the director; but shall not be dismissed the service without due form of trial.

When two or more Surgeons are on duty in one hospital, each shall act independently with respect to all matters relating to his own particular charge, and shall be accountable to the director only, or the Surgeon presiding in his stead. In case of dispute, with regard to any matter respecting the whole hospital, the Surgeon of senior appointment shall control, until the matter in dispute can be decided by the Director, or in his absence, the presiding Surgeon.

The regimental Surgeon shall give diligent attention to such regulations as may be established respecting their conduct, and shall manage the sick of their respective regiments accordingly; and shall also be accountable to the Physician in Chief as the common head of the Medical Department.

The regimental Surgeon shall observe the director of the Surgeons, and shall diligently perform all the reasonable duties required of them, for the recovery of the sick. They shall also make out returns of the sick, for the Surgeons respectively, agreeable to such forms as the director shall require.

The Apothecary and his Assistants shall receive, prepare and deliver Medicines, Instruments and dressings, and other articles of his department, to the hospitals and Army, on orders, in writing, from the director or Surgeons. He shall appoint a proper number of Mates to assist him in his duty, and shall furnish one to every Hospital, where one is required by the Director.

All the Instruments delivered by whose order soever obtained, shall be paid for, at prime cost, by the Surgeon or Mate receiving them.

The Purveyor shall provide all necessary medicines, utensils and stores of every kind, that may be ordered by the Medical Board, for the delivery of which a written order from the Director of a hospital Surgeon shall be his voucher. It shall also be his duty to pay all the Officers of the Hospital and every debt and expense of the sick after being duly certified. For these purposes he shall draw money from the Treasury agreeable to the estimates given him by the Medical Board. He shall settle his accounts of expenditure in money every three months, with the Auditors of accounts, and once a month, he shall lay a state of the expenditure of stores with the stock on hand, before the Medical Board.

The Purveyor shall direct the conduct of his Assistant, and by advice and order of the Medical Board shall appoint such other Assistants, Storekeepers and Clerks as the service may require.

In every hospital the purveyor or his Assistant shall appoint a steward: whose duty it shall be to purchase vegetables, straw and other small articles, to
receive the stores and provisions for the use of the hospital and deliver them agreeable to the orders of the prescribing Surgeons. And although in his purchases and Issues he is to obey the orders of the prescribing Surgeons; yet for the faithful discharge of his Office, he is to be accountable to the Purveyor, and for this purpose he shall keep separate accounts of all he receives from the Purveyors, Quarter Masters and Commissaries, and of what he purchases himself from the country; and shall render an account of all his Issues monthly, with his stock on hand, to the Purveyor; thus to enable the Purveyor to lay the whole monthly expense of the hospital, before the Medical Board. The Steward's vouchers shall express not only by whom ordered, but by whom received also. The Steward shall also receive the spare regimental arms, accoutrements and clothing of each soldier admitted into the Hospital keeping entries of and giving receipts for every Article received, which when the soldier shall be discharged, shall be accounted for by the said Steward, with the Commanding Officer of the regiment to which such soldier belonged, or other proper person, and shall also take charge of the hospital clothing. In every Hospital, the director or Senior Surgeon present, shall appoint a Matron and a proper number of Nurses to be under the direction of the prescribing Surgeons, and paid by the Purveyor.

During the summer, when the Army is in the field, the Director shall institute a flying or field Hospital, in the rear of Camp, and appoint proper Surgeons to take direction of it, considering it always as a branch of the General Hospital and to have one common regulation and interest with it.

One Surgeon at least, whom the General may choose, shall always reside near head Quarters, to attend the General and Staff Officers, and to be in readiness for any emergency when a division or detachment of the Army is sent off, or in any manner becomes a distinct and separate body from the Main Army, the Medical board shall nominate its proportion of Medical Staff of which the Surgeon eldest in appointment shall preside, with all the powers of Physician in Chief and director; and shall form a Medical board, to be authorized as before mentioned: and when two Armies unite, having each a Medical board, one shall dissolve of course by direction of the Commanding Officer of the whole.
December 20, 1781. 1182
(Note) A memorial of George Glentworth and others, supernumerary physicians and surgeons of the general hospital, was presented this day and referred to the Secretary at War, as the indorsement shows. It is dated December 17, 1781, and is in the Papers of the Continental Congress, No. 41, III, folio 483.

December 24, 1781. 1183
An ordinance respecting the hospital department was read the first time:

**Ordered, That Wednesday next be assigned for the second reading of this ordinance.**

**STANDING COMMITTEES**

**Medical**

16 February, 1781. William Burnett

January 3, 1782. 4–7

On a report of the Secretary at War, to whom was referred a memorial of Dr. Glentworth and others:

**Resolved, That it be, and hereby is recommended to the State of Pennsylvania, to settle the balance of pay and depreciation due to Doctors G. Glentworth, W. Smith, J. Fallon, S. Duffield and S. Halling, late physicians and surgeons in the general hospital, on the same principles they settled with the other physicians and surgeons of the army, citizens of that State.**

On a report of a committee, consisting of Mr. (Abraham) Clark, Mr. (Ezekiel) Cornell and Mr. (Isaac) Motte, to whom was referred an arrangement of the medical department:

The Committee to whom was referred the ordinance respecting the Hospital Department, beg leave to report—

That they have considered the same, and are of opinion that any ordinance for a new establishment of the hospital, (on) the plan proposed, is unnecessary and at this time for many considerations improper they have therefore returned the same in the manner they received it.— Your Committee are nevertheless of opinion that sundry alterations and amendments are necessary to be made to the plan for conducting the General Hospital, passed on the 30th day of September, 1780, and accordingly have herewith submitted such alterations and amendments for the consideration of Congress, in case they shall be of opinion with the Committee, that a new regulation of the Hospital by an Ordinance is at this time unnecessary or improper.—

Resolved, That for the more regular conducting of the general hospital, the offices of chief physician and surgeon of the army, and of chief hospital physician, be, and hereby are abolished; and that the chief physician and surgeon to the army, eldest in seniority, be continued in service, under the title of physician, with the pay and emoluments heretofore allowed to a chief hospital physician:

That the number of surgeons to all the military hospitals of the United States, be reduced so as not to exceed fifteen:

That the director have the general superintendence and direction of all the military hospitals, and of practice both in camp and in hospitals:

That in the absence of the director, his duty devolve on the deputy director or physician, and in their absence on the hospital surgeons, according to seniority:

That the director, or in his absence the senior medical officer, with the approbation of the Commander in Chief, or commanding general of a separate army, be, and hereby is authorized and empowered, as often as may be judged necessary, to call a medical board, which shall consist of the three senior medical officers then present; and it shall be the duty of such board to appoint all hospital mates, to examine all candidates for promotion in the hospital department, and recommend to the Secretary at War such as they judge best qualified; and generally to take cognizance of, and give their opinion and advice on every matter relative to the department, which may be submitted to them by the Commander in Chief, or commanding general of a separate army; provided always, that no regulation, plan or order of the board, shall be valid and take effect, until approved by the Commander in Chief, or commanding general of a separate army, and issued in general orders:

That all returns heretofore ordered to be made by the director or deputy director, to the medical committee, be made to the Secretary at War:

That the stewards may, in the first instance, when the purveyor or his assistant is at a distance, be appointed by the director or senior medical officer, but shall be removable at pleasure, and others substituted in their stead, by the purveyor or his assistant. And although in their purchases and issues, they are to obey the order of the prescribing surgeons, yet for the faithful discharge of their duty, they are to be accountable to the purveyor, who shall in like manner be accountable to the United States. Wherefore, the said stewards shall keep separate accounts of all they receive, and of what they themselves purchase; and shall render an account monthly of all their issues, with their stock on hand, to the purveyor, who shall render the said accounts, together with a particular account of the supplies furnished by himself or his assistants to each respective hospital, once every three months to the Superintendant of finance:

That the Secretary of War be, and he is hereby empowered and directed, on or before the first day of February next, and hereafter, from time to time, as the service may require, to arrange the department agreeably to the foregoing resolutions, and to issue his orders to such as he thinks proper to remain, paying a due regard in his first arrangement to such of the chief physicians and surgeons as may

158 See pages 1229 and 1230 of Vol. XVIII. I now give such appointments only as were made in 1781.

159 This report is in the Papers of the Continental Congress, No. 149, 1, folio 63. So far as Halling is concerned it superseded the following resolution sent to Congress by the Secretary at War December 18:
choose to continue in service in the rank of surgeons, and in his subsequent arrangements to such of the senior officers as may choose to remain in service: That such of the officers as shall not be called into service agreeably to the foregoing resolution, be considered as reduced by Congress, and be entitled to the emoluments granted by the Act of Congress of the 17 January, 1781:

That when by reason of vacancies or otherwise, any officer hereafter to be appointed in the hospital department, and whose appointment is reserved to Congress, it shall be the duty of the secretary at war to recommend the person or persons best qualified, provided that, in the recommendations for director, deputy director and physician, due regard be paid to the officers next in rank; and that the appointment of hospital surgeons be from among the regimental surgeons and hospital mates; provided that, in the recommendations for director, deputy director and physician, due regard be paid to the officers next in rank; and that the appointment of hospital surgeons be from among the regimental surgeons and hospital mates, but not otherwise.

Resolved, That the director, deputy director, physician, surgeons and mates, as well hospital as regimental, receive their pay out of the military chest, at the same time and in the same manner as the army with which they serve; the abstracts to be signed by the director, deputy director or physician, or in their absence by the senior hospital surgeon; and the warrants to issue in the same manner as for the pay of the army.

February 20, 1782. 81–2

The committee, consisting of Mr. (Abraham) Clark, Mr. (Ezekiel) Cornell, Mr. (Thomas) McKean, to whom were referred the report of the Secretary at War, on a petition of Dr. Hagan, and the memorials of Dr. Jackson, Dr. Williams, Dr. Eaker, and Dr. Frinke, delivered in a report; Whereupon,

Resolved, That the comptroller be, and he is hereby, authorized and directed to adjust the accounts of all the officers of the late general hospital for pay and subsistence, up to the time the arrangement took place in [October] September, 1780, for so much of the preceding time as they continued in service, upon their producing proper documents of the time of their respective services.

Resolved, That it be, and hereby is, recommended to the legislatures of the several states, to settle and discharge on account of the United States, the depreciation of pay of such officers in the late general hospital as are inhabitants of, or belong to their respective states, who resigned their appointments after the 10th day of April, 1780, or became supernumerary by the new arrangement in [October] September, 1780.

Resolved, That the comptroller be, and he is hereby, authorized and directed to settle the depreciation of pay of officers in the late general hospital, who resigned or became supernumerary as aforesaid, and who do not belong to any particular State, in the same manner as hath been provided for the officers of the late Colonel Hazen's regiment.

Ordered, That the account of Dr. Frinke, for taking care of the sick and wounded in the retreat from Ticonderoga, in 1777, and for furnishing supplies for the same, be returned to Dr. Frinke, and the settlement suspended, until authentic vouchers shall be produced respecting such services and expenditures.

February 26, 1782. 100

(Nota) On this day, according to the indorsement, a memorial of Joseph Eaker, of the same date, was read. It is in the Papers of the Continental Congress, No. 41, III, folio 71.

April 10, 1782. 179

That the petition of L. Morris praying for a settlement of his accounts, incurred by his being ordered to take the charge of an hospital in Litchfield in Connecticut, be referred to the Superintendent of Finance.

April 23, 1782. 209

War Office, March 23rd, 1782.

Sir,

There are frequent applications for the discharge of soldiers whose wounds and sickness incapacitate them for all farther duty even in garrison. They prefer a dismission from the service, which shall entitle them to a pension equal to half of their pay, to being classed with the invalids where full pay and every emolument of a soldier would be continued to them.

Was public economy the only consideration in this matter, there would not I think remain a doubt respecting the propriety of adopting this mode of discharge generally. But as it becomes necessary equally to guard against future inconveniences as to...
accommodate the wishes of individuals I beg leave to submit the following resolve, which as it only respects those whose private circumstances will enable them when discharged to live independent of any other gratuity than their pension, I think will obviate the possibility of an imputation against the public that they have dismissed such of their servants as could be no longer useful without provision being made to prevent them suffering individually or becoming burthensome to the societies where they might live.

[Congress came to the following resolutions:]

Resolved, That all such sick and wounded soldiers of the armies of the United States, who shall in future be reported by the inspector general, or the inspector of a separate department, and approved by the Commander in Chief, or commanding officer of a separate department, as unfit for farther duty either in the field or in garrison, and who apply for a discharge in preference to being placed or continued in the corps of invalids, and who can give authentic proof that they either have the means to support themselves, or that their friends will provide for them and prevent them becoming burthensome to the society where they really belong or reside. In that case all such persons shall be discharged, and be entitled to receive as a pension, [the value of half their pay,] five dollars per month, in lieu of all pay and emoluments.

Resolved, That it be, and hereby is, recommended to the several states to discharge such pensions annually, and draw on the Superintendent of finance for the payment of the money they shall advance.

And that the foregoing resolution take effect so soon as the Superintendent of the Finances shall signify to the several states, that he has made provision for answering such draughts.

May 3, 1782. 235

On a report from the Secretary at War:

War Office, May 3rd, 1782.

Sir,

To the two companies of Artificers now in this City (making the whole about fifty men) there are attached a Surgeon and a Surgeon’s mate. As part of these companies will be detained in this town, part are now at Fort Pitt, part will be sent to Virginia and part of them will join the army under General Greene, this dispersion will render it unnecessary to retain the Surgeon and mate longer in the service.

Should Congress be of this sentiment, and deem some compensation due to their past services they will please to resolve,

Resolved, That as the dispersed situation of the corps of artificers commanded by Captain Wyley, will no longer require the services of Dr. A. McCoskey, surgeon, and Dr. W. McCoskey, his mate, they be considered as reduced and retiring from service on the 10th instant and that the surgeon be entitled from that day to receive the same emoluments as heretofore allowed to surgeons and mates retiring under the resolves of the 3rd and 21st October 1780 to all the emoluments heretofore allowed to reduced regimental surgeons.

June 6, 1782. 319

Congress proceeded to the election of a deputy purveyor for the southern hospital; and, the ballots being taken, Dr. N. Brownson was elected, having been previously nominated by Mr. (William) Few.

(June 10, 1782.) 322

(Report of Secretary at War, on the arrangement of the Hospital Department.)

War Office, June 7th, 1782.

Sir,

I have, in obedience to the orders of Congress, conferred with the Superintendent of Finance on the report of your Committee respecting the Hospital Department and find it is agreeable to him—

As the Purveyor wishes that the Officers acting immediately under him should be of the same grade—he requests that he may be allowed to appoint three clerks, one of whom will have the charge of the store to be kept near the Army—

He also requests that there may be no distinct allowance of subsistence for himself and the Apothecary, but that the sum intended as subsistence be added to their pay—

I wish the Purveyor’s requisitions may be complied with and that the system, as it will then stand, should be adopted.

July 23, 1782. 408–12

On the report of a committee, consisting of Mr. (Joseph) Montgomery, Mr. (Abraham) Clark, and Mr. (David) Ramsay, to whom were recommitted their report respecting the hospital department, and the amendments and observations thereon by the Secretary at War:

Resolved, That in conducting the business of the general hospital, there shall be an invariable standard of prices established by which the apothecary shall be charged with every article (received into his department) and at which he shall be credited for every article he shall issue the standard to be established by the medical board, or such person or persons as they shall appoint, which shall only be considered as a certain ratio whereby to keep the accounts; but that, in the settlement of all accounts in that department, all deficient articles, not issued or returned, shall be accounted for at such real value as shall be estimated by the medical board, and approved of by the Secretary at War.

An account shall be taken as soon as possible of all the medicines, instruments and property in the possession of the hospital department, and in the hands of the Apothecary and Surgeons.

June 5 from General W. Smallwood, enclosing one of same date from Lieutenant Lovacher de Vaubrun, asking for a furlough to visit France. They were referred to the Secretary at War. General Smallwood’s letter is in No. 161, folio 183, and de Vaubrun’s is in No. 78, XXIII, folio 191.

Also a memorial dated June 5 from Oliver Hanchett was referred to the Secretary at War. It is in No. 149, I, folio 447.

The words in parentheses are in the report but not in the Journal.
apothecary's department belonging to the public, in the hands of the apothecary, the deputies, assistants, and mates, the surgeons of hospitals, and surgeons of regiments, for which they shall severally be charged at the standard value ascertained by the board as aforesaid, and for all they may hereafter receive, but to account for deficiencies at the real value, to be estimated as aforesaid.

The apothecary shall be accountable for all articles in his department to the purveyor throughout the states, until they come into the hands of the prescribers; and all deputies, assistants, and mates, shall make returns, and be accountable to the apothecary for the medicines, instruments and other property belonging to the public in the department, now in their hands, and of such as they may hereafter be possessed of.

The apothecary shall make up his accounts at the expiration of every year, and settle them as soon after as possible, and before the expiration of six months. He shall, at the same time, make out two returns for the director of the hospital, one specifying what has been received and issued, and the amount of what remains on hand; the other exhibiting a particular amount of the value of the medicines, and other public property, each prescriber has received within the year.

All losses which may happen by the events of war, or other circumstances unavoidable, shall be borne by the public. In cases of losses by fraud or neglect in any deputy, assistant or mate, the apothecary shall not be accountable for such losses, provided the delinquent be convicted thereof before a court-martial appointed to try the same.

The hospital prescribers shall be supplied, upon their own application, with medicines and instruments necessary for the sick and wounded under their care.

Every regimental surgeon shall receive yearly from the apothecary, a supply of medicines to such amount, by the above standard, as the medical board shall judge necessary.

Every prescribing surgeon or physician, either in hospital or with the army, shall be supplied by the apothecary with such a set of capital instruments as the medical board shall judge necessary, and shall be accountable for all losses in medicines and instruments not arising from the events of war and other circumstances unavoidable. Duplicates of all returns made by the apothecary to the director, shall be lodged in the war office.

Resolved, That in the army of the United States, excepting the southern army, at present under the command of Major General Greene, the officers of assistant purveyor, and assistant apothecary, and the storekeepers under the purveyor and apothecary, except one storekeeper under the purveyor to keep a store near the army, and all the clerks, except [one] two to the purveyor, shall hereafter be discontinued.187

[The committee to whom was referred the letter of the Secretary of War respecting the rank of the surgeons in the hospital department submit the following resolutions:]

That all surgeons of the hospital shall take rank after the director of the hospital, deputy director and physician to the army, in the following order, viz. those surgeons of the hospital, who have been either deputy director, physician general, surgeon general, chief physician, or chief surgeon to the hospital or army, shall take rank next to the above mentioned officers: and their relative rank to each other shall be according to the date of their respective appointments to either of the above offices.

That all such as were regimental surgeons, when appointed senior physician or surgeon to the hospital, shall take rank with such senior physicians and surgeons, agreeably to the date of their first appointment, whether to the regiment or hospital.

All surgeons, the date of whose first appointments, either to regiments or hospitals, shall have been on the same day, shall decide their rank by lot.

[That the pay and subsistence of the officers of the Hospital department and medical staff be as follows:]

Director of the Hospital 122 dollars per month

Deputy Director and Physician each 117 dollars per month

Hospital Surgeons each 96 5/6 dollars per month

Deputy purveyor and Deputy apothecary each 101 5/6 dollars per month

Deputy purveyor and Deputy apothecary each 101 5/6 dollars per month

Hospital Mates each 45 dollars per month

Stewards each 30 dollars per month

In the Papers of the Continental Congress, No. 22, folio 79, on a separate sheet in Charles Thomson's hand, is a copy of this part of the report relating to pay and subsistence, with the following variations in amounts: deputy director 111 dollars per month; hospital surgeons 93 1/4 dollars per month, three rations for himself and servant; purveyor and apothecary 101 3/4 dollars per month; deputy purveyor and deputy apothecary 101 3/4 dollars per month.
including their former allowance of rations and forage as follows:

The director of the hospital, four rations a day for himself and servants, forage for two horses, and twenty-five dollars per month subsistence.

The deputy director and physician, each three rations a day for himself and servants, forage for two horses, and twenty dollars per month subsistence.

Hospital surgeons, each two rations per day, for himself and servant, forage for two horses, and fifteen dollars per month subsistence.

Deputy purveyor and deputy apothecary, each one ration per day, forage for one horse, and ten dollars per month subsistence.

Hospital mates, each one ration per day, and five dollars per month subsistence.

Ward masters, each one ration per day, and three dollars per month subsistence.

That the above allowance of rations, forage, and subsistence to the officers of the hospital department, over and above what they severally were entitled to, at the time of passing this act, shall be charged to them respectively, as advances in part of their monthly pay.

That in the future the pay and allowance of the purveyor and apothecary be the same each as that of a hospital surgeon.

That none of the aforesaid officers, or other persons employed in any of the hospitals, be entitled to rations, forage or subsistence, when on furlough.

That the regulation respecting officers' servants, contained in the Act of Congress of the 11th day of March, 1780, shall not be construed to extend to the hospital department.

October 11, 1782. 645

Pursuant to the resolution of the 27 of February last, the Superintendent of finance reports, that he has appointed Mr. Edward Fox, a commissioner for settling the accounts of the hospital department, desiring to be favoured with the orders of Congress if they should disapprove the appointment.

November 12, 1782. 722

The Committee of the Week, (Mr. Ralph Izard, Mr. Ezra L'Hommedieu, Mr. William Hemsley) report, That the petition of Etienne Halbon on behalf of his wife, [parentheses which is in Abraham Clark's writing, is in the Papers of the Continental Congress, No. 22, folios 69 and 85. The report was delivered May 15, and on May 30 was referred to the Secretary at War to confer with the Superintendent of finance to report, and recommitted. A copy of the recommitted report is in No. 22, folio 73. The few changes made in their report by the Committee are apparent. The portion in parentheses was not in the recommitted report.

Resolved, That the above allowance of rations, forage, and subsistence to the officers of the hospital department, including rations for servants, shall be entitled to the following month's pay and subsistence; provided in like manner, that where the said subsistence money shall not be rendered any account of them.

November 25, 1782. 752


Sir,

The request of Doctor Thomas T. Tucker referred to me involves three questions.

170 This report, in the writing of a clerk, except the part in parentheses which is in Abraham Clark's writing, is in the Papers of the Continental Congress, No. 22, folios 69 and 85. The report was delivered May 15, and on May 30 was referred to the Secretary at War to confer with the Superintendent of finance to report, and recommitted. A copy of the recommitted report is in No. 22, folio 73. The few changes made in their report by the Committee are apparent. The portion in parentheses was not in the recommitted report.

The first is whether he is entitled to half pay allowed to other retiring hospital officers of his rank — the second whether he is entitled to pay for his attendance on the hospital in Virginia, and the third what allowance will be made for his expenses while attending the sick in Charlestown.

There cannot be a doubt with respect to the first. The resolves of Congress of the 17th of January 1781 fully secure to him the half pay allowed to other officers of his rank as he was not deranged until the 15th of May following.

On the second question I would observe that by the resolves of Congress passed May 15th 1781 it is ordered that all officers of the Medical department appointed under the direction of Doctor Olyphant who were then in captivity in South Carolina and Georgia, and had the charge of sick prisoners in those States be continued in their respective offices as heretofore — and be considered as vested with the same privileges and emoluments as they had enjoyed before their captivity, to extend no farther than to the troops and hospitals within the enemy's lines.

The Continental Hospitals on the first of July, 1781, removed from Charlestown to Williamsburg in Virginia. The hospital was there continued under the care of Doctor Tucker by order of the Marquis de la Fayette as the sick could not at that time be removed into the country. The Commander in chief, on his arrival in Virginia, directed the gentlemen in the Medical Department from South Carolina to do duty in the general hospital at Williamsburg. These are facts which appear from the enclosed papers.

With respect to the last question which relates to an allowance for the extraordinary expenses while detained in Charlestown attending the hospital, I suppose they were necessarily great, but he has not rendered any account of them.

On the whole of his request I beg leave to submit to the consideration of Congress the following draft of a resolve.

That Doctor Thomas T. Tucker, late a senior Surgeon of the hospital under the direction of Doctor Olyphant, enjoy all the emoluments of his office from the date of his appointment to the time he retired from actual service in the hospital in Virginia, and that a reasonable compensation be made him for his extra expenses while acting as Senior Surgeon in Charlestown after its surrender.

December 3, 1782. 759

Resolved, That after the fore-mentioned period, in lieu of the pay and rations allowed to the officers of the hospital department, including rations for servants, they shall be entitled to the following monthly pay and subsistence; provided in like manner, that where the said subsistence money shall not be
paid, they shall be entitled to draw an equivalent number of rations, at the rate of four dollars for each ration per month, viz.

The director, one hundred and two dollars pay and one hundred dollars subsistence.

The deputy director and physician, each one hundred dollars pay and forty-eight dollars subsistence.

The surgeons, each ninety dollars pay and forty dollars subsistence.

Deputy apothecary and deputy purveyor, each fifty-nine dollars pay and sixteen dollars subsistence.

Ward masters, each twenty-one dollars pay and eight dollars subsistence.

Report of Clark, Cornell and Motte. A copy is in the John Carter Brown Library. It measures 20.5 x 21 cm.

February 28, 1783.

The committee of the week (Mr. William Hemsley, Mr. Benjamin Hawkins, and Mr. Phillips White) report: That the memorial of Charles Mortimer of Virginia Doctor of Physic, praying payment of his account, and the usual wages and rations allowed to others; for attending the hospital at Fredericksburg; for nine months be referred to a special committee.174

March 6, 1783.

War Office, March 5th, 1783.

Sir,

There are many officers, who have been wounded in the service of the United States, who are thereby rendered incapable of farther duty either in the field or in garrison, and who wish to retire from the army. No other provision has been made for such officers than what they may receive by annexing themselves to the Corps of Invalids.

This is distressing to the individuals, and expensive to the public.

I beg leave to suggest the propriety of permitting those officers, who have been wounded in service and who wish to leave the army, to retire to their respective homes with allowances proportioned in some measure to their inability.176

March 22, 1783.

That all officers belonging to the hospital department, who are entitled to half pay by the resolution of the 17th day of January, 1781, may collectively agree to accept or refuse the aforesaid commutation, signifying the same through the Commander in Chief within six months from this time: that [the deranged] such officers [what] as have retired at different periods, intitled to half pay for life, [shall be intitled to the same commutation] may collectively, in each State of which they are inhabitants, accept or refuse the same; their acceptance or refusal to be signified by agents authorised for that purpose, within six months from this period; that with respect to such retiring officers, the commutation, if accepted by them, shall be in lieu of whatever may be now due to them since the time of their retiring from service as well as of what might hereafter become due; and that so soon as their acceptance shall be signified, the Superintendent of Finance be directed to take measures for the settlement of their accounts accordingly, and to issue to them certificates bearing interest at six per cent. That all officers intitled to half pay for life not included in the preceding resolutions, may also collectively agree to accept or refuse the aforesaid commutation, signifying the same [by their agents authorized for that purpose] within six months from this time.178

March 26, 1783.

Resolved, That Dr. Charles Mortimer's account be settled for pay and rations on the same principle as a junior surgeon, for the term of nine months, during which he appears to have been in the public service:

That the director-general in the hospital department, take order for delivering to Dr. Mortimer a quantity of medicines equal to what he has expended in the public hospital.177

March 31, 1783.

War Office, March 27th, 1783.

Sir,

On the petition of the late sergeant Menerson referred to me, I beg leave to report that there are more than twenty thousand men who have similar pretensions to be supplied with clothing from the

173 This report, in the writing of Alexander Hamilton, is in the Papers of the Continental Congress, No. 149, II, folio 315. According to the indorsement it was referred on this day to Mr. (Alexander) Hamilton, Mr. (Richard) Peters and Mr. (Daniel) Carroll. See ante, December 19, 1782.

174 This report, in the writing of Hugh Williamson, is in the Papers of the Continental Congress, No. 21, folio 445. The vote was transcribed by Thomson on the report.

175 This report, in the writing of Hugh Williamson, is in the Papers of the Continental Congress, No. 19, IV, folio 445.

176 This report, in the writing of William Hemsley, is in the Papers of the Continental Congress, No. 21, folio 309.
United States, and with whose claims it is altogether impossible to comply.

If it shall appear upon a Surgeon’s examining his wounds, that he has been thereby incapacitated from earning his bread, I would beg leave to recommend him to the provision made for disabled soldiers by the resolves of Congress of April 22nd, 1782.178

April 22, 1783.

On the report of a committee, consisting of Mr. (Oliver) Ellsworth, Mr. (Hugh) Williamson and Mr. (Abraham) Clark, to whom was referred a letter of 22 June, 1781, from Dr. George Gilmer:

Resolved, That the account of Dr. G. Gilmer for pay and rations, be settled on the same principles as the accounts of other hospital surgeons of the same rank, according to the time he shall appear to have been employed in the public service; and that the purveyor general return to Dr. George Gilmer a quantity of medicine equal to what he expended out of his private stores, for the use of the continental hospital under his care.179

April 30, 1783.

On a report from the Superintendent of Finance, to whom was referred a letter of the 17th from Darius Stoddard:

Ordered, That the commissioner for settling the accounts of the hospital department, adjust and liquidate those of Dr. Darius Stoddard.180

May 1, 1783.

Resolved, That the corps of Invalids be reduced, such officers as have lost a leg or been otherwise equal­ly disabled in service to retire on full pay for life, [or at their option collectively to the amount of seven years full pay in gross] such officers as may not be included in this description to retire on [half pay for life] the same principles with other officers of the army, such non commissioned officers and soldiers as being strangers in the country and having been disabled in service are incapable of providing for their own subsistence and are proper subjects for hospitals, to be received into some fixed hospital, to be appropriately for the purpose, and there supported during life on such provision as may be hereafter determined, to be entitled in the meantime to their usual rations and clothing; and such non commissioned officers and soldiers disabled in service as may have homes to which they can retire, to be discharged on the principles of the resolution of the 23rd of April last.

That the Secretary at War be directed to take proper measures previous to the reduction to assess the different classes above described, [and to report a list of them respectively to Congress.] That the officers who shall retire on full pay, may at their option collectively accept in lieu of such full pay for life, the amount of years full pay [in money or securities] on the terms of the resolutions of the last.

That at the reduction of this Corps all the officers and men shall receive one month’s pay and shall share in any further payments which may be made to the other parts of the army when reduced.181

May 12, 1783.

That the accounts of Doct. Jonathan Arnold be liquidated and settled by the commissioner for settling the accounts of the hospital department, who is hereby authorized to allow him pay and rations as an Assistant Deputy Director General in the said department from the 7 day of Jan’y. 1778 the time to recom­mended which his accounts were settled by the State of Rhode Island, to the 9th of May 1779 when he was discharged, charging him with the monies advanced him for the use of that Department by the State of Rhode Island and credit­ing the said State for the same in account with the United States.

That the claim of the officers of a Brigade raised in the State of Rhode Island in Feb’y., 1779 for one year, with the approbation of Congress, for depre­ciation of their pay, is inadmissible, no allowance of that kind having been made or approved by Con­gress to any officers or soldiers discharged from service before the 10th of April 1780.182

May 16, 1783.

Resolved, That the Commissioner for settling the accounts of the Hospital department be and he is hereby authorized and directed to audit and settle the accounts of Dr. Jonathan Arnold, as Assistant Deputy Director in the Eastern Department from 7th January, 1778, to May 9th, 1779, as well for all supplies and expenditures as for pay and rations, and that he also settle the accounts of all those who were necessarily employed in hospital service by the said Dr. Arnold within the term aforesaid. That their pay and other allowances be the same as by the resolutions of Congress are allowed to those of similar stations in the hospital department. And that the said commissioner allow in such settlement for depreciation upon all advances and sums due to each respectively, with an interest of six per cent. per annum from the times they became due.183

May 23, 1783.

That the petition of William Stevens and others, mates to the general hospital in the Southern de­

178 This report is in the Papers of the Continental Congress, No. 149, II, folio 407. According to the indorsement it was read on this 17th.
179 This report, in the writing of Hugh Williamson, is in the Papers of the Continental Congress, No. 19, II, folio 417.
180 This order is in the Papers of the Continental Congress, No. 137, II, folio 387.
181 This report, in the writing of Alexander Hamilton, is in the Papers of the Continental Congress, No. 31, folio 273. The indorsement states that it was delivered this day.
182 This report, in the writing of Oliver Ellsworth, is in the Papers of the Continental Congress, No. 19, I, folio 179. The indorsement states that it was reported this day, and on "September, 9, 1786, Arnold's accounts referred to the committee for settling hospital accounts. This to be filed." See post, June 10.
183 This motion, in the writing of Jonathan Arnold, is in the Papers of the Continental Congress, No. 42, VI, Folio 485. Committee Book, No. 186, gives it this date. It was referred to Mr. (Oliver) Ellsworth, Mr. (Hugh) Williamson, and Mr. (John Lewis) Gervais. See post, June 10, 1783.
June 10, 1783.

Resolved, That the commissioner for settling the accounts of the hospital department audit and settle the accounts of Doc' Jonathan Arnold, as assistant deputy director in said department from the 7th day of Jan'y. 1778 to the 9th day of May 1779, as well for all supplies and expenditures as for pay and rations charging him with the monies advanced him for the use of said department by the State of Rhode Island and crediting the said State for the same in account with the U. States, And that he also settle the accounts of all those who were necessarily employed in hospital service by the said Doctor Arnold within the term aforesaid, and that their pay and other allowances be the same as by the resolutions of Congress are allowed to those of similar stations in the said department.184

July 4, 1783.

The committee of the week, (Mr. William Ellery, Mr. Jacob Read and Mr. Jonathan Arnold) report that the petition of the Rev. William Plumb late chaplain to the Northern Hospital praying for an adjustment and payment of his accounts be read in Congress with the papers accompanying the same.

That the petition of Grace Mercer Widow of Richard Mercer Esq', late of Charles Town in the State of South Carolina deceased Purveyor to the Hospitals of the army of the United States in the said State of South Carolina be referred to the Superintendent of Finance to report.185

July 11, 1783.

The Superintendent of Finance to whom was referred the petition of Grace Mercer Widow of Richard Mercer Esq', Purveyor to the Hospitals of the United States in South Carolina begs leave to report.

That if, as is alleged, the Paper Money therein mentioned remained in the Hands of the said Richard Mercer from the time in which he received it until his Death and from that time to the present in the Hands of his widow the Delivery of it ought to discharge the said Richard Mercer's Estate in account with the United States from the value which so much money was of at the time it was received by him. And the Delivery of the said Money into the State Treasury of South Carolina ought in like manner to discharge the United States from the like value in account with the said State.

That the Commissioner for Settling the Hospital Accounts will therefore on proper Proof made to him of the facts above stated receive the said money and credit the same in the account of the said Richard Mercer and will transmit the money and Proof to the Commissioner for Settling the accounts of the United States with the State of South Carolina who will enter in those accounts to the Credit of the United States. Office of Finance 8 July, 1783.187

July 23, 1783.

On the report of a committee, consisting of Mr. (Richard) Peters, Mr. (Abraham) Clark, and Mr. (Stephen) Higginson, to whom was referred a report of the Superintendent of Finance, a petition of Mrs. Grace Mercer:

The Committee to whom was referred a memorial of Mrs. Grace Mercer, relict of Mercer, late Purveyor of the hospital in South Carolina, report,

That the time when the particular purpose for which the said money was received or the reason why the same was not applied to the use intended do not appear; and as a permission granted to public Officers to return paper money received at periods of depreciation would establish a Precedent which may be productive of many ill consequences Your Committee are of opinion,

Ordered, That the Superintendent of Finance transmit to the commissioner for settling the accounts of the hospital department, a copy of the memorial of Mrs. Grace Mercer, and in the settlement of the accounts of the late Mr. Mercer, due enquiry be made by the said commissioner, into the causes of the detention of the money therein mentioned; and that the said commissioner report the result of such inquiry to the superintendent of finance, who is hereby authorised to take order therein as shall appear to him just, on such report being made.188

August 5, 1783.

The Superintendent of Finance to whom was referred the Petition of Grace Mercer, widow of Richard Mercer Esq', Purveyor to the Hospitals of the United States in South Carolina, begs leave to report.

That if, as is alleged, the paper money therein mentioned remained in the Hands of the said Richard Mercer from the time in which he received it until his Death and from that time to the present in the hands of his widow the Delivery of it ought to discharge the said Richard Mercer's estate in account with the United States from the value which so much money was of at the time it was received by him—and the Delivery of the said money into the State Treasury of South Carolina ought in like manner to discharge the United States from the like value in account with the said State.

That the commissioner for settling the Hospital accounts will therefore on proper Proof made to him of the facts above stated receive the said money and Credit the same in the account of the said Richard Mercer and will transmit the money and the Proof to the commissioner for settling the accounts of the United States with the State of South Carolina who will enter it in these accounts to the Credit

184 This report, in the writing of Thomas Fitzsimmons, is in the Papers of the Continental Congress, No. 42, V, folio 200. Stevens' petition is in folio 297. The indorsement shows the action taken.

185 This report, in the writing of Oliver Ellsworth, is in the Papers of the Continental Congress, No. 19, I, folio 181. The indorsement states that it was delivered and read this day.

186 This report, in the writing of Jacob Read, is in the Papers of the Continental Congress, No. 32, folio 509.

187 This report, in the writing of Thomas Fitzsimmons, is in the Papers of the Continental Congress, No. 137, II, folio 607. The indorsement shows that it was read this day and on July 16 referred to Mr. (Richard) Peters, Mr. (Abraham) Clark and Mr. (Stephen) Higginson.

188 This report, in the writing of Richard Peters, is in the Papers of the Continental Congress, No. 157, folio 55. The indorsement states that it was passed on this day.
of the United States. Office of Finance, 31 July, 1783.189

August 12, 1783.

The committee, consisting of Mr. (James) McHenry, Mr. (Hugh) Williamson and Mr. (Abraham) Clark, to whom was referred a petition of Dr. Dirk Van Ingen, praying that depreciation may be allowed him in the settlement of his account, report, "That as Dr. Van Ingen, who served for some years as surgeon, in the continental hospital, appears by his petition to have [resigned or to have been left out of promotion] been reduced as a supernumerary before the 10th of April, 1780, [depreciation, therefore, cannot be allowed him without departing from the rule hitherto adopted and opening an account which may occasion much trouble and be a precedent for a variety of claims of officers in different departments, and as no depreciation [to officers in every department] has been allowed to officers who left the service before that period, [has been constantly refused;] Dr. Van Ingen's claim can not be granted without infringing the rule established by Congress." 190

September 2, 1783.

The committee of the Week (Mr. (James) McHenry, Mr. Abiel Foster and Mr. William Ellery) on consideration of the petition of Ebenezer Augustus Smith formerly a Surgeon in the General Hospital praying that depreciation may be allowed him, report as their opinion that the request of the said Ebenezer Augustus Smith being similar to that of Dr. Dirk Van Ingen lately determined by Congress can not be granted without infringing the rule established by Congress of the 10th day of April 1786.191

September 10, 1783.

The same reason which makes it proper to have two Serjeant Majors &c. in each Regiment of Infantry, will make it equally necessary to have two Surgeon's Mates,

October 23, 1783.

No Regiment to be allowed to draw rations for more than four women to serve as nurses in the Regimental Hospitals and to receive four dollars per month in addition to a ration per day.

General Hospital

A general hospital for the reception of the invalids of the army and navy will be necessary to consist for the present of the following persons:

<table>
<thead>
<tr>
<th>Title</th>
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<tr>
<td>Surgeon</td>
<td>50</td>
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<tr>
<td>Mates</td>
<td>25</td>
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<tr>
<td>Purveyor and Apothecary</td>
<td>50</td>
</tr>
<tr>
<td>Steward</td>
<td>15</td>
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<tr>
<td>Nurses</td>
<td>5</td>
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189 This report is in the Papers of the Continental Congress, No. 32, II, folio 731. According to the indorsement it was delivered this day. It was ordered to be filed among obsolete reports. Mr. Merecer's petition is on folio 735.

190 This report, in the writing of James McHenry, is in the Papers of the Continental Congress, No. 19, VI, folio 109. 191 This report, in the writing of Jacob Read, is in the Papers of the Continental Congress, No. 32, II, folio 721. According to the indorsement it was delivered this day. It was ordered to be filed among obsolete reports. Mr. Merecer's petition is on folio 735.

To be entitled to draw each a ration of provisions per day, but to no other allowance.

The invalids to receive one dollar per month, and the provisions and cloathing of a common soldier during life.

The total expence of this establishment [if complete] as reduced in peace, would amount to about . . . [531,950] Deduct the product of the manufacturies which is estimated at . . . . 131,950

Balance an annual charge upon the United States192. [400,000]

October 31, 1783.

The Secretary at War reported, that the following lines, corps and individuals, have agreed to accept the commutation of five years' pay, in lieu of the half pay for . . . , as appears by the papers accompanying his report: . . . . hospital department, and Dr. Titton, Dr. Bodo Otto, Dr. Frederick Otto, Dr. Martin.

November 4, 1783.

The Committee to whom was referred the letter of Major General Lincoln of the 18th have examined the list of bills drawn by him whilst commanding in the Southern Department, and find sufficient vouchers to support charges against the Commissary of purchases, the Quarter Master, the Clother, the Pay Master, Purveyor of the Hospital and the Navy, for five millions four hundred and twenty four thousand one hundred and nine dollars; and that bills to a considerable amount are yet outstanding, which when presented for payment ought also to be charged to the Departments in whose favor they were respectively drawn. Wherefore your Committee submit the following resolution:

Resolved, That Major General Lincoln be credited, in the books of the treasury, the sum of five millions four hundred and twenty four thousands one hundred and nine dollars, and that bills to a considerable amount are yet outstanding, which when presented for payment ought also to be charged to the Departments in whose favor they were respectively drawn. Wherefore your Committee submit the following resolution:

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curred by the performance of the said duty, be al-
lowed the sums affixed to their respective names con-
tained in a return deposited in the war-office, which
was transmitted and signed by David Oliphant, dep-
uty director of the southern hospital.

June 20, 1785.

On the report of a committee, consisting of Mr. Williamson, Mr. Stewart, and Mr. Howell, to whom
was referred the petition of Dr. J. Morgan,
Resolved, That when ever Dr. J. Morgan, shall
have accounted for the stores delivered to his care,
or when the several charges against his former de-
partment shall have been delivered in, and it shall
appear to the commissioner for settling the hospital
accounts, that the doctor's papers and books are un-
avoidably destroyed, or that he has rendered the
best account of the stores committed to his care, of
which the circumstances of the case would admit he
shall obtain a certificate for the balance due him.

May 8, 1786.

Resolved, That the powers and duties heretofore
exercised by the commissioners for the quarter mas-
ter's and the commissary's departments be exercised
by one commissioner, and that the powers and duties
of the commissioners for the hospital, marine and
clothier's departments be exercised by one other com-
missioner, to be elected annually by Congress:
and that the salary of each of the said commis-
ioners be at the rate of 1250 dollars per annum.

June 28, 1786.

The commissioner for settling of the accounts of
Robert Johnson, the commissioner for settling the
hospital accounts &c. be directed to examine strict-
ly into the propriety of all extra expenses incurred
in the executing their duties, and where it shall ap-
pear that such expenses were necessarily and un-
avoidably incurred, and that the subsistance allowed
was not adequate thereto, the surplus be allowed.
That, as it appears from the deposition of the said
Dr. Robert Johnson, that the sum of money and cer-
tificates stated in his memorial, were public monies
stolen from him, without any negligence on his part,
and that the balance of money remaining in his
hands has not been applied to any use since it came
into his possession, the commissioner for settling ac-
counts of the hospital department, be directed to
pass the amount of those sums to his credit, on his
returning to the commissioner the said balance and
a list of the certificates so stolen.

EXPERIMENTAL SECTION AND HEMI-SECTION OF THE SPINAL CORD

When the whole body experiences a loss of
function in the nerves it indicates that they
themselves are affected, which can be proved by
dissection. When all the nerves lose sensation
and motion at once, the affection is called Ap-
oplexy. If one-half, whether the right or the
left, is attacked, we call it Paralysis (Hemi-
plegia) of the right or left side. In like man-
er, as it occurs in one of the extremities, it
is a paralysis of that part. Paralysis, in fact,
sometimes attacks a whole arm or leg, some-
times only the foot and the parts below the
knee or the corresponding parts in the arm.
Dissection has taught us that for all the parts
of an animal below the neck which are capable
of voluntary motion, the corresponding motor
nerves arise from the dorsal part of the spina
cord. . . . You have seen that the motor
nerves controlling the chest have their origin
from the cervical part of the cord, and further
you have been taught that a transverse incision
of the entire cord deprives all parts of the body
below it of sensation and motion, seeing that
the cord derives the faculty of sensation and of
voluntary motion from the brain. You have
seen further in our dissection that transverse
hemi-sections, which do not cut deeper than
the centre of the cord, do not paralyze all the
inferior parts of the body but only those di-
rectly underneath the incision, the right when
the right side of the cord has been cut and vice
versa.

Galen de locis affectibus
THE END OF THE FIRST HALF OF THE
NINETEENTH CENTURY SAW WONDERFUL
CHANGES IN MEDICINE. NITROUS
OXIDE AND ETHER IN AMERICA,
CHLOROFORM IN GREAT BRITAIN, THE BREAKING
AWAY OF GERMAN MEDICINE FROM
METAPHYSICS AND NATURE PHILOSOPHY, THE
VIENNA SCHOOL, THE FOUNDATION BY VIECHOW
OF THE ARCHIV FÜR PATHOLOGISCHE ANATOMIE
UND PHYSIOLOGIE, THE TEACHINGS OF LOUIS AND
BROUSSAIS IN FRANCE—all of them were
destined to work what seemed the miraculous
in our art and science. Those of us who have lived at or since that time, and
certainly those who were fortunate enough
to see it all, have experienced evolutions
and emotions which stirred the hearts, fortified
the minds, and roused hopes for the
future. Among the few, if there be any,
advantages we older men have over you
who are our juniors, is the very fact that
we have lived, and in a measure partici-
pated, in the revolution passing over these
two or six or seven decades; it was not al-
ways a smooth revolution.

I learn that the first law to prevent the
introduction of adulterated pharmacological
medicines into the United States was passed
as late as 1848. Dr. Bailey, the first incumbent
of a new office, in a report to the New
York Academy of Medicine, stated that over
90,000 pounds of false and adulterated drugs
were rejected during the first nine months
at the single port of New York. Forty
years later my learned and revered friend,
Squibb, complained to me of the difficulties
encountered in meeting the demands of an
honest and conscientious supply of drugs.
An additional retrospect, brief and summary,
may be permitted for a few paragraphs.

A medical school was formed at Cam-
bridge on September 19, 1782. Two full
courses of lectures were required, as at
Philadelphia. As the course was only one of
four months, it was expected that the re-
main ing sixteen months of the two years
were to be filled with private instruction.
The Harvard School which conveyed a
degree of Bachelor of Medicine only, which
might be converted into Doctor of Medi-
cine after an interval of three years, changed
its degree to that of M.D. in 1811. In 1871,
Dr. Francis Minot was given, in addition
to his title of Assistant Professor of the
Theory and Practice of Physic, that of
Clinical Lecturer on the Diseases of Women
and Children. Both he and Dr. Calvin
Ellis, the Professor of Clinical Medicine,
aided pediatrics by being made special
instructors. They, however, were replaced
by Dr. Charles Pickering Putnam who was
appointed Lecturer on Diseases of Children
in 1873. He retired from the school in 1878.
From time to time, though rarely, questions
referring to pediatrics appeared on the ex-
amination papers until 1879, when Dr.
Joseph Pearson Oliver and Dr. Thomas
Morgan Rotch were appointed clinical in-
structors. The latter was placed in entire
charge of pediatrics, teaching as Instructor
in Diseases of Children, in 1885; in 1888 he
was given the title of Assistant Professor
of Diseases of Children, and a seat in the
faculty. Dr. Rotch asserted that this hap-
pened only in consequence of the strong
suggestion expressed in the introduction to
the five volumes of Keating’s “Cyclopedia of
the Diseases of Children”. Finally, in 1893,
he was made full professor of that branch.
A full professorship of that branch had
meanwhile been held, since 1888, in the
Medical School of Denver by Dr. Herbert
P. Whitney who had been an assistant at Harvard from 1887 to 1888. This latter position has since been filled by Edward Marshall Buckingham until his death, which occurred a few years ago.

Up to 1840 there were thirty-two medical schools in the whole country, with 2,500 students. In 1876 there were sixty-four schools with 6,650 students. Sixteen of these, sixty-four offered hardly anything which looked like clinical instruction.

Dr. Harold C. Goodwin, the Superintendent of the Albany Hospital, says:1 "It is recorded that the first step taken by any hospital toward teaching was in 1762 when the Pennsylvania Hospital founded a medical library. It was not until 1765 that, through the efforts of Thomas Bond, bedside instructions were given. The New York Hospital, in 1776, did the same." The author adds that "a medical library is more necessary to a student than a stethoscope"—which would prove that in the eyes of a mere superintendent, bedside instruction is of a doubtful character. Tastes differ.

According to Thomas F. Harrington,2 section-teaching in clinical surgery was inaugurated in 1890 by Professor Charles B. Foster at Harvard. The same method of systematic individual teaching has been extended to clinical medicine and obstetrics. In and after 1902, the fourth year of study was left to electives under certain regulations, so as to enable a student to perfect himself in the "line of work he intends to practice". This doubtful method was highly praised by many. Still all men and classes enjoy the privilege of mistakes they make and those they find in others. For instance: The elective way of study was methodically praised and fostered by Charles Eliot of Harvard; and abrogated by his immediate successor, Dr. Lowell. I well remember the almost comical impression caused by the discrepancy of the happenings at the presidential celebration of 1907 of the two famous presidents of Harvard. Within a single hour Eliot spent all his eloquence on the elective methods of study he had rendered popular among the young men of the University, and Lowell, on the contrary, praised the exact methods of restrictive teaching as the source of correctness and fundamental solidity.

At all events, the official section-teaching of 1890 did not arrive early and systematically, or uniformly. It arrived thirty years after that which I shall now refer to as the systematic bedside teaching of the New York Medical College, which was first established in 1850. Now thirty years seems to mean a great deal in this young country of ours.

From the pages of history and from what I personally know, and particularly from "A Short Sketch of the New York Medical College", by Edwin Hamilton Davis, A.M., M.D., New York, 1883, I cull the following: The subjects which especially interested the profession seventy and sixty years ago were certain reforms in medical education. The medical profession became more and more aware of the fact that the medical schools followed their old indolent methods of instruction. These schools were private enterprises, being mostly founded and maintained for private purposes and gain. The instruction gathered in them did not satisfy those few men who meant to become accomplished physicians; they went abroad, no longer exclusively to Edinburgh, as in the eighteenth century, but also to France where Broussais and Louis taught Jackson, Holmes, Bowditch, Francis, and others.

County and state medical societies, which means the profession at large, urged the schools to change their methods in regard to the quality and quantity of their teaching, but in vain. Then it was that the Medical Society of the State of New York—

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1 Albany M. Ann., Jan., 1918.
2 St. Paul M. J., April, 1906.
founded in 1806—called a convention of the prominent medical men of the whole country to consider these defects and to urge improvements in the schools. The second call proved successful. One hundred delegates from thirteen states assembled in New York in 1846. Many schools, remember the schools were the organized schools, were bitterly opposed to the movement—unfortunately, not for the last time; for even when thirty and more years afterward the fight was up for increased medical requirements of matriculation in medical schools and of state requirements before the license to practice should be granted, it was the organized schools that opposed it openly; and when public opinion became too strong and demoralized to be openly thwarted, two of the three great schools of medicine in New York City sent their strongest men with their influence to Albany for clandestine wire-pulling. They were, I am sorry to say, A. L. Loomis and Austin Flint, Jr. They did not succeed, however, in their endeavors. It is now conceded that the wisdom of the New York State Medical Society, displayed in 1882 in its modification of the Code of Ethics of the American Medical Association and in cooperation with all classes of legal graduates and practitioners, secured for us, and for most of the states of the Union which followed our example, laws which raised the standard of medical education, gave our students greater facilities, and protected the public by restricting ignorance or quackery.

In the Convention of 1846, committees had been appointed to report in 1847. In that year the Convention met in Philadelphia; it was there that the American Medical Association was founded. For years after, it urged the schools to adopt, among others, the following changes: 1st, to increase the length of the lecture term; 2nd, to increase the number of professorships; 3rd, to separate the granting of degrees from the Board of Official Teachers.

As not a single one of the existing schools saw fit to adopt a single one of these recommendations, the reform element in the profession established a few new schools. Dr. Davis reports: "Thus the New York Medical College was called into existence." It was chartered April 8, 1850. Its cornerstone was laid July 31, 1850, and the building was inaugurated on the 16th of October. The first Commencement of the new school was held in March, 1851.

It was the first to wholly conform to the changes advised by the American Medical Association. Its building, 112 East 13th Street, the most convenient for the comfort of the teachers and the public, of any in the country, contained three large lecture rooms, so that the classes were never compelled to occupy the same hall during two consecutive hours. The entire front of the building was devoted to the chemical laboratory and museums. Here in 1850 was founded the first chemical laboratory in the United States in connection with a medical college established for the instruction of students in medicine in analytical researches important in medical practice. Each candidate for graduation was examined before a Board of Censors.

The lecture term was lengthened and a summer course was established. The number of professors was gradually increased to ten, in place of the familiar seven, or less. The charter strictly separated the power of granting degrees from the Board of Trustees, as Section V., "provides for the appointment of a Board of Censors to be taken from the profession not connected with the College, without whose consent no degree could be conferred".

To remove all pecuniary temptation to increase the number of graduates, the same section provided that no fee should be charged for granting a degree. Finally, the Faculty, realizing the vast importance of combining more clinical with didactic instruction, procured a charter for a
21, 1860. In it were Doremus and Carnochan of the former faculty, I. Meredith Reese, A. K. Gardner, B. I. Raphael, John O. Bronson, Charles A. Budd, Bern L. Budd, R. K. Brown, and A. Jacob. Two thoroughly new departments were created. Toxicology was taught independently of chemistry by Bern L. Budd, and the position of Teacher of the Diseases of Children was made a full professorship. It has taken Harvard twenty-eight years, and Columbia forty years to follow the example of the struggling little school in East Thirteenth Street. In Columbia even the great names of Otis and Agnew were permitted to add to, or in part to make, the renown of the school as mere "clinicals" until their death. The "seven", that sacred close corporation, willed it so. Both in Harvard and Columbia the Diseases of Children are now, however, taught by full professors. Rotch must not be forgotten by either Harvard or America, and Holt's acknowledged high rank in his profession and specialty will always be remembered.

During the years 1861 and 1863 a few names were added, some of which were those of then, or afterwards, famous men. These were Noeggerath, S. R. Percy, Frederic Holcombe, and David S. Conant. Of all the men whose names I have mentioned only one is alive to-day—myself. I doubt not, or hope that many, aye most, of the names called up before you are well known to you. Still in these days our historical interest in things and men gone by, is not well developed, as yet—neither in the history of science nor of the country. That is why we meet with so much immaturity in both scientific and political life, and why there is so much waste of industry and of energy in rediscovering facts that could easily be gathered from our own or foreign literature. Still, names like Green, Barker, Peaslee, Doremus, Flint, and Carnochan stand out like so many illuminating lights on the battlefields of American scientific labors. Horace Green of Vermont died in 1867 at Sing Sing, at the age of sixty-five years. He taught medicine in Castleton for several years, and in 1850 was one of the founders of the New York Medical College in East Thirteenth Street. There he taught until 1860. When the reorganization took place, he remained in the faculty as emeritus. It was through his presence in the faculty that I made his acquaintance and enjoyed his confidence. He settled in New York in 1835. As early as 1846 he published a treatise on "Diseases of the Air Passages"; in 1849, his "Pathology and Treatment of Croup"; in 1852, the "Surgical Treatment of Polypi of the Larynx, and Ædema of the Glottis". These books were followed by a few others, mainly one on "Pulmonary Tuberculosis" in 1864, and a number of articles in journals. They might be studied to advantage by those who, because they are only half as old as his books and unacquainted with them, prefer to rediscover part of what was then known. His studies taught him that the larynx was accessible, and this accessibility made him catheterize that organ. His skill was such as to tempt him to make laryngeal and sublaryngeal applications with nitrate of silver and other substances, for croup and tuberculosis of the lungs. In the New York Academy of Medicine he was bitterly attacked. The great men of those days proved to their full satisfaction that the thing could not be done. Still, he exhibited his instruments and did it. But the overwhelming vote was that it could not be done. Meanwhile, I had the privilege of seeing him do his resecion of tonsils and his catheterization of the larynx in his own office. I was shy and bashful, and averse to raising my voice, but the treatment of Horace Green, of whom the profession in America had every reason to be proud, was one of the things that made me compare his fate with that of Bouchut of Paris who was the first intubator of the larynx in croup. The latter was unfortunate.
hospital to be located alongside of the College.

While awaiting the raising of funds to build, they organized and opened a charity ward in the College itself. In that ward I taught in 1860 and after, until both the ward and the college were discontinued—for discontinued they were. That is the brief history of the first attempt at establishing a regular daily bedside clinic for all branches of instruction in the indispensable parts of medical teaching. The twenty-seven beds were ours, and in daily, almost hourly, use. This should be recognized and remembered as a new and systematic teaching, the first one in America, and should be remembered as one of the progressive steps in American medical instruction. When it was discontinued in 1864, it had no successor until in 1898, when bedside instruction was established for the students of the College of Physicians and Surgeons. In that year, Dr. Francis Huber, my friend and assistant, furnished to Columbia University a capital the interest of which enabled the College of Physicians and Surgeons to facilitate a regular pediatric clinic with exclusive bedside instruction in Roosevelt Hospital.

The nefarious example of rival schools that kept on granting diplomas after two short winter courses, and the iniquitous tendency of the students to rush into practice with the least possible expenditure of money, time, brains, and knowledge, and the additional disadvantage of the Medical College caused by the fact that very many of our students were Southerners who ran or strayed away during the Civil War, made the life of the institution hard, and finally impossible. The last class was graduated in 1864.

Dr. Edwin Hamilton Davis, the Professor of Materia Medica, reports one of the ways in which the small Medical College was injured by a combination of the clouds and a thief. Our very blank diplomas—thirty-odd in number—were stolen. A violent storm blew off a skylight and soaked a number of documents. When new ones were procured, the old ones were left uncanceled and misused. The wrinkled specimens were taken away when the janitor was dismissed a few months later. He disposed of them in this country and also in London. From London a few were sent to New York for certification. This caused an opportunity for eliciting the facts that a number of the forged diplomas appeared in the market.

In the first faculty of 1850, there sat Horace Green, Professor of Theory and Practice; Abram L. Cox, of Surgery; Edwin Hamilton Davis, of Materia Medica and Therapeutics; B. Fordyce Barker, of Midwifery and the Diseases of Women and Children; and K. Ogden Doremus, of Chemistry and Toxicology. In 1851, John Murray Carnochan took the place of Dr. Cox, and Edward R. Peaslee the chair of Physiology, Pathology, and Microscopy. In 1852, two additional chairs were created: that of Medical Jurisprudence, occupied by Judge Joel Parker of Boston, and that of Dental Pathology and Surgery, for Dr. C. C. Allen. This was the first dental chair in an American medical school. Very few changes took place after that. H. G. Cox was elected Professor of Theory and Practice in 1855; Timothy Childs, Professor of Anatomy in 1856; Austin Flint, Jr., Professor of Physiology and Pathology in 1859. I have mentioned here only such men as before and since their appointment have made a name for themselves and have played a prominent rôle in American medicine.

In 1860 Southern students began their exodus from New York. The New York Medical College was not persona grata with the South nor with the other New York schools. These had not mended their ways during the whole decade of the existence of the New York Medical College; and the majority of the faculty of the college became discouraged.

A new faculty was appointed April
enough to exaggerate his results; that was why his adversaries in the Paris Academy of Medicine—the great Trouseau among them—succeeded in postponing intubation until our own O'Dwyer, without any knowledge of what had been accomplished twenty-five years earlier, rediscovered and improved upon Bouchut's manipulation. It was altogether an unfortunate time for great discoveries. Bouchut was not appreciated; Horace Green was suppressed. For instance, you also know that Holmes was ridiculed by Meigs and Hodge; and Semmelweiss was driven into a lunatic asylum by Braun and Scanzoni.

Fordyce Barker was born on May 2, 1817, in Maine, practiced in Norwich, Conn., graduated in Paris, France, in 1844, and was Professor of Midwifery in Bowdoin in 1845 and in New York Medical College in 1850. His principal book is one on puerperal diseases. He died in 1886.

John Murray Carnochan was born in Savannah, Ga., July 4, 1817, and died in New York October 28, 1887. He studied six years in Paris. In 1850 he was placed in charge of the newly established hospital for immigrants on Ward's Island, and added to the surgical literature of the femur and many other subjects.

Edward Randolph Peaslee was born in New Hampshire January 22, 1814, and died in New York on January 12, 1878. He graduated from Yale in 1840, continued his studies in London and Paris, and became professor in Dartmouth College in 1841. He published "Human Histology in its Relations to Descriptive Anatomy, Physiology, and Pathology" in 1857, the first systematic book on that subject in English; a complete monograph on ovariotomy in 1865; "Statistics of Ovariotomy for the Years 1860-61, '62 and '63, Including 150 Cases"; "Retroflexion of the Unimpregnated Uterus" in 1865 and 1866; and in 1872 "The History of Ovariotomy in This Country" and "Sketch of Dr. E. McDowell's Life". While a Professor in the New York Medical College and during his co-editorship of the American Medical Monthly, he published a number of his lectures and reports. He was one of the most erudite men in the American profession.

Austin Flint, Jr., was born March 28, 1836, in Northampton, Mass., and died in New York in 1915. He began the study of medicine at Louisville in 1856, and graduated from Jefferson in 1857. At an early date he began physiology as a special study, experimented in and wrote on that branch of medicine in Paris under Robin. In 1859 he taught in the New York Medical College, in 1860 at New Orleans, and in 1863 in the Bellevue Hospital Medical College, with which he remained in the same capacity for many years until he changed his position into that of a consultant in medicine and finally in psychiatry. Most of his literary work remained physiological; the study of the liver occupied much of his attention, and his extensive text-book of physiology in five volumes—the last of which appeared in 1874—first familiarized the profession with his work.

This may suffice. What I want to impress upon you is the knowledge of the fact that one of our small medical schools, the New York Medical College, was a principal cause of our national medical progress. This was to a great extent caused by the initiative in and the gradual taste for bedside instruction in practical medicine. British and American medicine has always been founded upon its practice, and the nation's health and felicity is the outcome of the people's sanitation based upon the labors and energy and successes of its doctors.
STUDIES IN PALEOPATHOLOGY

I. GENERAL CONSIDERATION OF THE EVIDENCES OF PATHOLOGICAL CONDITIONS FOUND AMONG FOSSIL ANIMALS

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DEFINITION AND SCOPE OF PALEOPATHOLOGY

The study of the evidences of disease among ancient man and fossil animals is known as paleopathology, the term having first been applied by Sir Marc Armand Ruffer in 1914 to methods he had developed in studying the pathological anatomy of the ancient Egyptian mummies. He defined it as follows:

"Paleopathology is the science of the diseases which can be demonstrated in human and animal remains of ancient times."

The significance of the term has been dwelt upon by Klebs, and a further extension of its meaning to include, not only the diseases of the ancient Egyptians but those of prehistoric man and fossil animals as well, has been suggested by the writer. The field thus involved includes the resources of anthropology and paleontology, as well as some details contained in archeological studies.

The present paper deals mainly with the so-called prehistoric, and especially prehuman, evidences of disease (prior to 500,000 b.c.) of the extinct vertebrates. It is interesting to note that the history of disease, from the first geological evidences at present obtainable down to the historical data contained in August Hirsch's "Handbook of Geographical and Historical Pathology" (circa 600 b.c. to 1875 a.d.), will be seen as a series of consecutive events from the introduction of diseased conditions among animals and plants down to the present time. There can be no doubt that many of the diseases existing today are of very great antiquity, having a history extending back into geological time for many millions of years.

It is not necessary nor pertinent to review in this place the studies of Ruffer, Elliot Smith, Wood Jones, Rietti, Fouquet and other writers on the pathological anatomy of the ancient Egyptian mummies, since their results are so readily accessible. Their the region under discussion. Thus in Egypt any grave earlier than the time of the first dynasty is often called prehistoric. This implies an age of 6,000 years or more. In France LeBaron defines the prehistoric period as closing at about 222 b.c., and several centuries later in Algeria. To the paleontologist the term is meaningless. Klebs has said: "The adjective 'prehistoric,' used so often, would seem a misnomer, because the distinction of a history read in written records from one seen and studied in equally characteristic objects, chronologically determinable, is purely arbitrary and artificial and it would do no harm to drop it altogether."
material might be regarded, from a certain standpoint, as fossil, meaning something "dug up." The term fossil, however, as used in this paper refers to material which is thoroughly petrified, the age of which must be reckoned by geological standards. The studies of the above-mentioned writers have been briefly reviewed and summarized by Garrison, Klebs, and Sudhoff, and will be extensively referred to elsewhere by the writer.

The studies of Ales Hrdlicka and Langdon on the pathological anatomy of the North American Indians, and of Hrdlicka, Eaton and other writers on the ancient Peruvians, must also be neglected, as well as the meager details of fossil man as they are recounted in the various works on anthropology. The subject of the diseases of ancient human races has never been systematically studied. The writer will present a consideration of this subject at some future time.

PALEONTOLOGICAL EVIDENCES OF DISEASE

The study of paleopathology is still in its initial stages, and especially is the application of pathological methods to fossil lesions a new field. But the comparative scantiness of facts so far brought out and the difficulties of research should not hinder its successful prosecution. What the final results may be remains to be seen. The immediate results are certain to bring attention to the presence of characteristic lesions of disease far back in geological time, and it is very interesting, if not important, to find in past geological ages evidences of pathological processes which are so familiar to us today. If we can trace the known lesions to any definite cause among the extinct animals it will be a step toward the erection of the newest branch of pathology, dealing with the oldest aspects of that science.

In regard to the importance of this branch of study, Klebs says:

"We need only consider what definite influence diseases exert in our individual lives, what profound social upheavals were brought about through the incidence of epidemics, less perceptibly perhaps but none the less strongly, through widespread chronic ailments, through professional diseases, how whole districts and countries are forsaken because disease made them uninhabitable, how disease affecting early childhood and others producing sterility led to the gradual extinction of whole peoples. . . . For the grasp of such problems, the study of disease as it appears to us now does not suffice; the traces left during immense periods of time have to be taken into account and it is in just such questions, not approachable by other methods, that paleopathology in time to come may furnish important solutions."

The attitude of students of paleontology toward this subject has been negative. Even men like Leidy, a trained anatomist and an eminent medical man, paid scant attention to the subject, although he did describe an example of caries in a mastodon tooth from Florida. Cuvier too, eminent as he was in the field of comparative anatomy, failed to recognize the importance of this phase.


of paleontology. His discussions of the few lesions he recognized were meager and inadequate. He has described a fractured skull of a Pleistocene *Hyaena* and a fractured femur of *Anoplotherium*.

Paleontology lends considerable light to the study of the antiquity of disease. The study of the lesions so far known among fossil animals indicates nothing new in the nature of pathological processes but simply extends our knowledge of disease to a vastly earlier period than had previously been known. It seems quite probable that some of the diseases exhibited by the extinct vertebrates went out of existence with the race of animals which were afflicted. If this proves to be true it will be an interesting opportunity to study the details of lesions of extinct diseases. There seems to be little possibility of determining the fundamental cause of disease other than is already known; for disease is apparently one of the manifestations of life, and has followed the same lines of evolution as have plants and animals, and is possibly directed by the same factors. Such a study as the present may, however, throw light on the origin of many of the diseases to which the human race is a prey. A knowledge of the pathological processes which have taken place in animals of geological antiquity will aid in an understanding of the general nature of disease.

The literature of vertebrate paleontology contains a number of incidental references to the diseased nature of the fossilized bones of fishes, reptiles, birds, and mammals, the lesions described indicating a variety of diseases, some of which are not uncommon today. It is manifestly impossible to diagnose correctly, on the basis of our modern knowledge of recent diseases, all of the lesions which are preserved in a fossil condition. In the extinction of the ancient races of animals, certain diseases, without doubt, became extinct with them, and it is partly the purpose of this paper to inaugurate an inquiry into the nature of the diseases of fossil vertebrates. No one has yet made a study of the evidences of disease among fossil animals, since these conditions, whenever noted, have been referred to only in an incidental way, by writers on paleontological subjects.

Geological evidences of the diseased state of animals are necessarily restricted to pathological lesions on the hard parts of fossil animal remains. Soft parts are seldom fossilized, and the few specimens known have not been subject to disease. Since the pathological changes which affect the hard parts of animals today are relatively few when compared to the diseases which afflict the body as a whole, it is to be supposed that the paleontological evidences of disease are but partial indications of the prevalence of pathological conditions in geological time. The following account, too, must be read in the light of the paucity of evidence available for discussion. The details are meager, but since they are all we have, they may be deemed worthy of consideration.

It will be clearly evident, after a consideration of geological matters, that all paleontological evidence is of relative value, since such small portions of the ancient faunas and flora are preserved in the rocks. However, we are safe in stating, from such evidence as we have, the probabilities of the occurrence of numerous diseases among extinct animals, just as it is safe for us to state, on the basis of a single tooth in a of Kansas, with a Review of Other Fossil Brains," *J. Comp. Neurol.*, April, 1915, vol. 25, No. 2, where an annotated bibliography of fifty papers will enable the interested reader to see just how meager is our knowledge of the soft parts of extinct vertebrates. Many of the softer structures are represented by impressions on the stone.

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13 Among diseases which have become extinct within historical times may be mentioned the *sweating sickness* described by Hecker in "Epidemics of the Middle Ages," 1846, pp. 181-353.

14 The soft parts of fossil vertebrates have been discussed by a number of writers. Our knowledge of the entire subject is reviewed in the author's paper, "A New Fish Brain from the Carboniferous
definite geological horizon, that such and such an animal existed at the time the formation was being deposited, provided, of course, the deposit is a primary one and the fossil was not moved by shifting in a secondary deposition.

All that we know of the earliest land vertebrates, prior to the Pennsylvanian, for instance, is a single footprint from the Devonian, and a few series of footprints from the Mississippian. On the basis of these footprints we are able to say definitely that there existed in North America a diversified fauna of vertebrates, probably amphibian, which preceded the well-known amphibian faunas of the great Coal Period.

DEFINITION OF DISEASE AS USED IN THIS STUDY

Disease, as the term is used in this study, may be defined as any deviation from the healthy or normal state of the body which has left a visible impress upon the fossilized skeleton. The evidence may take the form of broken bones, tumors, necroses, hyperplasias and arthritides of various kinds. Only the diseases of animals have been considered. This is done with a full realization of the enormous domain of phytopathology and is a confession of a limitation to a restricted field. Some of the paleobotanical literature has been read, but apparently no attempt has been made to trace the rise and progress of phytopathology from fossil material.

This is doubtless due to the unsatisfactory condition of fossil plant material which is usually quite fragmentary. Some idea of the nature of plant diseases of the past may be had from the following brief summary for which I am indebted to Professor Edward W. Berry:

"Bacterial and fungus activity are known in Carboniferous plants, and would probably be detectable at much earlier horizons if petrified material of greater age were available for study, since the bacteria appear to be among the earliest forms of life. Material preserved as impressions at all horizons, more especially the post-Paleozoic ones, show abundant leaf-spot fungi, and such remains from the Cretaceous and Tertiary show abundant insect galls and leaf cutting by caterpillars or bees; but this class of material is usually more or less indefinite. Whenever one handles much petrified material, one is struck with traces of fungal ravages and bacterial action."

EVIDENCES OF DISEASE IN FOSSIL PLANTS

It is often difficult to decide whether the ravages of fungi and bacteria are pre- or post-mortem. The agents of decay are well known to have existed early in geological time. During the Carboniferous there existed conditions which were especially favorable to the growth of a mycological flora, and much of it was probably on dead plant material.

Professor Berry writes further concerning the primitive fungi:

"Among the relics of former vegetation that carry the record back many millions of years the remains of fungi are so rarely found that their presence is always exceptional, although it is obvious that many times during the long history of the earth the environment has offered optimum conditions for their abundant development. To mention but one such occasion, that of the formation of the Coal Measures must have witnessed an exceedingly abundant mycological flora. That these plants were present thus early is indicated by the abundance of hyphae, and other traces of fungal activity such as butyric fermentation, in the tissues of...

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15 Berry: Letter to author, Jan. 4, 1918.
Carboniferous vascular plants, and the scarcity of described forms must be attributed to the perishable nature of most fungal tissues and to the lack of systematic work by experienced mycologists on the more or less obscure material available. To be sure, quite a considerable number of fossil forms referred to Fungi have been recorded from various geologic horizons but the vast majority of these are leaf-spot types based upon real or fancied resemblances, and found on impressions of foliage and without definite botanical characters. Some doubtless represent fungal ravages, others are due to insects, some are glandular, and others are purely imaginary."

Professor Berry refers to A. Meschinelli's "Fungorum Fossilium Omnium Iconographia," (1902, 144 pp., 31 plates), for a rather complete illustrated list of all of the forms referred to down to the year 1900. Other and more complete studies on the bacteria and fungi of the Coal Measures of France particularly have been made by Van Tieghem and Renault. A fairly complete list of their numerous papers is to be found in Smith's bibliography. Other information may be gleaned from the memoirs and textbooks dealing with Paleobotany.

It would be interesting in this connection to know Metchnikoff's sources of information relative to the presence of diseases at remote epochs. Virchow's studies on the kinds, but none of them, so far as the fossil lesions may be interpreted, were sufficiently severe to have played a part in the extinction of any of the known groups of fossil vertebrates. They are to be regarded rather as chronic infectious or constitutional diseases which may have played a part in extinction, but there must have been some other and more powerful ally which is at present unknown." ("The Influence of Disease in the Extinction of Races," Science, N. S., Jan. 19, 1917, vol. xlv., No. 1151, pp. 63-64.

"Diseases in general and infective diseases in particular were developed on the earth at a very remote epoch. Far from being peculiar to man, animals and the higher plants, they attack inferior forms and are widely distributed among unicellular organism, Infusoria and Algae. Diseases undoubtedly play an important rôle in the history of life on our planet, and it is very probable that they have contributed in a marked degree to the extinction of certain species. When we observe the ravages produced by parasitic Fungi among the young fish which we are trying to rear, or the destruction of cray-fish in certain countries in consequence of the rapid increase of epizootic germs, we are involuntarily led to the conclusion that pathogenic micro-organisms must have brought about the disappearance of certain animal and vegetable species."


The question of extinction is still one of the unsolved problems of paleontology. The importance of those diseases which leave an impress on the skeleton has been referred to by the author in the following words:

"It is not my intention to contend that disease has not been influential in the extinction of races (or species); it probably has been; but those diseases which have left an impress on the fossilized skeleton certainly cannot be regarded as among those diseases which would produce widespread extinction. Some other has been the dominant factor. The present results of the study of fossil pathology indicate the early appearance in geological time and widespread distribution of diseases of many kinds, but none of them, so far as the fossil lesions may be interpreted, were sufficiently severe to have played a part in the extinction of any of the known groups of fossil vertebrates. They are to be regarded rather as chronic infectious or constitutional diseases which may have played a part in extinction, but there must have been some other and more powerful ally which is at present unknown." ("The Influence of Disease in the Extinction of Races," Science, N. S., Jan. 19, 1917, vol. xlv., No. 1151, pp. 63-64.

cave bears of Europe were well known, and his characterization of the arthritic lesions of the fossorial animals as the "Höhlengicht," was certainly famous at the time Metchnikoff wrote. The studies of Mayer on the lesions of the cave bears and cave lions of Europe as well as the writings of Cuvier (1820), Esper (1774), Goldfuss (1810), Walther (1825), Schmerling (1835), Owen (1842), Schaafhausen (1858), Newton and Parker (1870), Graff (1885) and Leidy (1886) may, any or all of them, have been known to Metchnikoff. They all suggest the pathology of ancient times and some deal entirely with the pathological anatomy of fossil remains. None, however, are studies which deal with remains older than the middle Tertiary, and to a paleontologist the term "remote epoch" hardly applies, when compared to lesions known from the Carboniferous, for example. I am, therefore, forced to conclude that Metchnikoff simply forecasted what would be discovered, on the basis of what he knew in modern plants and animals. All of the literature in paleontology dealing with pathological evidences of any great antiquity, prior to the mid-Tertiary, has appeared since 1900. The literature is meager and unsatisfactory. Paleontological studies seldom deal specifically with diseased conditions, so that the field is still to be explored. The studies in paleontology dealing with pathological evidences among fossil vertebrates have been reviewed by Rudolf Virchow: "Ueber einen Besuch der west-fallischen Knochenhöhle," Ztschr. f. Ethnol. 1870, Bd. 2, p. 365, footnote; "Knochen vom Höhlenbären mit krankhaften Veränderungen," Ibid., 1895, Bd. 27, pp. 706-708, figs. 1-4; "Beitrag zur Geschichte der Lues," Dermat. Ztschr., 1896, Bd. 3, p. 4.


Their discovery was forecasted by Walcott in his "Pre-Cambrian Algal Flora," Smithsonian Misc. Collect, 1914, vol. 64, No. 2, p. 95.
recent forms are highly parasitized and are occasionally subject to disease. It appears probable that vertebrates have been more liable to diseases which afflict the hard parts than have the invertebrates, and this liability to pathologic processes has been increased with the passage of geologic time.

IMMUNITY IN MODERN INVERTEBRATES

The greater immunity of early Paleozoic animals to disease, based on the evidences of paleontological material, is probably not a true index to actual conditions, though it may be so. It is probably not safe to conclude from present-day conditions what the state of Paleozoic animals may have been as regards disease. At any rate the paleontological evidences are not wholly substantiated by conditions found in modern forms. Metchnikoff24 has called attention to the occurrence of epidemics of a severe nature among protozoa, such as diseases in *Amebae* caused by the *Microsphaera* and the disease in *Actinophrys* attributed to Fungi allied to the genus *Pythium*. Pasteur's studies on the *pebrine* and *flacherie* of the silkworms will be remembered as instances of severe epidemics in an invertebrate group. Molluscs, however, are apparently largely immune to infection, and since the mollusccous animals formed such a large percentage of the preserved faunas of the early periods of the earth's history we may attribute our ignorance of the presence of disease to this factor, in part at least. The immunity of many intermediate hosts to infection25 is well known, and the classical example of the mosquito-borne infections will suffice, although it is well known that insects of many kinds are subject to fatal diseases. Kowalevsky has discussed the anthrax of crickets and many other students have studied the problem. The entire question of immunity in its relation to all forms of extinct animals is of course a new and unsolved, probably an insolvable, problem. But it seems certain that if the early animals were diseased, the ensuing pathology was of such a nature as to leave no impress upon the fossilized part; or else we have not yet learned to recognize these lesions.

THE ORIGIN OF DISEASE

Phagocytosis24 doubtless began very early in the history of animal life, and it is probable that the natural immunity of the early animals was sufficiently strong to resist the invasion by any pathogenic organisms in sufficient numbers to produce disease. The breaking down of this immunity may possibly be correlated with the development of senescence27 among the early races of animals, which reached a climax in some forms—the trilobites, for instance,—at about the time when we find the first indications of disease among fossil animals. The breaking down of the immunity, due to the development of race senescence and the introduction of disease, doubtless was of very great importance in the extinction of the trilobites and other great groups.

24 Metchnikoff: "Immunity in Infective Diseases," translated from the French by Francis G. Binnie, 1905, p. 18; also Chap. iii.

25 Edward Hindle: "Flies in Relation to Disease (Blood sucking Flies)," 1914.

G. S. Graham-Smith: "Flies in Relation to Disease (Non-Blood sucking Flies)," 1914.


27 The studies of Charles Emerson Beecher (1836-1904), an American paleontologist, upon evolutionary phases of the early fossil brachiopods and trilobites are especially important to consider in connection with the question of race senescence and the extinction of animal groups. His papers have been collected into a volume: "Studies in Evolution," New York, 1901.

The entire subject of senescence in the recent lower animals is discussed by Child in "Senescence and Rejuvenescence," University of Chicago Press, 1915.
of animals which have disappeared from the earth.28

I do not intend to assert that senility or senescence is a disease, but that age weakens the organism and the race and allows the ingress of disease. Minot has stated:

“Old age is not a disease and cannot be cured; it is an accumulation of changes which begin during earliest youth and continue throughout the entire life of the individual.”

It may be said that disease in the past has often attacked the races of animals which showed senescence. Many of the virile races of animals in the past were also subject to disease. The paleontological indications of senescence are the reduction in size, the loss of vigor and the production of apparently useless spines as seen in the races of animals which have become reduced or extinct, such as the crinoids, trilobites, brachiopods, ammonites and the dinosaurs. Other examples of senescence may be seen among some of the Permian reptiles which assumed bizarre forms. The tendency of many races of animals to acquire spinous and other useless excrescences of the hard parts shortly before the extinction of the group is noteworthy, and this tendency has been regarded by paleontologists as an indication of senescence.

LESIONS OF PARASITISM IN CARBONIFEROUS CRINOIDS

Our knowledge of the history of disease, as it is based on paleontological evidence, begins with the Carboniferous, when certain crinoids were afflicted in their stems with tumor-like lesions, possibly due to the parasitic action of myzostomids such as commonly attack crinoid stems today. A careful description of the enlarged stems of recent crinoids and the parasitic action of the myzostomids is to be found in the reports of the Challenger Exploring Expedition. A comparison of the ancient and recent lesions on the stems of crinoids leads one to accept the enlargements of fossil crinoid stems as due to the parasitic action of the myzostomids or some similar form.

The evidences for such a conclusion are, apparently, incontrovertible, and have been established by a number of writers on fossil crinoids. Parasitized crinoid stems are known from the Carboniferous of Scotland, Germany (Fig. 1) and the Keokuk beds (Fig. 4) of North America. Graff29 found the carbonized remains of the parasite in one of the enlargements (Fig. 2) which he studied and which he referred to as the fossilized integument of the myzostomid. The presence of this soft-bodied animal so early in the geological history of the world is not surprising, since from the researches of Walcott30 we know that jellyfishes, sea cucumbers, many types of annulates, and soft-bodied crustaceans lived during the Cambrian, many millions of years earlier. The parasitism of animals during the Carboniferous was preceded by partial parasitism or commensalism of the earlier periods, and is known to have occurred among fossil corals (Fig. 3) of the Devonian. The intimate association of animals and the origin of parasitism and commensalism during the early part of the Paleozoic has been studied by Clarke.31 The reader is referred to his paper for further details.

28 This suggestion has been discussed by René Larger in his paper “La contre-évolution où dégéné­trésence par l’hérédité pathologique cause naturelle de l’extinction des groupes animaux. Essai de pale­opathologique générale comparée,” 1916, Bull. et mèm. Soc. d’anthrop. de Par.
The remains of the early vertebrates prior to the Permian have shown no noteworthy pathological lesions. There may have been diseases among these early forms, but the lesions have not yet been discovered. We find, to be sure, certain laterally compressed fishes preserved in the attitude of the opisthotonos and pleurothotonos in horizons prior to the Permian. These attitudes may have been due to spastic distress induced by cerebrospinal infections or to some form of poisoning. Since this subject will be more fully treated elsewhere nothing more need be said than that these attitudes possibly represent diseased conditions of the central nervous system.

PATHOLOGY OF THE PERMIAN VERTEBRATES

Several pathological conditions are indicated among the vertebrates of the Permian. Renault has described caries of certain fish bones preserved in coprolites from the Autun basin. He concludes that this type of caries is due to several types of bacteria which he has described and figured. A left radius of *Dimetrodon*, a primitive reptile, from the Permian of Texas shows an incompletely healed fracture (Fig. 5) with abundant osteosclerosis and some intermediary callus. *This is the oldest known case of fracture.* It was a simple fracture cutting the bone at right angles, and the healing process has taken place with very little shortening. The bone has no medullary cavity, so that attempts to study the nature of the fracture by means of the x-ray have been a failure. The Texas red beds, from which the bone comes, are impregnated with iron, and the radius reacts to the x-rays much as a bar of iron would. A fractured rib with an old callus is also known from the Permian of Texas. A description of this lesion with illustrations is to be found in *The Surgical Clinics of Chicago*, April, 1918. Von Huene has described the skull of a phytosaur from the Triassic of Germany, showing a fractured snout with many necrotic sinuses.

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DISCUSSION OF GRAPH SHOWING INCREASE OF DISEASE IN GEOLOGICAL TIME

It is not necessary at this time to go into further details concerning the progress of disease, since the details are to be given in a later paper. The accompanying graph (Fig. 6) will show how, according to present evidences, disease has progressed during the geological history of the earth. The twenty-five divisions on the base line a-d (Fig. 6) represent as many periods of the earth's history. The divisions on the vertical line d-b represent the approximate number of diseases present in each period, as indicated by the known fossil lesions. The time intervals in the graph are shown as of equal value, but the geological periods are not at all of equal duration nor of equal character. This should be kept in mind in studying the graph.

At the point "a" we may say that organic life is first known. It will be seen that the line "a-b," representing the history of disease, follows a base level for the first twelve periods of the earth's history. Then the curve gradually rises until, during the Cretaceous, at "c," diseases and accidents—such as caries, osteoperiostitis, deforming arthritides, necroses, hyperostosis, osteophytes, osteomata, fractures—and many infective processes, reached a maximum of development among the dinosaurs, mosasaurs, crocodiles, plesiosaurs, and turtles. The curve suddenly and sharply descends from "c." For with the close of the Cretaceous and the sudden extinction of large groups of the giant reptiles, the incidence of disease also decreased. It seems quite probable that many of the diseases which afflicted the dinosaurs and their associates became extinct with them.

The mammals of the Cretaceous and early Tertiary periods (Fig. 7) do not seem to have been so generally afflicted with disease as were the preceding groups of giant reptiles, nor as were the later mammals. The ascending curve therefore is not so abrupt as one might expect. Certain processes of disease seem to have been acquired by the mammals from preceding forms, for caries and other primitive diseases are evident (Fig. 8) among early Tertiary mammals. The curve rises rapidly, however, and reaches the highest point at "b," indicating that disease is much more prevalent at the present time than ever before in the history of the world.
The geological development of disease has certain curious characteristics which parallel facts in the evolution of animals and plants. Huxley many years ago called attention to geological antiquity a few can certainly be called "persistent or primitive types which have remained the same since the close of the Paleozoic. Other diseases arose and became extinct, but some of them have retained the same characteristics, as seen in the resulting changes of structure.

According to present evidences, disease 

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**Fig. 7.** The skeleton of an early Tertiary mammal, *Titanotherium robustum*, from the White River Oligocene of South Dakota, as it is mounted in the American Museum of Natural History. The fifth rib on the right side has been fractured and has healed with a pseudarthrosis and considerable callus. The details are shown in the enlarged sketch in the lower right hand corner. One-sixteenth natural size. (Courtesy of Dr. W. K. Gregory.)

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**Fig. 8.** Two views of the mandible of a three-toed horse, *Merychippus campestris*, from the Miocene, about one and one-half million years old. The figures show in the absorbed alveolar margins pathological processes similar to alveolar pyorrhea of the present day. A left premolar shows evidences of caries, and the swelling in the left ramus, so evident in the right-hand figure, is indicative of a fistula, possibly indicating the presence of *actinomycosis* in the early stages. (Courtesy of Dr. W. D. Mathew)
Fig. 9. Lateral view of a dorsal vertebra of a saber-toothed cat, Smilodon, from the Rancho la Brea asphalt beds, Pleistocene, of California, showing the characteristic lesions of spondylitis deformans. Natural size. About 500,000 years old.

Fig. 10. Posterior view of a dorsal vertebra of a cave bear, Ursus spelæus, from Europe, showing characteristic lesions of spondylitis deformans. Natural size. About 250,000 years old. (After Mayer.)

Fig. 11. Spondylitis in the lumbar vertebra of an ancient Egyptian. About 5,000 years old. (After Ruffer.)

Fig. 12. Spondylitis deformans in a recent human vertebra. Natural size.

These four figures show the characteristic lesions of this osteoarthritis at different periods of the history of animals and man. So far as external appearances go there has been no change in the pathological processes producing these lesions since the Pleistocene at least. Similar lesions of greater antiquity have not yet been seen.
is, from the geological standpoint, of relatively recent origin and has afflicted the inhabitants of the earth for only the last one-quarter of the earth’s history—that is, for the last 25,000,000 out of a possible 100,000,000 years. Future discoveries will doubtless modify our present conceptions, but the above outline is a summary of our present knowledge of the rise and development of disease among animals.

**Tabulation of Geological Evidences**

The table given below will show at a glance the antiquity of pathological evidences in geological history. The estimates of time are based upon the relative thickness of the pre-Cambrian and post-Cambrian rocks, after Walcott and Schuchert, as given by Osborn in his “Origin and Evolution of Life.” The estimates of the duration of the geological periods vary greatly. The duration of the Proterozoic was as great, probably, as all post-Cambrian time, which has been estimated as high as 100,000,000 years. A study of radioactive substances gives estimates as high as 1,600,000,000 years for the duration of the Archeozoic, although Walcott estimates that only 70,000,000 years have elapsed since the beginning of sedimentation. While authors vary greatly in their estimates, they all agree that the duration of geological time has been very great, running into many millions of years. The estimates given in the first column of the table are extremely conservative. I have followed Osborn in this column. In the second column a much greater estimate is given. The table will show the relative antiquity of various diseases, whatever values are assigned to the time estimates.

**Fossil Pathological Lesions**

The following annotated list and illustrations of fossil lesions will indicate the extent of diseases among fossil vertebrates. The study of these lesions is by no means complete, and other pathological processes will doubtless be indicated as the study of them progresses.

1. **Caries** is very common among fossil vertebrates and has been described by Renault as occurring among Permian fishes, 20,000,000 years ago. A large marine reptile, from Belgium, one of the Cretaceous mosasaurs, according to Abel, shows in the left mandibular ramus extensive evidences of the ravages of this disease. In an early Tertiary species of the three-toed horse (Fig. 8), the mandible has been affected by caries and possibly also by actinomycosis, as well as some necrotic process which has resulted in the exposure of the roots of the teeth and the absorption of the alveolar margins, similar to the results of **pyorrhea alveolaris**. Caries has been noted also in the tooth of a mastodon, and in the early cave bears (Fig. 13) of Europe. The early races of men were singularly free from this disease as evidenced by the fossil remains.

2. **Pyorrhea Alveolaris**, or some similar pathologic process, is especially evident in the absorbed alveolar margins and in the loosened teeth of a three-toed horse (Fig. 8) from the Miocene of North America. It is also extensively indicated in the mandibles of the European cave bears (Fig. 13), and in a Cretaceous mosasaur from France.

3. **Deforming Arthritides** are fairly common among fossil vertebrates and indicate a variety of pathologic conditions.
### Geological Evidences of Paleopathology

<table>
<thead>
<tr>
<th>Millions of Years</th>
<th>Time</th>
<th>Eras</th>
<th>Geological Periods</th>
<th>Chief Animal Groups</th>
<th>Evidences of Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,000,000 to 10,000,000 years</td>
<td>Cenozoic</td>
<td>Quaternary</td>
<td>Age of Man</td>
<td>Abundant lesions on fossil and subfossil human remains</td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td>Tertiary</td>
<td>Age of Mammals</td>
<td>Numerous diseases represented on animal remains from the deposits of the period</td>
<td></td>
</tr>
<tr>
<td>6,000,000 to 12,000,000 years</td>
<td>Mesozoic</td>
<td>Cretaceous</td>
<td>Age of Reptiles</td>
<td>Lesions on the bones of mosasaur, dinosaurs, pliosaur, turtles, crocodiles, pterosaur, and other reptiles representing diseases similar to the modern forms of periostitis, hemangiomma, necrosis, caries, pyorrhoea alveolaris, arthritides, fracture with callos, pachyostosis, osteoma, opisthotonos, and other lesions which cannot be interpreted.</td>
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<td>10</td>
<td></td>
<td>Comanchian</td>
<td>Jurassic</td>
<td>The lesions known represent dental caries, pyorrhoea alveolaris, fracture, callus and parasitism. These periods witnessed the beginnings of disease. Bacteria and fungi were abundant.</td>
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<tr>
<td>15</td>
<td></td>
<td>Triassic</td>
<td>Permian</td>
<td>No evidences of disease are known from these periods. Beginning of dependent life.</td>
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<td>20</td>
<td></td>
<td>Paleozoic</td>
<td>Devonian</td>
<td>Age of Fishes</td>
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<td>25</td>
<td></td>
<td></td>
<td>Silurian</td>
<td>Age of Invertebrates</td>
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<td>30</td>
<td></td>
<td></td>
<td>Ordovician</td>
<td></td>
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<td>35</td>
<td></td>
<td>Proterozoic</td>
<td>Keweenawan</td>
<td>First known fossils</td>
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<tr>
<td>40</td>
<td></td>
<td></td>
<td>Animikian</td>
<td>Bacteria (non-pathogenic)</td>
<td></td>
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<tr>
<td>45</td>
<td></td>
<td></td>
<td>Huronian</td>
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<td>50</td>
<td></td>
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<td>Algomian</td>
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<td>55</td>
<td></td>
<td></td>
<td>Sudburian</td>
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<tr>
<td>60</td>
<td></td>
<td></td>
<td>Archeozoic</td>
<td>Paleolaurentian</td>
<td>No life known</td>
</tr>
</tbody>
</table>
Arthritides are especially common in Pleistocene mammals. The most prominent case of a deformed joint is the case of two caudal vertebrae (Fig. 14) of a large dinosaur, the interarticular surfaces of which have been extensively deformed and surrounded by a huge exostosial growth.

The mass resembles closely the tumor-like masses seen on oak trees. It entirely encircles the vertebrae and has involved fully half of the two bones. The dark line running vertically in the middle of Fig. 14 indicates the point where the normal union of the two vertebrae would occur, but all evidences of separate structures are obliterated, and the two vertebrae are fused into a single mass. The specimen has a length of 26.5 cm. and a weight of 5.1 kg. The circumference of the normal articular surface of one of the vertebrae measures 27 cm., and the same measurement around the middle of the tumor-like mass is 38.5 cm. The lesion has involved a length of 12 cm. Its surface generally is rather deeply pitted. There is an unusual ventral growth, which is shown in its normal condition in Fig. 15 at "A." This bony process, "the chevron," which served to protect the caudal vein and artery, is commonly present in the tail of these reptiles. The growth of the diseased portion is unequal and has involved more of the vertebrae on one side than on the other; likewise, the growth has attained greater lateral dimensions on one side.

The enlargement is somewhat suggestive of the lesion of chronic osteomyelitis. It may be a callous growth, possibly due to a fracture of the caudal vertebrae; or it may be a bone tumor. The character of the lesion is naturally problematic, but it is interesting that pathological growths in the
early geological periods so closely resemble the lesions of today. Section of the tumor mass shows the presence of numerous vascular spaces, so that in this respect it resembles a hæmangioma. Microscopic study of the periphery (Fig. 16) shows the presence of well-developed Haversian systems of osseous lamellae.

The bones exhibiting these interesting indications of Mesozoic pathology are the caudal vertebrae of a huge land reptile, one of the sauropodous dinosaurs, possibly Apatosaurus. The position of these bones in the body of the animal is indicated by the arrow in Fig. 17. The sauropodous dinosaurs were the most gigantic of all land vertebrates, although not nearly so large as some of the modern whales. The largest of these reptiles attained a length of nearly 70 feet and an estimated weight of 39 tons. The head was approximately the size of that of a modern draft horse and the contained brain was no larger than one’s fist. The lumbar intumescence, however, was ten times the size of the cephalic portion of the nervous system, or at least the subdural space was. Whether the nervous material filled the entire cavity or not is unknown. The animals lived, possibly, in the swamps and low-lying rivers, feeding on the succulent vegetation, and are said to have been capable of attaining the ripe age of 1,000 years. Diseases are rarely seen on fossil dinosaur bones, in spite of the great abundance of their remains.

The tail in some of these large animals was very long and slender, and it may have been used in swimming, as a muskrat uses his today. The terminal caudals in some species were reduced to mere slender rods of bone, so that a fracture or an injury of
any kind in this region could easily occur. Aside from possible blows from the head, the dinosaur to which the above described vertebrae belonged was entirely defenseless. The tail, for example, might be seized by one of the carnivorous dinosaurs and vigorously chewed for some time before the owner of the tail was able to turn his huge body and knock the offender away.

Lesions of a similar nature, but not so well developed, are known to occur in the tail of *Cetiosaurus Leedsi*, an English dinosaur; and Hatcher has described the same lesions in the tail of *Diplodocus*. A fuller discussion of these lesions is reserved for another time.

The nature of the above-described lesion is such that it may have been due to bacterial activity, and suggests, at any rate, the presence of pathogenic bacteria in the early part of the Cretaceous period. Bacteria and primitive fungi have, indeed, been described from much older periods. The best account of their occurrence is contained in "Microorganismes des combustibles fossiles," by B. Renault. Renault has described and figured many forms of bacteria and fungi in the fossilized feces (coprolites) of fishes, in fossil wood, and in coal. He has also discovered in the teeth of some ancient fishes what he regards as indications of the activity of organisms which have produced results similar to caries. He shows in one of his plates photomicrographs of fossil bone from the petrified feces in which the ravages of the bacteria, Micrococcus are evident in the canaliculi and the bone corpuscles, which appear in various stages of destruction.

Other deforming arthritides are represented by the arthritic condition sometimes spoken of as rheumatoid arthritis which has been noted by Virchow in the cave bears, by other observers in certain fossil human skeletons, in the famous Lansing man of Kansas, and it is probably indicated in the Cretaceous mosasours, where a well-developed osteoma accompanied the arthritic inflammation.

4. Osteomyelitis is probably indicated in the dinosaurian caudals figured herewith and in certain phalangeal elements of a gian wolf from the Pleistocene of California.

5. Eosxtoses due to trauma, indicated as callous growths around fractures of ribs and limb bones, or as outgrowths due to chronic irritation or infection, are fairly common among fossil vertebrates. Healed fractures (Fig. 7) are very common among mammals and are occasionally seen among fossil reptiles. Dinosaurs exhibiting broken ribs, vertebrae, and horn cores attest the accidents or fights which caused these traumatic conditions, and has led Abel to infer that the males of these animals contested during the breeding season for the female. An exostosis which is especially clearly marked is evident on the inner or visceral surface of a dinosaur scapula, where it takes the form of a hook-like process, evidently due to chronic irritation. An exact duplicate of this lesion may be seen on a recent human femur. One of the most perfect exostoses is seen in a mosasaur from the Cretaceous of Kansas where there is a decided lump at the articular surface between the third and fourth dorsal vertebrae, resulting in what is probably the only known fossil osteoma. Curious exostoses which are bilaterally symmetrical occur on the radii of an Oligocene dog, the skeleton of which is in the Carnegie Museum of Pittsburgh.

7. Osteosarcomata have not been positively identified among extinct animals, but the condition is suggested in several instances. Esper, in 1774, described what he thought was an osteosarcoma in the femur of a cave bear, but Mayer, who studied...
the specimen later, suggested that it might have been a fracture with callus and necrosis.

8. Fistulae are evident in the lower jaw of an ancient and primitive whale from the Eocene of Egypt, and an enlargement of the mandible of a three-toed horse from the Miocene of North America indicates the presence of a fistula, possibly due to actinomycosis, in its early stages. Dental fistulae are occasionally seen among the known remains of fossil man, often resulting in the loss of teeth.

9. Rickets is indicated, according to Abel, among the apes which are found mummified in the old Egyptian graves.

10. Necroses, due possibly to a variety of causes, and attributed by certain French writers to tuberculosis, are fairly common among fossil vertebrates. A marked necrosis of the ilium of a large dinosaur, accompanied by expansion and thickening of the bone, is evident in the mounted skeleton of Camptosaurus on exhibition at the National Museum in Washington. A mosasaur bone from the Cretaceous of Kansas and certain crocodile limb bones from the Jurassic of England show lesions of a necrotic nature. The assignment of any of the lesions to a definite cause is manifestly impossible, and while tuberculosis has been suggested as a possible cause, the diagnosis is so uncertain as to be nearly worthless. In the crocodile skeleton, above referred to, there is abundant evidence that the infection, the focus of which was in the pelvis, was carried by metastasis to the bones of the palate which were also involved, as well as other parts of the body.

11. Hyperostosis or Pachyostosis, which is similar to the enlargement of the bones in Gigantism, is indicated as thickened and enlarged portions of the skeleton. This condition has been detected in certain fossil Paleozoic fishes and Mesozoic reptiles, some of them of great geological antiquity. A genus of fossil whales, known as Pachycanthus, has the neural, vertebral spines very greatly enlarged and swollen.
Fig. 19. Microscopic section of one of the lesions from the surface of the humerus, Fig. 18, showing bundles of perforating fibers of Sharpey, osseous lacunae, and vascular openings. The large clear space at the upper portion of the picture is a vascular opening filled with calcite crystals. 300 diameters.

A similar condition is seen in the skeleton of a Triassic nothosaur. We are not justified in stating on these evidences the presence of pituitary disturbances in ancient animals, but further studies in this line may add very interesting data.

12. OSTEOPERIOSTITIS or some similar disturbance is the result seen in the arm bones of a mosasaur from the Cretaceous of Kansas (Fig. 18). The articular surfaces are very greatly roughened and the surfaces of the bones are covered with smooth, somewhat flattened excrescences, possibly due to a subperiosteal irritation. The lesions have been observed in no other instances, so that no comparative statements can be made. Microscopic study of the peripheral lesions reveals many interesting histological details. One area shows typical osteoid tissue, similar in all essential respects to osteoid tissue developed in a human humerus in a case of osteomyelitis. Other areas, such as the one figured (Fig. 19), show perforating fibers of Sharpey, as seen in the dark bundles, and the nature of the osseous lacunae. The whole section is filled with vascular spaces. An especially large one, filled with calcite crystals, is seen in the upper portion of the picture. There are no apparent Haversian systems or canals. Whether this is due to the pathology of the bone or whether it is an occurrence in normal bone of the mosasours will be determined later by microscopic study of the normal tissues.

13. OPISTHOTONUS and the allied phenomena, pleurothotonos and emprostonos, are quite frequently seen among fossil vertebrates. It has been suggested elsewhere that these attitudes represent possible cerebrospinal infections or other neurotoxic conditions, and they must be considered in connection with the study of disease among fossil animals. The skeleton of the small dinosaur, Struthiomimus altus (Fig. 20), described by Osborn, shows a very well-developed condition of opisthotonos, with the head thrown sharply back, the tail strongly flexed, and the toes contracted and appressed. The whole attitude strongly suggests a spastic distress, possibly brought on by some form of poisoning of the central nervous system, from infection or the deglutition of some poisonous substance.

14. OSTEOMALACIA is evidently the cause of the hypertrophy of the bones of Lirnocyon potens, an early carnivore from the Washakie Eocene of Wyoming, nearly 3,000,000 years old.

MATERIALS AND METHODS

The material described in the present paper has been loaned the writer for description by the Field Museum of Chicago.

36 This subject has been discussed at length by the writer, in "Opisthotonos and Allied Phenomena among Fossil Vertebrates," American Naturalist, 1918.

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by the American Museum of Natural History of New York City, by Walker Museum of the University of Chicago, and by the University of Kansas Natural History Museum. made by the well-known petrographic methods so common in all geological laboratories. The diagnoses, where they are attempted, are made from comparisons of the

Fig. 20. The skeleton of *Struthiomimus altus*, a small dinosaur from the Belly River series (Cretaceous), Red Deer River, Alberta, Canada, now regarded as of approximately the same age as the Judith River series. The unique feature of the skull is the total absence of teeth, with a size of skull one-third larger than the ostrich and a length of body of about fifteen feet. The position of the skeleton is decidedly that of the opisthotonos which may be regarded as an indication of disease. (After Osborn).

A beautiful specimen of an osteoma, the only one known so far, on the vertebra of a Kansas Cretaceous mosasaur, was given the writer by Dr. J. M. Armstrong of St. Paul. The writer expresses his obligations to the gentlemen connected with the above-mentioned institutions and to Dr. Armstrong.

The methods used are a combination of procedures in the various lines involved. Microscopic sections, which can be made thin enough for immersion lens study, are material with similar lesions in recent human material; but strict diagnosis has not been attempted. We must have some name for the lesions, so the terms used must be regarded as suggestive rather than an accurate statement of conditions. The interpretation of the lesions in the fossil material is a matter of experience with fossil remains. The author feels that twelve years experience in the study of fossils should be sufficient to avoid most of the usual pitfalls.
PLAGUE TRACTATES

By DOROTHEA WALEY SINGER AND REUBEN LEVY

OXFORD, ENGLAND

I. Introduction

During the later middle ages and earlier renaissance, and especially during the one hundred and fifty years that succeeded the visitation of the Black Death of 1348, Europe was repeatedly devastated by waves of pestilence that swept over the continent, usually in the direction from the East and South towards the West and North. These terrible epidemics left deep their stamp on the literature of the period— theological, political, and medical. The contemporary medical writings on the plague consist mainly of short treatises or tractates.\(^1\) They are to be found in every European language and several of them have been translated into Hebrew.\(^2\)

Among the most influential and widely circulated of the plague tractates was one written in 1365, which professes to be the work of John of Burgundy, otherwise known as John à la Barbe.\(^3\) This has been printed several times, and recently a French version has been published from a manuscript dated 1371—only six years after the original issue of the work.\(^4\)

The tractate professes to be the third by its author on the same subject. He gives the “incipit” and subject matter of his previous works on the plague, which he describes as well known, but so far they have not been satisfactorily identified, if, indeed, they ever existed outside the imagination of the old physician.

After an astrological introduction to the work, the author describes himself as “Jo-han de Bourgogne, otherwise called à la Barbe, citizen of Liège and professor of the art of medicine, though the least of all physicians”. This last tribute to modesty

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\(^2\) Besides the plague tractate, of which the Hebrew version forms the subject of this paper, Hebrew versions of the plague writings of Antonio Cerisone, Francesco da Gagnili, Gentile da Foligno, Antonio Guainerio and Pietro de Tussignano are noted by M. Steinschneider in “Die Hebräischen Uebersetzungen des Mittelalters und die Juden als Dolmetscher”, Berlin, 1893, pp. 790–1, 799–800, 804, 818, etc.; and in *Il Buonarroti*, Rome, 1876, vol. xi, pp. 113–114. Doubtless an examination of the manuscripts of the great libraries would reveal more of these Hebrew versions and translations.

\(^3\) Not to be confused with Giovanni Borgondio of Pisa (died 1190), who translated Galen’s “*De Regimine Sanitatis*”.

\(^4\) Dorothea Waley Singer, *loc. cit.*, Appendix.
he takes care to discount by frequent allusions to his success and long experience. The influence of this text may be traced directly and indirectly in many fourteenth and fifteenth century works on the plague. One, that was immensely popular throughout England, bears in most versions the name "John of Bordeaux, a noble physician". This "John of Bordeaux" is often confused with the above-mentioned "John of Burgundy", whose work appears to constitute his sole source.

Five Hebrew texts have been described as versions of the tractates, either of John of Burgundy or of John of Bordeaux. Before examining these texts we will summarize for the reader the evidence as to the identity of John of Burgundy, who, it will be shown, had almost certainly a share in the authorship of the "Travels of Sir John Mandeville".

II. SIR JOHN MANDEVILLE, JEAN DESPREIS

From the fifteenth to the eighteenth century the identity of the author of the famous "Travels of Sir John Mandeville", with a certain Liège physician described as Bearded John of Burgundy, was too universally accepted to excite discussion. In the Guillelmite manuscript of the "Myreur des Histor" of Jean des Preis, dit d'Oultremeuse, clerk and notary at Liège, and Audencier in the Court of Justice (born 1338). It is here recounted that on his death-bed the physician, Jean de Bourgogne called à la Barbe, revealed himself to d'Oultremeuse, declaring that he was none other than Sir John Mandeville, the famous English traveler, and that he had left his native land owing to having "had the misfortune" to kill a nobleman. The passage cited is from the fourth part of the "Myreur des Histor", now unluckily lost.

The evidence from the tombstone is supplemented by an extract from a fourteenth century manuscript of the "Myreur des Histor" of Jean des Preis, dit d'Oultremeuse, clerk and notary at Liège, and Audencier in the Court of Justice (born 1338). It is here recounted that on his death-bed the physician, Jean de Bourgogne called à la Barbe, revealed himself to d'Oultremeuse, declaring that he was none other than Sir John Mandeville, the famous English traveler, and that he had left his native land owing to having "had the misfortune" to kill a nobleman. The passage cited is from the fourth part of the "Myreur des Histor", now unluckily lost.

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Further circumstantial evidence seems to be offered by the “Travels” themselves. In the final chapter of the earliest Latin version we find a curious story which may be translated here:

“In the year 1355 of the birth of the Lord Jesus Christ I was staying in the city of Liège, and owing to the severity of my arthritic gout I lodged then in the street called Bassesauenyr. And I consulted various doctors of the town as to my convalescence, and it happened by the will of God that there came one physician more venerable than the others by reason of his age and grey hairs, and evidently expert in his art. He was known there as Master Johannes ad Barbam. And when I would have spoken also with him he intervened, and after some words he at length renewed the acquaintance that we previously had at Cairo in Egypt, at [the court of] the Soldan Calalxlich as I mentioned above, in Chapter VII of this book. And when he had most excellently demonstrated upon me his experience in his art, he urged me and did most instantly entreat me that I should set down in writing something of those things that I had seen during my travels throughout the world, that they might be read and heard for the benefit of posterity. So that at length, thus urged and with [his] help this treatise was composed. Nor indeed did I propose to write aught of it until at least I should have reached my native England.

“And I believe that by the providence and grace of God I attained that which was ordained for me. For from the time that I wrote it down our two kings of England and France have not ceased each in turn to perpetrate great destructions, depredations, ambuscades and slaughter, so that unless defended by God I should never have passed over without death or danger of death and many accusations. And now behold in the thirty-third year since my departure I am established in the city of Liège which is but two days’ journey from the English sea, and I hear that the hostile words of our rulers are by the grace of God reconciled. Wherefore I hope and propose for the rest, as befits my ripe age, to be enabled to turn to my own land for the ease of my body and the health of my soul.”

If we turn to Chapter VII of the work we find a description of the first meeting between Mandeville and the physician in Cairo, and we are assured “Long afterwards and in a far distant place, viz., the town of Liège, exhorted by this venerable man and with his help, I composed the manuscript was known to exist as late as 1750. Our extract was first made from the manuscript by Louis d’Abry (1643–1726), Herald and Archeologist of Liège who, however, modernized the language. Bormans states that this modernized version of d’Abry is to be found in the Library of Count d’Outremont, where it bears the number “66”. It was copied by Jean Gilles Le Fort, Herald of Liège from 1682 until 1718 or perhaps by Jean Henri Le Fort who occupied the office until his death in 1751. The passage is cited by Bormans from the “Le Fort Manuscripts”, Series ii, vol. xxvii, p. 102, forming part of the Liège archives. For details of the Lefort family, see S. Bormans in Bull. de l’Inst. Archaeologique Liégeois, vol. iv, Liège, 1860, p. 319.
present treatise as I will narrate fuller at the end of this work."

With the exception of a few medical recipes at Heidelberg and in the Bodleian Library, the only work, besides the "Travels," hitherto known as bearing the name of "Sir John Mandeville" is a lapidary. In the Amiens fifteenth century manuscript of the "Travels", this "Lapidary" is given as a sort of postscript under the name, not of "Mandeville", but of "Johans à la Barbe". Thus immediately after the Explicit of the "Travels" we find:

"Chy comenche Ie Iapidare maistre Johans à la Barbe",

while the explicit at the end of the whole codex runs:

"Chis Iibre est appelleis Ie Livre Johans de Mande Ville, chevalier qui fut fait, escrit, copilie et extrais hors d’une auttre en la ville de Hutton, par le


Hénàux, Bull. de l'Inst. Archéologique Liégeois, Liège, 1860, vol. iv, p. 159, quotes a similar passage from a French manuscript since lost (No. 360 of Liège University Public Library, fol. 118). This French version described the physician as "maistre Johans de Bourgogne dit ale barbe". It gives 1336 for the year of the composition of the "Travels," "in the 34th year of my wandering". Hénàux also cites a Latin version of Martins dé Alost, of the year 1491, as describing the same incident. The story appears again in a fifteenth century French manuscript version of the "Travels" in the Public Library of Amiens, manuscript Fonds Lescalopier 94 (5200). Our physician is here described as "uns venerable homme et discret, maistre Johans à la Barbe, phisiechiens", and the same dates are given for Mande-
vestigated by Professor Paul Hamélius, whose weighty opinion supports the suggestion first made by Warner, that Jean des Preis, dit d'Oultremeuse, was himself largely responsible for the "Travels". Professor Hamélius concedes, however, that the tombstone in the Guillemite monastery can hardly have been erected to a wholly fictitious character, and he accepts the hypothesis that most probably our physician, Bearded John, collaborated in the production with his friend and fellow townsman, Jean d'Oultremeuse. This hypothesis perhaps gains further support by the fact that d'Oultremeuse was himself the author of "Le tresorier de philosophie Naturelle des pierres précieuses". At the end of this work is a list of philosophers in which we read, in almost the same words used in the "Myreur des Histors" of the "noble homme, seigneur Jehan de Mandeville, chevalier, seigneur de Montfort, de Castelpereuse et de l'isle de Campdi" who fut en Orient et es parties par della par longtemps, si en fist unq lappidaire selon l'oppinion des Indois". May we not perceive the Liège notary enjoying a quiet chuckle as he penned these lines?

It would be interesting to compare the two manuscripts of the Lapidaire d'Oultremeuse with the "Lapidary of Mandeville", with a view to ascertaining whether the internal evidence for common authorship, as well as common sources, is as strong in the case of the "Lapidaries" as in that of the "Travels" and the "Myreur des Histors". Professor Hamélius suggests that the joke of d'Oultremeuse was perhaps


18 No such places as Campdi or Château Pérouse have been traced, but as regards the title "Comte de Montfort", Warner makes the ingenious suggestion that perhaps this was a misinterpretation for "du Comte de Hertford". Mandeville calls himself in the prologue to the "Travels" a "chiualer ... neez ex norriz Denglaterre de la ville Seint Alban". The monastery of St. Albans in Hertfordshire used to show precious jewels which it claimed to have received from the author of the "Travels" and of the "Lapidarium". Early records of the monastery claim "Johannis de Mandeville, miles Anglicus, in villa Sancti Albani oriundus" (E. A. Bond, "Chronica Monasterii S. Albano a Johanne Amundesham monacho", London, 1871, vol. iii, p. 306. Appendix E from a number of tracts, probably by Thomas Walsingham who continued the Chronicon. Both the works of Bond and Riley form part of the "Chronicles and Memorials of Great Britain and Ireland during the Middle Ages", published by the Master of the Rolls.)

In the seventeenth century John Weever, while recording the claim and setting down the St. Albans epitaph, remarks of Mandeville "That he was born here in this towne I cannot much deny; but I am sure that within these few yeares, I saw his tombe in the City of Leeege, within the church of the religious house of the "Guillumites. ..." (John Weever "Ancient Funeral Monuments within the United Monarchie of Great Britain, Ireland and the Islands adjacent", London, 1631, p. 567.) Speaking apparently of St. Albans, Weever adds: "The churchmen will shew you here his knives, the furniture of his horse, and his spures, which he used in his trauells". F. Hénaux, loc. cit., tells us on the other hand that the knight's trophies of travel had been treasured and exhibited at their convent by the Guillemite brothers.

We may indeed concur with the opinion of Charles Ellis, who wrote in 1699: "At Leige is Sir John Mandeulil's Tomb, whose Epitaph is also at St. Albans with us, which may be hard to be reconciled" (Phil. Tr. Roy. Soc. 1703., vol. xxiii, No. 286, p. 1418).
taken seriously by pious descendants of our Liège physician, who may have erected the Guillelmite tombstone in a mistaken belief in their exalted ancestry.20

Are we then to place no credence in the "knight’s" romantic story of his flight from England? Perhaps it may have at least been suggested by the experience of John of Burgundy himself.

The internal evidence of the "Travels" indicates a certain knowledge of the middle English language of the period.21 Moreover, it is remarkable that a certain "Johan de Burgoyne, chamberlain" (to John de Mowbray), does figure in the civil disturbances in England during Edward II's reign, and that the pardon previously granted to him was revoked in May, 1322,22 the very year, according to the "Travels", of the author's departure from England. The author of the "Travels" speaks of "anno egressionis meae 33".

On referring, however, to the records in the Parliamentary Writs, we find a curious coincidence. Among the list of those whose pardon, granted in August, 1321, was revoked in May, 1322, there occur the following three names: "Johan le Barber de Catthorp," "Johan Mangevilayn . . .", and "Johan de Burgoyne, Chamberlayn". These and similar names indeed dog one another in English annals of the period as though for our special confusion.23

But on the whole, the great balance of evidence does point to a real John of Burgundy, otherwise known as La Barbe, as having shared with d'Oultremeuse in the authorship of the work attributed to Sir John Mandeville, while it seems not improbable that this physician of Liège did originally hail from England. It is not without interest to recall that it was during the latter half of the fourteenth century that Queen Philippa's weavers were established in England. Already we may observe industry sharing with scholarship in the slow task of pioneering international amenity, and during the years when our physician was a figure of some little importance in the town of Liège, the Low Countries, on their part, were laying the foundation of a new industry in Great Britain.

20 It has even been surmised that possibly the name "Mandeville" was suggested to the authors of the "Travels" by the contemporary work of Jean du Pin, "Mandevie," which describes a voyage of exploration through the moral world, somewhat parallel to Sir John Mandeville's journeys over the terrestrial globe.

21 Warner, loc. cit., p. 71; British Museum MSS. Egerton 1892, fol. 60; Harley No. 4383; chap. xv, Cotton MSS., Titus, cxvi, fol. 60.


23 Thus in a list of horses and their owners, in 1298, we find "Johannes de Maundevill . . . habet unum badium," and "Dominus Johannes Bourdun habet 3 equum" (H. Gough, "Scotland, in 1298", Paisley, 1888, p. 163). But if we identify this "Johann de Mandeville" with the bearer of that name recorded in other contemporary documents, we find that he could hardly have survived until 1372. (Cf. C. Roberts: "Calendarium Genealogicum", London, 1865, vol. 1, p. 240, and Morant: "History and Antiquities of Essex", London, 1768, vol. 2, p. 123.)


We do not give details of the later confusion of "Mandeville" with "John Manduith", fellow of Merton College, Oxford. The source of this error is probably the entry under Mandeville's name in J. A. Fabricius Bibliotheca Latina Medii et Infimae etatis, Hamburg, 1734, vol. iv, p. 280, and subsequent editions. Three works of Manduith are, probably by a printer's carelessness, here attributed to Mandeville: tabulae astronomicae de chorda recti et umbra de doctrina theologica.

There is a quite separate entry for Manduith himself and the three works are duly given in it as his productions. Subsequent copyists overlooked the entry under "Manduith" and attributed the works to Mandeville. The error is perpetuated by Bormans.
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III. Hebrew Versions, now in the Bibliothèque Nationale, of the Plague Tractate of Bearded John

Paris Bibliothèque Nationale, Fonds hébreu 1191 (viii) and Fonds hébreu 1124 (vi a)

Both the manuscripts here translated are now in the Bibliothèque Nationale, at Paris. Though each contains only a fragment of John of Burgundy's Treatise, it will be seen that the two combined present an almost complete version of the work. We have been unable to obtain any information as to R. Benjamin ben Isaac of Carcassonne, described as the translator of MS. 1191 (viii). Both manuscripts are on paper. Zotenberg ascribes MS. 1191 (viii) to the fifteenth century, and MS. 1124 (vi a) to the sixteenth century. We reproduce the first page of each:

Paris Bibliothèque Nationale
Fonds hébreu 1191 (viii)
[Ancien Fonds 404] folio 141 Verso

A Very Noble Treatise on Corruption of the Air and on the Pestilence (Fol. 141, Verso)

GENERAL INTRODUCTION
(Fol. 97, recto line 13)* In the course of time air is corrupted, and it becomes plague-stricken. However, I do not say that the air becomes corrupt in its essence—for it is an elementary substance—but it is because of vapours which are mingled therewith that the air is called corrupt. Plague results therefrom in many countries, and in many places there still remain traces of the Plague. And this is clear from the fact that many men die, being full of evil humors.

* The references to the original manuscript which appear in this article in italics are to the French version of the Treatise, dating from 1371, published in Proc. Roy. Soc. Med., loc. cit. The references in lower case letters are to the Hebrew MSS.

Plate I. Facsimile from Bibliothèque Nationale, MS. Fonds Hébreu 1191 (VIII) fol. 141, verso.
The corrupt air alone is not the cause of pestilence, but it is the mixture of humours which fill the men that die. And Galen testifies thereto in his Book of Fevers, his words being: “know that the air receives no corruption, if the matter of the body be not prepared for the corruption or if it be not subjected to any corruptible thing, just as fire does not burn any matter save that which is prepared for burning, so the plague-stricken air does not harm the body unless it finds the matter prepared for corruption; so that bodies which are clean and have not neglected purging continue healthy. So, too, they continue healthy whose complexion 26 is contrary to that of the affected air. For if it were not so, the people would sicken and die wherever the air is plague-stricken. For the air so corrupted generates various diseases according to the variety of humours, for the agents always work according to the disposition of matter in the patient.”

Now there are many physicians who work with abstract wisdom (noon) but are little skilled in practice and are innocent and bare of the science of astrology, that science (Fol. 97, verso) being of supreme importance to the physician. As Hippocrates says in the book on Epidemics: “The physician that is innocent of astrology is worthless, [Fol. 142, recto] and no man should trust himself to be healed at his hands.” For in a man possessing both the science of astrology and the art of healing, the one corrects the other and each science derives much support from the other, for not everything can be explained in the same way.


25 Our Hebrew translation starts just after the opening of the Introduction, omitting the astrology.

26 Complexio — mixture of humours = temperament (temperare—to mix).
And I have proved, having been occupied in physic for forty years or more, that a remedy administered under an adverse constellation, even though it be according to the art of medicine and correctly compounded and ordered, will not act according to the purpose of the practitioner nor to the benefit of the patient. A case in point is that if a remedy be given as a laxative, the patient will vomit it even though in the ordinary course he would not reject the remedy.

So that he that has not drunk fully of the waters of astrology cannot help a sufferer, especially not against pestilential diseases. As the prince of physicians says: "How can I heal when I know not the cause of the illness?" So, too, Avicenna in his "Cures of Fevers" says: "He that is ignorant of the cause cannot use the correct remedy."

This, too, is what Averroës intends when he says in his "Physica" that knowledge is the recognition of near and remote causes. That being so, since the heavenly matters are amongst the primary causes, one must endeavour to acquire knowledge of them; and it will therefore be plain that without astrology the healing process will be inadequate. For this reason many are defeated owing to lack of counsel.

PERSONAL INTRODUCTION

(Fol. 98, recto) Therefore I, Giovanni of Bourgogne, of the province of Liège, professor of the lore of medicine and the least among physicians, in the days at the beginning of this Plague which came about in the year 22 of the Short Era, when it came on our borders, wrote a short treatise on astrology, together with this treatise of mine concerning the causes and the nature of this Plague, and many took copies of it. It begins thus: "My God, my God, etc."

And when I saw that this Plague returned anew and was destined in course of time to appear again continually—for no end of it had been reached, and being grieved at the dying of people and eager to make some attempt for their benefit, I composed (Fol. 142, verso) this work and called it "Ezer Elohim" [the Help of God].

My aim is to set out the prevention and cure of these diseases with completeness, so that scarcely any man may need a physician and that each may be his own physician, protector, guardian and guide.

First then we will speak of the fitting treatment.

He that desires to know my meaning with regard to the influence of the Heavenly matters and also of the terrestrial conditions let him see the aforementioned treatise which has been composed for these things.

And I, the least in quality and importance, Benjamin son of Isaac of Carcassonne, the translator, when I saw this treatise hidden away and sealed up in their stores, though tried and proved by noble
destroyed. The liver too discharges it into the groin. So also does the brain [to its emunctory].

**THERAPEUSIS**

*(Fol. 99, verso.)* By these following symptoms the physician may recognize these diseases and whence they arise. If the symptom is seen in the arm-pit the cure is to bleed speedily from that vein of the heart which is called *median* on the same side and not the one opposite. For through bleeding on the opposite, two inconveniences arise; the first that it empties out the good blood which has not yet been harmed, and the second that the poisoned blood crosses over by the sound channels and poisons the sound parts.

If it be in the liver, then bleed the basilic vein of the right arm; that is from the vein of the liver or from the vein of the arm which is called *salvatella*, and which lies between the little finger called *Zeretb* and the ring-finger called *Qemisab*.

If these superfluities travel within the body towards the groin and the membro virile— that is the male member—and towards the glandular surfaces of the groin, then bleed the vein of the foot on the same side— that is between the big toe and the next. For if you bleed from the arm on that side you bring up the poison to the noble organs, that is the upper organs. And this would be a grievous error, for you would increase and not abate the plague.

*(Fol. 134, recto.)* But if the symptom is far removed from the membro virile, then open the vein of the foot which is called *saphena*, near to the little toe and the next. Or else apply cupping-glasses to the legs close to the ankle.

If [the symptoms] appear in the parts belonging to the brain, at the back of the ear or at the throat, bleed on the same side from the cephalic vein, which is above the middle or *median* [vein], or in the hand between the thumb and the first finger.

Make deep (?) scarifications and [apply] cupping-glasses in order to remove the poison from the principal members. *(Fol. 100, recto.)* Strengthen nature with cold cordial electuaries, such as the following: Take powder of *diarrhodonre, abbatis, dragaganth, triasandal* and powder of [*?] *litbarge*, together with sucrum rosarum. The powders to be taken day and night.

The diet must be meager and the patient feed on small fowl and occasionally eat small fish roast on a griddle, and also green grapes. Tisane, too, is beneficial. If there is severe thirst give cold water and vinegar well mixed, and occasionally it is good to give a little more food and some pure white wine well mixed. On the affected spot put this unguent: Take trimitina 4 ounces, seed of *ruta* 1 ounce, root of *calamint* and *sambucus* of each 1 drachm, root of *seremion*—which is a kind of parsley—5 drachms. Pound them all to-
physicians, applied all my energies to redeem it from their hands and to translate it from their tongue into the Holy Tongue that it might be a help and glory to us and to them that follow us. Praise be to the Helper. Amen.33

PROPHYLAXIS
(Fol. 98, recto line 24.) I will begin by setting out the treatment as follows: It is good to guard against plethora of food and drink, to avoid baths and all such things that desiccate the body and open the pores; for the corrupt air enters by way of the open pores and so penetrates the body and corrupts it. For this reason also it is absolutely necessary to avoid coitus and to beware of eating fruits—if they are eaten they should be exiguous in quantity except they be sour fruits. It is good to partake only of easily digestible foods and wine of good flavour well diluted.

Every confection of honey must be avoided and every dish should be seasoned with vinegar.

In rainy and misty weather a fire should be made in the bed-chamber, and before he leaves the house in the morning or goes into an airy place the patient should use some fragrant medicament such as diambra, diamusk, or dianthus with musk philaris arquaticon, together with musk or the like. If he is too poor for this he should use cloves, macis, nux muscada, zedoary and other substances. He should take . . . 34

Pathological Theory, etc.

(Fol. 99, recto, line 19). If anyone fall into the sickness of the plague through the ill manner of his living, it is necessary speedily to give him some remedy because such epidemic sicknesses become confirmed after twenty-four hours. It is therefore necessary speedily to give some remedy and medicine.

You know that there are three principal organs in man's body, namely the heart, the brain, and the liver. Each of these, as you know, has an emunctory through which it discharges its superfluities; that of the brain is behind the ears, that of the heart is the arm-pit,37 and that of the liver in the groin.

You also know that the property of poison is to distress man's nature, as you know you can see in the bite of poisonous creatures. This poisonous air becomes mingled with the blood and with the vital spirit which is in the body and then immediately makes for the heart which is the foundation of our nature, in order to destroy and exhaust it. When the heart perceives this, it exerts itself violently to empty out the poisonous blood at its emunctory, and nature again attempts to send it into closed passages that it may not reach the heart.38 And sometimes it labours to discharge it and to send it on to the liver, which is the fundamental source of all the natural spirits; whereby nature would be exhausted and

33 This passage is not in the original French or Latin.

34 The text breaks off here and is followed on the next folio by a series of recipes written in the same hand.

35 This version starts in the middle of the work and finally reveals the part of the beginning.

36 "He it is who has ordained times"; i.e., times of sickness and also, no doubt, times of healing. But the author is thinking of the plague and has in mind Jonah of Psalms 9 and 10.

37 סֵפִּיק , Ditellus or Titillium of the Arabists Joseph Hyrtl: Das Arabische und Hebräische in der Anatomie, Wien, 1879. p. 64f.

38 This and the following sentence are rather differently turned in the French version, which omits the characterization of the liver as "the fundamental source of all natural spirits".
gether with oil of camomile and a little wax, pitch (here of the text is left untranslated) and resin. Make a little stiff unguent and apply to the spot three or four times a day. This plaister draws out the poisoned matter from the humours so that they do no harm to the principal members. Sometimes galbanum is added.

There is another tried and excellent powder for this, and one which is of greater benefit than theriac. It is (Fol. 100, recto, line 30) called amongst the infidels "the Emperor’s powder", which the Arabian emperors used in times of plague and also against all venom and poison and against snake bite and against any poison in the world. It is called in Arabic, Zinwar meaning “The Deliverer from Death.” This powder is compounded of the herb palamenon, that is [?] tigice, from another herb called philadia (some call it osilla nigra, others call it [?] gentian and still others clove)—some suggest turmintella or (here of the text is left untranslated) latipbaron, or bola armenic or terra sigillata. It can be said of all these herbs that they are most beneficial; they repel all poisons injurious to mankind and against snake bite, also taken internally or applied to the affected spot they draw out the poison as blood is drawn out by bleeding. This has been proved often and by many people; and although the men who understand these herbs have died out, there are said to be some people still in Leotida (Liege) who understand the herbs.

ASTROLOGICAL EPILOGUE

(Fol. 100, verso, line 15.) Others say that the cause of the pestilence is the conjunction of Saturn with Jupiter and other planets which came into conjunction in the past year. But the real cause is the conjunction which occurred in the year 22, from which there are still effects remaining. For in the course of time many evils will still be brought about by these stars, such as famines, plagues and dearth.

POSTSCRIPT.

(Fol. 101, recto, line 8.) The remedy mentioned should be carried out speedily and there should be no delays after the time we have mentioned, and the bleeding should be done from the places mentioned. If it be impossible to carry out the bleeding immediately, at least do it within six hours, that the poison may not penetrate and strengthen its hold. The patient must refrain from food and drink until the phlebotomy is performed, but after it they must be taken together with cordial remedies that he may gain strength.

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50 camomile transliterates camomila.
50 resin transliterates resin.
50 galbanum transliterates galbana.
50 atricia transliterates atricia, the Arabic form of theriaca.
51 infidels. The French version describes the powder as used by “li imperial des pay (n)s”, the emperor of the pagans.
51 Palamenon transliterates Palamenon.
51 tigice transliterates tigice.
51 philadia transliterates philadia.
51 osilla nigra transliterates osilla cruda.
51 gentiana transliterates gentiana.
51 giroflata transliterates giroflata = giroflée.
51 tormentilla transliterates tormentilla.
51 latipbaron transliterates latipbaron.
51 bala armenic transliterates bala armenic.
51 graciecissino transliterates graciecissimo.
55 A marginal gloss in the same hand as text emends “22” to “52”. This, without Stein- Schneider’s emendation would give the year 1292. See above, note 29.
56 Both the Astrological Epilogue and the Postscript are shortened in the Hebrew translation and vary somewhat from the Latin and French versions.
over a long period of more than twenty years in which this change [in the position of the planets] has taken place in these [pestilential] districts, that a great number of cases are cured by phlebotomy alone. For the poisonous matter is by this method expelled, the vitality aiding to evacuate the evil matter; and the heart also endeavours to evacuate the evil from the body. This evacuation of the poisonous matter relieves him [the patient] and he is thereby delivered from the pestilence.56a

PROPHYLAXIS 57

(Fol. 98, recto, line 23.) It is necessary to be sparing in food and drink, avoid frequent bathing and heavy labour and all such things that open the pores in the body. For when they are open the heated air easily penetrates, and so the vital and the natural and the animal spirits are dissipated and decayed. Fruits must be avoided except they be acid, and at all costs coitus must be avoided, for it weakens the heart.

Take easily digestible foods and aromatic wines. Avoid confections and particularly such that contain honey, and all dishes should be seasoned with strong vinegar.

In cold weather and on rainy days a fire should be lighted in the bed-chamber. In summer the patient should eat something in the morning before rising and afterwards go out into the open air.60 He should take aromatic (Fol. 98, verso) remedies such as diabra, diamsusk and [?] diacodi. If he is poor let him use cloves, nux muscata and mace, and once or twice a week some theriac. He should carry in his hand a pomander or other (Fol. 135, recto) fragrant substance and smell it frequently.

In the evening he must return home speedily and go close to the fire, throwing upon the coals some fragrant wood or of the following powder: Take of olibanum and storax 1 ounce, of storax and mint 2 drachms, of aloe-wood 1 drachm. Put it on the coals and it will produce a smoke. Let him do this also when he perceives an evil odour. And, by the help of God, if he act in this wise. . .62 In summer he must take much vinegar and green grapes—he must not use hot spices. If in the morning he is warm or perceives an evil odour, then let him make a practice of smelling roses, violets, cloves, sandal-wood and aloes. Also he should hold a sponge dipped in vinegar to his nostrils when the weather is hot.63

61 French version “a lentree du lit.”
62 The copyist has omitted a line here, probably through “homoioteleuton”. It no doubt began: “in time of cold”, as in the French which runs (Fol. 98 verso, line 15 ff.): “alaide de dieu en temps froit bruyneus, on corru(m)pu effect de mauvais accide(n)t pourra estre preseruez”.
63 This passage is briefer than in the French and Latin versions which, however, do not mention the sponge dipped in vinegar. The use of this device was common. Our translator may have utilized here the popular plague treatise of Bengt Knutsson (two Latin editions of this work are believed to have been printed by Gheen, Antwerp, 1485 and a third by Arnoldus de Colonia, Leipzig, 1493). Two English translations are ascribed to Machlin, London, 1480, another to the same publisher dating from 1483 (reprinted by Jan van Doisbos, Antwerp, early in the 16th century) while another was published by Wynkin de Worde, about 1510. Many of these editions have survived only in fragmentary copies, but one of the Machlin editions of 1480 has been reprinted from a copy in the John Rylands Library at Manchester: Guthrie Vine “A Litel boke . . . for . . . the . . . Pestilence”: John Rylands Facsimile 3, Manchester, 1911. See also Dorothea Waley Singer, loc. cit., pp. 183-185.
He must avoid onions, garlic and leek, but parsley and cinnamon are allowed him, for they are not excessively hot. (Fol. 99, recto.) It is good to drink cold water with vinegar and also to drink tisane, for it is of great benefit to people of a hot dry nature.  

The house should be sprinkled several times a day with cold water mixed with vinegar and rose-water. Pills of Rhazes too are of great good taken once a week. They are beneficial to all complexions of men and at all seasons. Avicenna and all the other authors praise them greatly. They disperse all corrupt matter and their formula is:—

Take cicotri aloes 3 drachms; myrrh and saffron of each 1 drachm; make into a paste with syrup of fumo terra 1½ drachms, and form into pills which should be taken in the evening before sleeping.

TRANSLATOR'S EPILOGUE

And if a man, with God's help, employ the means which I have set forth he will stand secure in a season of pestilence.

This treatise was completed here, in the year 65 one thousand three hundred and ninety-nine by Maestro Giovanni of Cenobarba. And this reckoning is according to the reckoning of the Nazarenes.

APPENDIX I

Early Evidence for the Former Existence at Liege of the Tomb of the Author of The Travels of Sir John Mandeville

The epitaph from the Liège tomb is transcribed by Abraham Ortellius and Joannis Vivianus, “Itinerarium per nonnullas Galliciae Belgicae partes,” Antwerp, 1584, p. 15.

64 The Hebrew version here omits the warning that a sensation of “pricking or motion in the blood should be treated by instant phlebotomy” “on the same side and in the nearest vein.”

65 No other version we have encountered gives this date. The usual date is 1369. The treatise “in 4 chapters” of “John of Bordeaux” especially current in England, usually bears the date 1390.

and in the poem addressed to the Archduchess Mechtilde of Austria in 1462 by Jacob Pütterich and published from a sixteenth century manuscript of Herzogenburg by Moriz Haupt, in Zeitschrift für deutsches Alterthum, Leipzig, 1848, p. 55. Both Ortellius and Pütterich give detailed descriptions of the tomb and of the coat of arms which it bore. These arms have been traced by G. F. Warner to two families, the Lamonts and the Tyrells, or Tyrrells, of counties Somersetshire, Herefordshire and Hertfordshire. Possibly our hero had seen the arms of the Hertfordshire family at St. Albans. The epitaph on the tombstone is also quoted by Pits, who says it was sent to him by the English priest Edmundus Lewknerus, who saw it before his death in Liège. See John Pits, “Relationum Historiarum de Rebus Anglicis”, Paris, 1619, vol. 1, p. 511. John Weever, “Ancient Funeral Monuments within the United Monarchie of Great Britain, Ireland and the Islands Adjacent”, London, 1631, found (p. 567) an epitaph to Mandeville in the church of St. Albans, and a legend current of his burial there. He explains that he has himself seen the tomb at Liège with the epitaph. The epitaph in our text is here given verbatim from Pits. Ortellius and Weever give the date 1371, but almost all later references confirm the “1372” of Pits and Pütterich. Pütterich, however has also modified the name and title to “Monteuilla” and “Compredi”. The only other differences in the versions of the epitaph that we have seen are the omission by Ortellius and Weever of the word “suorum” after “bonorum”. The various abbreviations, etc., in spelling we have ignored.

Mandeville is mentioned as an eminent physician and great traveller, buried in the Guillelmite convent at Liège, by so early a writer as Radulpho de Rivo, Dean of Tongres (ten miles from Liège), who died in
(For the life of Rivo see P. C. Mohlberg, “Radulph de Rivo: der letzte Vertreter der altromischen Liturgie”, Louvain, Paris and Brussels, 1911.) De Rivo gives the date of the tomb as 1367, a mistake explained by Warner as probably due to the easy confusion between a Latin X and V, supposing the real date to have been 1372. Similar references to our author are given by Cornelius Zantliet, monk at the convent of St. Jacques at Liège, in his “Chronicon ab anno 1230 ad 1461”, edited by de Louvron and published by Martene and Durand, “Veterum scriptum et Monumentorum, documentorum, moralium, amplissima collectis”, vol. 5, p. 67; John Bale, “Illustrium Maioris Britannicæ Scriptorum” (Ipswich?), 1548, Centurion iii, p. 140b; Jacob Meyer, “Commentarii sive Annales rerum Flandricarum”, Antwerp, 1561, Lib. xiii, p. 165; Lodovico Guicciardini, “Descrittione Di Tutti i Paese Bassi Altrimenti detti Germania inferiore”, Antwerp, 1567, p. 281c; F. X. de Feller, “Dictionnaire Historique”, Liege, 1781, vol. 4 p. 329 (quoted by Henaux; we have ourselves seen only the edition of Paris and Lyon, 1822, vol. 8, p. 395); P. Lambinet “Recherches sur L'Origine de l'Imprimerie Brussels, ann. VII de l'ère française”, p. 299.

J. Leland, “Commentarii de Scriptoribus Britannicis”, Oxford, 1709, p. 366, has a lengthy notice of Mandeville. He does not give the name “ad Barbam” but describes the knight as “ex fano Albani oriundus”. He says that he studied first theology, then medicine, and that finally, owing to his thirst for knowledge, he became a great traveler. Leland devotes much space to praise of this latter pursuit.

R. P. Fouillon, “Historia Leodiensis . . . ab origine populi usque ad Ferdinandi Bavari tempora”, Liège, 1735, vol. I, pars. 2, lib. 5, p. 436, mentions “Mandevillum, Equestris Ordinis Angliam nobilem, vivis excessisse Leodii, Sepulumque in Suburbae Guilemitarum Aede elegisse, scribit Radulfa”. He corrects both Rivo and Ortelius as to the date, commending the greater accuracy of Guicciardini; also he notes the sentence carved “in the dialect of Liège as used to this day”.

**APPENDIX II**

Paris, Bibliothèque Nationale Fonds hébreu 1191 (VIII), (Ancien Fonds 404) folio 141, verso
(fol. 142, recto)

A lawyer said it is not enough to call the translator a fool because he is poor or illiterate.

(fol. 142, verso)

A day to remember the translator.

Read 409
Annals of Medical History

Paris Bibliothèque Nationale, Fonds hébreu 1124 (Vla) (Ancien Fonds 417)
fol. 133, verso

Supply ש.ד.
Read מ.ד.
Plague Tractates

Page 411

1. Plague Tractates' dim amo Ki KBK^siKnKa i*? pup tfn idibsrii (?) ik K^iaaiana n ,ai^ tew ainn am lpiamiK i^ia pirnm an 'tan 6antyinn tep D1K
telpinmi laiDiDIKiDKia K"mia 25 D^run pra^i dik 1 ) (fol. 134, verso)
aipan tep amity ik ana nntyity tfiyr» 1
nrprna Din laa aiKn ip s"yKi amni 'mya naai naa naia nn 'naran amtyyn annan ina
annaty kiidiki '3 pny iKsaa tep 'bik'
aw annKi .anaran amtyyn amam pis oy iKnaty nan lain raa
tep mayty natya nannaty 'nnK
pny m 6 ba"" natya ityyaty ananaSnpn
'manna p*»iy ityK tyi nnma
nv»aiayi Dmaaa pm "jiiKa man niyi
'ran nKisim .ipm msaai
pra nnysann aw ^ai mna ntyynty ■»i«n
laiaKty iaa rprty iiki

tey

9 Read D*awyn.
® a Marginal gloss in same hand as text; mpi,
® b Marginal gloss in some hand as text: n"j.
See note 29 and 55 of the translation.
7 Marginal gloss in same hand as text: aaina
See note 56a of the translation.
6 Read ח"נכש.
6 Marginal gloss in same hand as text: ח"ק.
6 Marginal gloss in same hand as text: 52.
See note 29 and 55 of the translation.
5 Read ח"נכש.
4 Read ח"נכש.

20 25

25

6 Read ח"נכש.

8 Read ח"נכש.
THE MEDICAL PHRASES OF VICTOR HUGO*
By HUBERT ASHLEY ROYSTER, M.D.
RALEIGH, NORTH CAROLINA

LITERATURE is not lacking in medical characters: many great writers of drama and fiction have introduced doctors into their narratives. The doctors of Shakespeare and of Dickens have furnished themes for interesting studies, while much of Molière’s satire is heaped upon the doctor and his foibles. In the stories of innumerable lesser writers of fiction may be found physicians as major or minor characters; some play the parts of heroes, others the parts of villains. In each instance the authors display more or less knowledge of doctors and familiarity with their work, according as they have had opportunity for personal observation of or association with them. Usually scant justice is done the doctor in his attitude and service, but, on the other hand, much effort at mock heroics is wasted in attempts to give him more than he deserves. The average fictionist is glaringly ignorant of medical men and their ways and even more so of medical science itself. The hero or heroine is still dying of “brain fever,” and peculiar pathology is often developed from sensational injuries.

Conversely the comparatively few physicians who have gone in for literature rarely use their works for displaying their professional learning. It appears certain that Keats and Goldsmith actually avoided medical ideas, if, indeed, they had many; and very little of the best thought of Holmes and Mitchell contains medical allusions.

In lay literature one author—Victor Hugo—stands forth supreme in his medical knowledge. Yet not one of Hugo’s leading characters is a physician. He makes no attempt to portray the personality of the doctor. He merely writes into his works his wide and accurate knowledge of the whole science of medicine. An astounding mastery was his of every branch of science as it existed both before and during his day; his books fairly teem with evidences of it. Most of his medical expressions are in the form of figures of speech.

It is not uncommon, however, for speakers and writers to employ medical similes; now and then they add strength to the ordinary discourse and enliven the usual occasion. The ability to use such expressions wisely and well constitutes an art, even if it does not attest a profound knowledge of medical subjects. But when one illuminates one’s pages over and over again with deep-rooted ideas of all that pertains to a great science, as Hugo does, it is nothing short of genius. And genius he was in the truest measure of the term.

There was apparently nothing in Victor Hugo’s early life or his education to give him such knowledge, except that in the year 1818, in a general yearly competition of all French scholars for University prizes, he obtained fifth place for physics. At sixteen he left the school for good, determined not to try for admission to the Ecole Polytechnique or to be a soldier, as was his father before him. Instead, he began to write. We know also that he began to read widely; only omnivorous reading can account for his omniscient writing. At least I shall claim that he read greedily and remembered tenaciously all science, and medical science in particular, for without this preparation he could hardly have set down the wonderfully true and interesting scientific observations which enrich all his works. Whether in figure of speech, running illus-

*Read at a meeting of the Harvard Medical History Club, Boston, Mass., April 4, 1917.
The Medical Phrases of Victor Hugo

The illustration or homely simile, the details are perfectly presented and the meaning is exact.

My purpose, then, will be to pass in review the phrases which give evidence of the profound medical knowledge of this man of letters and of his artistic perception in weaving this knowledge into his narrative. Let me hope that my account may not be a tiresome catalogue of quotations.

Beginning with the fundamentals, let us first find the anatomical references. With his wonderful power of description Hugo refers to “a row of great piles set upright in the sand against a wall” as “dry, gaunt, knotty logs resembling an array of leg bones and knee-caps afflicted with ankylosis.” Indeed he carries the figure further and suggests that “revery . . . might inquire to what race of men these three-fathom tibias had belonged.” One of his philosopher characters (Combeferre in “Les Miserables”) is said to have been “enraptured with a lecture in which Geoffroy Saint-Hilaire had explained the double function of the exterior carotid artery and the interior carotid artery, one of which supplies the face, the other the brain.” This same philosopher was said to believe in “the suppression of suffering in surgical operations.” Anatomical figures are vividly set out in the experience of children hidden in the elephant of the Bastile: “Above a long dusty beam, from which projected at regular distances, massive encircling timbers representing the vertebral column with its ribs, stalactites of plaster hung down like the viscera, and from one side to the other huge spider webs made dusty diaphragms.”

Similar anatomical description is seen in this passage from “The Toilers of the Sea”: “Over his head was a roofing not unlike the insides of a vast skull; the vault was the cranium; the arch was the mouth; the eye sockets were lacking. . . . The vault with its cerebral lobes, and its crawling ramifications, similar to outspreading nerves, had a tender reflection of the chrysoprase.” In one of his letters he calls the Strait of Mau-musson “one of the navels of the sea”; and in proving how divinity adheres to the “rough draught” he shows “how the solar ray is an umbilical cord,” how the “disfigured becomes transfigured.” Walking the corridor of a dungeon gives rise to a comparison: “This gut made circuits; all entrails are tortuous, those of a prison as well as those of a man. . . . The stone pavement of the corridor had the viscousness of an intestine.”

Hugo exhibits his peculiar talent in no way better than in his strictures upon the destruction of the marvelous art of the Middle Ages by modern architects. “They have,” he says, “audaciously adjusted, in the name of ‘good taste,’ mounds of Gothic architecture, their miserable gewgaws of a day, their ribbons of marble, their pompons of metal, a veritable leprosy of egg-shaped ornaments. . . . Three sorts of ravages today disfigure Gothic architecture. Wrinkles and warts on the epidermis; this is the work of time. Deeds of violence, brutalities, contusions, fractures; this is the work of the revolutions from Luther to Mirabeau. Mutilations, amputations, dislocations of the joints, restorations; this is the Greek, Roman and barbarian work of professors.” Bemoaning the fate of the “charming little bell tower” of the Cathedral, he tells us that “an architect of good taste amputated it and considered it sufficient to mask the wound with a large, leaden plaster, which resembles a pot cover.”

Our author’s familiarity with physiology, pathology, chemistry and allied subjects is striking. Here is a contrast between pathology and anatomy: “The simplicity which is short-winded is a case for pathology. A hospital ticket suits it better than a ride on the hippogriff. . . . I admit that the hump of Thersites is simple; but the pectoral muscles of Hercules are simple also. I prefer this simplicity to the other.” How does the logic of the following physiological chemico-pathological study appeal to
you? It is selected from the postprandial remarks of a reveller: "Now listen attentively! Sugar is a salt. Every salt is desiccating. Sugar is the most desiccating of all salts. It sucks up the liquids from the blood through the veins; thence comes the coagulation; then the solidification of the blood; thence tubercles in the lungs; thence death. And this is why diabetes borders on consumption. Crunch no sugar, therefore, and you shall live." In 1862 through the mouth of Grantaire, who is "perfectly boozy," Hugo gives vent to this strange physiology of the nations: "If I do not admire John Bull shall I admire Brother Jonathan then? I have little use for this brother with his slaves. Take away 'time is money,' and what is left of England? Take away 'cotton is King,' and what is left of America? Germany is the lymph; Italy is the bile. Shall we go into ecstasies over Russia? Voltaire admired her. He admired China also. I confess that Russia has her beauties, among others a strong despotism; but I am sorry for the despots. They have very delicate health." Did this keen observer have any inkling then of the greatest world crisis now at its acme? Speaking in "Les Misérables" of the grosser interests of certain states, he hits the nail squarely: "Sometimes the stomach paralyzes the heart. The grandeur and the beauty of France are that she cares less for the belly than other people; she knots the rope about her loins more easily." The physiology of digestion was a favorite theme of illustration with Victor Hugo. Of a shipwreck scene he says that "the deck underwent the convulsions of a diaphragm, which is seeking to vomit." Ursus cries: "I have toiled today, empty stomach, plaintive throat, my pancreas in distress, my bowels ruined, far into the night my recompense is to watch another eat." Gringoire, the impecunious man of letters, thus figures the King: "He is a sponge, to soak money raised from the people. His saving is like the spleen which swelleth with the leanness of all the other members." Then there is this illuminating antithesis: "The foreign war is a scratch one gets on the elbow; civil war is the ulcer which eats up the liver."

Hugo's chemistry comes in for its share in his figures of speech. He is not very complimentary to the products of the metropolis when he writes: "The mud of Paris is particularly stinking; it must contain a great deal of volatile and nitric salts." Then a glimpse of cloacal chemistry: "Death in the mire under a cover! the slow stifling by the filth, a stone box in which asphyxia opens its claws in the slime and takes you by the throat; fetidness mingled with the death rattle; mire instead of sand, sulphuretted hydrogen instead of the hurricane; ordure instead of the ocean." The grandeur of scenery is used to bring out further details: "The oxides of the rock had placed here and there upon the cliffs red patches resembling pools of clotted blood." The toxicology of character is expressed when he makes Gilliatt say: "I test the quality of a scoundrel as a doctor will test a poison."

For true science this great man had the profoundest respect, but he could not conceal his utter disdain for all spurious and quasi-forms of learning. Satire and ridicule were effective weapons in his hands. All through his monograph on Shakespeare, in which he hales into court the world's greatest men, of whatever branch of learning, he gives examples which prove his remarkable acquaintance with the history of science, the real and the sham. He believed that long advances had been made, and quite as confidently looked for more. "Look at the point," he states, "at which spermatology and ovology have already arrived and recall Mariana reproaching Arnaud de Villemeu (who discovered alcohol and the oil of turpentine) with the strange crime of having attempted human generation in a pumpkin." This is vivi-genesis with a vengeance. Were there other "antis" in those
days besides Mariana? In the following passage one can hardly decide whether the author is serious or satirical. At any rate here is an unusual cause of death: "Chrysippus of Tarsus forms an era in science. This philosopher (the same who died—actually died—of laughter caused by seeing a donkey eat figs out of a silver basin) had studied everything, gone to the bottom of everything. . . . He condensed in his brain all human knowledge." But we do definitely perceive, further on, the insight Hugo had into the scientific pretense of his day. "Five hundred years before Jesus Christ it was perfectly scientific, when a King of Mesopotamia had a daughter possessed of the devil, to send to Thebes for a god to cure her. It is not exactly our way of treating epilepsy. In the same way we have given up expecting the Kings of France to cure scrofula." Substituting "eminent specialist" for "god" and remembering that most cases possessed of the devil are afflicted with hysteria, these words have a very familiar sound at this day. Neither have we by lapse of time or more diffuse education entirely outlived those who still believe in the Royal Touch and the laying on of hands—except that the Royal Touch is now frequently given by a famous physician; we have places of pilgrimage, too.

Hugo draws on his knowledge of digestion and dietetics for an argument against formal, stilted writing. This is his point: "It seems that the only question [with the 'serious' school] should be to preserve literature from indigestion. Formerly the device was 'fecundity and power'; today it is barley gruel.' . . . Be of the temperance society. A good critical book is a treatise on the dangers of drinking. Do you wish to compose the Iliad, put yourself on diet." Again: "He does not stop, he does not feel fatigue, he is without pity for the poor weak stomachs that are candidates for the Academy. The gastritis called 'good taste' does not afflict him." In describing the choice of subjects for writing by a genius, he asks: "What is the Iliad? A collection of plagues and wounds—not an artery cut which is not complacently described."

In the realm of internal medicine and diagnosis we find the great author demonstrating the same capacity for critical illustration. What an observant attitude is pictured in this passage: "The pedestrian bathed in sweat finds in this vault [tower rock on the road to the Rigi] an abundance of chilling shade, and a little cool water falling all about him; a treacherous bench has been placed there, and on it pleurisies are in wait!" General manifestations of disease are thus brought into service: "The revolutionary fever, however, was increasing. No point of Paris or of France was exempt from it. The artery pulsed everywhere. Like those membranes which are born of certain inflammations and formed in the human body, the net-work of the secret societies spread over the country."

In this connection, when the young men, enthusiastic over the Revolution, were sent about to organize their several branches, Joly, the medical student, was to "go to Dupuytren's clinique and feel the pulse of the medical school." Joly, by the way, was a typically latter-day neurasthenic. He is depicted as a "young malade imaginaire. What he had learned in medicine was rather to be a patient than a physician. At 23 he thought himself a valetudinarian and passed his time in looking at his tongue in a mirror."

Discriminating knowledge of special diseases is constantly exhibited: "There is something of the cholera in that sort of tempest"; and, "The breath of the cholera was felt in those winds"—evidently the prevailing idea of the epidemiology of cholera in those days. With the same figure in mind, Hugo finds the origin of storms: "Tempests are nervous attacks and fits of delirium on the part of the sea. The sea has its sick headaches." A similar figure is employed to explain an unobserved leak
during shipwreck: "They had not noticed it amid the convulsive violence of the wind which had shaken them. In a fit of tetanus one does not feel a prick." Describing the condition of a little child, he thought "a nurse would have reckoned her five or six months old, but she was, perhaps, a year old, for in poverty growth undergoes heart-breaking reductions which sometimes extends to the rickets." The etiology is somewhat mixed, as is the metaphor, but the kernel of knowledge is there. Further along Ursus "listened to the other child eating," and exclaimed: "It will be a task, if I must henceforth nourish this glutton who is getting his growth. He will be a tapeworm which I shall have in the belly of my industry." I dare say that no one could express more clearly the relation of certain degenerative diseases to the life we live than is found in the following paragraph: "His rheumatism came to him about the time when he had gotten into easy circumstances. These two products of labor are fond of keeping one another company. At the moment when one becomes rich, one is paralyzed. This crowns life." The sclerosis of age is well presented in the personification of the cathedral door which yielded but slowly to the attack of the vagabonds; one of them said: "It is old, and its gristles have become bony." The following gives his diagnosis in the crowd: "Persons who wore cravats that hid their chins were called the scrofulous."

A really remarkable excerpt is the one I am now about to quote. Well might we ask, did Victor Hugo know of gall-stones and duodenal ulcer? Portraying a man in the full vigor of life, he says: "This vision is splendid and astounding; but a little gravel in the liver or an abrasion of the pylorus—six feet of earth, and all is over." Not less remarkable is his broad prophecy of fecal infection contained in a longer extract. Did Hugo anticipate Metchnikof's theory and foresee Lane's operation when he wrote: "The belly being the centre of matter is our gratification and our danger; it contains appetite, satiety, and putrefaction. The devotion, the tenderness which seize us are liable to death. . . . The belly is to humanity a formidable weight; it breaks at every moment the equilibrium between the soul and the body. It fills history; it is responsible for nearly all crimes; it is the matrix of all vices. . . . It is perhaps obesity, perhaps dropsy. . . . The large intestine is king; all that old world feasts and bursts; and Rabelais (doctor and priest) enthrones a dynasty of bellies."

On a lonely journey through the Alps, Hugo wrote letters to his wife. During one of these tramps he had an opportunity to indulge his fancy in speculation on the etiology of goitre. The following quotation is worth reading: "There was one witness in reality, only one. . . . In a cleft in the crag, seated on a huge stone with legs hanging down, was an idiot with a goitre, his body slim and his face enormous, laughing with a stupid laugh. . . . The Alps were the spectacle, the spectator was an idiot. I forgot myself in this frightful antithesis. . . . Nature in her superbest aspect, man in his most miserable de-basement. What could be the significance of this mysterious contrast? What was the sense of this irony in a solitude? Have I the right to believe that the landscape was designed for him—the cretin, and the irony for me—the chance visitor? However, the goitrous idiot paid no attention to me. . . . At this height the convexity of the globe confuses to a certain extent all lines and rearranges them. The mountains take extraordinary postures. . . . The landscape is crazy. With this inexpressible spectacle before your eyes you begin to understand why Switzerland and Savoie swarm with stunted minds. The Alps make many idiots. It is not granted to all intelligences to cohabit with such marvels and to keep from morning till evening, without intoxication and without stupor, turning a visual radius
of fifty leagues across the earth around a circumference of three hundred."

_Materia medica_ and _therapeutics_ form the basis of certain comparisons which were the beliefs of the times. Some of these reflected the serious side of the author. Witness: "Many will remember that great epidemic of croup which desolated, thirty-five years ago, the quarters bordering on the Seine at Paris, and of which science took advantage to experiment on a large scale as to the efficacy of insufflations of alum, now so happily replaced by the tincture of iodine externally applied." On the other hand he takes occasion at times to berate the ignorance both of the physician and of the layman. The archdeacon showed the inscription, "Medicine is the daughter of dreams," to his doctor, who immediately had his ire aroused and exclaimed: "Medicine a dream! I suspect that the pharmacoplist and the master physician would insist upon stoning you if they were here. So you deny the influence of philters upon the blood, and unguents on the skin! You deny that external pharmacy of flowers and metals, which is called the world, made expressly for that eternal invalid called man!" The cleric replied: "I deny neither pharmacy nor the invalid. I reject the physician." "Then it is not true," replied the doctor hotly, "that gout is an internal eruption; that a wound caused by artillery is to be cured by the application of a young mouse roasted; that young blood, properly injected, restores youth to aged veins; it is not true that two and two make four and that emprosthotonos follows opisthotonos." Which being said, the debate ended in surli ness on the part of the priest and anger on the part of the physician. But, "Ursus, in his capacity of physician healed, because, or in spite of. He made use of aromatics. He was versed in simples. He took advantage of the profound power which is contained in a mass of disdained plants,—hazel twigs, white alder, guelderrose, the wayfaring tree, slatern, viburnum, buckthorn. He treated phthisis with sundew; on appropriate occasions he used the leaves of the tithymal, which plucked from the root are a purgative, and plucked from the top are an emetic; he took away your sore throat by means of the vegetable excrescence called 'Jew's ear'; he knew which rush cures the ox and which mint cures the horse; he was acquainted with the beauties and virtues of the herb mandragora, which, as every one is aware, is both male and female. He had receipts. He cured burns with the wool of the salamander, of which Nero, according to Pliny, had a napkin."

A more modern example of botanical superstition may be recalled. An old woman, (whether male or female I do not know) once asked the celebrated Abernethy: "Doctor, do you believe that poplar bark scraped 'up the tree' is an emetic and scraped 'down the tree' is a purgative?" "Certainly," replied the doctor, "and don't ever take any scraped around the tree, for, if you do, it will fly through your ribs and kill you." Hugo tells us that Ursus "correctly preferred Galen to Cardan; Cardan, learned man as he is, being only a worm of the earth in comparison with Galen." But in his "Shakespeare" he violently asserts that "a country horse-doctor would not inflict on horses the remedy with which Galen treated the indigestions of Marcus Aurelius." What the remedy was we are left to conjecture.

Obstetric references are few but pointed. The family of nations is thus to be nourished: "France bears within her the sublime future. This is the gestation of the nineteenth century. That which was sketched for Greece is worth being finished by France." The channel islands are described as the "puritanical archipelago, where the Queen of England has been blamed for violating the Bible, because she gave birth while under influence of chloroform." When Dom Claude rails at a fellow by shouting, "What means of safety have you found,
knave? Must your idea be extracted with forceps?”, one is at a loss to know whether to classify this metaphor with obstetrics or with dentistry. Idiopathic Cesarean section, amid rather warm surroundings, is thus described: “Under Mary Tudor a mother and two daughters were burned... One of the daughters was with child. She brought forth the child in the coals of fagots. The chronicles say: ‘Her belly burst. A living child came forth; the new born infant rolled out of the fiery furnace; a certain House picked it up. [Then] bailiff... caused the child to be flung back into the fire.’”

Maternal impressions are hinted at when the populace hoots the hunchback of Notre Dame: “The monster! a face to make a woman miscarry better than all the drugs and medicines... ‘Twas you that made my wife, simply because she passed near you, give birth to a child with two heads! And my cat bring forth a kitten with six paws!”

Two or three figures of speech must suffice to convince us of Hugo’s knowledge of the eye and its diseases. Hardly could there be expressed a more beautiful figure than this: “The pupil dilates at night, and at last finds day in it, even as the soul dilates in misfortune and at last finds God in it.” Another is keenly suggestive: “He suffered the strange pangs of a conscience suddenly operated upon for the cataract. He saw what he revolted at seeing.” Ocular therapeutics is brought into play upon literary diseases: “Let us not, then, be surprised... at the poultices applied by a certain school of criticism to the chronic ophthalmia of academies.”

It may not be surprising to realize that the great Frenchman was well versed in surgical science and practice. He certainly writes of times when surgery was often in demand and when the average citizen was necessarily familiar with its practices. His exact knowledge of surgical pathology is evident. As an introduction Hugo regretted that “we are deprived of the progress which the executioner caused surgery to make,” for “by cutting the limbs of living men, by opening their bellies and tearing out their entrails, they [of the olden days] caught phenomena in the very moment, and made discoveries.” Hearing this, let the women rage and the anti-vivisectionists imagine a vain thing. Hugo’s phrases on wounds are interesting. Combating the idea that “emotion grows dull” he argues that “it is as though one were to say a wound is assuaged and become calm beneath nitric acid falling drop by drop.” The wounds of Marius afforded ample opportunity for descriptive talent: “The doctor examined Marius and, after having determined that the pulse beat, that the sufferer had no wound penetrating his breast, and that the blood at the corners of his mouth came from the nasal cavities, he had him laid flat upon the bed, without a pillow, his head on a level with his body, and even a little lower, with his chest bare, in order to facilitate respiration... The head... was covered with hacks; what would be the result of these wounds on the head? Did they stop at the scalp? Did they affect the skull?” Does not the following observation show marked discrimination? “Fie had for several weeks a fever, accompanied with delirium, and serious cerebral symptoms resulting rather from the concussion produced by the wounds in the head than from the wounds themselves.” And this also: “The suppuration of large wounds always being liable to re-absorption and consequently to kill the patient under certain atmospheric influences.” Further, “the dressings were complicated and difficult, the fastening of cloths and bandages with sparadrap not being invented at that period”... “they used for lint a sheet ‘as big as a ceiling’... and ‘it was not without difficulty that the chloruretted lotions and the nitrate of silver brought the gangrene to an end.” The convalescence was delayed “on account of the accident
resulting from the fracture of the shoulder blade. There is always a last wound like this which will not close, and which prolongs the dressings, to the great disgust of the patient.” Can it be doubted that the author of these lines, only a part of which I have transcribed, had himself seen and attended such wounds? Even the King had pretensions, for we are told that he was “something of a doctor; he bled a postillion who fell from his horse; Louis Phillipe no more went without his lancet than Henry III without his poniard.”

Of wounds in special regions we note an instance here and there. “There was a wound in the shoulder blade . . . but as the lungs were not touched she might recover.” “Wounds in the breast demand silence.” Surgical diseases are the particular care of Ursus, who thus addresses the populace: “I think and I dress wounds. Chirurgus sum.................Almost all our local inflammations and sufferings are issues and, if well cared for, rid us gently of other ills which are worse. Nevertheless I would not counsel you to have an anthrax, otherwise called a carbuncle. ‘Tis a stupid malady which serves no end. One dies of it and that is all.” He also gives a much needed caution: “An awkward movement, a fright, and there you have a rupture of aneurysm. He had suffered a loss of virtue . . . and he felt something like a generous transfusion in his veins.” A geographical reference is inspiring: “French blood is largely mixed with Spanish blood. . . . The Pyrenees are simply a ligature efficacious only for a time.” History furnished this: “Revolutions such as the revolution of July are arteries cut; a prompt ligature is necessary.” Other affections appeal to the figurative nature within him: “The bulging of the canvas became larger. It grew more and more distorted like a frightful abscess ready to burst.” The diagnosis in the following case is not plain, but the plan of treatment admits of no uncertainty: “One day . . . a man was dying, choked by a tumor in his throat, a horrible fetid abscess, possibly contagious and which had to be emptied at once. . . . [The priest] applied his mouth to the tumor, sucked it, spitting out as his mouth filled, emptied the abscess and saved the man’s life.” Physical disability has always furnished a plea for clemency in crime. “The old punishment,” writes Hugo, “which our ancient laws of torture called ‘extension’ and which Cartouche escaped because of a hernia, this Prometheus undergoes.” The question is how did Hugo find that Cartouche had a hernia.

Nor does our observant genius overlook the question of anaesthesia. Referring to the time of Queen Anne he recalls “that even at that day the means of putting a patient to sleep and of suppressing pain was known. Only at that epoch it was called magic. Nowadays it is called anaesthesia.” He speaks at another place of “a stupefying powder . . . which suppressed pain,” and, whether accurately or not, thus relates its history: “This powder has always been known in China and it is still employed there at the present day. China had all our inventions before us, printing, artillery, aerostation, chloroform. Only the discovery which in Europe immediately acquires life and growth, and becomes a prodigy and a marvel, remains an embryo in China, and is there preserved in a dead condition. China is a jar of fetus.”

Victor Hugo was certainly not ahead of his times in sanitary science. What would our trained public health officers think of his ideas on the following question? He says “that strong mental excitement is a preservative against all ailments. In times of pestilence, while sanitary and hygienic measures should not be neglected, the people
should be entertained by grand fêtes, grand performances, noble impressions. If no one troubled about the epidemic it would disappear." At least he knew the value of the nurse and paid her this tribute: "It is the physician who prescribes, it is the nurse who saves."

Humor at the expense of the doctor is found in spots. It is not biting. "A funeral is passing. There is a doctor in the procession. 'Hullo!' shouts a gamin, 'how long is it since the doctors began to take home their work?'" And the physician to Louis XI is spoken of as "the brave man [who] had no other farm than the King's bad health. He speculated on it to the best of his ability." After obtaining from his Majesty in one day an appointment for his nephew and a new roof for his house, the doctor had applied to the royal loins "the great defensive cerate composed of Armenian bole, white of egg, oil, and vinegar" and retired followed by the raillery of the attendants: "'tis easy to see that the King is ill today; he giveth all to the leech." Louis' retort to the barber closed the scene: "The physician has more credit than you. 'Tis very simple; he has taken hold upon us by the whole body, and you hold us only by the chin."

Below the rank of royalty a bit of dialogue between notables may bring a smile: "Good morning, Marat," said Chabot. "You rarely attend our meetings." "My doctor has ordered me baths," answered Marat. "One should beware of baths," returned Chabot, "Seneca died in one." The following reference includes the social problem along with its grim humor: "If he is rich, let him have a doctor. If he is not rich, let him not have any. If he doesn't have a doctor, he will die. And if he does have one, he will die."

Hugo was hard on the quack. He knew the brand instantly. Of Gilliatt he relates: "Peasants came with fear and trembling, to tell him about their maladies. This fear begets confidence; and in the country the more the physician is suspected of magical powers, the more efficacious the remedy. Gilliatt had prescriptions of his own, which he had inherited from the old dead woman; he bestowed them upon those who asked and would take no pay. He cured whitlow by the application of herbs, the liquor from one of his phials cut short the course of a fever; the chemist thought that it was probably a decoction of cinchona. Gilliatt was a very good fellow for sick people where his ordinary remedies were concerned. He absolutely refused to perform miracles, which was ridiculous in a sorcerer. Do not be a sorcerer; but if you are one fulfill your profession." Do we not now meet those of this kind? And is it not all true to our own life and times—except the "no pay" feature? Ursus, the man, represents the peripatetic patent medicine vendor in all his glory, and, without doubt is one of the cleverest and queerest characters in fiction. "Regarded as a good mountebank and a good physician" he was everything else that it was necessary to be. He describes himself: "I am neither an Englishman nor a man, having the honor to be a doctor. That goes together. Gentlemen, I teach. What? Two sorts of things; those which I know and those which I do not know. I sell drugs and I give away ideas." That stamps Ursus as an out-and-out quack. The real physician sells his ideas, and may or may not give away his drugs. Being a quack he proceeds to denounce other quacks: "Gentlemen," says he, "distrust false savants who speculate upon the briony root and white adders, and who make eye salves from honey and cock's blood. Learn to see clearly through his lies. It is not true that Adam had a navel. Oh, gentle friends who listen to me, if any one tells you that whoever smells of the herb valerian will have a lizard born in his brain, that a man weighs more dead than alive, that buck's blood dissolves the emerald, that the falling sickness is cured by means of a
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worm which is found in the brain of a kid, believe it not; these are errors. But here are truths: The skin of a sea-calf is preservative against lightning; the toad is nourished upon earth, which makes a stone grow in his head; the elephant has no joints and is forced to sleep standing erect against a tree; make a toad hatch a cock's egg, and you will have a scorpion which will make you a salamander; a blind man recovers sight by placing one hand on the left of the altar and the other on his eyes. . . . Good people, feed yourselves on these evidences.”

Hugo’s interest in deformities is shown by his creation of these two freaks in human shape—Gwynplaine and Quasimodo. No other writer in our knowledge has succeeded in producing such hideous and repulsive deformities—the one artificial, the other natural. Much has been brought against Hugo for giving these characters sentiment, one critic going so far as to say that he has made “fatherhood sanctifying physical deformity; motherhood sanctifying moral deformity.” Marzials says of the “Laughing Man”: “To me it is simply a preposterous, an impossible book.” Assuredly it is a weird conception. But the details are admirably worked out. Very briefly the method of producing the deformity of Gwynplaine may be stated by Hugo himself: “This artificial production of teratological cases had its rules. It was a complete science. Let the reader imagine orthopedy reversed. Where God had placed a glance, they put strabismus. Where God had placed harmony, they put deformity. . . . It seemed evident that a mysterious science, probably occult, which was to surgery what alchemy was to chemistry, had chiselled that flesh, assuredly at a very early age, and deliberately created this visage. This science, skilful in cuttings, obtusions and ligatures, had split that mouth, opened those lips, bared the gums, distended the ears, removed the partitions of the cartilages, disarranged the eyebrows and the cheeks, enlarged the muscles of the cheek bones, softened down the seams and scars, brought the skin back over the wounds, still maintaining the face in the gaping state, and from that powerful and profound sculpture, that mask, Gwynplaine, had emerged.” A full, if not clear, exposition of the principles of plastic surgery!

Quasimodo I do not attempt to explain. He might be dismissed, according to one reviewer, as follows: “An animal with a turn for bell-ringing and, apart from his deformity and deafness, not entitled to much sympathy.” But whatever the classification of his misshape, it was congenital, not acquired. My feeling is that Hugo must have received the impression of this monster through a bad dream. At any rate he put down no figure of speech in which Quasimodo is involved.

Hugo has been accused of being theatrical, of straining after effect. Perhaps so, but he got the effect. Poet, dramatist, novelist, publicist; he stood apart—the great Frenchman. His espousal of the Republic and the Revolution was his absorbing passion. He came down and remained close to the people—a circumstance that caused him to study them deeply, to live with them intimately. This naturally may have directed him to those homely medical illustrations, of which he was so full. Coppée’s estimate is not wide of the mark: “Among all the poets of mankind Victor Hugo is the one who has invented the greatest number of similes, and those the best carried out, the most striking, the most significant.” What need to tell his life story? Study the man in his writings—there he reveals himself. A characteristic piece of his imagery may form a fitting close to our study: “An idea is a balm; a word may be a dressing for wounds; poetry is a physician.”
Franciscus Dela Boë Sylvius was a physician whose character and career have an unusual interest. He was a famous and original teacher; and while holding a chair in medicine, he was an industrious student of chemistry and anatomy, particularly that of the brain. In this latter line of work, his descriptions were so vivid and accurate that his name became identified with four different portions of the nervous system.

Sylvius was a handsome man and has left us an unusually fine engraving of himself, done by C. van Dalen. This is one reason, perhaps, why we celebrate his memory here.

Of recent years we have been made familiar with his work through an article by Prof. Frank Baker in the Johns Hopkins Bulletin of November 1909, and one by Dr. Smith Ely Jelliffe in The Charaka Club Book, Vol. III.

Sylvius was born in 1614 of French parents in Hanau, Germany. He studied in several universities, took his medical degree in Basle, Switzerland, went to Paris for a time, settled in practice in Amsterdam, till he was called to be Professor of Medicine in the University of Leyden in 1658, when he was 44 years old. He made a definite success there as a lecturer, teacher, investigator, and practitioner. Here he first instituted bedside instruction.

Sylvius had admirable powers of description with a gift to see things correctly and to individualize what he saw. He had, one might say, a synthetic and epitomatic mind.

He saw the fissure of Sylvius as an anatomical entity and described it so definitely that it received his name. He called the *iter tertio ad quartam ventriculam* an aqueduct, and it became the aqueduct of Sylvius. He discovered or rediscovered the fifth ventricle, sometimes called the ventricle of Sylvius. Naturally, the artery of the Sylvian fissure became the Sylvian artery. So, through his power of perceiving acutely, describing clearly, and emphasizing his units, the name of Sylvius dominates all others in cerebral nomenclature. Herophilus, Galen, Varolius, Viessens, and Rolando have each one part, but Sylvius has four.

By his happy art, Sylvius has made himself anatomically immortal; though he was not a great discoverer or a man of the very highest type, but an able "runner-up" of greatness. Indeed, Prof. Frank Baker asserts that he was one of the great original thinkers of the seventeenth century.

He was interested in chemistry and physiology, and he had a chemical theory of vital action and disease, but it had no more merit than other theories of those and later days. However, he was a masterly clinical teacher and his greatest real achievements were along this line.

Sylvius was a man of handsome presence, fine personal qualities; benevolent, sincere, and kindly; making and retaining friendships. He was a serious-minded person and seemed rather to court than shun contemplation upon death. Before he was fifty
years old, he prepared a sepulchre for himself in the choir of St. Peter's Church at Leyden, and had a very modest inscription placed on it.

FRANCISCUS DELEBOE SYLVIIUS
MEDICINÆ PRACTICE PROFESSOR,
TAM HUMANÆ FRAGILITATIS
QUAM OBREPENTIS PLERIQUE MORTIS
MEMOR,
DE COMPARANDO TRANQUILLO INSTANTI
CADAVERI
SEPULCHRO
AC DE CONSTITUENDA RUENTI CORPORE
DOMO
ÆQUE COGITABAT SERIO.
LUGDUNI BATAVORUM
MDCLXV
Franciscus de le Boë Sylvius,
Professor of the Practice of Medicine,
mindful of human infirmity

and of the often stealthy approach of death, bethought him to prepare against that time a quiet sepulchre for his remains, a house for his mortal body.

At Leyden,
1665.

It would be interesting to know what destruction Sylvius had in mind when he prepared this “sepulchrum” for his “instans cadaver” and a “domus” for his “ruens corpus.” I should guess that he believed the house was to hold the body for the resurrection.

When taken ill with a fever in 1672, Sylvius said to a friend: “I know the gravity of this disease. I escaped three years ago; this time I shall die.” His prediction proved true. His death occurred November 14, 1672.

CHARLES L. DANA

THE TUBERCLE OF CARABELLI AND CONGENITAL SYPHILIS

The diagnosis of congenital syphilis on the basis of the condition of the teeth is well known in the case of Hutchinson’s teeth, where the central incisors or occasionally the canines show a sharply marked cleft. A diagnosis of this condition on the presence of an aberrant cusp which occurs often on the upper molars is perhaps not so well known, but, according to Jeanselme, treatment for congenital syphilis has often been made on the basis of such a diagnosis. Jeanselme points out that, since this cusp is present in molar teeth of man from the neolithic, paleolithic and later periods, there is no basis for using such a condition in the diagnosis of congenital syphilis. The case is of even wider import than Jeanselme suggests.

The tubercle of Carabelli was described by the noted dentist of Vienna in 1842, as a Tuberculus anomalus, which frequently occurs on the anterior lingual surface of the first, second and, also, the third upper molars. Since aberrant cusps may develop at any one of three places along the lingual margin of the molar, there has often been confusion in the proper identification of the tubercle of Carabelli. The fact that this cusp occurs more frequently in children than in adults and in primitive races more frequently than in civilized races is of great importance.

This tubercle is often seen in neolithic and in paleolithic man. Gorjanović-Kramberger says that it occurs in nearly all of


the first and second upper molars of the fossil human skeletons from Krapina, which represent a race of men who lived about 75,000 years ago. He has given an excellent photograph of the tubercle of Carabelli on the molar of a fossil man, and, for comparison, similar cusps on the molars of a native of Java are shown. Batujeff has shown that the presence of this cusp in the primitive races of man and many genera of apes is of wide distribution. I do not doubt that a careful study of the upper molars of fossil primates would reveal the presence of similar cusps.

This cusp arises from the cingulum near the hypocone and may be regarded as of phylogenetic significance. Gorjanović-Kramberger says: "Den Carabellischen Höcker kann man als ein in Entwicklung begriffenes Gebilde, welches beim rezenten Menschen bereits in höheren Masse ausge-

bildet ist, als phyletisch wichtig bezeichnen und füglich für ein den Homo primigenius mit dem H. sapiens verbindendes Merkmal ansehen." Adloff and others have taken exception to this view. The entire subject of the evolution of the primates, of which the question of the tubercle of Carabelli is a part, has been recently reviewed by Gregory.

Since the tubercle of Carabelli has such an ancient history, being demonstrable many, many thousands of years prior to the knowledge of the presence of syphilis, it is difficult to see that the two have anything to do with each other. The presence of this tubercle may be regarded as the persistence of an ancient character, and, while it is often said to be hereditary, it seems improbable that it has any connection whatever with congenital syphilis.

ROY L. MOODIE

THE ANATOMIE UNIVERSELLE OF AMBROISE PARÉ

The early works of the Father of French Surgery were in the vernacular, and so popular that, like school books, they were "thumbed" away, and few copies remain. Among the rarest is the "Anatomie Universelle" of 1501, of which Malgaigne knew of only two copies—one imperfect in the St. Geneviève Library and the other at Bar-le-duc in private hands. The St. Geneviève Library is the fortunate possessor of six of the nine works which preceded the great surgery of 1575; but the Anatomie is not at Washington, nor in the British Museum or Bodley, nor, so far as I can ascertain, in any of the special collections, except the Hunterian at Glasgow. Dr. Hahn writes (1918) that it is not in the Biblio-


The gem of the book is a copper engraving, the earliest known portrait of Paré at the age of forty-five, a wood-cut of which, an oval medallion, appeared a few months later in “La méthode curative des playes, etc.” Both bear the legend Labor improbus omnia vincit; in the latter work, encircling the picture, not at the base. It was reproduced in the “Dix livres de la Chirurgie,” 1564, with the figure 5 changed to 8. It is by far the most pleasing picture, and I have not found in the Hope and other collections available a reproduction. The impression is unusually clear, much more so than the copies from “La méthode curative” and the “Dix livres...” just referred to.

The great surgeon is here seen in his prime, and one may read in the face “The gentle masterly and true man” (Albutt).

The fitness of things demands that this copy should return ultimately to France, to the great collection of the École de Médecine.

WILLIAM OSLER.
HISTORICAL NOTES

EARLY INSTRUCTION IN BACTERIOLOGY IN THE UNITED STATES.—Following the publication by Pasteur of the results of his investigations on the relations of the bacteria to fermentation and to disease, several scientists in this country took up, independently, the study of bacteria by Pasteur’s methods. These men were interested in the bacteria from either the broad biological standpoint or from the standpoint of pathology.

Probably the first name in the list of early teachers is that of the late Dr. T. J. Burrill who introduced the study of the bacteria into his course on the fungi, during the “seventies.” He discovered the organism of pear blight in 1879, and in the following years conducted extensive inoculation experiments with this organism on a large orchard of young pear trees, thereby definitely establishing the etiological relation of the organism to the disease.

The late Surgeon General George M. Sternberg, whose investigations on the causation of yellow fever, malaria, syphilis and other diseases are well known, also discovered the pneumococcus in normal sputum, and laid the foundations for our knowledge of the value of a large number of chemical substances as disinfectants.

Dr. William H. Welch from 1878 on was interested in the bacteria and their relation to disease. On returning from Europe in 1885 Dr. Welch became the head of the Pathological Institute at Johns Hopkins University, and had for his assistant in the instruction in bacteriology Dr. A. C. Abbott, who had been Dr. Sternberg’s assistant in the Biological Laboratory the previous year. Later on Dr. George H. F. Nuttall also became his assistant, and was associated with Dr. Welch in the discovery and study of the “gas” bacillus.

Dr. T. Mitchel Prudden at the College of Physicians and Surgeons in New York also taught the staining of bacteria in sections of tissues and in sputum, to his students in pathology, and commenced the cultivation of bacteria on solid media about 1883. Dr. Prudden, aside from his interest in the pathological action of bacteria, also very early interested himself in the relation of bacteria to air, water, and ice, which were subjected to critical study, the results forming the basis of valuable monographs.

Beginning about 1879, Dr. D. E. Salmon commenced his important studies on the relation of bacteria to animal diseases in the Bureau of Animal Industry at Washington, and while Dr. Salmon is not known generally as a teacher of bacteriology, there is every evidence that he was the instructor of assistants in the Bureau and was the leading inspiration for many of the early discoveries made by the Bureau staff; notably the epoch-making work which he did in association with Dr. Theobald Smith on Texas cattle fever, work which in a broad sense can be included here, even though the organism responsible for the disease is not a bacterium, but a protozoon.

In addition to those early teachers the following also deserve special mention: Dr. Henry Formad, at the University of Pennsylvania; Dr. W. T. Councilman, known particularly as a pathologist; Dr.
Herman M. Biggs, in charge of the Carnegie Laboratory when that was attached to the Bellevue Hospital Medical College; Dr. E. A. Birge, who inspired some of our noted biologists who studied under him; Dr. C. T. Cheesman, who began the first systematic instruction in bacteriological technique; Dr. John E. Weeks, at the Ophthalmic and Aural Institute; Dr. Harold, at the Harvard Medical School in 1885; Dr. Theobald Smith; Dr. L. H. Pammel, in the veterinary school at the Iowa State College of Agriculture; Dr. Bayard Holmes, at the Chicago Medical College in 1888 and later at the Post Graduate Medical School at Chicago and at the College of Physicians and Surgeons; Dr. Victor C. Vaughn and Dr. F. G. Novy, at the University of Michigan in 1889; Dr. H. W. Conn, who has directed his interest principally to the activities of the bacteria of milk and soil in their bearing on agriculture; Dr. W. T. Sedgwick, at the Massachusetts Institute of Technology in 1888–1889; Dr. Joseph MacFarland, at the Medical School of the University of Pennsylvania in 1892 and following years; and Dr. William H. Park, at Bellevue Hospital Medical College in 1895.

From these simple beginnings the teaching of bacteriology has come in a comparatively brief time to play a very important part in the scientific education of many persons, and bacteriology is to-day being taught in a large number of educational institutions in this country. Courses are given, not only in elementary bacteriology to general science students but to students in domestic science, agriculture, dairying, water and sewage purification, public hygiene and sanitation, medicine, dentistry, veterinary medicine, pharmacy, brewing and fermentation industries, food production and preservation and plant pathology.

David H. Bergey,
Major M. R. C., U. S. Army,
University of Pennsylvania

The Evolution of Dermatology—The impulse to specialization during the last quarter of the nineteenth century grew so strong that the intercommunicating bonds among the various fields of medicine became obscured. Dermatology suffered with the rest. The apostles of the newer creed worshipped most devoutly in Vienna at the shrine of Hebra. A scientific priesthood evolved, speaking a language incomprehensible to other physicians, and often vague enough to the anointed. A technical vulgate flourished at the expense of scientific dermatology. Thereupon, the latter entered its dark ages, but the renaissance is at hand.

It was the thundering of the Southern Teutonic school that effected the division between dermatology and general medicine. In France and England, although unnoticed in the general din, the influence of Willan and of his disciples still sustained the substantial principle that the anatomical envelope of the human body was an integral physiological part thereof, and not a vestment that could be taken off, mended, laundered, and replaced. In northern Germany Unna and his pupils opposed the Viennese orthodoxy by attempting to bring the study of cutaneous maladies in line with Virchow’s ideas of cell pathology. Thus, the Hamburg faction, upon a basis of microscopy and microchemistry, made a definite contribution to dermatology as a biological science rather than a dialect. In the late eighties America was invaded by alien votaries of all cults, and Americans themselves returned from abroad, having studied at the various centers, some having studied at all of them. Thus, without bias, American dermatologists founded an eclectic school upon the best that Europe could offer.

Europe is now understanding that America is to be regarded seriously. So far as Americans are concerned, Europe has ceased to be Mecca in dermatology, and such pil-
grimages as they may deign to make in the future will not be with the idea of obeisance, but with the full knowledge that they will bring abroad at least as much as they receive. In general, European medical opportunities excel ours, because the clinical material is concentrated, and is more readily employed for investigation. This stimulated medical research in the old world earlier than here, but now we are fast closing the gap. Considering Europe’s research advantages, and this holds particularly true in Germanic countries, there has been virtually no creative dermatology abroad. In our country, on the other hand, and against the utmost opposition and with the scantiest of equipment, very earnest original work has been attempted. That it has not yet led to anything definite is due almost entirely to the newness of the work, and the fact that we must embark timidly upon uncharted seas. In Teuton Europe dermatologists are still classifying, labelling and making histological studies in order to create an illusion of science. In America a small but ever increasing group of men is studying metabolism, the endocrinous glands, anaphylaxis, and clinical medicine in relation to skin diseases. It is the object of this exposition to set forth the little that has been accomplished, but that little is the result of scarcely ten years of effort and a generation of dermatological independence. This seems most encouraging to those of us who do not believe that the royal road to dermatology is Alserstrasse.

WALTER JAMES HEIMANN, M. D.
New York City

THE CHARMS OF PRECEDENCE

Such is my theme, which means to prove,
That though we drink, or game, or love,
As that or this is most in fashion
Precedence is our ruling passion.

When college-students take degrees,
And pay the beadle’s endless fees,
What moves that scientific body,
But the first cutting at a gaudy?
And whence such shoals, in bare conditions
That starve and languish as physicians,
Content to trudge the streets, and stare at
The fat apothecary’s chariot?
But that, in Charlotte’s chamber—see
Moliere’s Médecin malgré lui—
The leech, howe’er his fortunes vary,
Still walks before the apothecary.

William Shenstone (1714-1763).
BOOK REVIEWS


This impressive and beautifully illustrated book opens with an introduction by Sir William Osler, who presents a lucid and interesting explanation of the object of the work. This is to contribute to the story of how human knowledge was gained, and how scientific methods were evolved and their results systematized. (We just venture to say passim that we do not believe Sir William could construe his first sentence.)

The volume is made up of a series of historical and critical studies, which are richly illustrated and which, for the most part, represent the results of original investigations. It is not at first apparent why the title “Studies in the History and Method of Science” should be given to such a collection, for most of the articles deal with persons who did not follow scientific method as we know it to-day. We infer, however, that the subjects dealt with represent various historical examples in which knowledge was sought for by means of rational observation, rather than accepted as from inspiration or tradition.

The Editor opens with a very elaborate, original and beautifully illustrated article on the scientific views and interpretative visions of St. Hildegard. The author has used the Saint and her activities as a medium for describing the condition of natural knowledge at the period in which she lived, 1098–1180. He depicts Hildegarde’s schemes of the Universe, her allegorical conception of “The Soul pervaded by the Godhead,” and again of this God-pervaded Soul “embracing the macrocosm and microcosm.” There are wonderful reproductions in color showing “The Celestial influences on men, animals and plants”; “The Fate of the elements at the last judgment,” “The relationships of human and cosmic phenomena,” “The birth of the soul, its trials and departure after death.” There is also an impressive colored illustration of “The Fall of the Angels” which is suggestive of William Blake, or whatever form of most modern art it is that aims to tell a story by means of weird symbolisms. It is better than the Picassos, and Matisse, and Cézannes of New York shops. In fine we are shown that in the dark days of the good Saint, there were definite attempts made, out of the scriptures, and legends and visions and some serious thinking, to explain the plan of the universe and man’s relation to it and his Maker.

Dr. J. W. Jenkinson has a well-written essay on “Vitalism” in which he does not believe. He touches only briefly on the newer physiological interpretation of vital phenomena; hence his argument and article do not seem complete or convincing.

Dr. Singer contributes a study in “Early Renaissance Anatomy with a new Text: The Anatomia of Hieronymo Manfredi (1490).” It contains much original and interesting material with many illustrations. Manfredi (1430–1493) was Professor of Medicine in Bologna and wrote a good many treatises on astrology and medicine. A manuscript copy of a short treatise on anatomy is in the Bodleian Library. This is reprinted and parts of it are translated in the present article. Dr. Singer states that Manfredi’s Anatomy is more complete than that of Saliceto or that of Mondino.

“The Blessing of Cramp-rings—a chap-
ter in the History of the Treatment of Epilepsy,” by Raymond Crawford is an interesting and well-illustrated story of the blessing of rings for the cure of epilepsy by the kings and queens of England.

The article on Dr. John Weyer and the Witch Mania by Dr. E. T. Wellington is a careful historical study of this abnormal phase of human deviation. Witches and witchcraft form a curious phase of life among savages and early civilizations. Probably witchcraft added somewhat to the picturesque and dramatic side of savage and semi-civilized life. In early medieval times witchcraft was a harmless and unimportant factor, but in the fifteenth and sixteenth centuries Europe became obsessed with fear of witches and a zeal to destroy them. It seems incredible to us now that in those years so many persons should have been tortured and burned as this account avers. The real number is not even approximately known. It ranged from 40,000 to over a million, and we are told that the mania for burning supposed witches caused more deaths than the wars or pestilence of those two centuries. The author might have lightened his article by inserting some of the old cuts which filled Reynard’s book on this same subject—published twenty odd years ago. Reynard took the matter less seriously and more journalistically. As we read Dr. Wellington’s article and its descriptions of epidemic fear, we realize that even civilized countries to-day often get touches of this same outrageous obsession. More often, now the fear is of some disease like tuberculosis or influenza, or in wartime, of enemy spies.

We have not space specially to discuss Dr. Levy’s brief but learned article, “Tractatus de Causis et Indiciis Morborum.” He shows that the tractate was not written by Maimonides.

F. C. S. Schitler’s contribution, “Scientific Discovery and Logical Proof,” is devoted to showing the limitations of formal logic. Many years ago Macaulay in an Essay on Mill’s Theory of Government, attacked the validity of logic in a less elaborated but more winsome way than does Dr. Schitler, but Dr. Schitler pursues the method of science, and he is more convincing if less readable than Macaulay.

CHARLES L. DANA


This essay is delightful reading for those conversant with the older physiology. It recalls the four elements of Empedocles (470 b.c.)—air, earth, fire and water, each of which was compounded with two of the properties, hot, cold, wet or dry. Galen (a.d. 200) in Medical Definitions says: “The elements of medicine, as some of the ancients thought, are hot and cold, moist and dry,” and also “Of what are our passive bodies composed? Of four things, blood, phlegm, bile and melancholy humour, which some also call passive elements. Or (putting the question in another way) of what do our material bodies consist? Of the four elements, fire, air, earth and water.”

Chaucer’s doctor, from this ancient information, knew the causes of diseases:

“He knew the cause of every malady,
Were it of cold or hot or moist or dry
And where engendered and of what humour,
He was a very perfect practisour.”

And this tradition persisted despite the warning of Hippocrates, the Father of Medicine (c. b.c. 430), “Whoever having undertaken to speak or write on medicine have first laid down for themselves some hypothesis to their argument such as hot or cold or moist or dry or whatever else they choose (thus reducing their subject within a narrow compass and supposing
only one or two original causes of disease or of death among mankind) are clearly mistaken in much that they say.”

Molière satirizes physicians who are his contemporaries as follows:

“First doctor: ‘Do you eat well, sir?’

Pourceaugnac: ‘Yes and drink still better.’

“First Doctor: ‘So much the worse! This great craving for cold and moist is an indication of heat and dryness within.’”

Phlegm is described by Galen as “cold and moist, applied by nature to the swallowing of food and the movements of the limbs.” Phlegm included saliva, mucus of the respiratory tract and the synovial fluid. Thus Pope speaks of the stomach after excessive eating as:

“A tomb of boiled and roast, and flesh and fish,
Where bile and wind and phlegm and acid jar
And all the man is one intestine war.”

In the fourteenth century medical students at the University of Cambridge still attended two full courses of lectures on Galen’s “Commentaries on Hippocrates.” The author believes that the Galenic physiology was currently known among educated people of the sixteenth century. He states “In the case of Shakespeare, however, the number and accuracy of his illusions warrant the belief that he had made acquaintance with medical writings at first hand.” He does not believe that Shakespeare anticipated Harvey’s discovery in 1620, of which Dryden speaks:

“The circling streams, once thought but pools of blood,
(Whether life’s fuel or the body’s food)
From dark oblivion Harvey’s name shall save.”

These few selected fragments are taken as illustrative of a scholarly and interesting effort.

Graham Lusk.
To the Editor:—

Bibliographical Notes on Plague Tractates.—The article “Plague Tractates” appearing in this issue of the Annals, by Dorothea Singer and Reuben Levy has interested me very much as a welcome contribution to a much neglected branch of medieval Jewish literature. Aside from some publications of medical works of Maimonides by Kroner nothing has been done in this field since the death of Steinschneider, and it is seldom that competent medical students favor us with the edition and interpretation of Hebrew texts. May I be permitted to add a few bibliographical notes which occurred to me when reading the article.

In amplification of Note 2, I would mention that of Hebrew tracts on the plague, two are printed. A translation of Valesus de Taranta “de peste” (a part of his Philonium), appeared in Constantinople circa 1510 under the title “runan, imn 9 leaves 4, see Steinschneider “Hebraeische Uebersetzungen”, p. 819. (A copy of this extremely rare booklet as well as the MS formerly belonging to Steinschneider may be found in the library of the Jewish Theological Seminary of America, New York.) An original treatise by Isaac ben Todros, written at Avignon after 1373, was published by David de Günsburg from a MS in his possession in the “Jubelschrift zum neunzigsten Geburtstag des Dr. L. Zunz”, Berlin, 1884, Hebrew part, pp. 104–26; compare D. Kaufmann in “Goettingische gelehrte Anzeigen”, 1885, pp. 451–56, Histoire littéraire de la France, XXXI, pp. 699–700. An interesting passage on the plague in Moses Narboni’s medical work “םָוֹר הַנְּבָאָה, written in 1350, was published with the omission of the technical medical points by Steinschneider in the Hebrew periodical תַּנְחָנ, VII, p. 110–11. (See further on this book, of which the same library possesses two MSS representing different versions, in Steinschneider, loc. cit. 746–47; Histoire littéraire, loc. cit. 676–78.) The treatise on this subject by Abraham Caslari, which precedes that of John of Burgundy in the Paris MS 1191, reads almost like a translation according to Steinschneider, “Catalogus codicum hebæorum bibliothecæ academïæ Lugduno Batææ”, Leyden 1858, p. 159.

Concerning the identity of the two MSS which is discussed in Note 24, it should be noticed that the beginning of Vienna MS in “Hebraische Bibliographie” XVII, 57, note 1, shows the identity with Paris MS, 1124, but omits the three puzzling words which are rather arbitrarily interpreted in Note 36. The Berliner-Günsburg MS of the other version while literally agreeing with the Paris MS, 1191, as can be seen from the extracts in Magazin XII, 183, has a complete ending before the astrological epilogue (fol. 134 verso line 1 of MS 1124) with the variant Montpellier for Liège. The title of the other tract of John on the subject (deus deorum) reads here also תַּנְחָנ; in consequence the correction in Note 30 becomes rather doubtful, the translator possibly having chosen this term.

Cod. Hebr. 2 of the Leeuwarden library contains, according to De Goeje, “Catalogus
Correspondence

Cod. Orientalum Bibliothecae Academiae Lugduno Batavae” Vol. V. p. 305, as the last piece a treatise on dietetics by Isaac Israel! Neubauer, however, when examining the MS found instead three tracts on the plague, see Letterbode II, p. 84. Of these the third by John of Tornamira is written in Spanish with Hebrew characters, the other two are Hebrew; the first is ascribed to a still unidentified Paul of Sophia? Steinschneider, “Hebraeische Uebersetzungen”, p. 816; the second, which is anonymous, Neubauer thinks might be identical with that of John of Burgundy, Paris MS, 1191. A glance at the first words which he communicates permits us now to definitely deny this identity. The text accordingly requires further investigation.

The articles by Renan-Neubauer in the “Histoire litteraire de la France”, XXXI, pp. 723–25 and by Moise Schwab, “Revue des Etudes Juives”, XLI, pp. 154–55, should be noted as giving some data about Benjamin of Carcassone, who is described as translator of MS 1191, (viii).

As to the anonymous translator of MS 1124, Steinschneider’s hypothesis that it might be the same Joshua of Bologna who translated another tract on the subject following ours in the Paris and Vienna MSS deserves mention. A linguistic examination of the names of medicaments in the text might show whether the translator was an Italian.

In conclusion a few remarks may be added about the Hebrew texts.

The copyist of MS 1191 frequently divides the words if he lacks the space at the end of a line to finish them, a very uncommon procedure in Hebrew texts. For the convenience of the reader these cases might have been indicated by a hyphen. The practice to fill the empty space at the end of a line by the first one or two letters of the next word is very common. The line on top of these letters is not an abbreviation mark but stands for “deleatur.” The same is the case with the line over fol. 141 verso line 18; the copyist began to write when he noticed that he had omitted a word. All such letters might just as well have been omitted in the edition.— Fol. 141 verso line 26 read for see facsimile.

— Fol. 142 recto line 1 perhaps ought to be read for ənq.

MS 1124 is corrupt in many places. In addition to the corrections proposed by the editors the following may be suggested: Fol. 133 verso line 8 read: ənq; 16 line 22 and 134 recto line 1 read ənq; fol. 134 recto line 5–6 read ənq (comp. line 16 and 134 verso line 13); ib. line 6 for əenq perhaps ənq (comp. 134 verso line 10) ib. line 25 seems to be dittography from the following word; fol. 134 verso line 9 for ənq better ənq; ib. line 10 for ənq perhaps ənq; ib. line 14 read ənq; the marginal gloss “Infetto” probably refers to ənq; line 15 add ənq after ənq; fol. 135 recto line 9 read ənq There still remain some passages in need of emendation.

Alexander Marx.

Translation of Galen’s Entire Works into English—Cataloguing Scientific Manuscripts.—The following extract from a letter of Dr. Charles Singer to Dr. Dana should greatly interest students of medical history.

There are two projects that we have in hand which I think would interest you and other American scholars, and to which I should like to call your attention.

1. The first is a scheme for complete translation into English of the entire works of Galen. The Germans are gradually bringing out the Corpus Medicorum Graecorum, which will include Galen in his entirety.

As they come out, volume by volume, we hope to have them rendered into English. With this end in view, we propose to found a Galen Society, in which we hope to include American men.
The services of Dr. Withington are available for the purpose. Dr. Withington, I may say, is an absolutely first class Greek scholar and, for reasons of health, is entirely unavailable for military purposes. I believe the Oxford University Press could be persuaded to publish the translation, and the only burden on the Galen Society would be some recompense to the translator for his time and trouble.

I should be glad to hear what your view, and that of other Americans, may be on the subject, and should you be interested I would let you know of the progress of our scheme.

2. The other undertaking which I would like to mention to you is the Catalogue of Scientific MSS in the libraries of Great Britain and Ireland, which is in process of preparation by Mrs. Singer and by myself, or rather by Mrs. Singer, for she, with several helpers, has been responsible for the whole work in my absence.

It is our hope, when the Catalogue reaches a serviceable stage, which should be by the end of the summer, that it will place the worker who cares to use it in quite as favorable a position for the study of medical and scientific MSS as those of us who are living in touch with the great European libraries.

The Catalogue will include all MS material up to the year 1500. It will be in card form, and will be classified according to the subject, Anatomy, Astronomy, and so forth. It will contain about 40,000 entries.

By its means a worker, in the United States for instance, will be able to see at a glance what MSS there are that are of interest to him, and he could procure photographic or photographic copies of them by communicating with the library where they are to be found.

Yours sincerely,

Charles Singer


The Catalogue will be arranged primarily under subjects, and subdivided chronologically, by centuries, and by the localities in which the MSS are found.

There will be a very brief excursus on each text so far as is possible.

There will also be two indices.

Index 1.—Alphabetical combined list of: authors; places; scribes; languages (giving subject, collection, MS number and foliation, and catalogue page).

Index 2.—Alphabetical list of manuscript collections with the MSS arranged in numerical order, and giving the library in which each collection is preserved, the subject and the catalogue page.

Headings of the Catalogue

Alchemy
Chemistry
Anatomy
Aristotle (Secretum Secretorum Aristotelis to Alexander)
Arts and Crafts
Astrology
Menology
Astronomy
Bestiaries
Monstrosities
Fables
Calendar
Computus
Charms
Magic
Children
Cosmology
De Rerum Natura
De Elementis
Diet
Fermentation and Generation
Fevers
Geography
Travel
Gynaecology

Hematoscopy
Blood-inspection
Herbaria
Hospitals
Husbandry
Lapidaries
Mathematics (Pure)
Measures and Weights
Medicine (General)
Melosthesia
Miscellaneous
Music
Harmony
(Scientific Aspects)
Ophthalmology
Pestilence
Contagion
Epidemic
Plague
Infection
Phlebotomy
Blood-letting
Physics
Physiognomy
Chiromancy
Physiology (Four temperaments, etc.)
Prognostics

1 Under Bodleian Library, it will be necessary to print also a list of the MSS in numerical order according to the old numbers (retained in the New Summary Catalogue) giving the present pressmark, i.e., collection and number.
To the Editor:

A Modernist’s View of Mediaeval Science

—I should hate you to misunderstand my attitude towards Mediaeval Science. I always feel towards it as Huxley did towards Ghosts. He used to say, you know, that “he didn’t believe in ghosts because he had seen too many of them.” I don’t think there are many mediaevalists who feel less mediaeval than I do. But the Middle Ages, like the Germans, are there, and we have just got to consider them. The important question is, to my mind, not whether mediaeval science made any advance on knowledge, for it clearly did not, but whether the point of view and the intellectual processes which gave rise to the Middle Ages have or have not had a deep and lasting effect. To my mind they have. To my mind modern thought is the descendant of mediaeval and not of classical thought. To my mind the classics have never been, and cannot now be studied from the inside by the Western nations. If the men of the Middle Ages were children, then the men of Greece were foreigners. It is, of course, possible to appreciate the beauties and the meaning of the Greek and Roman writers, but to

MS is cited (and in brackets their Bodley pressmarks, if known, otherwise leave space for pressmarks). If the Catalogue is the only work, it need not be cited.

On Body of Card—

1. If the work is printed, in bold letters printed, followed by a list of works in which the MS is printed (and in brackets their Bodley pressmark, if known; otherwise leave space for pressmark).

2. Followed by name of Scribe and any important note or remark.

3. Any figures or illustrations will be noted in bold letters.

4. Followed by full title, incipit, explicit, and any other quotation given in Catalogue.

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