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Ballantyne Press
BALLANTYNE, HANSON AND CO.
EDINBURGH AND LONDON

SAINT BARTHOLOMEW'S HOSPITAL REPORTS.

EDITED BY

W. S. CHURCH, M.D.

AND

JOHN LANGTON, F.R.C.S.

VOL. XX.

LONDON:
SMITH, ELDER, & CO., 15 WATERLOO PLACE.
1884.

IN EXCHANGE.

Guy's Hospital Reports.
St. Thomas's Hospital Reports.
Pharmaceutical Society's Journal and Transactions.
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CONTENTS.

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December 31, 1884.

The Orders and Ordinances for the better Government of the Hospitall of Bartholomew the Lesse.

Among my few treasures in the shape of old books, one of the most valued is a copy of the Rules which were drawn up for the government of St. Bartholomew's Hospital at the time at which it was refounded by King Henry VIII. It is dated 1652, and is a Reprint of the original Pamphlet which was first published in the reign of King Edward VI., and again printed in the year 1580. It is bound up with two other rare pamphlets; of which one is entitled, "Orders taken and enacted for Orphans and their Portions," and the other, "A Briefe Discourse of the laudable Customes of London." The whole have been evidently reprinted and published together, and are, apparently, in the original calf-binding. The title-page of my copy is here given in fac-simile; but I have reprinted only the Pamphlet which relates to St. Bartholomew's Hospital.

The "Orders and Ordinances" are accompanied by a Preface written on behalf of the Lord Mayor and Corporation of the City of London as a reply to "certain clamours and slanders raised by some ill-minded persons."

The voice of the Clerk, or other official, who, in this Preface, defends the Hospital Authorities, sounds pleasantly from the

1 King Henry VIII. 1509–1547.
King Edward VI. 1547–1553.

distance of more than three centuries, as he exhorts the good Reader to disregard the wickedness of Report which "is grown to such ranckness, that nothing almost is able to defend it selfe against the venime thereof." And I have thought that many, to whom the original pamphlet is inaccessible, may be glad to possess a copy of it, and to learn how the Hospital was governed in the reign of Henry VIII. and for many years afterwards. Many points of great interest will strike all who read through the "charges" of the various officers of the Hospital; and much might be written on them by one who possessed the necessary antiquarian knowledge. To this, however, I can lay no claim, and, therefore, will leave the "Orders and Ordinances," without comment to speak for themselves.

W. MORRANT BAKER.

1st January 1885.

ORDERS
AND
ORDINANCES,
FOR
The better government of the Hospitall
of BARTHOLOMEW the lesse.

AS ALSO
Orders enacted for Orphans and
their PORTIONS.
M D LXXX.

Together with
A Briefe DISCOURSE of the laudable
Customes of *LONDON*.

LONDON,
Printed by JAMES FLESHER,
Printer to that Honourable City, 1652.

A Preface to the Reader.

He wickedneſs of report at this day, good Reader, is grown to ſuch ranckneſs, that nothing almoſt is able to defend it ſelfe againſt the venime thereof; but that either with open ſlander, or privy whiſpering, it ſhall be ſo undermined, that it ſhall neither have the good ſucceſs, which otherwiſe it might, nay the thanks which for the worthineſs it ought. It is better known by report unto the number, then weighed in effect almoſt to any, that for the reliefe of the ſore, and ſick of the City of *London*, it pleaſed the Kings Majeſty of famous memory *Henry* the eight (father to this our moſt dread Soveraign Lord now reigning) to erect an Hoſpitall in *Weſt-Smithfield*, for the continuall reliefe and help of an hundred ſore and diſeaſed. And the ſame endowed with the yeerly revenues of five hundred Marks, to give unto the ſaid City and Citizens conditionally, that they alſo for their part, ſhould adde other five hundred Marks by the yeer. Which thing with all due thankfulneſs, they received at his Majeſties hands: And (for that they ſaw it proceed from his Highneſs, as well of moſt charitable zeal toward the afflicted members, and his brethren in Chriſt, as of a ſingular favour toward the City) very gladly embraced the condition. Thinking it for their parts rather too little then enough. But when they had taken ſuch ſurvey thereof, as was convenient for them in this caſe to do: Although the Kings Majeſties endowment was after the rate of his Highneſs moſt gracious gift, yet found they the nature of the ſame, and the ſtate of the whole, farre under that that they at the firſt had hoped. The raiſing of this five hundred Mark-rent, to lye onely in a certain of houſes, ſome in great decay, and ſome rotten ruinous: And ſome other to whom better Tenants had happen-

ed, already leaſed out at term, and rent ſcant reaſonable for the behoof of the poor. So that firſt to make them again worth the wonted revenue, and then to continue them in the ſame, was no ſmall charge, and the help thereunto, which out of the better repaired might have grown, was by the former leaſes and rentings prevented. In the Hoſpitall it ſelfe (beſide the penſions iſſuing out of the ſaid five hundred Marks, and granted by the Letters Patents of his ſaid Highneſs to the Hoſpitaller there and to other the Miniſters of the ſame) was found ſo much of houſhold implements and ſtuffe, toward the ſuccouring of this hundred poor, as ſufficed three or four Harlots, then lying in childe-bed, and no more, yea, barely ſo much, if but neceſſary cleanlineſs were regarded, ſo farre had the godly meaning of the gracious King been abuſed at at thoſe dayes; and yet was little then ſmelled and leſs talked of. The good Citizens nevertheleſs not ſo much diſcouraged with others evill doings, and the great fall of their hope, as moved with the duty of their enterpriſe and godly regard, not to their own poor and afflicted onely, but to all other ſore and diſeaſed, which daily out of all quarters of the Realm reſort to the City (as into a commune receipt and refuge of their miſery) proceeded with ſuch ſpeed as they could to the redreſs of all theſe decayes, diſorders and defaults; and beſtowed thereabout above their covenant of five hundred Marks yeerly, for their welcomming and beginning not much leſs than a thouſand pounds, whereby (together with other their good endevours) when they had won it to ſuch point, that it was fit to receive the number, and to ſuccour the ſame with all neceſſaries requiſite, and in ſuch caſe needful, and had indeed received, and daily maintained it at the full; certain buſie bodies more ready to eſpy occaſion how to blame other, then skilfull how to redreſs things blame-worthy indeed, yea, I fear me having all their zeal in their tongue onely, not contented privately one, and another, among their neighbours to hinder the profit of the poor, and to ſlander the good Citizens occupied thereabout, rounded into the eares of the Preachers alſo, their tender conſideration. Who being leſs circumſpect in crediting their matter miniſtrers then to men of ſuch

ſuch calling appertaineth: and thinking peradventure if the City had done their duty herein, this Hoſpitall ſhould have made a generall ſweep of all poor and afflicted: As though this privy backbiting, could not ſo ſufficiently and weightily ſet forth this enormity of the Citizens, as ſeemed behovefull for the querele of charity, took upon them to give ſpeed and authority to the thing, each after his manner. So that the good Citizens, which now for theſe five yeers ſpace, have ſhunned for no loathſomeneſs, to adminiſter the reliefe without other gain then that Jeſus Chriſt God and man, promiſeth, and will undoubtedly pay, have here received nothing elſe but for a commune benefit, an open detraction, and the poor (as ſhall afterward appear) a larger hindrance. Where in the mean ſeaſon notwithſtanding, there have been healed of the Pocks, Fiſtulaes, filthy Blains and Sores, to the number of eight hundred, and thence ſafe delivered, that other having need might enter in their room. Beſide eight ſcore and twelve, that have there forſaken this life, in their intolerable miſeries and griefes, which elſe might have dyed, and ſtunck in the eyes and noſes of the City, for all theſe charity tenderers, if this place had not vouched ſafe to become a pump alone, to eaſe a commune abhorring. Wherein although they have at all hands ſo well deſerved, that hard it were with the moſt favourable report to requite it, yet for that they look for their reward another where, contented to paſs that in ſilence: It may juſtly be anſwered to all ſuch charity proctours, that if they well weighed theſe things already alledged, and the wages of the Chirurgions, and ſuch officers and ſervants, as needfully are attendant about the poor, the charges of bedding and ſhift for ſo many ſore, and diſeaſed; and the exceſſive prices of all things at this day, they might both marvell how ſo many are there relieved, and daily maintained: And with repentance, of that they have miſſaid, endevour themſelves with as much good report and praiſe, to advance both the deed and the dooers, to wipe away the ſlander, as they have to hinder them both by the contrary. But for as much as it is doubtfull, whether they will do as they may, and of conſcience are bounden, and the ſlander is ſo wide ſpred, that

a narrow remedy cannot amend it: It is thought good to the Lord Mayor of this City of *London*, as chief Patron and Governour of this Hoſpitall, in the name of the City, to publiſh at this preſent the overſeers and orders by him appointed; and from time to time practiſed, and uſed by twelve of the Citizens moſt ancient in their courſes, as at large in the proceſs ſhall appear, partly for the ſtay and redreſs of ſuch ſlander, and partly for that it might be an open witneſs, and knowledge unto all men, how things are adminiſtered there, and by whom. Wherein if any man judge more to be ſet forth in word, then in deed is followed, there be means to reſolve him. But if there be not ſo much ſet forth as is expedient, (as what thing at the firſt can attain to the top of perfectneſs?) or that any man ſpieth, ought in this order worthy to bee reformed, he ſhall not need to cry it at the Croſs, but ſhall finde thoſe at the Hoſpitall, that both gladly will and may reform it. And where yet by ſuch means occaſion is found, as tofore was ſignified, to withdraw mens charities, by reaſon that it is thought but folly to beſtow more reliefe where there is enough, for the number already: The City of their endleſs good will toward this moſt neceſſary ſuccour of their poor brethren in Chriſt, although at the firſt they ſeemed bound to the preciſe number of an hundred, and no more, wiſh all men to be moſt aſſuredly perſwaded, that if by any means poſſible they might, they deſire to enlarge the benefit to a thouſand, as ordinary as at this day the hundred are. Finally, they wiſh that all Almoiſners and Houſes of Almoiſe, known either by the name of Hoſpitall, or Savoy, might by theſe their doings, bee provoked to like endevour and benefit to the poor, that what one is not able alone to ſuccour, the other might in fellowſhip ſupply, at this time namely when the miſery of the poor moſt buſily ſeemeth to awake. The Lord Jeſus, kindle in us all, that faith that worketh by love, that we may indeed put on Chriſt our righteouſneſs before God, and not ſuffer him to lye up in Preſſe, that ſeeketh to be worn, to the glory of his Father, and ours, and to the Teſtimony of our hope laid up in him. *Amen.*

THE

THE Diviſion of the Governours, and Officers: the Names, and Nature of them both.

IT behoveth firſt to underſtand for the more evidentneſs of that that followeth, that there are in this adminiſtration, two ſorts, or kindes of men. The one called Governours (by a name proper to their Authority) placed there by the Lord Mayor, as Patron of this Hoſpitall: And the other called Officers, that for wages are hired, for to have the neceſſary doings in the ſervice of the houſe and the poor.

The Governours ſo change, that the one halfe remaineth two yeers in their governance, to help and inſtruct the later elected, which alſo become Inſtructers to their followers. And theſe are in number twelve, whereof four are Aldermen; and the reſidue Communers, and according to their governance, thus are they named.

The Preſident, alway the Seniour Alderman.

Surveyors four, two Aldermen, and two Communers.

Almoiſners four, one Alderman, and three Communers.

The

The Treaſurer a Communer.

Scrutiners, two, both Communers.

The Officers are ſeven in number, continuable or removable, as the governours ſhall finde cauſe, and bee thus called.

The Hoſpiteler.
The Renter Clerk.
The Butler.
The Porter.
The Matron.
The Siſters, twelve.
The Byddles, eight.

Theſe are alſo as in a kinde by themſelves, three Chirurgians in the wages of the Hoſpitall, giving daily attendance upon the cures of the poor.

And a Miniſter named the viſitour of *Newgate*, according to his office and charge.

The Governours are alwayes elected by the Lord Maior and his brethren, who yeerly electeth ſix, that is to ſay, two Aldermen, and four Commoners, which are admitted into the Hoſpitall, after this manner.

The whole Company of the twelve old Governours, ſitting in Aſſembly together, cauſe their Clerk to read unto the ſix newly elected, the charge hereafter following.

The Charge.

IT may pleaſe you to underſtand, that yee are here elected and choſen, as fellow governours of this Hoſpitall, to continue by the ſpace of two yeers: By all which time according to ſuch laudable degrees and ordinances

dinances as have been; and ſhall be made by the authority of the Lord Maior chiefe Patron hereof, in the name of the City, and the conſent of the governours for the time being, all your other buſineſs ſet apart as much as you poſſibly may: ye ſhall endevour your ſelves to attend onely upon the needfull doings of this houſe, with ſuch a loving and careful diligence, as ſhall become the faithfull Miniſters of God, whom ye chiefly in this vocation are appointed to ſerve; and to whom for your negligences or defaults herein ye ſhall render an accompt. For truly ye cannot be blameleſs before God, if after you have ſet hand to this good plough, and promiſed your diligence to the poor, ye ſhall contrarywiſe turn your head backward, and not perform the ſuccour that Chriſt looketh for at your hands, and hath witneſſed to be done to himſelfe, with theſe words: Whatſoever ye do to one of theſe needy perſons for my names ſake, the ſame ye do unto me. And contrarywiſe, if ye neglect and deſpiſe them, ye deſpiſe me. We therefore require and deſire every of you, on Gods behalfe, and in his moſt holy name, that ye endevour your ſelves to the beſt of your wits and powers, ſo to comfort, order, and govern this houſe, and the poor thereof, that at the laſt day, ye may appear before the face of God, as true and faithfull Stewards, and diſpoſers of all ſuch things, as ſhall for the comfort and ſuccour of them, (during the time of your office) be committed to your credite and charge. And this to do wee require you, faithfully to promiſe in the ſight of God, and hearing of your brethren. And ſo doing we here admit you into our fellowſhip.

That done and the new elected conſenting, and yeeld-

ing themſelves to the charge, the half of the governours that have already fulfilled their two yeers governance, to ſtand apart: and the other half that ſhall remain with the new elected, to take them by the hands after their degrees, and ſo admit them, and not to depart fellowſhip, before they have dined together all wholly, as well thoſe that come new, as thoſe that have governed their time, and thoſe that remain, every man at his own coſt and charge.

The Preſident.

THe Preſident of this Hoſpitall, is chiefe Ruler and Governour of the ſame, under the Lord Maior, who hath authority from time to time, to convocate and call together all the Governours for matters concerning the maintenance, and good ordering of the poor, and to demand of every of them, the account of their doings in their ſeverall offices; and with the aſſent and conſent of the ſaid Governours, to grant Leaſes, and Fees, and make neceſſary decrees, and ordinances.

The Treaſurer and his Charge.

ALl the Treaſure of this houſe, is committed to your charge, that is to ſay, all ſuch money as ſhall riſe and grow, either by rents, or by gifts to the uſe of this houſe, of the which ye ſhall keep a true and a juſt account. And it ſhall not be lawfull for you to pay any manner of perſon, any ſum or ſums of money, (except it be to the Steward of this houſe, for the victualling of the ſame; and

and the ordinary fees and wages that goeth out thereof:) but ye ſhall firſt have the names of thoſe perſons ſubſcribed to the ſaid ſum of money, under whoſe office and charge ſuch payment ſhall happen to riſe and grow, or the names of the moſt part of them.

Ye ſhall alſo keep one ſeverall account between the Renter and you, by which may appear, not onely the charge of the ſaid Renter and his arrerages, but alſo whether the rents of the lands pertaining to the ſaid houſe, encreaſe or decay.

Ye ſhall alſo yeerly the 20. day of *October* (within this Hoſpitall) yeeld and give up in writing unto the Preſident, & Governours of the ſame, a true and a perfect account of your whole charge, during the yeer of your treaſurerſhip; and then the ſaid Preſident and Governours, ſhall name and appoint among themſelves four to be auditours for ſame. And the ſecond day of *November* next following, ye ſhall likewiſe reſort to the ſaid Hoſpitall, at the houre of eight of the clock in the forenoon, that ye may then anſwer and clear your account, if any doubts or faults ſhall happen to ariſe or be found by the auditors of the ſame. And the ſame day, then and there ye ſhall declare unto the new Treaſurer that ſhall be appointed, the whole courſe and ſtate of the affaires, profits, and commodities of this houſe, in as large ſort as ye poſſibly can, and deliver unto him all ſuch ſums of money due to the houſe, as ſhall then reſt in your hands, and all ſuch acquitances, rentalls, and other writings, as neceſſarily ſhall appertain to the affaires of the ſaid houſe. And the ſame day to dine within the ſaid Hoſpitall, with the Governours thereof. And in recompence of your pains, ye ſhall be aſſured of the mer-

cies layed up for you in the promiſes, and bloud of Jesu Chriſt our Saviour.

Surveiours.

UNto you is committed the view of all the Lands, and Leaſes pertaining unto this houſe, as well ſuch as heretofore have been granted, as alſo hereafter ſhall be granted; and ye ſhall cauſe the ſame to be regiſtred in the repertery Book by the Clerk, from time to time, when, and as often as you ſhall aſſign him, to the intent that the governours of this houſe may alwayes be aſſured, what grants have paſſed them, and both whereunto they have bound themſelves, and alſo whereunto their Tenants are bound, that the Lands and Tenants may be looked unto accordingly. And ye ſhall adjoyn unto you the Treaſurer of this houſe for the time being, as a neceſſary aide in all your doings, for that he moſt chiefely hath experience of all the affaires and doings of this houſe. And for the better accompliſhing hereof, you or the greateſt part of you, ſhall meet every fourteen dayes in this houſe on the *Wedneſday*, at which time ye may warn the Tenants that have made default in none doing of reparations, or none payment of their rents or other to be before you, to take order with them, according to the Covenants expreſſed in their Leaſes. And your grant with the particulars of ſuch reparations as by you ſhall be allowed, to bee entered into a book with the name of the Tenant and Tenement; whereunto you or the moſt part of you ſhall ſubſcribe your names, and then commit the overſight thereof to the Renter, ſo that it be agreed, that one or more of you may

may viſite and peruſe the ſame in ſuch wiſe as the greatneſs or quantity of the thing will require.

Alſo every yeer at the Feaſt of Saint *Michael* the Archangell, two new Surveyors to be choſen; and the old with the new to make the 12. day of *October* following, or within two dayes before or after, a generall view and ſurvey of all the Lands appertaining to this house, and truly to keep a Book of the defaults thereof; and for your pains taking here, God hath promiſed to give you reſt and pleaſure in heaven perpetually.

Almoners.

YOu ſhall every *Monday* come unto this houſe or oftner if you ſhall think good, but at the leaſt once in the week: Alwayes provided not on the *Saturday*, for that day ſpecially ſhall be reſerved, and kept for the ſeſſion of the Preſident, and Governours of this houſe, for the generall affaires of the ſame.

And at every time of your being here, if there bee cauſe why, ye ſhall call before you every particular officer of this houſe, and enquire if every man do his duty therein according to his charge, and whether there bee peace and quietneſs maintained in the ſame. And if ye ſhall at any time finde any diſordered perſon or perſons, then to take ſuch order with him or them for their better reformation, as to you ſhall ſeem moſt meet. And if any refuſe to be ordered by you, then to make ſuch perſon known to the Preſident, and the reſt of the Governours, that further order may be taken by the whole houſe.

Ye ſhall alſo diligently enquire, if the Chirurgians of

this houſe do their duty toward the poor without corruption or partiality, and calling them before you, yee ſhall enquire what number there were healed that week, and the ſame deliver, and reward, according to your diſcretions, and of the ſame rewards to have your allowance of the Treaſurer, ſo that ye deliver unto him the particulars thereof, ſigned with the hands of two of you at the leaſt. And in the places of the poor ſo departed, to admit other, in ſuch ſort and manner, as in the charge of the Hoſpitaler is mentioned and declared.

Ye ſhall view from time to time this houſe, keeping one entire and perfect Inventary of the utenſils and neceſſary implements thereof, in a Book, as well that proviſion may be made in due time, for ſupplying that which ſhall be found to lack, as alſo in due time to provide for Wood, Coale, and other neceſſary furniture. And whatſoever elſe ſhall ſeem needfull unto you for the benefit of the poor, as the enlarging of rooms, or encreaſing the number of beds, the ſame ye ſhall ſignifie to the Preſident and Governours, that by one aſſent it may be decreed, and by you finiſhed and performed.

Ye ſhall alſo see unto the keeping ſweet of the poor, and in your proper perſons viſit them once every week at the leaſt, and to ſee that their ſervice of bread, meat, and drink, be truly and faithfully delivered unto them. And for your labours and pains, ye ſhall be ſure of the reward that God hath promiſed to all them that ſuccour his members.

Scrutiners.

Scrutiners.

YE ſhall bee ready and diligent to make ſearch and enquiry from time to time for all ſuch Gifts, Legacies, and bequeſts, as have been, or ſhall be given, or bequeathed to the ſuccour and comfort of the poor of this houſe. And the ſame receive at the hands of the givers or executors, together with a bill of the ſum, ſubſcribed with their names that make payment, or deliverance thereof: the which Bill, and money, ye ſhall forthwith deliver unto the Treaſurer of this houſe, receiving his acquitance for the ſame, keeping nevertheleſs a Book your ſelves, wherein ye ſhall enter and regiſter all ſuch charity, the givers, the time and the ſum; and for all ſuch ſum or ſums of money, as by you, or any of you, ſhall be procured, had, or received, ye ſhall (if it be required) make unto the givers, or deliverers thereof, an acquitance in your own names, as the Governours and Scrutiners of this houſe.

And yeerly at the Election of the new Governours into this houſe, ſhall be elected one new Scrutiner, and the old Scrutiner that ſhall be removed, ſhall make delivery unto the new Scrutiners, of all ſuch Records, Bills, and Writings as concern the affairs of this houſe. And alſo at the audite of the Treaſurers account, the Scrutiners Book of gifts and bequeſts, ſhall in like manner be examined and allowed.

Finally ye ſhall in every place where you ſhall have occaſion to come in the company of good, vertuous, and wealthy men, to the uttermoſt of your power, commend and ſet forth the good order of this houſe, and how

how rightly the goods given to the poor, are here beſtowed, to the encouragement of other to extend their charity thereunto. Ye ſhall alſo as occaſion and opportunity ſerveth, move thoſe that have the Office of Preaching committed to them, that they may the rather provoke the devotions of the people, to the help and comfort of this houſe. And thus doing, you ſhall not loſe the reward that God hath promiſed to all them that ſeek to glorifie and reverence his name in his poor members.

An admonition to the Auditours.

IN to your audite muſt be brought theſe ſorts of Books, firſt the Hoſpitall Book, being in the cuſtody of the Hoſpitaler, to which alſo ye ſhall look, that every page or totall ſum thereof be ſubſcribed with two of the hands of the Almoners: And this Book ſhall ye confer with the Stewards Book, who firſt maketh the proviſions. Ye muſt alſo have the Scrutiners Book, to examine the account of the Treaſurer for money delivered unto him by gifts and bequeſts. Alſo the Book of Survey, to confer the Bills brought in by the Treaſurer with the allowances of reparations, expreſſed in the ſaid Book. Alſo ye ſhall demand of the Renter, his rentall for that yeer, not forgetting always to charge him with the arrerages that remaine the yeer before, (if any be) and to confer the ſums of money, received by the Treaſurer, with the charge and account of the ſaid Renter. And laſtly to have ſpeciall regard, if any ſum of money have been payed by the Treaſurer, by any decree or generall order of this houſe, to look in the Journall for the ſame.

And

And thus in the whole affaires of this houſe, ſhall yee perfectly be inſtructed.

An Order for the ſafe keeping of the evidences and writings appertaining to the Hoſpitall.

THere ſhall one faire and ſubſtantiall cheſt be provided, and the ſame be ſet in the moſt convenient and ſureſt place of the houſe, the which ſhall have three ſeverall locks, and three keyes, whereof the Preſident alwayes to have one, and the Treaſurer one, and a Communer appointed by the whole houſe, to have the third. And it ſhall not be lawfull to any of the Governours to have any ſpecialty, evidence, or writing, out of the ſaid cheſt, neither any other perſon, to carry any of them out of the houſe (no, though it be for the affaires of the ſaid houſe) but onely a Copy thereof, which ſhall be taken in the preſence of the three perſons above named, that have the keyes, and the originall forthwith to be locked up againe.

Officers of Houſhold, with their particular charge.

The Renter Clerk and his charge.

YOur office is, with all care and diligence to collect and gather the Rents due of the Lands and Tenements appertaining to this houſe, and of all ſums of money ſo by you collected and gathered, to make deliverance and payment to the Treaſurer of this houſe, for the time being, receiving his acquitance for your diſcharge.

You ſhall alſo once every week at the leaſt, reſort unto the Preſident of this houſe, or to the Treaſurer thereof, for the knowledge of the affaires of the ſame, and at every of the ordinary ſittings of the Governours in this houſe, for the affaires thereof, as well at the dayes appointed for the aſſembly of the Surveyors and Almoners, as alſo when the Preſident, and all the Maſters ſhall aſſemble, ye ſhall give your attendance, that from time to time, ye may enter, and regiſter all ſuch decrees, orders and determinations, as by them and every of them in their ſeverall charges ſhall be decreed, ordained, and determined.

And for that, the good order and governance of this houſe may the better appear, as well to the governours now being, as to all other worthy perſonages, that hereafter ſhall govern, or ſhall deſire the certainty thereof, it ſhall be requiſite that ye keep diligently four ſeverall Books, the names whereof, and the uſe are here deſcribed.

A Repertory.
A Book of Survey.
A Book of Accounts.
A Journall.

And firſt you ſhall note that before every of theſe Books ye muſt have a Calender, into the which ye may enter by order of Letters of the A. B. C. all proper names and matters, that ſhall be contained in every of them. And for the better accompliſhing hereof, yee ſhall with your pen in the head of the leafe, number the pages of every leafe, in every of theſe Books, and then adding in your Calender the number of the page, where the

the name or matter is entred in your Book, the reader without any difficulty may turn to the ſame.

The uſe of the firſt Book called a Repertory.

IN to this Book ſhall ye firſt enter the foundation of this Hoſpitall, and alſo all Deeds, Leaſes, Obligations, acquitances, and other ſpecialties: uſing alwayes in the margent of the ſaid Book, to note in a few Engliſh words the ſum, and content, of every article of thoſe writings that ſhal appear note-worthy and the ſame notes particularly to enter into their ſeverall and proper places of your Calender, according to the order of the A. B. C.

The uſe of the ſecond Book, called a Book of Survey.

FIrſt in a ſeverall leaſe, yeerly before ye enter any other thing into this Book, yee ſhall make an abſtract of the names and furnames of every of thoſe Tenants, to whom this houſe is bound to do reparations, and alſo of them that are bound to finde their own reparations, noting in the margent, the leaſe of your Repertory, where every of their Leaſes is entred. Alſo every yeer when the Surveiours ſhall ſurvey the Lands of this houſe, yee ſhall be attendant upon them, and aptly and plainly enter into this book all ſuch defaults as by them ſhall bee found, in the time of their view, making a diſtinct difference between Tenants at will, and Tenants by Leaſe, and alſo between thoſe, to whom this houſe is bound to finde reparations, and ſuch as have bound themſelves to reparations.

Alſo ye ſhall diligently enter into this book, all ſuch

orders and grants of reparations or other, as the Surveyours from time to time ſhall make or take with the Tenants.

And every yeer when the Treaſurer ſhall bring in his account, and before the Auditours ſhew ſuch bills of reparations, ſigned with two of the hands of the Surveiours, as he hath payed, ye ſhall after the admiſſion of the ſaid bills by the Auditours, enter every of them into this book particularly under this title.

Reparations done in the yeer that A. B. was Treaſurer of this Hoſpitall (that is to ſay) from the Feaſt of Saint *Michael* in the fifth yeer, &c.

And then ſhall ye write firſt the name and ſurname of the Tenant, the Tenement, and the day of the moneth, and then the reparations. And thus ſhall ye do with all other. And it is to be noted, that in your Calender muſt be entred the name of every Treaſurer, and the leaf where the reparations brought in his account are entred. And next after the reparations, ye ſhall enter yeerly your whole rentall, being firſt examined by the Surveyours, and having two of their names at the leaſt, ſubſcribed thereunto. And in a particular and plain manner ye ſhal expreſs and declare the encreaſe of Rents that yeer, and that ſhall yee enter into your Calender under this title, *Augmentation of Rents*, titling from leafe to leafe, where the ſaid encreaſings be noted; and in like manner ſhall ye do with Rents decayed, entring them into your Calender by this word, *Decayed Rents;* likewiſe with Tenements or Rents altered or changed, by this name *Alteration of Rents.*

The

The uſe of the third Book, called a Book of Accounts.

IN this Book ye ſhall firſt enter all the Accounts (being allowed by the auditours) of all the Treaſurers that have been ſince this Hoſpitall was firſt committed to the City of London. And from henceforth at the foot of every account made by the Treaſurer, ye ſhall expreſly and plainly adde, and enter the arrerages of the Renter for that yeer, which alſo firſt by the auditours ſhall bee examined, and ſubſcribed as aforeſaid.

And foraſmuch as in all accounts, divers and many things at fundry times, are requiſite to be known, ye ſhall therefore in your Calender firſt note the name of the Treaſurer, with the leafe where his account is entered, and alſo in the margent at the entrance of the ſaid account, ye ſhall note the leafe of your Book of Survey, where the reparations mentioned in the ſame account, are particularly entered.

And for the ready finding of every matter, contained in every account, ye ſhall in the margent of this book uſe as is aforeſaid, to note divers generall words, *Accompts*, *Proviſions*, *Liveries*, *Gifts*, *Legacies*, *Rewards*, *Agreements*, *Surrenders*, *Bargains*, *Suits*, *Recoveries*, *Penſions*, *Fees*, &c. Adding to every one of theſe being placed in your Calender, the leaf where every of them is mentioned in any of the accounts contained in this book, that at a word may be ſeen what hath been done in all theſe things, from the firſt Treaſurer to the laſt.

And for a perfect declaration of the whole affairs of this houſe, ye ſhall alſo out of another book (which ſhall

containe the doings of the Almoners, and ſhall be called the Hoſpitall book) enter into this book of accounts, as well a perfect Inventary of all ſuch Implements, as then ſhall be found within this Hoſpitall: as alſo a full remainder of all the proviſions and victuals firſt ſubſcribed by two of the ſaid Almoners. And in the end ye ſhall manifeſtly declare the names and ſurnames of ſo many diſeaſed perſons, as that yeer have been cured and delivered out of this houſe, and alſo the names and ſurnames of ſo many as that yeer have dyed in the houſe. The names and ſurnames alſo of as many as then ſhall remain ſick and diſeaſed in this houſe, together with the name of the ſhire wherein each was born, and their faculties, exerciſe, or occupations.

The uſe of the fourth book called a Journall.

THis book muſt alſo have a Calender, and it ſhall alwayes be brought forth at ſuch time as the Preſident and moſt part of the Governours ſhall ſit within this Hoſpitall, for the generall affaires of the ſame. And into this book ſhall ye enter all ſuch orders and decrees, as from time to time, ſhall by the ſaid Governours, or greateſt part of them, be decreed and ordained. And in the margent thereof, ye ſhall do as before is aſſigned in the book of Repertory, in few words ſet forth the ſum of every decree, order, &c. contained therein. And chiefely ye ſhall uſe the generall words before deſcribed in the book of accounts, that by the entrance of them into your Calender, every matter may eaſily and readily be found. And ye ſhall not faile, but in five dayes next after the enterance of any thing into this book, to enter

enter the ſame by a general word into the Calender, that as well when you are abſent, as preſent, the governours may without difficulty be ſatisfied of that they ſeek for therein.

The officer of the Hoſpitaler.

YOur office is chiefely and moſt principally to viſit the poor in their extremes and ſickneſſes, and to miniſter unto them the moſt wholſome and neceſſary doctrine of Gods comfortable word, as well by reading and preaching as alſo by miniſtring the Sacrament of the holy Communion at times convenient.

To receive alſo into this houſe, of the Steward, to the uſe of the ſame poor, ſuch victuals and other proviſion as by him ſhall be provided, entring the ſame into your book, and ſafely to keep them to their uſe.

Alſo to deliver unto the Cook of this houſe, from time to time, ſo much of the ſame victuals, as ſhall be needfull for the preſent time, to be dreſſed for the poor. And the ſame being dreſſed to ſee ſeaſonably, and truly delivered, and diſtributed unto them.

Alſo whenſoever any poor perſon ſhall be here preſented or ſued for, to be admitted into this houſe, you ſhall receive the ſame preſentation, calling unto you, two of the Chirurgians of this houſe, to view and examin the diſeaſe of the ſaid perſon, whether it be curable or not curable; if they Judge it curable, then you, by a bill of your hand, to certifie the name, and ſurname of the ſaid diſeaſed perſon, unto the Almoners, or two of them at the leaſt, deſiring them to ſubſcribe their names thereunto, and that being done, you to keep upon a file the ſame

ſame bill for your warrant. And then ye ſhall commit the ſame poor to the Matron of this houſe, to bee placed accordingly as the caſe ſhall require.

Alſo at the admiſſion of every poor perſon into this Hoſpitall, ye ſhall enquire what money, or other things of value he, or ſhe hath, and the ſame together with his, or her name, to enter into your book, & you to receive and ſafely keep the ſame to the uſe of the ſame poor, to bee delivered again unto him, her, or them, when they ſhall be cured out of this houſe. And monethly to deliver to the ſaid Almoners, a copy of your book of entrances, that they may regiſter the ſame in the book of their ordinary doings. And if any ſuch poor fortune do deceaſe and dye in this houſe, then you to deliver all ſuch money and other things, as ſhall be in your cuſtody, to the Treaſurer of this houſe for the time being, entering the ſame into your book, to be committed, and diſpoſed, to the uſe of the poor.

And as often as any of the poor ſhall bee cured and made whole, you with the Chirurgians to preſent them to the Almoners of this houſe, at their next aſſembly here, and to regiſter in your book their names and ſurnames of them, and every of them, with the day and yeere of their delivery, and departure out of this houſe. And at their departure to give unto them a paſſe-port, to be made according to the Precedent and form that is expreſſed in the end of this book.

This is your charge, and ye have not to do with any other thing in this houſe. Howbeit, if ye ſhall perceive at any time, any thing done by any Officer of this houſe, or other perſon, that ſhall maintain diſorder, or procure ſlander to this houſe, that ye then declare the ſame to

ſome,

ſome, one or two of the governours of this houſe, and to none other perſon, and no further to meddle therein.

The office of the Steward and Butler.

YOur charge is faithfully and truly to make proviſion of ſuch needfull victuals, as from time to time yee ſhall be appointed by the Almoners to provide, for the poor of this houſe, remembring alwayes that wherein ſo ever you ſhall hinder, or negligently burden this houſe, either with exceſſive prices, or not making your proviſion in due time, the ſame dammage and hurt you do unto GOD whoſe members the poor are, and therefore yee ought the rather to ſtudy to ſerve in this houſe with fear of God, and conſcience, as one that manifeſtly and plainly walketh before the face of God, who perfectly ſeeth and beholdeth the very thoughts of your heart.

Your charge is alſo to keep a true, and perfect account of all ſuch victuals as by you ſhall be bought, and to make deliverance of the ſaid victuals unto the Hoſpitaler of this houſe, declaring unto him the juſt weight, number, and prices of the ſame, that he may make due and true entrance and account thereof.

Alſo at all ſuch times as ſhall be needfull for the poor, to be ſerved of their ordinary meales or otherwiſe, either of Bread or Drink, yee ſhall not be abſent, but with all diligence and readineſs ye ſhall give your attendance.

Ye ſhall have to do in none other mans office in this houſe, but onely with your own in manner as is above deſcribed. But if yee ſhall perceive at any time, any thing done by any officer or other perſon of this houſe, that ſhall be unprofitable thereunto, or that may be oc-

caſion of any diſorder, or ſhall engender ſlander to the ſame: That then ye declare the thing to ſome one or two of the Governours of this houſe, and to none other perſon, nor farther to meddle therein.

The Office of the Matron.

YOur office is to receive of the Hoſpitaler of this houſe, all ſuch ſick and diſeaſed perſons, as he by his warrant ſigned from the Almoners of this houſe, ſhall preſent unto you, and the ſame perſons to beſtow in ſuch convenient places within this houſe, as you ſhall think meet.

You have alſo the charge, governance, and order of all the Siſters of this houſe, to ſee from time to time, that every of them in the wards committed to their charge, do their duty unto the poor, as well in making of their beds, and keeping their wards, as alſo in waſhing and purging their unclean clothes, and other things. And that the ſame Siſters every night after the houre of ſeven of the clock in the Winter, and nine of the clock in the Sommer, come not out of the womans ward, except ſome great and ſpeciall cauſe (as the preſent danger of death, or needfull ſuccour of ſome poor perſon.) And yet at ſuch a ſpeciall time it ſhall not be lawfull for every Siſter to go forth to any perſon or perſons (no though it be in her ward,) but onely for ſuch as you ſhall think vertuous, godly and diſcreet. And the ſame Siſter to remaine no longer with the ſame ſick perſon, then needfull cauſe ſhall require.

Alſo at ſuch times as the Siſters ſhall not be occupied about the poor, ye ſhall ſet them to ſpinning, or doing of

of ſome other manner of work, that may avoid idleneſs, and be profitable to the poor of this houſe.

Alſo ye ſhall receive the flax provided by the Governours of this houſe, and the ſame being ſpun by the Sifters, ye ſhall commit to the ſaid Governours, that they may both put order for the weighing of the ſame to the Weaver, and for the meaſuring of it at the returning thereof.

You ſhall alſo as the chiefe Governereſſe, and worthy Matron of this houſe, have ſpeciall regard to the good ordering and keeping of all the Sheets, Coverlets, Blankets, Beds, and other implements committed to your charge, that now do or hereafter ſhall appertain unto the poor.

Alſo ye ſhall ſuffer no poor perſon of this houſe to ſit and drink within your houſe at no time, neither ſhall yee ſo ſend them drink into their wards, that thereby drunkenneſs might be uſed and continued among them, but as much as in you ſhall lye, ye ſhall exhort them to vertue and temperance, declaring this houſe to be appointed for the harbour and ſuccour of the deer members of Chriſts body, and not of drunkards, and unthankfull persons.

Herewith yee are charged, and not with any other thing. But if there ſhall bee any thing done by any officer or other perſon of this houſe, that ſhall be unprofitable thereunto, or that may be occaſion of any diſorder, or ſhall engender ſlander to the ſame, that yee then declare it to ſome one or two of the Governours of this houſe, and to none other perſon, nor no further to meddle therein.

The Siſters.

YOur charge is, in all things to declare and ſhew your ſelves gentle, diligent, and obedient to the Matron of this houſe, who is appointed and authorized to bee your chief Governereſſe and Ruler.

Ye ſhall alſo faithfully and charitably ſerve, and help the poor in all their griefes and diſeaſes, as well by keeping them ſweet and clean, as in giving them their meats and drinks, after the moſt honeſt and comfortable manner. Alſo ye ſhall uſe unto them good and honeſt talk, ſuch as may comfort and amend them, and utterly to avoyd all light, wanton, and fooliſh words, geſtures and manners, uſing your ſelves unto them with all ſobriety and diſcretion. And above all things ſee that ye avoyd, abhor and deteſt ſcolding, and drunkenneſſe, as moſt peſtilent and filthy vices.

Ye ſhall not haunt or reſort to any manner of perſon out of this houſe, except ye be licenced by the Matron, neither ſhall yee ſuffer any light perſon to haunt or uſe unto you, neither any diſhoneſt perſon, either man or woman, and ſo much as in you ſhall lye, ye ſhall avoid and ſhun the converſation and company of all men.

Ye ſhall not be out of the womans ward, after the hour of ſeven of the clock in the night, in the winter time, nor after nine of the clock at night, in the Sommer; except yee ſhall be appointed and commanded by the Matron ſo to be for ſome great and ſpeciall cauſe that ſhall concern the poor, (as the preſent danger of death or extream ſickneſs) and yet ſo being commanded, yee ſhall remain no longer with ſuch diſeaſed perſon, then juſt cauſe ſhall require. Alſo

Alſo if any juſt cauſe of grief ſhal fortune unto any of you, or that ye ſhall ſee lewdneſs in any officer, or other perſon of this houſe, which may ſound or grow to the hurt or ſlander thereof, ye ſhall declare the ſame to the Matron, or unto one or two of the Governours of this houſe, that ſpeedy remedy therein may be had, and to none other perſon, neither ſhal you talk or meddle therein any further. This is your charge, and with any other thing you are not charged.

The Chirurgians.

YOur charge is, faithfully and truly to the uttermoſt of your knowledge and cunning, to help to cure the griefes and diſeaſes of the poor of this Hoſpitall, ſetting aſide all favour, affection, gain or lucre, and that as well to the pooreſt deſtitute of all friends and ſuccours, as to ſuch as ſhall peradventure be better friended, yee ſhall with all favour and friendſhip procure the ſpeedy recovery of their health.

Alſo for your ſtipend and fee, given and paid out of this houſe, yee ſhall be ready at the commandement of the Almoners of this houſe, and Hoſpitaler of the ſame, to view and look upon ſuch diſeaſed perſons, as here from time to time ſhall be preſented. And after your view to ſignifie to the ſaid Almoners or Hoſpitaler, your Judgement of the ſaid diſeaſed perſon, without all affection, whether he or ſhe be curable or not, to the intent there may be none admitted into this houſe, that ſhall be incurable, to the great let and hinderance of the curing and helping of many other; nay, none rejected and put back that are curable, to the great ſlander of this houſe, and diſpleaſure of God.

Alſo at all ſuch times as ye ſhall goe to the dreſſing of any diſeaſed perſon in this houſe, as much as in you is, ye ſhall give unto him or her, faithfull and good counſell, willing them to minde to ſin no more, and to bee thankfull unto Almighty GOD, for whoſe ſake they are here comforted of men. And above all things, ye ſhall take nor receive of no perſon, any gift or reward for the curing or helping of them, either of them, or their friends, but yee ſhall firſt make the ſame offer or reward known unto the Almoners of this houſe.

Alſo we utterly forbid and command you, that yee by no colour peſter or burden this houſe with any ſick or diſeaſed perſon, for the curing of which perſon, ye before have received a ſum or ſums of money, upon pain to be diſmiſſed this houſe.

This is your charge and office, with the which ye have to do, and not with any other thing, neither with any other office in this houſe. But if you ſhall perceive at any time, any thing done by any officer or other perſon of this houſe, that ſhall be unprofitable thereunto, or that may be occaſion of any diſorder, or ſhall engender ſlander to the ſame, that ye then declare it to the Almoners, or one of them, and no farther to meddle therein.

The Office of the Porter.

YOur charge is, to keep the doors, opening and ſhuting them in due time, and to give good heed to all ſuch perſons as ſhall at any time paſſe to and fro out of this houſe, as well for the conveighing, or embezelling of any thing that appertaineth to the poor of this houſe, as Wood, Coale, Bread, Meat or Drink, as alſo for all ſuſpicious

ſuſpicious perſons, as men to reſort to the womens ward, or women to the mens wards, or ſuch ſuſpicious men to reſort unto the men, or women, to the women, as ſhall be thought to bee pety pickers, or perſons otherwiſe of naughty diſpoſition.

And alſo every night at the hour of ſeven of the clock in the Sommer, yee ſhall go into every ward where the poor men be, and ſee them in good order; and ſuffer no Siſter, nor other woman to remain among them (except juſt cauſe be declared by the Matron) and cauſe them to ſay the appointed Prayers.

And whatſoever poor perſon ſhall be found a ſwearer or an unreverent uſer of his mouth, towards God or his holy name, or a contemner of the Matron, or other officer of this houſe, or that ſhall refuſe to go to bed at the lawfull houres before appointed, him ſhall ye puniſh (after once warning given) in the ſtocks, and further declare his follie unto the Almoners of this houſe, that they may take ſuch order with him or them, as ſhall ſeem meet by their diſcretions.

Ye ſhall alſo be diligent and ready from time to time, to do ſuch other things, as the Governours of this houſe ſhall aſſign and appoint you. This is your charge, and more you have not to do, but if ye perceive at any time, any thing done by any officer of this houſe, or other perſon that ſhall maintain diſorder, or procure ſlander to this houſe, that ye then declare the ſame to ſome one or two of the Governours of this houſe, and to none other perſon, and no further to meddle therein.

The

The Bedells.

YOur office and charge is to give attendance from time to time, upon the Governours of this houſe, and to do ſuch buſineſſe as they ſhall aſſign you.

And alſo all ſuch dayes as the Governours of this houſe ſhall not ſit in this Hoſpitall for the affaires of the ſame, ye ſhall ſeparate and divide your ſelves into ſundry parts and liberties thereof, every man taking his ſeverall walk. And if in any of your walks yee ſhall happen to eſpy any perſon infected with any lothely griefe or diſeaſe, which ſhall fortune to lye in any notable place of this City, to the noyance and infection of the paſſers by, and ſlander of this houſe, yee ſhall then give knowledge thereof unto the Almoners of this Hoſpitall, that they may take ſuch order therein as to them ſhall be thought meet.

Ye ſhall alſo have a ſpeciall eye and regard unto all ſuch perſons, as have been cured and healed in this houſe, that none of them counterfeit any griefe or diſeaſe, neither begge within the City and liberties thereof. And if ye ſhall fortune to finde any ſo doing, ye ſhall immediately commit him, or them, to ſome Cage, and give knowledge thereof to the Governours of this houſe, that they may take further order, as they ſhall think beſt.

Ye ſhall not haunt nor frequent the company of any poor and beggerly perſons (that is to ſay) to drink or eat with them in any victualling houſe, or other place, neither ſhall yee receive any bribe or reward of any of them, leſt by occaſion thereof ye ſhould winck at them, and ſo lewdly licence them to begge, upon pain to be diſmiſſed this houſe.

Alſo

Alſo ye ſhall not ſuffer any ſturdy or idle begger or vagabound, to begge or ask almes within this City of *London*, or Suburbes of the ſame, but yee ſhall forthwith commit all ſuch to ward, and immediatly ſignifie the name and ſurname of him or them, to the Alderman of that ward, where ye ſhall apprehend any ſuch begger, or elſe to the Lord Mayor, that execution may be done as the Law in that caſe hath provided. This is your charge.

The viſitour of Newgate.

YOur charge is faithfully and diligently to viſit all the poor and miſerable captives within the Priſon of *Newgate*, and miniſter unto them ſuch ordinary ſervice at times convenient, as is appointed by the kings Majeſties book for ordinary Prayer.

Alſo that ye learn without book the moſt wholſome ſentences of holy Scripture, that may comfort a deſperate man, that readily ye may miniſter them to ſuch perſons as yee ſhall perceive them moſt needfull to be miniſtred unto.

Alſo yee ſhall faithfully and truly uſe and bear your ſelf between party and party, excluding bribes and all other corruption, that is to ſay, between the priſoners and the parties to whom they have offended, exhorting them to the uttermoſt of your cunning, to make reſtitution of their things falſely gotten, ſhewing them the burthen of conſcience depending thereupon. And that alſo they diſcloſe all ſuch other perſons as they know living, which by robbery or murther may hurt a common weale. And in all their extremes and ſickneſſes, ye ſhall

be diligent and ready to comfort them with the moſt pithy, and fruitfull ſentences of Gods moſt holy word.

And whatſoever perſon you ſhall perceive to have ſubſtance, and to be minded to beſtow ſomewhat thereof in deeds of charity, ye ſhall exhort him or them, to beſtow ſome part to the reliefe of the needy and diſeaſed perſons of this houſe. And of all ſuch gifts from time to time, to give knowledge to the Almoners or Scrutiners of this houſe.

And for as much as you are numbred among the Miniſters of Chriſts Church, yee ſhall therefore four times in the yeer at the leaſt, (that is to ſay) every quarter once, do ſuch ſervice in the ſaid Church as is requiſite for ſuch a Miniſter to do.

This is your charge, which ſee that ye do, and with any other thing ye are not charged.

The eſtimate of the yeerly charges of this Hoſpitall.

IT is firſt here to bee conſidered, that although the charges were very great to bring the endowment of the Hoſpitall into ſuch point as behoved, and to furniſh the houſe with neceſſary Implements and bedding for ſuch number (as hath been afore touched in the beginning) yet is there of all theſe charges, no parcell here under mentioned, but the yeerly expences onely, ſuſtained for the maintenance and continuance of the ſame. And albeit theſe charges following, be all and every of them ordinary, and of neceſſity, yet for that there is a difference in the certainty of the one and the other, they are divided

divided into two kindes, with theſe titles. Charges certain, and Charges uncertain.

Charges certain.

Are firſt the yeerly Wages and Fees of thoſe Officers and Servants, that neceſſarily ſerve and attend for the poor, as enſueth, and after them the charges of houſhold, Reparations, and ſuch like.

To the Hoſpitaller. x. l.
To the Renter-clerk. x. l.
To the Butler. vi.l.xiii.s.iiii.d.
To the Cook, for his meat, drink, and wages. vi.l.
To the Porter. vi.l.
To three Chirurgians. lx.l.
To eight Bedles. xxvi.l.xiii.s.iiii.d.
To theſe and to the other, for their liveries. x.l.
To the Matron, and twelve Siſters for their wages. xxvii.l.vi.s.viii.d.
To the Matron for her boord wages, at xviii. pence the week. iii.l.xviii.s.
To the xii. Siſters, for their boord wages at xvi.d. the week for every of them. xl.l.xii.s.
To the Matron for her livery. xiii.s.iiii.d.
To the Siſters for their liveries. vi.l.
To the Miniſters of Chriſts Church, by the Kings Majeſties aſſignment, that is to ſay, a Vicar, a Viſitour of *Newgate*, five Prieſts, two Clerks, and a Sexton, yeerly. C. and vi.l.
To the Miniſters of the Church within the Hoſpitall, by the ſame aſſignment, that is to ſay, to a Vicar, a Clerk and a Sexton. xxiii.l.vi.s.viii.d.

To certain men of Law and other perſons, given in Fees by the Kings ſaid Majeſty, yeerly by Patent. xxviii.l.iiii.s.

Charges of Houſhold.

For the Dyets of an C. perſons, at two pence the perſon for every day, iii.C.l.vi.s.viii.d.
For lxviii. load of Coals, at xvi.s. the load. liiii.l.viii.s.
For Wood yeerly. xxiiii.l.
For Candles yeerly. v.l.
For yeerly reparations of the Hoſpitall and Tenements, appertaining to the ſame. xl.l.

Sum of the Charges certain. { vii.C.lxxx. / xviii. l.ii. s.

The charges uncertain (for as much as it cannot certainly be known to what they may amount) are here ſet forth without Sums, onely to ſignifie unto you, that there are many charges more to be conſidered, then certain account can be made of.

Charges uncertain.

For Shirts, Smocks, and other apparell for the poor, needfull, either at their comming in or departure. For Sugar and Spices for Cawdles for the ſick, Flax for Sheets, and Weaving of the ſame, Soltwich Cloth for winding Sheets, Bolls, Brooms, Baskets, Incenſe, Juniper, Aſhes to buck their Clothes. And alſo money given to the poor at their departure, which is meaſured ac-

according to their Journey and need. The which uncertain charges amounted one yeer to the ſum of lx.l.

So commeth the certain charges of this houſe yeerly, to the ſum of vii. C.lxxx. xviii.l. ii.s. beſides the uncertain expences, and other extraordinary charges, which cannot be rated, nay, accounted.

Toward the which is yeerly received by the endowment of the Kings Majeſty, iii. C. xxxiii. l. vi. s. viii. d. And by the like endowment of the City of *London*, iii. C. xxxiii. l. vi. s. viii. d. The which in the whole is, vi. C. lxvi. l. xiii. s. iiii. d.

So is the Hoſpitall charged yeerly of certain (beſides the uncertain expences) over and above the ſumme of their revenues, C. xxx. l. viii. s. viii. d.

Which onely riſeth of the charity of certain merciſull Citizens, for whoſe continuance with the encreaſe of moe, we earneſtly pray unto the fountain of mercy, Jeſus Chriſt, the Lord of all, to whom for ever appertain, the Kingdome, the power and the glory, world without end. *Amen.*

A Thankſgiving unto Almighty God to be ſaid by the poor that are cured in the Hoſpitall, at the time of their delivery from thence, upon their knees in the Hall before the Hoſpitaler, and two Maſters of this Houſe at the leaſt.

And this the Hoſpitaler ſhall Charge them to learn without the Book, before they bee delivered.

WE magnifie and praiſe thee O Lord, that ſo mercifully and favourably haſt looked upon us miſerable and wretched ſinners, which ſo highly have offended thy divine Majeſty, that wee are not worthy to bee numbred among thy elect and choſen people: our ſins being great and grievous are daily before our eyes, we lament and be ſorry for them, & with ſorrowfull heart, and lamentable teares, we call and cry unto thee for mercy, Have mercy upon us O Lord, have mercy upon us, and according to thy great mercy, wipe away the multitude of our ſins, and grant us now O Lord, thy moſt holy and working ſpirit, that ſetting aſide all vice and idleneſs, we may in thy fear walk, and go forward in all vertue and godlineſs. And for that thou haſt moved O Lord, the hearts of godly men, and the Governours of this houſe, to ſhew their exceeding charity towards us, in curing of our maladies and diſeaſes, we yeeld moſt humble and

and hearty thanks to thy Majeſty, and ſhall inceſſantly laude and praiſe thy moſt holy and glorious name: Beſeeching thee, moſt gracious and mercifull Lord, according to thy holy word and promiſe, ſo to bleſs this thine own dwelling houſe, and the faithfull Miniſters thereof, that there be here found no lack, but that their riches and ſubſtance may encreaſe, that thy holy name may thereby bee the more praiſed and glorified, to whom be all laud, honour, and glory, world without end. *Amen.*

A

A Paſſe-port to be delivered to the *POORE.*

To all Mayors, Bailiffes, Conſtables, &c.

KNow ye that A. B. Taylour born in the Town of S. T. in the county of *Northampton*, being cured of his diſeaſe in the Hoſpitall of S. *Bartholomews* in Weſt *Smithfield* in *London*, and from thence delivered the 13. day of *Auguſt*, in the ſixt yeer of the Reign, &c. hath charge by us A. B. C. the Governours of the ſame to repair within dayes next enſuing the date hereof, to his ſaid place of nativity, or to *Weſthandfield*, the place of his laſt abode, and there to exhibite this preſent Paſſe-port to the head officer or officers, in either of the places appointed, that they may take further order for his demeanour.

The

The Table.

FINIS.

SAINT BARTHOLOMEW'S HOSPITAL REPORTS.

ON

THE AMOUNT OF CARBONIC ACID IN LONDON AIR.

BY

W. J. RUSSELL, Ph.D., F.R.S.

The following experiments were made to determine with tolerable accuracy the amount of carbonic acid which exists in the air of the City of London. The samples have, however, been collected at one place only, in an open space at St. Bartholomew's Hospital, twelve feet from the ground. The samples were always taken during the middle of the day, between twelve and one o'clock.

The amount of carbonic acid in air has a twofold interest: it indicates, as it may be termed, the amount of degradation the air has undergone, and how much of the active heat-giving oxygen has been replaced by inert carbonic acid; and although the carbonic acid, as compared to many gases, is physiologically inactive, still, from the experiments of Angus Smith and others, the amount in inspired air cannot be largely increased without affecting respiration. The principal interest, however, with regard to the carbonic acid in air arises from the fact that, whether the production of this gas be from respiration or from ordinary burning, coincident with its production is the production of other bodies which are far more deleterious when inhaled than the carbonic acid itself. In inhabited rooms attendant on a very

small increase in the amount of carbonic acid is an oppressive and disagreeable atmosphere, and even out of doors the same is probably true, if not quite so obvious, consequently the amount of carbonic acid becomes an indicator of other impurities in the air—impurities which are not easy to distinguish or estimate.

It has been usual to assume that the amount of carbonic acid in pure air is four parts in 10,000 of air, but from late experiments, carried out principally on the Continent, it appears that this number is considerably too high. Schultze, at Rostock, analysed the air daily for four years, and gives as a mean for all his experiments 2.9197. Reiset, at Dieppe, obtained as the mean of ninety-two experiments 2.942. At the Mountsouris Observatory, at Paris, the mean of the determinations made between 1877 and 1882 is 3.00. Angus Smith found the air on the Scotch hills to contain 3.36 parts, and G. F. Armstrong found at Grasmere that the air contained during the day an average amount of 2.96, and during the night 3.30 parts in 10,000 of air. We may then fairly assume that in really pure air there are three parts of carbonic acid in 10,000 parts of air.

The following table gives the results of 159 determinations of the carbonic acid in London air, arranged according to date, and describes the weather at the time of each collection. It should, however, be stated that during the first year samples of air were collected whenever there was a fog, and only occasionally, and at irregular intervals, when the weather was clear. After then the samples were collected with tolerable regularity once a week, irrespective of weather, and, in addition to this regular collection, other samples were taken whenever during the day there was fog or mist.

The estimation of the amount of carbonic acid in the air was in all cases made by what is known as Pettenkofer's method, that is, by shaking a known volume of air with a known amount of a solution of baryta of determined strength, and then ascertaining how much of the baryta had been converted into barium carbonate. To collect the air, bottles holding between nine and ten litres were used, and these were filled with the air for experiment by means of a large aspirator, which drew a steady current of air through them for nearly twenty-five minutes. This was proved by experiment to be amply sufficient to completely expel the original contents of the bottle.

TABLE I.

Date.	Weather.	Direction of Wind.	Vols. of CO_2 in 10,000 of Air.	
			1st Experiment.	2d Experiment.
1882.				
Jan. 7	Dull	S.E.	5.2	5.4
,, 16	Dull	S.	5.9	6.0
,, 17*	Dense black fog	S.	6.4	6.7
,, 18*	Dense black fog	S.	5.6	5.7
,, 19*	Slight white fog	S.	4.8	—
,, 25*	Dense black fog	S.	10.5	10.5
,, 26	Fine	S.W.	5.1	4.9
,, 28	Fine	S.W.	5.6	5.6
,, 31	Dull	S.E.	4.8	4.8
Feb. 1	Very fine	N.W.	4.7	5.1
,, 3*	Slight fog	S.	6.2	6.9
,, 4*	Dense black fog	S.	10.7	10.2
,, 9	Clear	S.E.	4.4	4.8
,, 14	Very fine	S.W.	4.1	—
,, 18	Dull	W.	4.3	4.8
,, 20	Dull	W.	4.7	4.9
,, 21	Dull and misty	N.W.	4.6	5.0
,, 22	Very fine	N.W.	4.5	4.6
,, 27	Very bright after much rain	W.	6.0	—
Mar. 1	Very fine	S.W.	4.0	4.1
,, 11	Dull	N.E.	4.2	—
,, 15*	White fog (9.30 a.m.)	N.E.	5.0	5.6
,, 20	Very fine	N.	3.8	—
,, 27	Very fine	N.W.	3.9	—
Apr. 4	Very fine	N.E.	4.4	—
,, 19	Dull	S.W.	4.5	4.2
,, 20	Very fine	E.	4.5	4.5
,, 21	Very fine	S.E.	4.4	4.3
,, 24	Dull, showery	S.W.	4.4	4.4
May 2	Dull, showery	S.E.	4.5	—
,, 12	Very fine	W.	4.0	—
,, 22	Dull	S.E.	3.4	—
June 27	Very fine	N.W.	3.6	—
,, 28	Dull	N.W.	3.8	4.0
July 20	Fine	S.W.	3.5	3.6
,, 21	Fine	S.W.	3.3	3.4
,, 27	Very fine	S.W.	3.4	3.5
,, 29	Very fine	N.E.	3.3	—
,, 31	Very fine	N.W.	4.0	3.9
Aug. 1	Dull	N.W.	3.2	3.6
,, 7	Very fine (Bank Holiday)	N.E.	3.0	3.1
Oct. 4	Dull	S.E.	3.7	3.9
,, 9	Very fine	S.	3.4	3.5
,, 10	Dull	S.	3.9	—
,, 12	Dull after much rain	N.W.	3.5	—
,, 16	Dull after much rain	S.E.	3.5	—
,, 17	Dull after much rain	N.	4.0	—
,, 18	Dull	N.E.	5.1	—
,, 21	Dull, with rain	S.E.	4.1	—

TABLE I.—*Continued.*

Date.	Weather.	Direction of Wind.	Vols. of CO_2 in 10,000 of Air.	
			1st Experiment.	2d Experiment.
1883.				
Oct. 23	Fine	W.	6.4	—
„ 24	Dull; strong gale	N.W.	3.8	4.0
„ 25	Very fine	W.	4.6	—
„ 26*	White fog (10.30 a.m.)	W.	9.9	—
„ „	Very fine (12.30)	W.	5.0	—
„ 28	Dull	N.E.	3.7	3.8
Nov. 1	Fine	N.W.	3.8	3.4
„ 4	Fine after heavy gale	W.	3.7	—
„ 8	Very fine after rain	W.	3.6	—
„ 13	Dull	E.	3.7	—
„ 17	Fine, after snow	N.	3.2	—
„ 18*	Dense black fog	S.E.	9.6	—
„ „	Fine. Sun 1½ hour after above	S.E.	5.0	—
„ 23	Dull	S.E.	4.1	—
„ 29	Dull, after much rain	N.W.	4.1	—
Dec. 1*	Thick white fog (11 a.m.)	S.	5.5	—
„ „	Dull and misty (3.30 p.m.)	S.	4.1	—
„ 2*	Slight mist	S.E.	5.1	—
„ 5	Very dull	S.	5.0	—
„ 8	Fine	N.	4.0	—
„ 10*	Thick white fog	S.W.	9.4	—
„ 11*	Thick white fog. Darker, 12 a.m.	S.W.	11.0	—
„ „*	Thick white fog. Very dark, 5 p.m.	S.W.	14.1	—
„ 12	Dull and hazy	S.W.	4.7	—
„ 13	Fine	W.	4.5	—
„ 14*	White fog (wet)	S.E.	6.2	—
„ 15*	White fog	S.E.	5.4	—
„ „*	Overhead fog, white	S.E.	4.8	—
„ 17	Dull	S.	3.8	—
„ 19	Dull and hazy	S.E.	4.4	—
„ 20*	Thick black fog at 10.30 a.m.	S.	8.1	—
„ „	Fine (at 12)	S.	5.2	—
„ 21	Very fine	W.	4.0	—

Date.	Weather.	Direction of Wind.	Vols. of CO_2 in 10,000 of Air.
1883.			
January 8	Very fine	N.E.	4.8
„ 11	Dull	E.	3.9
„ 16	Fine after rain	S.W.	4.1
„ 17	Dull, hazy	S.W.	4.7
„ 19*	Foggy	S.W.	5.0
„ 22	Very fine	N.E.	3.8

TABLE I.—*Continued.*

Date.	Weather.	Direction of Wind.	Vols. of CO_2 in 10,000 of Air.
1883.			
January 24	Very fine	W.	3.7
,, 25	Fine	W.	4.1
,, 30	Dull	W.	5.0
February 6	Fine	E.	3.7
,, 14	Dull, rain	S.E.	4.2
,, 22	Fine	N.W.	4.2
,, 27	Dull	N.W.	3.9
March 6	Very fine	N.E.	3.8
,, 13	Fine	N.E.	4.3
,, 15	Fine	N.E.	4.0
,, 21	Fine	N.E.	3.9
,, 27	Dull	N.W.	3.8
,, 31	Fine	N.W.	3.7
April 3*	Very foggy	W.	13.3
,, 5	Overcast	S.E.	4.8
,, 8	Dull, slight fog	S.E.	4.7
,, 13	Dull	S.	4.1
,, 17	Dull	S.E.	4.0
,, 20	Fine	S.E.	4.0
,, 28	Fine	N.W.	3.6
,, 30	Very fine	N.W.	3.7
May 6	Fine	W.	3.6
,, 12	Dull	S.W.	4.0
,, 14	Dull (Whit Monday)	S.E.	3.3
,, 16	Very fine	N.W.	3.6
,, 20	Very fine	W.	3.5
,, 24	Very fine	N.W.	3.4
,, 31	Very fine	S.	3.8
June 6	Very fine	W.	3.6
,, 13	Very fine	N.W.	3.5
,, 20	Dull, with rain	S.E.	3.5
August 5	Dull, after rain (Bank Holiday)	N.W.	3.3
October 10*	Dull, yellowish fog	N.W.	4.5
,, 11*	Dense black overhead fog, 10.30 a.m.	S.E.	7.6
,, ,,	Fine, sun after 3.30 p.m.	N.W.	5.1
,, 18	Very fine	N.W.	3.8
,, 25	Dull	W.	5.1
,, 30	Dull and misty	S.E.	3.9
November 6	Dull	N.E.	4.2
,, 15*	Dull and foggy	W.	6.6
,, 22	Dull	S E.	3.7
,, 29	Very fine	N.E.	3.8
December 4	Very fine	N.W.	3.4
,, 6	Dull and snowstorms	N.E.	4.5
,, 7	Fine	N.E.	4.5
,, 10	Dull and misty	N.W.	4.3
,, 12	Dull, stormy	W.	3.9
1884.			
January 16*	Dull, slight fog	N.W.	5.5
,, 17	Very dull	W.	4.2
,, 18*	Dull and foggy	S.W.	4.5

TABLE I.—*Continued.*

Date.	Weather.	Direction of Wind.	Vols. of CO_2 in 10,000 of Air.
1884.			
January 22	Dull and stormy	W.	3.3
,, 24	Very fine	N.W.	4.1
,, 26	Dull and rainy	S.W.	4.1
,, 28	Very fine	N.W.	3.7
February 7	Dull	S.W.	4.1
,, 8*	Black fog, 10.30 a.m.	S.E.	4.5
,, ,,	Black fog, 2 p.m.	S.E.	5.1
,, ,,	Black fog, 6 p.m.	S.E.	5.5
,, 16	Very fine	S.E.	3.5
,, 18	Very fine	E.	4.0
,, 21	Dull and rain	S.E.	4.0
,, 28	Dull	S.E.	3.8
March 6	Fine	S.E.	3.9
,, 13	Fine	S.W.	3.7
,, 27	Dull	E.	3.7
April 25	Dull	N.E.	4.1
,, 27*	Overhead fog, 11.30 a.m.	S.E.	5.3
,, ,,	After, clear at 2 p.m.	S.E.	4.6
,, 28	Yellowish fog (slight)	S.E.	4.8
May 9	Dull	S.E.	3.8
,, 15	Dull	S.E.	4.1

The above table includes a considerable number of determinations, made for a special purpose, during a fog or a mist. These are distinguished by an asterisk; and if these be excluded, the mean of the remaining numbers is 4.03, which may fairly be taken as representing the average amount of carbonic acid in London air; that is, in the centre of London the increase of the amount of carbonic acid as compared to the purest country air is 1 part in 10,000. Taking the years separately, the mean for 1882 is 4.10; for 1883, 3.98; and for 1884 up to September, 4.07.

It appears, then, that the average amount of carbonic acid in the City in ordinary weather is very nearly four parts in 10,000 of air, and if we take the results of 1883 and the first half of the present year,—and these are the more systematically carried out experiments,—then the average amount is only 3.96.

This number seems to compare favourably with other towns. Dr. Angus Smith in Manchester in ordinary weather found 4.03, in Perth, 4.14, and in Glasgow 5.02 parts of carbonic acid in 10,000 of air. Roscoe and M'Dougall found in Manchester air 3.92 of carbonic acid. With regard to previous experiments on London air,—and it is to be remembered that all the experiments here given are from the very centre of London,—those of Angus Smith are, as far as I know, the only systematic ones recorded. He found in 1864, as the mean of five experiments, that the

amount of carbonic acid in the air of the parks of London was 3.01, and in the streets 3.80; and in 1869, as the mean of thirty-five analyses of air from different parts of London he found 4.39.

On examining Table I., it will also be seen that the amount of carbonic acid is often very considerably below the average, and that, when this is the case, the weather is fine with bright sun. The diminution of the amount of carbonic acid in bright weather in the country has been assumed to arise from the increased activity of the chlorophyll in vegetation. In the City it probably arises from the production of an active circulation in the air. The smallest amount of carbonic acid found in the City air was 3.0 parts. In country air it appears that the amount of carbonic acid does not vary with the time of year. In London, as we should expect, it does. The following are the results obtained by taking the mean of the summer (April to September) and of the winter (October to March) observations separately:—

	Vols. of Carbonic Acid per 10,000 of Air.	
	Winter.	Summer.
1882	4.70 (Jan. to March only)	3.86
1882–83	3.94	3.72
1883–84	4.01	3.85

These give as a mean for the three winters, 4.22, and for the three summers, 3.81 parts per 10,000 of air. It was of interest to ascertain how far the composition of the air of the City was altered by such an absence of population, and of course also of combustion, as occurs on Bank Holidays. So on five such occasions the composition of the air has been determined, and the following are the results obtained:—

	Carbonic acid in 10,000 parts of air.
August 7, 1882	3.0
May 14, 1883	3.3
August 5, 1883	3.3
June 2, 1884	3.3
August 4, 1884	3.2

Evidently on these occasions the purity of the air is very considerably above the average. Probably on a Sunday the same thing occurs, but this has not yet been proved by experiment.

Turning now to the cases in which the average amount of carbonic acid has been exceeded, we find this is always the case when fog or mist are present. Evidently, then, the products of

combustion and respiration cannot pass freely away, but accumulate often to a very considerable extent in the lower air. The cases when there is no fog and the carbonic acid is above the average are when the weather is dull and gloomy and the air still. Table II. gives exclusively the results of experiments made when there was either a fog or a mist, and shows very well the great accumulation of carbonic acid which often occurs.

TABLE II.

Fog and Mist Experiments.

Date.	Weather.	Temperature.		Barometer in mm.	Direction of Wind.	Vols. of CO_2 in 10,000 of Air.
		Wet Bulb.	Dry Bulb.			
1882.						
Jan. 17	Dense black fog . .	—	10.0	786	S.	6.7
,, 18	Dense black fog . .	—	4.0	786	S.	5.7
,, 19	Slight white fog . .	—	6.0	768	S.	4.8
,, 25	Dense black fog . .	—	3.5	780	S.	10.5
Feb. 3	Slight fog . . .	3.0	4.4	781	S.	6.9
,, 4	Dense black fog . .	4.0	5.0	785	S.	10.7
March 15	Slight white fog . .	9.0	11.0	775	N.E.	5.6
Oct. 26	White fog . . .	0.6	7.7	750	W.	9.9
Nov. 18	Dense black fog . .	2.2	2.7	760	S.E.	9.6
Dec. 1	Thick white fog . .	1.6	2.2	765	S.	5.5
,, 2	Slight mist . .	1.1	1.6	766	S.E.	5.1
,, 10	Thick white fog . .	0.5	1.1	755	S.W.	9.4
,, 11	Thick white fog, darker noon . . .	—	0.5	755	S.W.	11.0
,, ,,	Thick white fog, very dark 5 p.m. . .	—	0.5	755	S.W.	14.1
,, 14	White fog, slight .	4.4	4.4	755	S.E.	6.2
,, 15	White fog, slight .	5.0	6.1	753	S.E.	5.4
,, ,,	Overhead fog, white .	3.3	4.4	760	S.E.	4.8
,, 20	Dense black fog . .	4.4	4.7	767	S.	8.1
1883.						
Jan. 19	Slight fog . . .	10.0	8.8	763	S.W.	5.0
April 3	Fog, dense . . .	10.0	12.2	762	W.	13.3
,, 8	Slight white fog . .	7.7	11.1	756	S.E.	4.7
Oct. 10	Slight yellow fog .	12.2	13.8	760	N.W.	4.5
,, 11	Dense black fog . .	11.6	12.7	758	S.E.	7.6
Nov. 15	Slight yellow fog .	5.5	7.7	761	W.	6.6
1884.						
Jan. 16	Slight yellow fog .	6.1	7.2	776	N.W.	5.5
,, 18	Slight fog . . .	6.6	8.3	775	S.W.	4.5
Feb. 8	Black fog . . .	6.1	7.7	747	S.E.	5.5
April 27	Overhead fog . .	7.2	8.3	754	S.E.	5.3
,, 28	Yellowish fog, slight .	8.8	10.0	753	S.E.	4.8
						29)207.3
					Mean .	7.2

The largest amount of carbonic acid found was 14.1 parts. This was on December 11, 1882, and was during a long-continued fog. On referring to the table, it will be seen that the fog had begun on the previous day, when there was a "thick white fog," and the carbonic acid had then increased to 9.4; at noon on the 11th there were 11.0 parts, and at 5 p.m. the carbonic acid had increased to 14.1 parts in the 10,000 of air, that is, there was more than three and a half times the average amount present. Supposing, then, this had been an increase of only pure carbonic acid, such a change in the composition of the atmosphere would be felt by most people, if not by all; but an accumulation of carbonic acid means, as before indicated, a very large accumulation of other bodies, which probably are far more deleterious than carbonic acid itself. Hence this alteration in the composition of the air is by itself sufficient to account for many of the ill effects of a London fog.

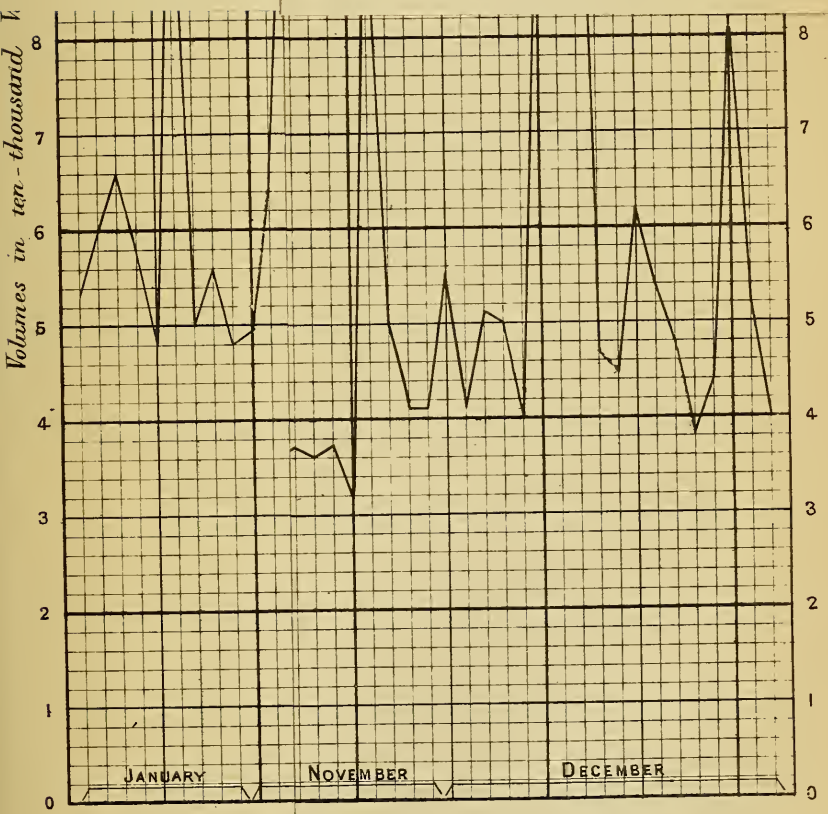
In Table I. will be seen several instances of the rapid change in the composition of the air with the clearing off of a fog. The following are instances :—

Date.	Vols. CO_2 per 10.000 of Air during Fog.	Vols. CO_2 per 10,000 of Air when Fog had cleared.
October 26, 1882 . .	9.9	5.0 (2 hours after)
November 18, 1882 . .	9.6	5.0 (1½ „)
December 1, 1882 . .	5.5	4.1 (4½ „)
„ 20, 1882 . .	8.1	5.2 (1½ „)
October 11, 1883 . .	7.6	5.1 (5 „)
April 27, 1884 . . .	5.3	4.6 (2½ „)

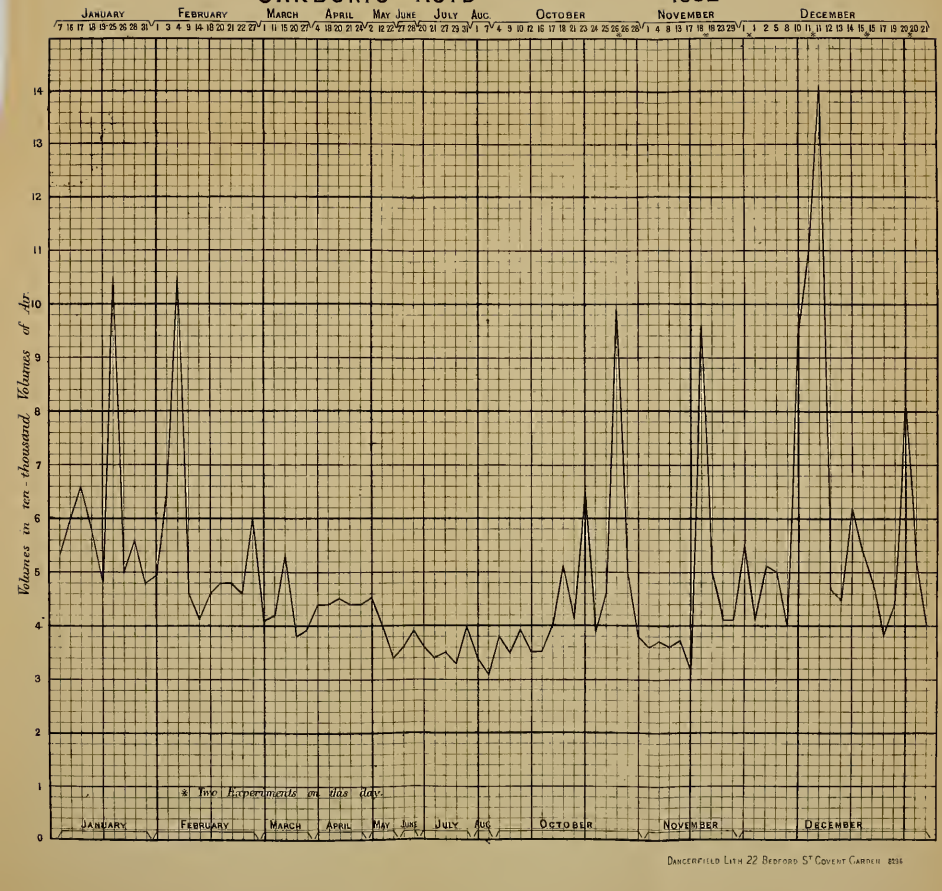
Table II. contains 29 experiments, and the mean of all these is 7.2, the maximum, as above stated, being 14.1, and the minimum 4.5. With regard to the time of year when these 29 experiments were made—

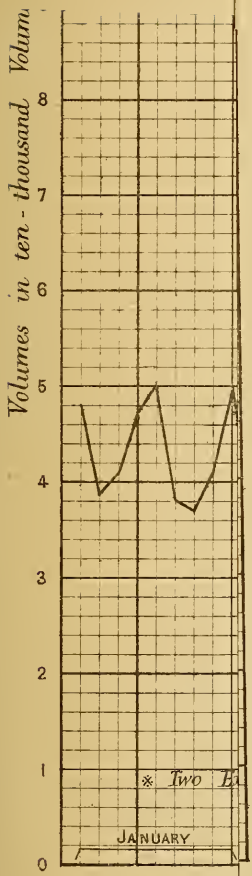
7	were made in January.	3	were made in October.
3	„ February.	2	„ November.
1	„ March.	9	„ December.
4	„ April.		

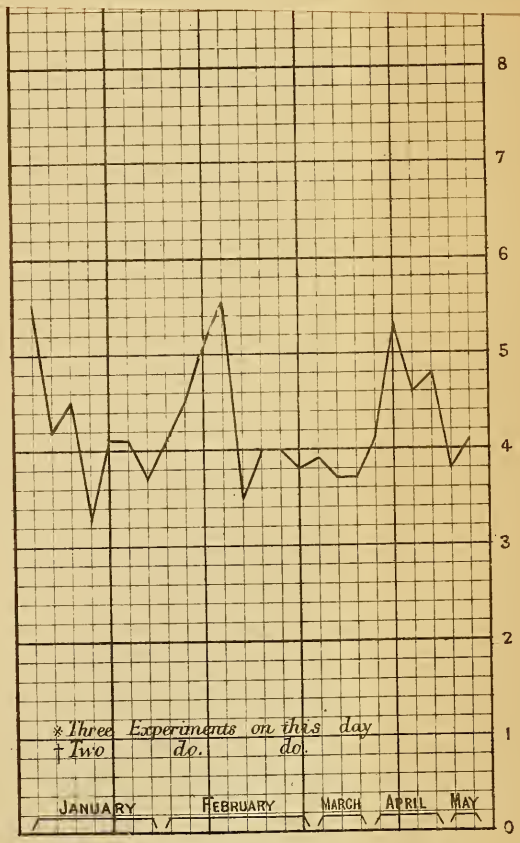
The above experiments certainly confirm the impression that the carbonic acid in town air is a very important indication of its purity.



DANGERFIELD LITH. 22. BEDFORD ST. COVENT GARDEN 8296


CARBONIC ACID 1882
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUG
OCTOBER
NOVEMBER
DECEMBER
Volumes in ten-thousand Volumes of Air
* Two Experiments on this day.
DANCERFIELD LITH 22 BEDFORD ST COVENT GARDEN





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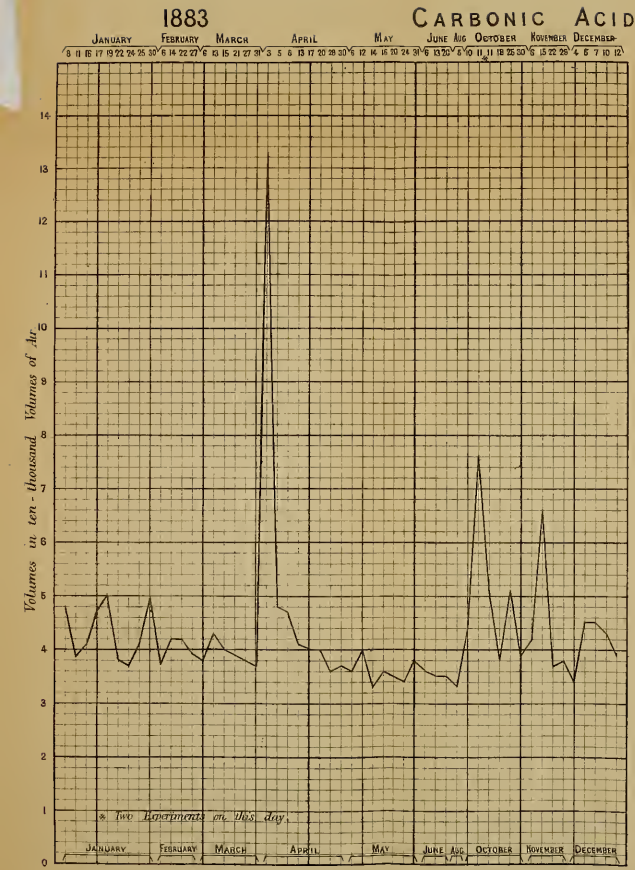
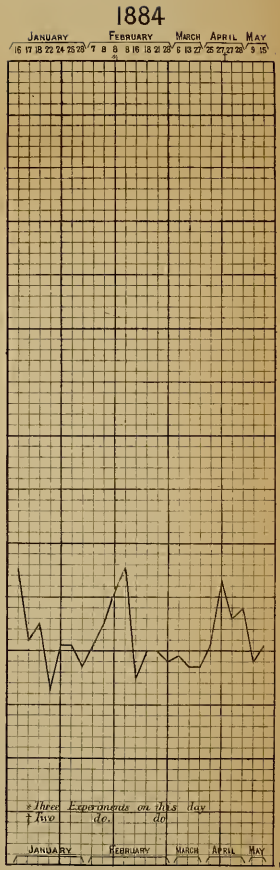
CARBONIC ACID





DANGERFIELD LITH. 22 BEDFORD ST. COVENT GARDEN 8286

MISCELLANIES.

BY

SAMUEL GEE.

I.—*A Kind of Eczema: Vaso-Paralytic?*

A lady, 70 years of age, had been subject for the past ten years to a disorder, having the following characters:—Suddenly, in a moment, she is seized with great flushing of the face and hands, great coldness of the feet, palpitations of the heart, great flatulence, and a feeling as if she were about to die. The flushed parts tingle, but are not tender. The symptoms described pass off in three or four hours, leaving the skin more or less swollen; in a few days it begins to desquamate; and in about two weeks it is nearly natural again. But the subsequent swelling and desquamation of the skin become worse with each attack, and when I saw her (twelve days from the beginning of an attack), the face had all the appearance of chronic eczema without much exudation, red, shining, tendency to crack, covered with thick scales; hairy scalp unaffected; wrists and arms unaffected; slight ectropium of lower eyelids. The seizure occurs in cold weather only; in the summer her skin becomes natural. Each winter she has from two to four attacks. In all other respects (with an exception soon to be mentioned) she was and had been healthy. She was put under regimen with respect to her food, exposure to wind and sun, and so forth. She also took small doses of liquor arsenicalis, which had not been given before. Whether in consequence of treatment or not, she quickly began to mend; her face became natural, and the tendency to ectropium disappeared. At the time of writing this, after a lapse of five years and a half, she has not had another attack.

Seizures of this kind seem to involve paralysis of sympathetic or vaso-motor nerves. In some attacks the fluxion of blood was distinctly confined, at the onset, to one side of the face. Moreover, she herself and all her children had suffered from strange nervous disorders, which shall be now narrated in the words of one of her sons, himself a physician.

II.—*Nervous Disorders Affecting a Whole Family.*

The father and his side of the family were free from any special tendency to nervous disorders.

The mother (whose kind of eczema has just been described) says that one of her sisters, when young, suffered from sick-headaches, ending in vomiting. The patient herself never suffered from megrim, but, from the age of 32 unto 61 years, she was liable to attacks of hemiopia, generally beginning at 11 A.M., and lasting some hours; no vomiting; glimmering before the eyes, but no teichopsia.

The eldest son, aged 41 years, when from 9 to 14 years old, used to have a headache before getting up in the morning, ending in a dreadful dream, in which he remembers a feeling of infinity and chaos,[1] with continual visual movements like those of a chromotrope, serpentine lines, a sense of hopeless calculation or task, a feeling of everything swelling out from a centre and becoming small again. These headaches and other symptoms ceased at about the age of 12 years. But much later in life, although not for some years past, if he fell asleep in his chair he felt a sense of being overwhelmed.

The second son, aged 38 years, from a very early age until he was 15 years old, was liable to seizures which conveyed a sense of the infinite, of chaos, rolling serpentine forms, everything swelling and getting larger, a sense of being overwhelmed, of hopeless struggle; all things soft, fluffy, and round. During the attacks, when the eyes were shut, he saw bright colours. He never had megrim.

The eldest daughter, aged 36 years, from the age of 13 was liable, for two years only, to megrim, worse on the right side, with hemiopia, coming on after breakfast, sometimes lasting two days, the attack usually ending in vomiting. Teichopsia doubtful; "the half of an object which I could not see was obstructed by a yellow or green halo." Night horrors,[2] in which she awoke screaming, and connected with a feeling of despair, "as if I had incurred a debt which I could never pay;" somnambulation also; impression of railway lines; hands felt as if swollen, "like boxing-gloves;" a sensation of things receding and becoming smaller, and then becoming larger again—compared to a chromotrope; a feeling of being overwhelmed when the eyes were shut.

[1] "Like that sleep
When the dreamer seems to be
Weltering through eternity."
—SHELLEY'S *Euganean Hills.*

[2] The patient herself referred to Dickens' "Old Curiosity Shop" (vol. ii. chap. 9) for a description of similar feelings.

The third son, aged 33 years, was subject to night horrors from the age of 14 to 20, usually when going to sleep, and especially if lying on the back, reminding him of the expression "Horror of darkness;" as if a great flood swept across his nerves, making each one of them vibrate; a distinct sense of rushing sound also.[1] The attack could be postponed by an effort of the will, but only for a time. From the age of 18 until the present time he has suffered from headache, commonly beginning in the morning with dimness of sight, followed by glimmering, hemiopia, and teichopsia, the colours yellowish, never brilliant, never vomiting; headache often occurs when a bright clear day, with a high barometer, follows dull mild weather with a low barometer. He still suffers occasionally from a sense of being overwhelmed if he fall asleep in an arm-chair, and he recognises the truth of Weir Mitchell's description as being exactly applicable to his own case. "In this form of night terror, which is seen rarely, but has often enough been described to me, the sufferer is perfectly conscious of the coming on of a nameless dread. Something precedes it in the way of a warning. He can, by an act of will, escape it by motion, or he may watch its onset. When it culminates, it is merely a state of insensate dread or terror, without a felt cause, dreamed or other" (Lectures, p. 166).

The second daughter, 30 years old, was subject, from 10 to 13 years of age, to megrim, beginning before breakfast, lasting most of the day, with hemiopia (a black mass on one side of the field of vision, with a bright edge; teichopsia doubtful), never vomiting; at other times a sense of movement, like that of a chromotrope, "things swelling and opening out," a feeling of hopeless struggle, also of woolliness, as if boxing-gloves were on, causing hopeless clumsiness. At the same time she was liable to frightful dreams. She still suffers at times from a feeling as if she were in a dream, although she is awake; from inability to go out alone, because of a feeling of dread, "like an atom in the midst of chaos;" objects at these times look grey; but the feeling does not occur especially in wide spaces, or where there are objects in lines.

The fourth son, aged 27, when from 15 to 17 years old, was subject to many of the feelings already described; night horrors, hopeless debt, sense of railway lines, and the rest. No sick-headaches.

Dreams are of two kinds. Dreams of one kind consist in a complicated succession of fancies (phantasiæ, visa animi, ima-

[1] "A sensation which I can only describe as a wave going through my head, and threatening, as it seemed to me, an unconsciousness which never came" (Weir Mitchell: "Lectures on Diseases of the Nervous System," p. 159).

ginations), which closely resemble those multitudinous fancies of our waking hours which we call real things or events. Moreover, dreams of this kind are incessantly varied; the same dream is seldom or never dreamt twice, even by the same dreamer.[1] Dreams of the other kind are much simpler, often confined to a single imagination, scarcely resemble anything in our waking experience, and are apt most monotonously to recur, not only to the same person, but to many persons, if not to all. A common instance of the latter kind of dream is the dream of falling through space. Other simple dreams, less common, are narrated in the histories just given of six dreamers who were continually dreaming the same dreams.

These dreams were attended by sorrowful emotions of despair and dread. Like fancies and attendent emotions beset several of the patients, even when awake. Indeed, most of the simple dreams are analogous to certain disorders which have hitherto been deemed peculiar to waking persons only. I think my cases show that people dream these morbid fancies. For instance, chromotrope dreams resemble the visual phantasmata of megrim.[2] Three of my dreamers suffered from megrim-hemiopia, and one at least from teichopsia. The dream of a loud explosion, described by Weir Mitchell (Lectures, p. 154), and which I myself have known to happen, seems like a kind of tinnitus aurium. Some of the feelings which are described as having been caused by a dream of infinity are very much like the phænomena of agoraphobia. Lastly, the dream of falling is a fancy identical with the abysmal giddiness from which Pascal[3] suffered, and of which one or two instances have come within my own experience.

III.—*Respiratory Croaking of Babies.*

I have seen about a dozen instances of what (for want of a better name) I will call respiratory croaking in babies. Breath-

[1] "The phantasms of men that sleep are *dreams*," says Hobbes (Elements of Philosophy, chap. xxv. par. 9), and he proceeds to give five characters of dreams, whence it is clear that the only dreams he had in mind were those which I have called the more complicated sort of dreams. And I think that this is the case with most of those who have written upon dreams.

[2] "Luminous forms . . . which appear first in the form of a small circular spot at a distance, whence they approach the eye in a direct line, gradually enlarging in surface and increasing in brilliancy as they advance, until at length they seem to be in contact with the eye, when they instantly expand and vanish, and are succeeded, after a few instants of time," by a renewal of the same appearance (Pelham Warren: Of Headaches. Trans. of College of Physicians, vol. iv. p. 235. 1813).

[3] Pensées, ed. Charles Louandre. Paris, 1861, p. 42, note. "Ce grand esprit croyait toujours voir un abîme à son côté gauche, et y faisait mettre une chaise pour se rassurer."

ing is accompanied by a croaking noise, which seems to me to have the characters of stertor more than of stridor; or, in other words, the sound seems to be produced in the fauces and not in the larynx. The croaking usually accompanies inspiration only, but in one of my cases it accompanied expiration only The noise is constant, both when the child is awake and when she is asleep; yet it may cease for a short time now and then. The tone of the cry is natural, and this is another reason for believing the noise not to be laryngeal. No dyspnœa; no recession of chest walls during inspiration. Fauces look natural. The noise continues when the nose is pinched. The croaking has nothing whatever to do with the crowing of laryngismus stridulus; the two disorders resemble each other in no respect, except that there is a noise produced in each. The age of my patients, when I first saw them, ranged from three to nine months. It is a remarkable fact that all of the nine children, of whom I have kept more accurate note, were girls. The general health of some of the children was good, but most of them were weak and sickly; two children suffered from congenital disease of the heart, and one was an idiot. In some of the children the croaking began at or soon after birth, and I know of no case in which it lasted much beyond the end of the first year. I know of no special treatment; indeed, the disorder causes more annoyance to others than to the child herself.

A similar condition may be met with in older children. Two years ago there was a boy in the Hospital for Sick Children, who was $3\frac{1}{4}$ years old, and who suffered from inspiratory croaking, which began at 6 months of age. The noise was almost continual during sleep, not so when he was awake. The larynx was easily seen by the laryngoscope, and looked natural. There were no physical signs of disease in the chest or elsewhere. He was much the same when he left the hospital as when he entered it.

I have put this case apart from the others, because it differs from them in respect of both the age and sex of the patient.

Joseph Frank, in his "Praxis Medica" (De Morbis Laryngis, cap. II. sect. ii.), refers to observations of Storch which somewhat resemble mine. But most of Storch's patients were older than mine; and he seems, so far as I can judge from Frank's report, to have confused all kinds of stridor and stertor together.

There is a much better description of the disorder in Rilliet and Barthez' book, "Des Maladies des Enfants," under the name of "Trachéite de la Première Enfance;" but in my description I have chosen to rely wholly upon facts within my own experience.

IV.—*Extreme and Fatal Dyspnœa in Newly-Born Children.*

Case I.

Male child, 7 weeks old, seen on March 30, 1881, with Mr. Edward Calthrop. The child had some slight dyspnœa since birth. When 4 weeks old the dyspnœa became much worse, and continued to be severe, so that the child could hardly breathe unless lying forward on the left side; in much the same posture as is sometimes taken by patients suffering from mediastinal tumour or pericardial effusion. The least disturbance brings on an attack of extreme dyspnœa, with great recession of the chest walls in front and below, lasting for some minutes. Lividity constant, becoming very great during the exacerbation of dyspnœa. Breathing sounds heard by auscultation are very weak. Percussion-note of chest good throughout. Heart sounds natural. Cry natural. Nothing amiss discoverable in mediastinum or root of neck.

Reflecting upon this case in the light of general principles, and having no light of experience to guide me, for I had never seen such a case before, the great inspiratory recession of the ribs and extremely weak breathing seemed to point to an obstruction in the windpipe. The larynx was probably natural, because the cry was so. Both sides of the chest were equally affected. No signs of heart-disease could be detected. For these reasons I suspected that there was some narrowing of the trachea, or bronchi, such as might be caused by progressive enlargement of the thymus or bronchial glands.

Yet now, as mostly, general principles led astray. The child died on April 1. Mr. J. L. Hewer made a post-mortem examination, and found that the right ventricle contained a globular mass of buff-coloured fibrin, adherent to the tricuspid orifice in one place. A whole lower lobe of one lung was totally collapsed. Smaller portions of lung elsewhere were in the same condition. Windpipe natural.

Case II.

A male child, 9 days old, seen on December 19, 1882, with Dr. J. G. Glover. When seven days old, the child (hitherto healthy) became livid. When I saw him the lividity was great. Cry natural. Great sinking of the front base of the chest during inspiration. No other physical signs of disease.

Guided by the experience of the former case, I thought that the disease might lie in the heart. The child died on the night

of December 22, in what was called a crying convulsion. Dr. Glover made a post-mortem examination, and kindly sent me the following report:—Extreme discolouration of body, even of front parts. A little, stout, wonderfully distended heart; quite square with distension of all its cavities; walls thick; the contents, half-clotted dark blood. Lungs crepitant everywhere; floated in water at all points; but at parts, chiefly about the base, an approach to hepatisation; and, on section, white yellow spots of muco-purulent secretion. Vessels of brain filled with dark blood.

Case III.

"A male child was born on January 3, 1884, at full time, of healthy parents, after an easy labour of four hours, which was completed under chloroform. Much difficulty was experienced in making the child respire after an hour of artificial respiration. The extremities were livid, and remained so for three days; with considerable drowsiness, the child rousing up only on the application of urgent stimulus. The fourth day the child became jaundiced, but in other respects improved, taking the breast fairly well; the jaundice gradually diminished, eventually disappearing about the twelfth day. During this time the drowsiness still continued, and considerable efforts were required to make the child take the breast. On the nineteenth day the child was stated to have had a fit, the breathing stopping for over a minute, with much lividity; there were no convulsions or rigidity of limbs or body. Six fits of a similar kind occurred in the twenty-four hours succeeding the first. On one occasion the breathing was entirely suspended for three minutes and three-quarters, not the slightest movement being observed in either chest or abdomen by myself. The fit of apnœa terminated by a long-drawn stridulous inspiration, succeeded by regular breathing, the lividity rapidly passing away."

For these notes I am beholden to Mr. G. H. Hames, of Bayswater, with whom, on January 24, I saw the child, being then twenty-one days old. We saw a fit of apnœa, which lasted two minutes and three-quarters by the watch, the child being stripped; not the slightest movement of ribs or belly; the lips became black; pulse could be just felt, and heart sounds just heard. The fit on the whole lasted five minutes; but twice, at intervals of a minute or so, the child drew a deep breath, but once went (as above said) for nearly three minutes without breathing. The nurse told us that she had timed a fit of perfect apnœa which lasted five minutes. There were some mucous râles in both lungs, but no other physical signs of disease in the

lungs or heart; the râles had not occurred until to-day. Mr. Hames' notes thus proceed :—"The fits of apnœa gradually increased in frequency, reaching two or three attacks every hour, until the evening of January 25, when the child died. The last twenty-four hours no milk was taken, though every means were used. There was no rise of temperature. No examination after death was permitted."

Case IV.

I saw a child, in consultation, on January 13, 1880, at Brompton. A male, born at full time on January 8, labour easy, and no sign of aught amiss with the child until the evening of January 12, when two or three pemphigus blebs appeared about the buttocks. An hour or two afterwards fits of dyspnœa began. When I saw him, on January 13, the slightest disturbance of the child was followed by a fit of apnœa; he ceased to breathe; no sound of any kind; lips became black; after half a minute or so he began to breathe slowly, and the breathing soon became natural. No recession of chest walls to speak of; no laryngeal signs; no physical signs of disease within the chest. I wished to examine his throat, but any attempt to do this brought on a fit of apnœa. Moreover, the muscles of the jaw contracted so strongly that nothing short of violence could have opened the child's mouth. For these reasons he could not be fed. His thumbs were turned in upon his palms, and the fingers bent over; the big toe was widely separated from the other toes. No rigidity of neck or back. Later on, the lightest touch seemed enough to bring on a fit of this kind. Three hours before death, on January 14, the fits of apnœa ceased, and he lay exhausted. The navel was apparently natural.

The day after death I examined the body post-mortem, all excepting the brain and spinal cord. The thoracic and abdominal viscera, the heart, larynx, trachea, and fauces were perfectly natural. There was no doubt that the pemphigus was syphilitic.

Here are four instances of extreme and fatal dyspnœa coming on shortly after birth. In other respects the cases have no great resemblance.

Case I.—The slight dyspnœa, continuing for four weeks after birth, may have been due to congenital non-expansion of lung. The severer dyspnœa of the following three weeks may have concurred with the formation of the clot found in the right ventricle after death. The clot may have been the result of impeded circulation through the lung, consequent upon its atelectasis. On the other hand, the pulmonary collapse may have occurred

after birth; but if so, I find it still more difficult to explain the actual sequence of disease.

Case II.—Here there is no possibility of congenital atelectasis. But how is the distended heart to be explained?

Case III.—The want of a post-mortem examination renders explanation of this case impossible. It would seem to have been congenital non-expansion of lung; but the fits of apnœa which ensued on the nineteenth day must remain unexplained.

Case IV I deem to have been tetanus, and possibly secondary to the pemphigus or unhealed navel. However, the case differed greatly from the only two instances of ordinary trismus (or rather tetanus) nupernatorum which I have seen, in the very speedy death of the child from apnœa. The two cases of ordinary trismus nupernatorum lived several weeks, died from difficulties about feeding, and suffered not at all from dyspnœa.

V.—*Idiopathic Dilatation of the Large Intestine.*

One kind of great and fatal tympanites is an extreme dilatation of the large intestine, in whole or in part. This dilatation may be called idiopathic, inasmuch as it constitutes the whole of the disease, and the foregoing conditions or causes cannot be discovered. The disease may be compared with a like dilatation, also idiopathic, which affects the œsophagus and the stomach.

A boy came under my notice when he was $4\frac{1}{2}$ years old. When three months old he began to have difficulty in passing his motions, which were hard. His belly began to swell when he was twelve months old, and afterwards it became continuously bigger. When I first saw him he was thin. His abdomen was very large; everywhere resonant to percussion; what looked like coils of intestine were distinctly seen; the tension of the abdomen and dyspnœa were very great. His bowels had not acted for two days, and an enema of warm water was given. Fifteen minutes afterwards he passed a large quantity of very dark, loose fæces, smelling badly. The same evening he began to vomit; he thrice vomited large quantities of sour brownish liquid, not stercoral in smell or look. In short, he seemed threatened with ileus. Next day I passed a long tube up his rectum as far as it would go, and so let off a little loose, slaty-coloured stool, and a very great quantity of wind. His belly became much smaller and softer. The vomiting ceased. Appetite for food returned. He was able to lie down. After this I tried divers means to try to get his bowel to contract, namely, cold douches to the belly, friction with stimulating liniments, passage of a tube twice a day, and careful bandaging of the abdomen. But to no avail; the child

became thinner; and after ten days I desisted. He seemed much as usual, until, about a fortnight afterwards, his urine was observed for the first time to be bloody; it had been examined several times before, and found to be natural. He quickly became worse; very abundant watery diarrhœa set in, and he died two days afterwards.

When the belly was opened after death, nothing was to be seen therein save two great pieces of intestine, which were the sigmoid flexure hugely distended. It formed two sacs, which lay side by side, one sac filling up the right half of the belly, and the other the left. The anus led into the lower end of the right sac, which passed upwards and opened, under the diaphragm, into the upper end of the left sac, by a short strait of narrower bowel, whence there was a descent into the left half of the sigmoid, as hugely distended as the right. This descending sigmoid sac led, in the left iliac fossa, into the lower end of the descending colon. The colon was quite natural, both in size and position, and lay hidden behind the enormous sigmoid flexure. Cæcum and small intestine were natural. Diameter of widest part of sigmoid was about 4 inches; its muscular coat and nerves were greatly hypertrophied. The liver was much pushed back; structure of both liver and spleen natural. Kidneys very hard, quite like the kidneys of dilated heart; cortical structures distinct, veins dilated. Pelves of kidneys were much dilated, ureters also; in right ureter was a hæmorrhagic ulcerated ring, coated with uric acid. The condition of kidneys and ureters was probably due to pressure.

A somewhat similar example of this form of tympanites will be found in De Haen (Rat. Medendi IV., cap. iii.); another in the posthumous works of C. H. Parry (vol. ii. p. 380); and a third reported by Dr. Goodhart in the fourteenth volume of the "Clinical Society's Transactions." In all these cases, however, the colon was dilated; in my case it was natural.

At present, for want of a better explanation, I think that mere constipation and retention of wind are the cause of the dilatation, and that this opinion is rendered probable by the analogy of the two following cases:—

A boy, 5 years old, had extreme tympanites, which had been coming on gradually for six months. There was no great difficulty in procuring an action of the bowels. The left ischio-rectal fossa was occupied by a rounded tense swelling, which caused a deformity of the anus, such that it looked like a semicircular slit, with its convexity to the left side. By the finger the swelling was found to reach upwards alongside the rectum, and when the finger was withdrawn a large quantity of flatus was suddenly

expelled, followed by liquid fæces. The size of the belly was diminished a little after the examination. Mr. Willett punctured the swelling with a trocar, and six ounces of mucus were let out, colourless and flocculent. Dr. Vincent Harris thus reported upon the liquid:—"Specific gravity, 1010; neutral; contains a proteid (serum-albumen) and chlorides; deposit under microscope consists of leucocytes (pus or mucus corpuscles)." The size of the belly was very much diminished; the anus resumed its natural shape; no tumour could be seen or felt. In a few weeks the fluid collected again in the cyst. It was opened by an incision, and allowed to granulate from the bottom. The belly became very much smaller, but was still rather too big, and so it continued to be when last I saw the boy.

I saw a boy, aged 4 years, a patient of Dr. J. H. Galton's of Anerley. His belly was very tympanitic, a condition which was noted first when the child was only one month old. At one year of age he was seen by Dr. Hilton Fagge, who considered the tympanites to be due to spasm of the rectum. The child suffered from habitual constipation. When I saw him, the tympanites was extreme; nothing could be felt in the rectum except very hard and gritty fæces. But in the right iliac fossa there was a lump to be felt, which was very easily moved upwards, and which we deemed to be scybalous. He died soon afterwards, and Dr. Galton was kind enough to send me this report of the post-mortem examination:—There was general peritonitis; surface of intestines greasy; contiguous edges adherent, with recent lymph, and a good deal of flaky fluid in abdomen. There was a very curious disposition of intestine; the sigmoid flexure, distended to the size of a stomach, and looking just like one, lay right across the hypogastrium, and the lump which we felt on the right side was a dense intestinal concretion about the size of a medium-sized orange. Above the concretion, the upper part of the sigmoid flexure and the descending colon were enormously distended with semi-liquid fæces, while below the concretion and constriction the lower part of the sigmoid flexure and upper part of rectum were contracted, but not in a very tight stricture, admitting easily the index finger. Dr. Galton goes on to say that the interest of the case lies in the probable existence of the same condition (spasmodic stricture) which existed at one year of age, and the extreme misplacement of the sigmoid flexure, which led us to suppose that the lump we felt was in the ascending colon.

NOTES ON

THE LATER STAGES OF HEMIPLEGIA.

BY

J. A. ORMEROD, M.D.

The object of the following paper is to illustrate briefly certain phenomena which may occur during the later stages of hemiplegia. As the cases are taken from out-patient practice, the notes are necessarily brief, and contain nothing that relates to morbid anatomy.

Only those cases will be considered where the original lesion was essentially non-progressive; for otherwise new and later symptoms might be due to the spread of the primary disease; as, for instance, of tumour, syphilitic disease, multiple sclerosis, &c. This practically limits us to cases of vascular lesion—hæmorrhage, embolism, thrombosis, and the like; and although it is often difficult to determine, late in the disease, which of these constituted the original cause, yet the character of suddenness in the onset of the hemiplegia may be said to pronounce for one or other of them. Moreover, further discrimination is unnecessary, for most of the later phenomena are determined by the site rather than the character of the original lesion. The commonest and most important of these later phenomena are degeneration of the pyramidal tract, and the symptoms connected with it, viz., contracture and increase in the tendon-reactions of the paralysed limbs; but others occasionally occur, some probably spinal and connected with the secondary degeneration, such as muscular atrophy and extension of the paralysis to the opposite side, some probably cerebral, such as hemichorea, mental phenomena, epileptiform fits.

On exaggeration of the tendon-reactions and its relation to rigidity I have made some remarks in an earlier number of these Reports,[1] I shall therefore here only notice some modifica-

[1] Vol. xvii. p. 151.

tions of these phenomena which I imagine to be exceptional. The rule is, that in persistent hemiplegia, (1) there appears, after a certain duration of the disease, exaggeration of tendon-reactions on the paralysed side; (2) that this exaggeration is generally the precursor of permanent rigidity. Nevertheless it may happen that the exaggeration is considerable and prolonged, yet there results little or no rigidity.

For example—

Case I.

J. C., æt. 37, policeman, had been hemiplegic on the left side for seven months. The onset had been sudden, the paralysis complete at first. He can now (September 14, 1881) walk, dragging the left leg. There is very slight stiffness at the knee, none in the arm. Tendon-reactions exaggerated, and ankle-clonus present on the left side. The paralysis improved steadily, till in April 1882 the leg was practically well, and he could do most things with his left hand. All stiffness had disappeared, but still there was ankle-clonus on the left side.

Case II.

Alfred D., æt. 19, had a sudden attack of left hemiplegia 8 months ago. The leg has by this time (June 14, 1881) improved, the arm not. There is exaggeration of tendon-reaction and ankle-clonus on the left side. Beyond a slight stiffness of the fingers there is no rigidity. He remained under observation for 15 months or more; the leg improved; the arm remained useless, though not rigid; the tendon-reactions and the ankle-clonus were unchanged.

In such cases as these, Brissaud[1] sees a "latent contracture;" the pathological conditions necessary for the production of rigidity (viz., degeneration of the pyramidal tract) are, he thinks, present, and slight exciting causes, such as injury, emotion, and the like, will actually bring it on. If this be so, we have here a transitional form between the ordinary hemiplegic contracture and functional contractures; thus—

(*a*) Hemiplegia, lateral sclerosis—permanent contracture.
(*β*) Hemiplegia, lateral sclerosis—contracture not permanent, but appearing under appropriate circumstances.

[1] Recherches sur la Contracture Permanente des Hemiplegiques, chap. iii. Paris, 1880.

(γ) Hysteria, or functional disease, without definite anatomical lesion—contracture not permanent,[1] but appearing after injuries, emotion, &c.

To recur to exceptional cases of tendon-reactions. It occasionally happens that these are greater on the sound than on the paralysed side. I gave three instances of this in my previous paper. Of these three patients, two had suffered from fits, and one had athetosis. Athetosis was also associated with diminished tendon-reaction in the following case.

Case III.

James P., æt. 69, has had right hemiplegia for twelve months, presumably embolic in its origin, for there is displacement outwards of the apex-beat, and a blowing systolic murmur heard over the præcordia. The leg is dragged as he walks, the grasp of the right hand is feeble, but he can just use a knife with it. There are slight involuntary movements of the right hand, and he says he cannot keep the right foot still. Some obtuseness of sensation on the right side. Tendon-reactions at the wrists equal; but at the right (paralysed) knee less than at the left.

In the next three cases there were neither fits nor athetosis.

Case IV.

Mary Ann G., æt. 51, had had two attacks of hemiplegia, both on the right side. The first, two years ago, was sudden, unaccompanied by loss of consciousness, and caused incomplete and transitory paralysis of the arm, leg, and face, and impairment of vision of both eyes; the second, a year ago, was a sort of swoon, after which the right side became more permanently affected, and the speech slightly impaired. She can now (February 21, 1882) move all her limbs, but cannot stand alone. There is decided exaggeration of the patellar tendon-reaction on the left (non-paralysed) side as compared with the right; and doubtful exaggeration in the left arm. No ankle-clonus. Lately there has been slight numbness of the left arm. No cardiac murmur; no albuminuria; no rigidity.

Case V.

Arthur J., æt. 52. Right hemiplegia of fourteen months' duration; onset sudden, with loss of consciousness; paralysis at first complete, with some aphasia. He never had convulsive fits; the left side was never paralysed. Radial arteries atheromatous;

[1] For cases of this last kind see Charcot's "Leçons sur les Maladies du Système Nerveux," vol. iii. pp. 104, 117.

second sound of heart accentuated; no albumen in urine. Patellar tendon-reactions—on right (paralysed) side doubtful exaggeration, on left (sound) side decided exaggeration. These conditions are just reversed in the upper limbs, the exaggeration being there on the paralysed side, as is usual. No rigidity; no ankle-clonus.

Case VI.

Edward S., æt. 43, left hemiplegia of four months' duration; onset as follows: While walking one day his leg began to drag; on getting home he fell. For two weeks previous to this he noticed some loss of power in the hand, but the upper limb became worse when the leg was attacked. For some weeks before the attack he had pain in the right side of the head. The heart sounds are normal; there is no optic neuritis; no note of urine; the fingers are getting stiff; tendon-reactions just as in the last case, viz., excessive in the upper limb of the paralysed side, but in the lower limbs greater on the sound than on the paralysed side.

The occurrence of the abnormality in the legs only may stand in some connection with the paraplegic condition which I shall next notice.

It is commonly supposed that in hemiplegia only the side of the body opposite to the damaged hemisphere is affected. Brown Sequard[1] seems to have been the first to state that there is in addition a slight paralysis on the corresponding side. This statement has recently been verified by Pitres[2] and Friedländer.[3] These authors show (Pitres from forty observations, Friedländer from twenty-three) that there is always a loss of muscular power in the limbs of the side corresponding to the lesion. Moreover, Pitres asserts (though this is disputed by Friedländer) that this loss of power is more evident in the leg than in the arm. These observations have reference to mere loss of muscular power as estimated by the dynamometer; not to the power of executing and directing voluntary movements, such as walking, sewing, writing, and the like. Nevertheless, even in this latter respect, both lower limbs are, according to Pitres, liable to suffer.

Now, although the investigations of these authors do not specially refer to *old* hemiplegia (indeed it appears to be an undecided point whether the loss of power diminishes or not as time goes on), yet they have a distinct bearing on the less

[1] As quoted by Pitres and Friedländer.

[2] Note sur l'Etat des Forces chez les Hémiplégiques. Archives de Neurologie, July 1882.

[3] Ueber den Kraft-Verlust der nicht gelähmten Glieder bei Cerebraler Hemiplegie. Neurolog. Central-blatt, June 1, 1883.

common class of cases, where, after a considerable period, the symptoms of paralysis spread from the hemiplegic to the sound side. It is not very rare to find exaggeration of tendon-reaction in both legs.[1] This may be regarded as the first indication of a rarer condition, in which actual paralysis and occasionally contracture spreads over both legs.[2] I referred in my previous paper to the observations of Charcot and Dejerine upon this point, and was able to give one observation of my own. The following is probably a case of the kind :—

Case VII.

Sarah G., æt. 54, applied first on June 16, 1882. She had then had right hemiplegia for six months; there was rigidity of the right arm and exaggeration of the tendon-reactions on the right side. She said it had come on suddenly,[3] without loss of consciousness; the paralysis had from the first been incomplete. There was no history of rheumatism and no albuminuria, though the second heart-sound was accentuated.

June 30.—Pain down right (paralysed) arm.

December.—Pain down *left* side.

May 11, 1882.—She says that the right side has improved on the whole during her attendance, but that the left side has been getting gradually weaker during the last two months. Tendon-reactions are exaggerated on both sides, though the right more so than the left. She walks with short steps, and seems to drag both legs, though it is difficult to be sure of this.

July 13.—She thinks the left leg is even weaker than the right. Grasp of left hand is feeble, though stronger than the right. Tendon-reactions as before.

Oct. 5.—Pain almost gone from the left leg, but she says it feels numbed. She feels weaker in all her limbs. She now distinctly drags both legs, though the right more decidedly than the left.

In another case a man æt. 50 had had left hemiplegia for four months. He had recovered sufficiently to move the leg, arms, and fingers, but not to stand. There was some rigidity of the paralysed arm, and excess of tendon-reactions in the arms and legs *of both sides.* He was unable to attend again, but his

[1] Sometimes in both arms and both legs, but always, I imagine, in both legs, if it be bilateral at all. See Tables IV. and V. in vol. xvii. p. 159, of the Reports.

[2] See Hadden, St. Thomas's Hospital Reports, 1883: Paraplegic Rigidity in Hemiplegia. Féré, Arch. de Neurologie, July 1882 : Note sur un Cas d'Hémiplégie, avec Paraplégie Spasmodique. Althaus, Transactions of Clinical Society, 1882.

[3] Unfortunately she was not consistent on this point; for later on, when specially questioned, she said it came on by degrees.

friends reported that he got worse, and that the weakness extended to the limbs of the right (non-hemiplegic) side.

As to the reason for this extension of the paralysis, and the reason why it should occur in the legs rather than in the arms, the same hypothesis will serve both for this and for the explanation of the usual order of recovery in hemiplegic limbs. This recovery usually takes place in the leg before the arm. Assume that either cerebral hemisphere represents not merely the limbs of the side opposite to it, but also those of the same side; that the representation of the opposite side, however, is preponderant; assume further that this preponderance is greater for the arms than for the legs, so that the representation of each arm is more nearly unilateral; then in an ordinary case of hemiplegia, the hemiplegic leg will suffer less and recover sooner than the hemiplegic arm, because it has a larger representation in the sound hemisphere.[1] But just as the hemiplegic leg escapes in virtue of its representation in the sound hemisphere, so must the other leg suffer in virtue of its representation in the diseased hemisphere. Hence we might expect, what is the fact, that the tendency of a hemiplegia to generalise itself would be manifested first as a paraplegia.[2]

The anatomical data for this explanation are not, as yet, satisfactory. Dr. Althaus, if I understand him rightly, inclines to Charcot's [3] hypothesis, that there is a second decussation of motor fibres in the cord as the lumbar region is approached. Dr. Hadden prefers to fall back on the division of the pyramidal tract as established by Flechsig; the direct or anterior pyramidal tract of the cord serves, he thinks, to connect each hemisphere with the lumbar motor cells of the same side. But this is still uncertain;[4] at any rate, the direct pyramidal tract has disappeared before the lumbar enlargement is reached. Pitres[5]

[1] Mr. Victor Horsley, Lancet, July 5, 1884, gives a different explanation of the order of recovery in hemiplegia.

[2] Upon the representation of both sides of the body in each half of the brain, I would refer to Dr. Hughlings Jackson's remarks, Croonian Lectures, Lancet, 1884, vol. i. p. 557, and to the experiments of François and Pitres, which he there quotes. The explanation of post-hemiplegic paraplegia by means of an extension of Broadbent's hypothesis is well worked out in Dr. Hadden's paper quoted above.

[3] Leçons sur la Localisation, &c., p. 252.

[4] Quain's Anatomy, vol. ii. p. 278. "It is highly probable that the decussation of these anterior pyramidal tracts goes on along their whole course, their fibres passing through the anterior commissure and through the grey matter of the opposite side to reach the lateral pyramidal tract on the other side of the cord. The decussating fibres in the anterior commissure would thus form a continuation of the larger decussation in the medulla oblongata."

[5] Recherches anatomo-cliniques sur les Scleroses bilaterales de la Moelle épinière consecutives à des Lesions unilaterales du Cerveau. Archives de Physiologie, vol. xxx. part 2.

has made some important anatomical investigations on the subject, but they still leave the matter in doubt. Out of ten cases of unilateral cerebral lesion with descending degeneration which he examined post-mortem, there was in six instances degeneration of *both crossed pyramidal tracts* from the decussation in the medulla downwards. We should have expected paraplegic phenomena, but in these cases the contracture during life was limited to the hemiplegic side.

Next to cases of post-hemiplegic paraplegia naturally follow those in which hemiplegia is associated with some disturbance of micturition.

Case VIII.

William S., æt. 26 (Aug. 23, 1881) has been hemiplegic for seven months. Onset sudden. While getting out of bed he shook all over; the shaking came on again in ten minutes, and left an incomplete left hemiplegia. He could stand in three or four days.

By this time he has much improved; grasp of left hand strong, though not equal to right; halts a little on left leg; face still drawn to right. Tendon-reactions exaggerated on left side; only a little stiffness of left leg. No cardiac disease; no albuminuria.

Jan. 3, 1882.—The paralysis is improving; but he has to hurry to make water. He cannot retain it for even a short time when once he has felt the desire to pass it. This has been the case, he says, ever since the paralytic stroke; it was not so before. Tr. Belladonnæ ℥vij. ter die.

March 28.—The leg has recovered so far that he can walk from Hounslow to London. Micturition better.

June 23.—The arm has been worse since a fall upon the left side. Chief difficulty is in movements at the shoulder. Face still drawn. Urine still "comes too quick."

Nov. 14.—Micturition said to be quite natural again.

Case IX.

James W., æt. 47, had had, when first seen (Oct. 8, 1879), left hemiplegia for eight months. Onset sudden, without loss of consciousness; numbness on the left side.

Oct. 13, 1880.—The hemiplegia has improved, but he has now incontinence of urine. Tendon-reactions excessive on left side.

Dec. 21, 1881.—Came again on account of an attack of giddi-

ness. Condition of limbs unchanged. Ankle-clonus left side. The incontinence of urine still remains.

In a third case—left hemiplegia about fourteen months' duration, incontinence of urine three months—both patellar tendon-reactions were almost absent, and there had been shooting pains in the shoulders and loins. Probably the incontinence was here an early symptom of tabes.

As a rule, the muscles of a hemiplegic limb preserve their nutrition, and their electrical reactions remain normal. But sometimes, if the degenerative process extend from the pyramidal tract to the anterior cornua,[1] muscular atrophy becomes superadded to the paralysis.

Case X.

Frederic William B., æt. 45, had on August 21, 1881, a sudden attack of right hemiplegia, accompanied by loss of consciousness. He was at first aphasic. He began to recover in five or six months' time. Now (August 1, 1882) he can walk, dragging the right leg and holding it stiffly. He can move the right forearm and fingers freely, but cannot raise the arm above the shoulder. The muscles of the right arm are thin but not distinctly wasted; but there is well-marked wasting of the thumb-ball. He cannot oppose the thumb, or flex its metacarpo-phalangeal joint, nor separate it from the hand, so as to bring the thumb and finger-tips together. The right shoulder-joint crepitates, and is painful on movement; he has also had some swelling of the right hand, ascribed to chronic rheumatism, but occurring during the course of the paralysis. The middle phalanx of the middle finger is thickened and its base displaced. Albumen was found in the urine (August 8).

August 2.—Dr. Coxwell examined the thumb-muscles electrically; they react to the Faradic current, but require a stronger current than those of the examiner. They react to thirty-five cells of the battery current; the polar reactions are abnormal —ACC > KCC.

Post-hemiplegic disorders of movement may vary in character, from rhythmical tremors like those of paralysis agitans or insular sclerosis[2] to the irregular jerky movements of chorea.

A classification of these, with numerous examples, has been

[1] For anatomical proofs of this, see Brissaud, *op. cit.*, pp. 173, 175, 179, 187.

[2] See Dr. Ord's case, Transactions of Clinical Society, 1882.

given by Dr. Gowers.[1] The so-called athetosis (probably a variety of chorea) is characterised, according to Oulmont,[2] by the slowness of the movements, their exaggerated extent, and their tendency especially to affect the small muscles of the hands.

In the two following cases the "mobile spasm," as Dr. Gowers calls it, of athetosis was not constant, but seemed to merge from time to time into a condition resembling late rigidity.

Case XI.

Jane Ann L., æt. 21 (April 18, 1883), became hemiplegic on the left side at five years of age, according to her mother; the movements began three months after the hemiplegic attack. Now she can move the left arm and forearm voluntarily to a certain extent, but not the hand. The fingers, as seen at first, are tightly flexed as in late rigidity; she proceeds to unclasp them with the other hand, and then they become extremely extended; the arm and forearm also become drawn into various positions. After going through a variety of exaggerated movements, the limb lapses into its original position. Occasionally the contortions begin of themselves. The condition seems to consist in involuntary movements, much slower than those of chorea, which frequently pass into a tonic spasm. She can walk, but the left foot is everted and dragged; the muscles of the left calf are rigid. Sometimes, she says, there are involuntary movements of the left foot and toes. She never remembers any loss of feeling on the left side. Patellar tendon-reactions—right present, left exaggerated; tendon-reactions at the wrists—right present, left cannot be obtained. Deaf from 4 years of age; absolutely with right ear: otorrhœa from left. Bromide of potassium did no good; the constant current was tried down the arm, but she thought it made her worse.

Case XII.

Sarah H., æt. 36 (Aug. 7, 1883), hemiplegic on the right side since 15 months of age. Subject to fits at night, coming on, as a rule, with the menses every three weeks—aura, a horrible feeling which she cannot explain; the actual convulsions are, she believes, *right-sided*. The right hand and fingers, as she first came into the room, were tightly flexed (giving the appearance, as in the last case, of late rigidity); but from time to time the

[1] Medico-Chirurgical Transactions, 1876, vol. lix.
[2] Sur l'Athetose. Paris, 1878, p. 13.

fingers unbend themselves and spread out, and the forearm moves involuntarily. These movements are slow and strong, as in the last case. The right leg is in a somewhat similar condition; the foot is slightly everted; the knee flexes itself suddenly. These movements may go on, she says, for half a day, and *chiefly when the fits are about her.* At other times she can use the hand for such purposes as washing. She speaks of it as if it were not part of herself; "sometimes it will do what I wish, sometimes not, till it makes me quite cross." Tendon-reactions, so far as can be judged at present, not excessive on the right side. Pot. bromid. ʒss. o.n.

August 21.—Has had two fits, but thinks herself much better. Before the fits the left (?) knee becomes drawn up and painful.

There appeared to be here some connection between the fits and the athetosis.[1] The same connection appears in the following case (though not post-hemiplegic) :—A man applied to me at the Metropolitan Free Hospital on account of involuntary movements of the right hand. As he sat with the hand on his knee, the fingers, then the wrist, then the forearm became slowly flexed. He had to keep that hand in his trouser's pocket to keep it still. The right leg and sometimes the left hand were less markedly affected. From 13 to 16 years of age he had had fits, aura—a humming in the head and *twitching of the right arm.* When he got rid of the fits, the athetosis began. Moreover, when I made passive extension of the affected fingers, he became pale and faint, and felt as if a fit were coming on. Fits had actually been produced by this means.

Post-hemiplegic epilepsy is the last subject of which I shall give examples. It may be worth while to consider first some of the relations which hemiplegia and convulsive fits may bear to one another when associated in the same subject.

(1.) They may be quite independent of each other. Each affection is sufficiently common *per se*, and there must therefore be some instances of chance association. Indeed it is difficult to prove in any given instance that the association is not due to mere coincidence. The points to which one would look, I think, are the age of the patient; is he at the time of his first convulsive attack past the age at which idiopathic epilepsy usually manifests itself? the family history; have his relations been epileptic or not? his health before his hemiplegic attack; had he suffered from petit-mal or other symptoms indicating an epileptic taint? the character of the fits; unilateral convulsions on the same side

[1] See Gowers on Epilepsy, &c., p. 131.

as the hemiplegia point strongly to a connection between the two, though the reverse by no means holds if the statements made above be admitted concerning the representation of both sides of the body in each half of the brain.

(2.) The same cause may have produced both paralysis and convulsion; a cause such as—

(*α.*) Injury to the head. Thus a boy, in whose previous and family history there was no epilepsy, fell down a ship's hold and hurt his head. He was unconscious two weeks, and on recovery had lost the use of his right side. Within two months fits commenced, epileptic in their general character, but evidently connected with the injury from the fact that the convulsions were limited to the paralysed side.

(*β.*) New growth or syphilitic disease, especially when they affect the cortex. The gradual onset and spread of the paralysis, the character of the fits (Jacksonian epilepsy), and the probable presence of optic neuritis are characteristic enough of this class of cases, if the case be seen at the outset.

(*γ.*) Other common causes may be thought of; thus hemiplegia and convulsive attacks may coexist in hysterical patients; or a patient suffering from granular kidneys may have uræmic fits, and be hemiplegic from cerebral hæmorrhage.

(3.) After the fits of idiopathic epilepsy paralysis may occur, hemiplegic in character if the convulsions have been unilateral (paralysis of exhaustion). This is usually easily distinguishable by its transient and incomplete character. In children, however, permanent hemiplegia is often found, the onset of which followed an attack of convulsions, while the convulsions are repeated at variable intervals like those of ordinary epilepsy. This class of cases forms a large proportion of those in which epilepsy and hemiplegia are associated. Perhaps we ought not to consider the hemiplegia as post-epileptic, but rather to suppose that (as in Class 2) a common lesion originated both hemiplegia and convulsions. At any rate, Dr. Gowers[1] gives reason for thinking that such a cause is to be found in vascular obstruction. The softening causes the paralysis; the collateral congestion tends to produce instability of the nerve cells, and so to lay the foundation of epilepsy.

(4.) There remain, however, certain cases which may be properly called post-hemiplegic epilepsy; the patient is not necessarily young, the hemiplegia, both in onset and in cause, has had the characters of (what we may call provisionally) an ordinary hemiplegia; there were no convulsions at first, but these, or other epileptic symptoms, appear later.

[1] On Epilepsy, &c., p. 126.

Case XIII.

Robert H. (Nov. 22, 1881). Left hemiplegia for two years; two attacks of it; in the first, unconscious for three days. Can now move the arm and fingers; drags the leg as he walks; slight, if any, rigidity. Involuntary movements, such as shaking, &c., of the foot, accompanying voluntary exertion of the paralysed limbs. Sight of right eye said to be impaired; nothing definitely wrong can be made out with ophthalmoscope. Heart sounds normal; no note of urine. Since the original hemiplegia he has had four fits of the following nature:—They occur principally when he is excited; the left (paralysed) arm begins to ache; the pain rises up to the left side of the chest; he has time to sit down, but then loses consciousness; then the left arm and leg are convulsed; with the right arm he strikes and fights violently.

Case XIV.

Arthur Wm. K., æt. 27 (July 11, 1882). Right hemiplegia and aphasia of nine months' duration. Onset sudden; he is said to have been delirious; afterwards was in bed two months. Before the attack had complained of his head; had had a skin eruption and sores on the genitals. Now can scarcely walk; still slight right facial palsy and aphasia; right arm rigid; tendon-reactions excessive, and ankle-clonus present *on both sides*. No history of rheumatism; no optic neuritis; no note of urine. Four months after the original hemiplegia fits began; in these he falls down, foams at the mouth, and is convulsed, usually all over, but sometimes (it would appear) only on the paralysed side. Sometimes has two fits in a day, sometimes none for a month.

He improved for a time under bromide and iodide of potassium, but in February 1883 was reported helpless and bedridden.

Case XV.

George M., æt. 48. Three years ago an attack of coma, lasting six hours or more, and followed by incomplete right hemiplegia and aphasia. Ten months after this an attack of somewhat dubious nature, but apparently consisting of unilateral convulsions. Since that, nine fits of convulsions, preceded by feelings of pressure in the head and followed by great prostration. Now the paralysis of the limbs has nearly recovered, and even the tendon-reactions are normal; but the right side of the face is still flattened and the speech imperfect. History of rheumatism; physical signs of aortic and mitral regurgitation.

The fits disappeared without special treatment.

In the remaining cases the convulsions were not unilateral, and in some there was petit-mal.

Case XVI.

Edward E., æt. 50, comedian (January 31, 1882). Ten months ago an attack of right hemiplegia, apparently incomplete from the first; no aphasia. Recovery began in five weeks; now some weakness of right hand is all that is left [right hand on dynamometer, 15 degrees; left, 55 degrees]. Was treated by Dr. Bastian during February and March 1882 with bromide and iodide of potassium, and got practically well.

September 25, 1883.—Comes again on account of fits. Two attacks, the first about eight months ago, early in the morning—loss of consciousness, foaming at mouth, convulsions; a feeling of giddiness remained after it: the second attack (similar to the first) was three weeks ago. In both the convulsions were violent, and he believes general. Still has giddiness and loss of nerve, which prevents him acting; sometimes pain in the forehead. Doubtful history of syphilis twenty years ago; optic discs and fundus of eyes normal; heart sounds normal. Urine, on first occasion, slightly albuminous. But this was repeatedly re-examined with a negative result; and I do not think, from his general condition, that the fits were uræmic. No fits have occurred since, though he has had no bromide.

Case XVII.

W. P. J., a man of 37, became an out-patient under me in May 1883. (He had been previously an in-patient under Dr. Ramskill.) Ten months before, while in India, he had an attack of right hemiplegia and aphasia: he was unconscious for three days. Previous health good, except for swelling of the joints, which he ascribed to rheumatism.

Recovery has been very incomplete; speech is very imperfect; the right hand is useless and its fingers flexed; right leg, as he walks, held stiffly and sometimes dragged. Much exaggeration of tendon-reaction, and ankle-clonus on paralysed side. Heart sounds normal; fundus of eyes normal; urine (examined later) normal. His relations say that during sleep there are constant jerky movements of the right hand. Since the beginning of the year he has had four fits; he loses consciousness, makes a noise in his throat, shakes all over. He complains (? before the fit) of a choking feeling in his throat and of pain across the forehead. He has also had frequent faints.

During the remainder of the year the aphasia improved slowly, the paralysis of the limbs little if at all. Some impairment of sensation noted (July 17) in right hand.

The fits recurred (generally in sleep) at intervals of a month while taking bromide, but became worse whenever he left it off.

Case XVIII.

George D., æt. 56 (March 16, 1881). Right hemiplegia six years ago; onset sudden, with loss of consciousness. The leg has now recovered; in the hand, power is still impaired; some rigidity of the fingers. Heart normal; no note of urine.

During the last eight months he has had four fits—loss of consciousness with convulsions. Eight weeks ago he fell and cut his scalp. He is still under treatment (July 1884), and has been taking principally bromide of potassium. The fits have ceased, but he is subject to severe attacks of giddiness; he has fallen and hurt himself in these attacks. He frequently sees before him "a planet and five satellites." Though a little odd in his manner, he seems perfectly sane.

Case XIX.

Charles H. had an attack of right hemiplegia when 31 years old. The onset was sudden; his health had been previously good. Two and a quarter years after this he had a fit; in the year succeeding this fit he had two others. No cardiac murmur; no albuminuria. Right arm rigid and practically useless; excess of tendon-reactions, with foot-clonus and finger-clonus on the paralysed side. He still attends (1884). The fits are held in check by bromide.

Case XX.

Emily S., æt. 40. At 10 years of age, after scarlet fever, had an attack of right hemiplegia; partial recovery; rigidity set in.

May 18, 1883.—Nine months ago she had a fit; she lost consciousness and fell, but was not convulsed. Six weeks afterwards a less severe attack; she did not lose consciousness, but had to sit down. She has had, however, what she calls "faints" or "giddy attacks" for two or three years. No albuminuria; heart's action excited, but no distinct murmur.

NOTE RESPECTING

TWO OLD SPECIMENS OF GOUTY ARTHRITIS IN THE HOSPITAL MUSEUM.

BY

DYCE DUCKWORTH, M.D.

In the edition of the Catalogue of the Hospital Museum published in 1831 (known as Mr. Stanley's Catalogue), the following descriptions are given of two diseased joints—Series II. 10 and 11 :—

"An os calcis and astragalus (probably from a gouty person), the articular surfaces of which are uniformly covered by thin deposit of white earthy matter, consisting principally of carbonate of lime. The cartilages themselves are thin."

The next specimen, No. 11, is a patella taken from the same body, whitened by a similar deposit. A note in the Catalogue records that these specimens were taken from a man between 40 and 50 years old; that nearly all the joints in the body were in a similar condition ; in some, a portion of the white substance was in a fluid state, and around some there was a similar condition in the adjacent tissues.

In the next edition of the Catalogue, 1846, the same account appears.

In the last edition, 1882, the account has been changed, and the earthy matter is affirmed to consist "principally of urate of soda." It appears that this alteration was determined upon solely from a naked-eye study of these specimens. As I shall presently show, it was well to give a different description of them.

These specimens have attracted a good deal of attention. Thus, Dr. Scudamore (afterwards Sir Charles Scudamore), in the third edition of his book on "Gout, Gravel, and Rheumatism,"

published in 1813, quotes on page 675, under the heading of "Sequelæ of Chronic Rheumatism," a full account of them, as communicated directly to him by Mr. Stanley. With the history of the case Mr. Stanley was unacquainted, and "therefore," Dr. Scudamore added, "I cannot offer the statement as an example of the consequences of rheumatism; but the narrative is too curious to be omitted."

This is Mr. Stanley's own account:—"The articular cartilages everywhere exhibited a perfectly white surface, such as would be produced by a very thin layer of plaster of Paris spread over them. In some of the joints a small quantity of the white substance was found in a fluid state within the capsules, which circumstance rendered it probable that the white matter had been in every joint originally deposited loosely within its cavity, and that, mixing with the synovia, it had become smeared over the cartilages, giving to them a white covering. Almost all the joints were thus affected, those of the extremities in the greatest degree. Even the articular cartilages belonging to the extreme joints of the fingers and toes were perfectly white. Around some of the joints of the toes the same kind of deposition had taken place into the cellular substance externally to the joint. By chemical analysis the white matter was shown to be carbonate of lime. Specimens of the joints are preserved in the Museum of the Hospital."

Again, the late Dr. Fuller, in his book on "Rheumatism, Rheumatic Gout, and Sciatica," published in 1852, of which later editions appeared, the last in 1860, alluded to these specimens. In chapter xi., on "Rheumatic Gout," at page 330, he discusses a class of cases which, he conceived, "differed materially from true gout, and presented all the characteristics of the hybrid disorder" he was describing. He then described the incrustation of cartilages by a white substance, which analysis had shown to consist of lithate of soda, mixed occasionally with lithates of potass, ammonia, and lime, as also with chloride of sodium, phosphate and carbonate of lime, "identical, or nearly identical, with the deposit which exists in gout."

He considered that "this was distinctly proved in some cases of Dr. Chambers, as also in a case of Mr. Stanley's (reported by Sir C. Scudamore in his work on 'Rheumatism')."

Dr. Fuller thought it was susceptible of easy proof that this peculiar deposit occurred only in the cases of rheumatic gout which approximated closely to genuine gout; but he would not admit the conclusion that such deposit was of itself sufficient to mark such cases as examples of true gout, because it took place usually in spare persons of temperate habits, whose symptoms in

many respects more nearly resembled rheumatism than gout, and who had been truly rheumatic in their younger days; also because it was associated with other changes in the joints which everybody would admit to be dependent on rheumatism. He further described two instances in which earthy deposits existed in some joints and were absent in others, although the latter were equally enlarged; and he formed the opinion, in consequence, that rheumatic gout, so called, was a hybrid disease, partly rheumatic, and partly gouty.

These specimens of Mr. Stanley's present to the naked eye the appearances commonly seen in gouty arthritis with uratic incrustation. Hardly a week elapses in our post-mortem theatre without demonstration of similar specimens.

Feeling sure that there was some error in the account of this specimen, a similar misgiving having occurred to the framers of the Catalogue of 1882, and led to the substitution of urate of soda for carbonate of lime, I requested our curator, Mr. D'Arcy Power, to unmount the specimen and subject it to fresh examination. This was done. Portions were removed for chemical analysis, and sections were made of the incrusted cartilage for microscopical examination. Mr. Power and I separately investigated the matter. The microscopical appearances were in every respect identical with those of ordinary uratic infiltration of cartilage. Micro-chemical tests were also identical.

Without any difficulty a distinct murexide reaction of uric acid was obtained from a fragment of the deposit. In the chemical laboratory Dr. Lepraik kindly made a more thorough examination. He found that uric acid and soda salts formed the chief part of the deposit, but there was an appreciable quantity of calcium. The amount of carbonic acid was so small as to be unworthy of note.

Thus, the chemical and microscopical, no less than the naked-eye, appearances confirm the opinion that these specimens were taken from the body of a man suffering from gouty arthritis. It is not to be supposed that sixty-five years' immersion in spirit involved any material chemical change. Certainly, it in no way altered the minute microscopical appearances.

Perplexity in the diagnosis of cases presenting uratic deposit, together with signs of arthritis commonly supposed to be rheumatic in nature, is now less common than formerly, but it is not yet a thing of the past. The difficulty arises, in my opinion, from want of appreciation of the fact that gouty disease is capable of doing much more damage to a joint than that caused by mere incrustation with uratic salts. It has been taught that uratic deposit is the sole sign of gout in a part. This is an error.

Gout can, and does, get up irritative and hypertrophic forms of arthritis, irrespective of, as well as in association with, uratic deposition. When this fact is recognised we have advanced one step towards the disuse of that misleading term "rheumatic gout."

Uratic deposit is a certain but not the sole sign of gout. Rheumatic arthritis may in some cases be associated with gout, the one sometimes preceding the other; but clinical study, no less than dead-house research, teaches that many of the so-called "rheumatic" changes in gouty disease are nothing else than the results of a purely gouty arthritis.

ON A

CASE OF ACUTE PEMPHIGUS IN AN ADULT,

FATAL ON THE NINTH DAY.

BY

DYCE DUCKWORTH, M.D.

For several reasons the following case seems worthy of record. Acute pemphigus is commonly regarded as a rare disease. Copland in his "Dictionary of Medicine" states this in so many words. Sir Thomas Watson describes it as "a very rare form." Dr. Duhring, of Philadelphia, remarks that it is "exceedingly rare, except in children." Dr. Bristowe observes that pemphigus is "sometimes acute, the entire duration being comprised within a period of three or four weeks." To Niemeyer, the debate as to whether there was an acute or chronic form seemed a mere dispute about words; and he thought that if the eruption did not last more than two or three weeks, it might certainly be called acute.

Hebra and others have denied the existence of acute pemphigus.

The late Dr. Sparks, in his article on pemphigus in Quain's "Dictionary of Medicine," thus sums up the matter:—"The existence of such cases, which was at one time doubted, is now certain." He describes its duration as from three to six weeks, and the disease as generally ending in complete recovery. Its course and symptoms much resemble the acute specific diseases. He mentions, on the authority of Senftleben, that albumen may appear in the urine; also, that fatal cases have occurred.

The particulars of my case are as follow:—

B. W. D., æt. 54, a railway guard, was admitted into John Ward on May 13, 1884, suffering from a bullous eruption.

His history, in brief, was that he had been a robust man all his life. In January 1881 his duty compelled him to be in the snow for many hours, and he thought he had never been thoroughly well since. He caught cold in December 1883, and has had cough ever since, feeling unable for duty for the last three months. States that he had "inflammation of the kidneys" during that time. Went to work six weeks ago, but felt very weak, and suffered from shortness of breath.

On May 8 an eruption appeared on the wrists, first as pimples, subsequently turning to blisters.

This eruption gradually spread all over the body, and caused a good deal of pain.

He was married, and had four healthy children. No history and no signs of syphilis, and his wife has had no miscarriages.

He was a dark-haired man with pallid complexion, rather sparely built.

May 13, 6th day.—The forehead was covered with a scabbed eruption. The hands and feet were the sites of large bullæ, some of which had broken and left exposed raw surfaces, in places two inches long; and similar bullæ were found on the arms, legs, and abdomen.

The tongue was clean and raw-looking, inclined to be dry. Temperature in morning 100°, rising in evening to 101.4°.

Nothing worthy of note was met with in the chest, either in respect of the heart or lungs.

The urine contained a large quantity of albumen.

Broth-diet with fish and extra milk was ordered.

No medicine was prescribed, and as the discharge from the bullæ was offensive, a weak carbolic acid lotion was ordered to be applied over them.

May 14, 7th day.—After midnight the patient became delirious somewhat suddenly, and went into bed with another patient, refusing to return. He was then moved to Casualty Ward, and had a dose of hydrate of chloral and bromide of potassium, and some brandy.

Slept well after 8 A.M. Unable to pass any urine. Catheter employed. Took liquid food well.

The eruption continued to increase in amount all over the body. The tongue became dry and brown. Temperature rose to 101.4° in evening.

Five ounces of brandy and half a pint of essence of beef were ordered. The body was smeared with carbolised zinc-ointment in the proportion of one drachm of carbolic acid to three ounces of benzoated zinc-ointment.

May 15, 8th day.—Was delirious last night, and had subsultus tendinum. Much feebler to-day. Increase of eruption, especially in the axillæ and flanks, the bullæ being in many places circular and ringed, rising on deeply red-coloured bases. Tongue dry and sordid. Ordered a dose of house-physic, and five minims of liquor arsenicalis in the soda and calumba draught of the hospital every six hours.

Morning temperature 100.8°, falling towards evening to 100°.

May 16, 9th day.—Had a good night; looked no worse. Bowels well open. Taking nourishment well. A measly-like rash appeared this morning for the first time all over the chest and abdomen. The backs of the hands and wrists are quite raw, and the skin of the fingers is in shreds. Temperature has risen to 102°. It is noticeable that the new bullous patches have the appearance of "iris," perfect circles of coalescing vesicles surrounding reddened patches of skin.

Towards evening prostration increased; the temperature continued to rise to 103.8°, when death supervened.

Dr. Legg and Mr. Baker kindly saw this patient with me on the last day, and we discussed his case.

Post-mortem examination revealed nothing of any importance. The body was very putrid and swollen.

It appeared that at least one-sixth of the whole surface was involved in bullous eruption, and implication of such an extent of the integument in cases of burning is commonly fatal.

There was hardly any doubt about the diagnosis in this untoward case. The only alternative was a bullous form of erythema; and to mention this seems little better than quibbling with words.

Towards the end of the disease the bullæ certainly presented the characters of iris, but the vesiculation was well marked. This form of the disease has been described as pemphigus iris, and Sir Erasmus Wilson regarded it as a link between erythema and pemphigus.[1] Universal herpes iris is, however, very rare. Hebra declared that he had met with it. He further described cases in which bullæ were formed instead of rings of vesicles, and believed that such instances were sometimes mistaken for cases of acute pemphigus.[2]

It is almost certain that this patient had suffered for some time from chronic tubal nephritis, and was thus a bad subject for an acute bullous disease.

A case of acute pemphigus is recorded by Dr. Southey.[3] It

[1] Lectures on Dermatology, p. 126. London, 1873.
[2] Diseases of the Skin. New Syd. Soc. Transl., vol. i. p. 380.
[3] Clinical Society's Trans., vol. viii. p. 179, 1875.

occurred in the hospital ten years ago, in the person of a young woman, æt. 19 years. She had a very severe illness, but recovered completely and left the hospital in six weeks. There was no albuminuria. No return of the disease took place for some months afterwards, when the patient ceased to report herself.

ON THE TREATMENT

OF

CANCEROUS STRICTURE OF THE ŒSOPHAGUS

BY MEANS OF

RAILWAY CATHETERS AND SOFT INDIA-RUBBER TUBES.

(ILLUSTRATED BY CASES.)

BY

JAMES BERRY.

The treatment of cancer of the œsophagus by dilatation with catheters or bougies has within the last few years attracted much attention and been employed with considerable success. More especially has this been the case since the appearance in 1881 of Krishaber's valuable paper,[1] in which he strongly advocated the constant retention of a catheter in the œsophagus. He showed that its presence had no prejudicial effect at the seat of disease, as had previously been supposed; while, moreover, he suggested the possibility of so far effecting the dilatation of the stricture as ultimately to permit the introduction of a soft flexible india-rubber tube.

His views have received warm support from many surgeons in this country, notably from Mr. Durham and Mr. Croft. The latter, in a paper in St. Thos. Hosp. Reports, vol. xii., has given details of two cases under his own care which were treated by this method, and has pointed out forcibly its superiority in most cases to that of gastrostomy. He appears to think, however, that, owing to the difficulty and danger of their introduction, catheters smaller than No. 5 should not be employed; and, moreover, on account of their liability to corrosion, he deems it necessary that the catheter be changed every fourth or fifth day.

[1] Trans. Intern. Med. Congress, 1881.

The object of this paper is to suggest some improvements in the method of œsophageal catheterism, which at once increase its range of applicability and obviate some of the disadvantages which belong to it as commonly employed.

In the first place, the use of an ordinary gum-elastic catheter or bougie is open to the somewhat serious objection that it frequently gives the patient much pain and inconvenience on account of the stiffness of the instrument employed. The point is liable to press against the œsophagus during the patient's movements, and to lead to such an amount of discomfort as frequently to necessitate the discontinuance of the method and the substitution of the formidable operation of gastrostomy.

Secondly, a time is likely to come, sooner or later, when the catheter cannot be passed at all.

Lastly, there is the danger that the point of the catheter may in its passage perforate the œsophageal wall, especially when it has become thinned or softened by the disease. An illustration of the reality of this danger has lately been afforded by a case that has occurred at this hospital, where the catheter having perforated the œsophagus just above the stricture, set up suppuration in the posterior mediastinum, which proved fatal in a few days.[1]

The second and third of these dangers are, it is true, diminished the longer the catheter is retained in the œsophagus without being changed; but occasional removals must be necessary, whether for the purpose of cleaning it, or, if the stricture has not yet been sufficiently dilated, for the introduction of a larger instrument; and whenever the catheter is taken out, there is always the risk either that it may be found impossible to reintroduce it, or that harm may occur in so doing.

The method by which I propose to avoid these risks consists in the employment of tubes with terminal openings (*railway catheters*), which are both introduced and withdrawn by sliding them over a catgut bougie previously introduced. Before the tube is withdrawn the catgut is first passed through it into the stomach, and over this the tube can again be readily replaced, exactly as is done in the treatment of urethral stricture by railway catheters. By this means the stricture is never for a moment without something in it, either a tube or a catgut guide, and the tube can be changed without any fear of losing the way through the stricture.[2]

[1] The œsophagus may be seen in St. Bartholomew's Hospital Museum, No. 1847A.

[2] I find that Mr. Erichsen, in his "Science and Art of Surgery," states that he

There still remains the great objection above alluded to, namely, the pain and discomfort so often produced by a stiff catheter. Now, if a perfectly soft flexible tube can be employed instead of a catheter, then it is found that this trouble is practically obviated. But for all, except the slighter degrees of stricture, a soft tube is generally considered to be inapplicable on account of the difficulty or impossibility of introducing it; for if passed down the œsophagus in the ordinary way, it will, unless the stricture happens to be originally only a slight one, or already widely dilated by previous treatment, curl up on reaching the seat of obstruction, instead of passing through it.

If, however, it is passed over a catgut bougie, I have found that it can be employed at a very much earlier period of the treatment with manifest advantage.

At first sight it might appear that the great length and flexibility of the soft tube would render its introduction unmanageable on account of the distance from the mouth at which the manipulations would have to be conducted. This difficulty may, however, be avoided by the adoption of the following method, which I have always found easy and successful.

The tube having been thoroughly oiled both *inside* and outside, the catgut, which need not project for more than 2 or 3 inches beyond the lips, should be held between the forefinger and thumb of the left hand, close to or just within the lips, and the tube held in the right hand, passed over the projecting catgut, and pushed on until the end is arrested at the point at which the catgut is held; it is still pushed on until the first 2 or 3 inches have been doubled up, and compressed into a good deal less than half that distance. The finger and thumb of the right hand now grasp both catgut and tube, and, the pressure of the other hand being relaxed, the compressed end of the tube is free to straighten itself out by its own elasticity, and does so by travelling a little way down the mouth. The same process is then repeated, the left finger and thumb now grasping both tube and catgut close to the lips as before, while an additional 2 or 3 inches of tubing is again pushed up against them, and fixed by pinching both tube and catgut; once more the pressure of the left hand is relaxed, and another portion of the tube is allowed to straighten itself out by making its way down the

has found that the introduction of a catheter in a difficult case may sometimes be facilitated by the employment of a tubular instrument, which will slip over a long small-sized bougie.

Mr. Erichsen has been kind enough to inform me that the catheters were only passed occasionally, and that he has never adopted the plan of continuous retention.

mouth and throat; this process is repeated until the whole length of the tube has passed over the catgut, which will then appear from out of the end of the tube without itself having been moved. The manner of progression of the tube is very similar to that of a caterpillar, which advances by alternately hunching its back and then straightening it. By this means no more force can be used than is presented by the elasticity of the tube itself.

If the tube stick at the stricture, it is a good plan to grasp both tube and catgut, push them on together for a short distance, and then withdraw the catgut into its original position again. To facilitate also its entrance into the stricture it is well that the end of the tube should be cut obliquely. This process of introducing the tube gives the patient hardly any discomfort and lasts only a very few minutes; it is, moreover, wholly free from any risk of perforation.

The following are three cases in which the methods I have advocated above were employed more or less completely. For the permission to publish them I have to thank Mr. Thomas Smith, Dr. Duckworth, and Dr. Gee, in whose wards respectively the patients were; to all of whom, and also to Mr. Willett, in whose hands the surgical management of Case III. had been placed by Dr. Gee, I am much indebted for their kindness in affording me many facilities for putting my ideas into practice.

Case I.

Eliza A——, aged 53, housewife, admitted into President Ward, June 5, 1883. Eight or nine months ago she first noticed pain in the throat and difficulty in swallowing; both have been gradually increasing ever since. For several weeks she has taken very little food of any kind, and has lost much flesh. She has never brought up any blood.

At present she is quite unable to swallow solid food, and liquids can be taken only with much pain and difficulty. Her pain is all referred to the region of the cricoid cartilage. Nothing abnormal can be felt in the neck externally, but upon examination with the finger in the throat, a small hard, rough ring of cancer can be felt opposite the cricoid cartilage, involving the beginning of the œsophagus and the back of the larynx; by means of the laryngoscope the growth can be seen involving part of the upper opening of the larynx; the interior of the larynx is free from disease. She is much emaciated and enfeebled; she is also suffering from slight bronchitis.

On June 6th, a No. 1 gum-elastic catheter was passed with considerable difficulty, and was tied in; on the following day another No. 1 catheter of the same kind was passed by the side of the first, and both tied in together.

On June 8th, one of these was replaced by a No. 3 *railway* catheter, the other No. 1 being left in.

On June 9th, the smaller catheter was withdrawn, and the larger one was replaced by a No. 8 railway catheter, a catgut guide having previously been introduced in the usual way.

On June 10th, this was again exchanged in a similar manner for a No. 12 railway catheter, which the patient wore for several days; this was then replaced by a piece of *soft red rubber tubing* a quarter of an inch in diameter, which was passed over a catgut guide just as the railway catheters had been.

This was subsequently replaced by a still larger piece of tubing ($\frac{5}{16}$th inch diameter). At first she wore this continuously, like the previous ones, but afterwards it was found to be sufficient to pass the tube twice a day only, the stricture having been so fully dilated that the guide could be passed without the least trouble, and the tube readily slipped over it. Occasionally the tube could be passed by itself without any guide.

Since June 6th, the patient had been fed through the tubes, or by the side of them, upon milk, beef-tea, eggs, and brandy, and had improved so much in her general condition that on June 19th she was discharged, having previously learnt to pass the tube for herself.

She went down into the country, and I have, unfortunately, been unable to learn anything of her subsequent history.

Case II.

Samuel B——, aged 46, coachman, admitted into John Ward, January 14, 1884. He had always had good health until about six weeks ago, when he choked in attempting to swallow a piece of meat. Since then he has not been able to swallow anything solid; he has been able to take plenty of liquid food, but he has to drink it very slowly, and very little at a time. He has never had any pain in the throat except a very slight feeling of soreness, referred to the region of the larynx; and, somewhat increased by swallowing, this soreness has existed for about three weeks. He has had some pain in the lower part of the back for about the same time; he has had a slight cough for about a fortnight, but has had no other trouble with his breathing; he has never brought up any blood with the rejected food; he has lost much flesh during the last five weeks; there are no signs of

aneurysm. He is much wasted, but seems otherwise in good general health. The interior of the larynx is seen to be natural. A catheter introduced into the throat stops at a point 7½ inches from the teeth; there is much mucous discharge, but no blood. Chest quite healthy.

January 16th.—A No. 1 ordinary gum-elastic catheter was passed after much trouble, and tied in; a few hours afterwards the first catheter was sufficiently loose to permit the passage of a No. 2 catheter by the side of the first; both were then tied in together.

17th.—Catheters replaced by a No. 6.

19th.—No. 8 passed; the patient is able to take plenty of liquid food, partly through the catheter, and partly by the side of it. He complains of the stiffness of the tube being rather irksome to him.

20th.—No. 8 catheter was removed, and could not be replaced. No. 6 was passed with a little difficulty. The patient was seen to-day by the surgeon of the ward, and it was decided that the operation of gastrostomy should be performed shortly.

21st.—No. 6 was removed on account of the discomfort produced by it; it was left out all night.

22d.—No. 4 passed, and tied in. The patient has gained 3 lbs. in weight since admission.

23d.—No. 4 *railway* catheter passed and tied in.

24th.—No. 6 catheter passed without any difficulty.

25th.—No. 8 passed.

27th.—No. 10 passed. The last four catheters were passed over a catgut guide in the usual way. Dr. Duckworth has consented to postpone the operation of gastrostomy, as the patient is now taking plenty of nourishment, and is fairly comfortable.

29th.—Catheter replaced by a piece of *red india-rubber drainage tubing*, ¼ inch in diameter externally and 16 inches long.

30th.—Did not sleep well; complained of a good deal of pain across the loins; much tenderness over lumbar spine.

31st.—A larger india-rubber tube ($\frac{5}{16}$th inch diameter) passed easily.

February 1st.—More pain in loins; hitherto the patient has been able to sit up to take his food; he has taken it usually by the side of the tube, and not through it. He is now unable to sit up on account of the pain in the loins, and is fed through the tube alone; he takes plenty of liquid food; he does not complain of the tube; he vomited some food through the tube, the cork being out.

4th.—Tube replaced by one $\frac{3}{8}$th inch in diameter.

5th.—Some swelling in the neck in the region of the larynx.

6th.—Tube, which had not been tied in, slipped out this morning; after much trouble, it was replaced by one $\frac{5}{16}$th inch in diameter; a small gum-elastic catheter was first passed, then the soft tube was introduced over this and tied in, the catheter being removed.

9th.—Tube easily replaced, over catgut guide as usual, by the larger tube ($\frac{3}{8}$th inch).

16th.—Tube slipped out during an attack of coughing; a large catgut guide was at once passed without much trouble, and a $\frac{5}{16}$th-inch tube introduced.

20th.—There is a well-marked angular curve in the spine, the last dorsal vertebra being prominent. Patient lies constantly on his back, being quite comfortable in that position, but feeling great pain in the back when moved.

21st.—The edge of the liver can be felt an inch below its natural situation; no definite tumour can be felt in it; slight jaundice present.

23d.—Tube changed; same size easily introduced.

27th.—Some diarrhœa during last three days.

March 1st.—Jaundice increasing; liver edge $2\frac{1}{2}$ inches below natural situation.

4th.—Slight diarrhœa still.

6th.—Tube changed without any trouble or discomfort to the patient. The tube is in perfectly good condition, although it has been in the œsophagus continuously since February 23.

7th.—Tube taken out by patient in a fit of temper; introduced again at once over catgut without any trouble; fastened in more securely; the growths in the liver and spine are increasing in size and the patient is much weaker. He wanders in his mind at times.

Tube pulled out again to-day by patient under the delusion that it is his tobacco-pipe. Although it was fastened securely to his moustache, he succeeded in taking it out by hooking his finger round it and withdrawing it doubled up. It was re-introduced in the usual manner, and about 6 inches of gum-elastic catheter with stilette was inserted into the tube to stiffen the upper part of it, and prevent patient from taking it out by doubling it up.

12th.—Cough rather troublesome to-day.

14th.—Tube had been insecurely fastened, and patient pulled it out again this evening. Three hours later it was re-introduced with much trouble; after twenty minutes' trial a catgut was passed, and the tube then passed over it with ease.

21st.—Much worse; abdomen distended; some fluid in peri-

toneal cavity; respiration 40, shallow; probably has some pleural effusion.

22d.—Died quietly at 5.25 A.M., still wearing the tube in the œsophagus.

Post-mortem.—Immediately below the cricoid cartilage the œsophageal wall consisted of a complete ring of cancer, extending downward 1½ inch; the inner surface fitted closely to the tube against which it had lain; its circumference internally at the narrowest spot was 1⅛th inch; above and below the growth the circumference was respectively 2 inches and 1⅝th inch. A few scattered nodules of new growth lay in the wall of the œsophagus above and below the stricture.

At one spot the growth had been much thinned by the constant pressure of the tube, but no perforation of the œsophageal wall had occurred; there were no signs of inflammation or suppuration outside the œsophagus. The larynx and lungs were natural; the thyroid gland was extensively infiltrated with new growth; the liver was studded with numerous nodules of cancer, varying in size from that of a walnut downwards. Some effusion into peritoneum and right pleura. The upper lumbar and twelfth dorsal vertebræ were so extensively infiltrated that a complete fracture had taken place (probably after death).[1]

Appended is a chart of the average daily amount of food taken by the patient from January 20th until the time of his death.

	Beef-Tea and Essence.	Milk.	Tea or Cocoa.	Eggs Beaten up.	
1st week, each day	2 pints	2 pints	2 pints	4	Ale, ½ pint
2nd week „	2 pints	2 pints	1½ pint	4	„ ½ pint
3rd week „	2 pints	4 pints	...	4	Brandy, 3 oz.
4th week „	2½ pints	4 pints	...	4	...
5th week „	2¼ pints	3½ pints	...	4	...
6th week „	¾ pint	3¾ pints	...	4	Ale, 5 oz.
7th week „	1½ oz.	4 pints	...	5	Wine, 1½ oz.
8th week „	½ pint	3 pints	...	6	Wine, 1 oz.
9th week „	¼ pint	2 pints	...	5	Wine, ½ oz.

I have thought it worth while to report the above case at some length, as it contains an exact account of the nature and size of every tube used, of every occasion on which it was changed, and of the length of time that each remained in the œsophagus.

[1] The œsophagus of this patient and a portion of the tube last used are at present in the Hospital Museum (No. 1046A).

Case III.

William R——, aged 45, labourer, admitted into Luke Ward, April 1, 1884.

Was quite well until three months ago, when he first noticed pain and difficulty in swallowing; both have been increasing steadily ever since. For about six weeks he has been quite unable to take any solid food; until four days ago he could swallow fluids without much trouble, but since then he has not been able to swallow anything whatever.

He is now much emaciated, and looks very ill; his pulse is feeble; some bronchitis in both lungs; no dulness; in the neck there is one small hard gland to the right of the trachea; nothing else abnormal can be felt. He is quite unable to swallow even the smallest quantity of fluid; any attempt to do so brings on at once a violent attack of coughing; he has probably some abnormal communication between the œsophagus and trachea; he expectorates much blood-stained frothy mucus; the larynx is seen to be free from disease. He complains greatly of hunger. An œsophageal bougie passed down the throat is arrested at a point nine inches from the teeth.

He is to be fed by the rectum with milk, beef-tea, and liquor pancreaticus.

4th.—He is weaker; much cough and expectoration. He was seen by Mr. Willett, who advised that gastrostomy should, as a last resource, be performed without delay.

5th.—Everything was ready for gastrostomy, but before proceeding to operate, Mr. Willett consented to attempt catheterisation of the stricture by means of railway catheters. A stout catgut bougie was first tried, and then a small one, and after a trial of about twenty minutes, during which the patient coughed a great deal, the latter was passed into the stomach. A No. 5 *railway catheter* was then, with very little trouble, passed through the stricture over this catgut guide and tied in; no anæsthetic was given; the patient was then sent back to the ward, and was fed with 7 oz. of beef-tea, 2 oz. of milk, and 1 oz. of wine, poured into the stomach through the catheter.

6th.—Expectoration more fœtid; much blood-stained mucus; has taken beef-tea 9 oz., milk 6 oz., wine 1 oz. No vomiting.

7th.—Catheter replaced by No. 9 *soft rubber catheter*, with terminal openings, passed over a catgut guide; tied in as before.

8th.—Patient more comfortable; still has as much cough and expectoration as ever, and is very weak. Continues to be fed through the tube.

9th.—Tube replaced without trouble by a soft india-rubber tube ($\frac{1}{4}$ inch diameter), having much thinner walls than the soft

catheter last used, and consequently a larger bore; the changing of the tube did not cause the patient any pain or annoyance; he says that the soft tube is much more comfortable than the stiff catheter used at first.

10th.—Considerably worse; cachectic appearance more marked; cheeks sunken; pulse 112, very feeble; cough continues; complains of pain in epigastrium.

11th.—Respiration 40, shallow; a few râles can be heard in front of the chest. Expectoration more profuse and extremely fœtid. He became gradually weaker, and died quietly in the evening, still wearing the œsophageal tube.

Until the day of his death he had taken a daily average of beef-tea 9 oz., milk 28 oz., one egg, and 3 oz. of wine.

Post-mortem.—Body much emaciated. Within the œsophagus, extending from a little less than half an inch below the cricoid cartilage downwards for a distance of three inches, was one epitheliomatous ulcer, completely encircling the œsophagus; its surface was rough and tuberculated; the upper edge was sharply defined, but there were several small deposits of new growth in the œsophageal wall above the ulcer; its lower margin was irregular and ill defined. The œsophagus was somewhat thickened by the growth, but in front there was a free communication between it and the trachea through an oval opening $\frac{7}{8}$ inch vertically and $\frac{1}{2}$ inch transversely; this hole was in reality double, being bridged across from side to side by a narrow strip of remaining tissue; the edges of the aperture were thick, rough, and everted. The internal circumference of the œsophagus, just below the level of the cricoid, measured 2 inches; opposite the middle of the ulcer it was 3 inches, and at its lower border, the narrowest part, $1\frac{3}{4}$ inch. There were no secondary growths in the liver, lungs, or any other organs; both lungs were very œdematous, and at the base of each were two or three semi-gangrenous cavities, varying in size from an inch in diameter downwards. Microscopic examination proved the ulcer to be epitheliomatous.[1]

It will be seen that in the first two cases there was great constriction of the œsophagus; it was only after much trouble that the smallest catheter could be introduced. In the third case, although the amount of constriction was not so great, yet, on account of the fistulous opening into the trachea, the difficulty in taking food was quite as great. All three patients were slowly starving; in each case plenty of nourishment was introduced within a very short space of time into the stomach—much sooner,

[1] St. Bartholomew's Hospital Museum, No. 1884A.

in fact, than would have been possible had the modern two-stage operation of gastrostomy been performed.

The presence of the soft tubes caused little or no discomfort, and the patients were able to live in comparative ease until death was caused, in one case by secondary deposits of cancer, in the other by lung disease, started probably by the irritation of food which had passed down the trachea. In none of the cases was there the slightest evidence that the presence of the tube had caused any inflammation or other irritation.

All three cases show how readily and rapidly a cancerous stricture of the œsophagus may be dilated, far more so than is usually the case with an urethral stricture. Post-mortem examinations show that even in cases where the stricture has been wholly untreated for many weeks or months before the patient's death (*e.g.*, cases of successful gastrostomy), a comparatively large channel through the diseased œsophagus still frequently remains.

The difficulty of passing any instrument through an œsophageal stricture of cancerous nature depends much more upon the roughness of its inner surface, the presence of little cracks and pouches, &c., than upon the amount of actual constriction. Now this difficulty is overcome just as efficaciously by a very small instrument as by a large one. Whatever the size of the instrument that is first introduced, we may be sure of being able to replace it in a very short time, as above described, by one large enough at any rate to allow of the introduction of food.

It may here be pointed out that fluid nourishment will sometimes make its way into the stomach by the side of a catheter or bougie when it will not do so without this help. This appears to have occurred in one of Mr. Croft's cases, and it was also noticed in two of mine.

It seems to me, therefore, that the use of catheterism should not be restricted to cases in which there is only a moderate degree of obstruction, but that it is also applicable to those in which only the very smallest instruments can be passed. Such cases, if not treated by catheterism, are condemned either to starvation or to gastrostomy; and these very bad cases are frequently, on account of the extremely exhausted condition of the patient, just the ones in which gastrostomy is very likely to have a rapidly fatal result.

Some valuable statistics of the results of gastrostomy, when performed for cancer, have lately been published by Dr. Gross.[1] Of 158 cases which he was able to collect, 42 died as the direct or indirect result of the operation, and 67 from other causes, at periods varying from nine hours to one month, so that only 49

[1] American Practitioner, May 1884.

survived longer than one month. It is true that great improvements in the operation have been introduced since many of the above cases occurred; and although the mortality of the later cases may be less than that stated above, yet when we consider how great a tendency there is among surgeons to publish only successful cases, and how many that are unsuccessful are never heard of again, it must be admitted, I think, that the mortality is probably excessively heavy.

With regard to Case III., all that can be claimed for the treatment is that life was prolonged a few days and the patient's sufferings alleviated. Had gastrostomy been performed, there is little doubt that he would have died within a few hours. The tube was useful inasmuch as it carried nourishment safely past the fistulous opening into the stomach. The communication between the trachea and the œsophagus took place on the fourth day before admission; up to that date the patient had been able to swallow fluids with comparative ease; afterwards, the smallest amount of liquid produced at once most violent coughing, because it simply ran straight into the trachea.

In such a case as the above any other method of catheterism would have been most unsuitable; any catheter not passed over a guide would have made its way into the trachea, as actually happened several times during the first attempts to introduce the catgut.

A consideration of the above cases leads me to offer the following suggestions for the treatment of a case of cancerous stricture of the œsophagus.

If the patient be seen at an early stage of the disease, when the amount of constriction is not great and the difficulty in swallowing is slight, the periodical passage of a good-sized catheter or œsophageal bougie will be sufficient, and the patient may be taught to do this for himself. If there be much difficulty in swallowing, then it will be best for the patient to take his food through the catheter, and not to attempt to swallow it in the ordinary way, as this would only tend to increase the sacculation of the œsophagus above the seat of stricture. But perhaps, when the patient first applies for treatment, there may exist a moderately tight stricture, barely admitting a medium-sized catheter, or there may be much difficulty in the passing of it. In such a case, the best treatment will be that of continuous dilatation, at first by ordinary railway catheters of small size, then by larger soft tubes having terminal openings, and passed always over a catgut guide. As soon as a large tube can readily be introduced, the periodical passing of it may perhaps again be resorted to, as in Case I.

If, however, when the patient first comes under the surgeon's notice, the degree of obstruction is so great as to render the passage of any small catheter exceedingly difficult—and it often happens that patients do not apply for treatment until they have reached this miserable condition—then recourse should be had to a catgut bougie. Now, I think that however bad the stricture may be, it must be very rarely indeed that a catgut bougie cannot be passed, if only sufficient care and trouble be taken in the attempt. In selecting a bougie for this purpose, care must be taken that it be long enough (at least twice the length of an ordinary catheter), that it be sufficiently stiff, and that it be straight, or only slightly curved; a bougie which is soft, or which has lost its shape from having been rolled or doubled up, cannot easily be passed.

It is probably best to try at first with a medium-sized catgut, since the most slender are not so easy to introduce, and the larger ones will not allow a small catheter to pass over them. In attempting to introduce the bougie the *utmost gentleness* should of course be used on account of the danger of perforation which must necessarily exist to a slight extent at this first introduction. If much coughing and choking be induced, it is much best to abstain from pushing the bougie farther, and to hold it perfectly still for a minute or two, when the spasm will speedily pass off. Any attempts to push the instrument on during the coughing or struggling of the patient can do no good, and may be dangerous.

When any difficulty occurs in getting the point of the bougie to pass in the desired direction, I have sometimes succeeded in overcoming it by making the patient attempt to swallow a few drops of water, and by gently pushing the bougie onwards just as the water is being swallowed.[1]

If there is much dilatation of the œsophagus above the stricture, the bougie is less likely to hit the entrance to it, but may slip into the pouch at the side. In a case of this kind, I think it is a good plan, after the bougie has been passed nearly down to the stricture, to direct the patient to swallow several times, and to push the bougie onwards a very short distance between each act of swallowing; this helps to keep the point in the right path. The advantage that may be gained by slightly bending the end of the catgut is too well known to need further allusion. I may here say that I have never found it necessary to employ anæsthetics. Although doubtless sometimes useful, their employment would of course do away with any help that the

[1] This suggestion was made to me when house-surgeon by Mr. Lovell Drage, at that time one of the surgical dressers.

patient is himself able to give. All the bougies, catheters, and tubes used in the above cases were passed by the mouth, and not by the nose.

As soon as the catgut bougie has been passed into the stomach it is advisable to pass over it at once an ordinary gum-elastic railway catheter. I have found that a railway catheter of comparatively large size can often be passed with ease in this way, while an ordinary catheter considerably smaller can be introduced only with great difficulty. If possible, the catgut should not be left by itself in the stricture, since in a very few hours it becomes so soft that the subsequent introduction of a catheter over it becomes by no means easy.

Having introduced the catheter, the catgut may now be withdrawn and the former tied in. This may be most securely effected by tying it to the patient's moustache or whiskers, if present, or, if the face be a smooth one, to the teeth, the ears, round the head, or by strapping to the cheeks. The first method is preferable, whenever possible. It is desirable that the end of the catheter should project as little as possible from the mouth, since, if it has much room to play about from side to side, the catheter is more likely to slip out. It is best to secure it on both sides of the mouth, so as to limit this movement as much as possible.

At the end of a few hours or a day or two—in fact, as soon as the catheter can be made to move readily up and down in the stricture—the catgut may once more be introduced and the catheter changed. Even at this early stage the stricture may be sufficiently dilated to admit of the introduction of a soft india-rubber tube by the method already described.

It will be noticed that in all the above cases the seat of obstruction was comparatively high up in the œsophagus. To what extent the difficulties of this method are, if at all, increased by the obstruction being nearer to the stomach, I know not. I have not yet met with a case of cancer at the cardiac end of the œsophagus in which I could put this method to the test.

If I have succeeded in showing that œsophageal catheterism may be employed more often and more safely than is at present the case, and that the application of the above-mentioned principles will help to limit the number of cases which are to be condemned to gastrostomy, then my object in writing this paper will have been achieved.

THE RESULTS

IN

A HUNDRED CASES OF OSTEOTOMY,

WITH REMARKS.

BY

ALFRED WILLETT.

I purpose in this article to place on record my experience of this operation in this hospital. The cases I have operated on readily admit of arrangement in tables. Some of the more striking and important cases I shall mention in some detail, and *en passant* comment on debateable points in osteotomy. The first two tables comprise the operations for genu valgum and varum; next will follow those on curved tibiæ; succeeding tables will include deformities resulting from injury or disease treated by this operation, such as contracted hip-joints with bony anchylosis, &c: 101 operations on 64 individuals are thus grouped.

For genu valgum and varum, M'Ewen's or the supra-condyloid operation, and Reeve's modification of Ogston's or the inter-condyloid method, have been performed; the former by far the oftener, inasmuch as of 82 osteotomies upon 49 patients, no less than 79 of these operations upon 47 patients were performed by M'Ewen's method, leaving only three operations upon two patients as having been submitted to Ogston's operation.

It will be observed, however, that I seem to have taken up with the inter-condyloid plan of operating somewhat recently, and I must express the decided opinion I have formed, that in the more extreme cases M'Ewen's plan fails to produce a straight limb. Such was the result in Case 3, where the condition of genu valgum was so great, that as the leg lay upon the bed the angle produced at the knee by the outward deflection of the leg was very nearly that of a right angle, and when the

Operations on the Femur for Genu Valgum.

No. of Case.	Date of Operation.	Name and Age.	Limb.	Operation Performed.	Result.	Remarks.
	1879.					
1	June 21	Clara C. —17	One	M'Ewen	Very good	Severe case.
2	,, ,,	Arthur B.—16	Both	,,	,,	Forcible straightening
3	July 8	Alice D. —27	One	,,	Only imprv.	Extreme case. [failed.
4	Sept. 10	Charl. G.—14	One	,,	Very good	
5	,, ,,	Thos. B. —17	One	,,	,,	
6	Oct. 4	Harri. G.—13	One	,,	,,	
7	Dec. 13	Cath. T. — 5	One	,,	Good	
	1880.					
8	Jan. 14	Rose C. — 7	One	,,	,,	
9	April 17	Henry G.— 7	Both	,,	,,	After failure of forcible straightening.
10	May 25	Herb. W.— 8	One	,,	,,	Seen recently. Patella outwardly displaced.
11	June 5	Walter F.—13	One	,,	,,	
12	,, 16	Alfred N.—18	Both	,,	,,	
13	July 7	George E.—15	Both	,,	Very good	Seen recently.
14	Oct. 27	Oliver A.—16	Both	,,	,,	
15	Dec. '2	Walter J.— 9	Both	,,	,,	
	1881.					
16	Feb. 23	Alice C. —18	Both	,,	,,	Regaining walking powers very slow.
17	Mar. 6	Ellen L. —15	Both	,,	Ultimately good	A small fragment of bone exfoliated.
18	Mar. 19	Daniel D.—12	One	,,	Relapsed	Ogston's op. '84 (Case 45).
19	Mar. 23	Fredk. D.— 8	One	,,	Good	
20	April 26	Annie M.—13	Both	,,	,,	
21	June 8	Mary A. M. 13	One	,,	,,	
22	,, 13	Margt. C.—12	Both	,,	,,	
23	,, 29	Edwd. M.—15	Both	,,	,,	Recent report.
24	Oct. 27	Amelia J.— 7	Both	,,	,,	
	1882.					
25	Feb. 15	James J.— 9	Both	,,	,,	
26	,, 24	Charl. A.—15	One	,,	,,	
27	,, ,,	Annie W.—15	One	,,	,,	
28	May 31	Harri. V.—16	Both	,,	,,	
29	July 1	Edwd. N.—12	Both	,,	,,	,,
30	Oct. 4	George H.—21	Both	,,	,,	
31	Nov. 29	Beatri. L.— 4	Both	,,	,,	
32	Dec. 13	Charl. H.— 5	Both	,,	,,	
	1883.					
33	Feb. 28	James G.—13	Both	,,	Very good	Seen recently.
34	Mar. 8	George B.—12	Both	,,	Relapsed	,,
35	May 2	James B.—14	Both	,,	Very good	Recent report.
36	July 11	Mary A. —19	Both	Ogston	Much improved	A month between operations. Seen recently.
37	,, ,,	George B.— 5	Both	M'Ewen	,,	Seen recently.
38	Aug. 1	Bertha B.— 5	Both	,,	Good	
39	,, 22	Frank D.— 9	One	,,	Very good	,,
40	Oct. 3	Wilm. G.—16	Both	,,	,,	,,
41	Nov. 5	Thos. K. —16	Both	,,	,,	,,
42	,, ,,	Arthur S.—18	Both	,,	,,	
43	,, ,,	Lily T. — 3	Both	,,	,,	
	1884.					
44	Feb. 11	James R.— 4	Both	,,	,,	
45	Mar. 10	Daniel D.—15	One	Ogston	,,	,,
46	,, 17	Edwd. G.—19	Both	,,	,,	Recent report.
47	April 8	Pietro M.—15	Both	M'Ewen	,,	,,

Operations on the Femur for Genu Varum.

No. of Case.	Date of Operation.	Name and Age.	Limb.	Operation Performed.	Result.	Remarks.
	1879.					
1	Nov. 14	Mab. de la C. 14	Both	M'Ewen	Good	Both tibiæ also divided. Seen recently.
	1880.					
2	Dec. 11	Charles P.—15	Both	...	,,	

Operations for Curved Tibiæ.

No. of Case.	Date of Operation.	Name and Age.	Limb.	Operation Performed.	Result.	Remarks.
	1878.					
1	Nov. 10	George F.—3	Both	Oblique section.	Good	Two months between operations.
	1881.					
2	Mar. 26.	Mab. de la C. 15	Both	,,	Very good	,, ,,
	1883.					
3	Mar. 14	Walter F.—16	One	,,	Good	In upper third.
	1884.					
4	Jan. 14	James T.— 5	Both	,,	,,	A month between ops.

Operations for Anchylosis of Hip-Joint causing Deformity.

No. of Case.	Date of Operation.	Name and Age.	Limb.	Operation Performed.	Result.	Remarks.
	1876.					
1	Jan. 25	Clara S.—24	One	Adams	Died	Strumous case; suppuration.
	1877.					
2	Dec. 14	Hanh. R.—24	Both	,,	Greatly benefited	Rheumatic case. A year's interval between opers. Recently reported.
	1880.					
3	Sept. 21	Katie B.—18	One	Below trochanter	Perfect	Strumous case. Seen recently.
4	Mar. 30	Annie D.—15	One	,,	Good	,, ,,
	1881.					
5	July 18	Charl. A.—15	One	,,	,,	,, ,,
	1882.					
6	Aug. 2	Hugh R.—16	One	Adams	Perfect	Rheumatic case. Seen recently.
7	Oct. 11	Thos. G.—13	One	Below trochanter	Good	Strumous case. Seen recently.
	1884.					
8	Mar. 17	Richd. K.—16	One	Adams	,,	,, ,,
9	May 8	Margt. C.—29	One	,,	Perfect	Rheumatic case. Seen recently.

Unclassed Operations.

No. of Case.	Date of Operation.	Name and Age.	Limb.	Operation Performed.	Result.	Remarks.
	1881.					
1	Mar. 5	James A.—38	One	Through fibula	Good	
2	Nov. 19	Fanny W.—19	One	,,	Not improved	

transverse section of the femur had been effected, I found that on bringing the limb straight the lower fragment was thrust so tightly against the integument at the outer aspect of the thigh, that I dare not leave it in that position; and, moreover, the angle which the two fragments made was so great, that it produced a compensating deformity almost as aggravated as the original. I placed the limb, therefore, in as good a line as I could, lessening the deformity by at least two-thirds, and in this line I was compelled to let it unite. I should now most certainly do Reeve's modification of Ogston's operation first, and should there be any deformity remaining, I would finally remove it by the performance of a M'Ewen.

It was on this view that I performed Reeve's operation in Case 36, one more extreme than No. 3. Here the patient seems so well satisfied with the result and walks so well, that she does not care to return to the hospital for the completion of her cure by M'Ewen's operation, in accordance with my original intention. This case illustrates very well many of the obstacles one has to meet and overcome in some patients. To commence with, she was both very short and very stout; her thighs seeming to be proportionally the shortest and stoutest parts of her body; besides which, the lower thirds of the thigh-bones and the upper thirds of the tibiæ were much curved. I met with no difficulty in chiselling off the internal condyles of the femora at either operation, but her peculiar conformation made it impossible to fix her so securely that she could not slide her splints round, and so allow of some return of the limbs to their old positions. Nevertheless, under the circumstances, the improvement was highly encouraging; the amount of deformity remaining is very slight, less than three inches between the internal malleoli, and could readily be completely removed by a M'Ewen. The patient is a very obstinate and petulant girl, and being so well, does not care to again incur the restraint and confinement of treatment.

Case 45 was also submitted to Ogston's operation, but on rather different grounds to the case last mentioned. Originally admitted in 1881 with slight condition of right knock-knee, the external malleolus being three inches from the left. Until two years previously the left leg had been similarly deformed; he then sustained a fracture above the condyles, and a second fracture in the same situation occurred four months afterwards, the result being that this limb was now quite straight. So far this case had proved the truth of the observation, that if a patient with knock-knee meet with fracture of the femur the deformity could be cured. I performed M'Ewen's operation

on the patient's right leg (Case 18); the femur was readily chiselled through on March 19, 1881. On April 11 this note occurs—"Leg taken down to-day; wound entirely healed. Inner malleoli now touch; measurements equal on both sides." The limbs were put up in plaster of Paris bandages, and shortly afterwards he left the hospital. He returned in February 1884 with relapsed genu valgum of the right leg and a genu varum of the left. There was an extreme condition of hypertrophy of the internal condyle of the right femur, to which I attribute the relapse, and on which account I decided to perform the intercondyloid operation on this limb, but the supra-condyloid on the left for the varum. The former I did on March 10, chiselling off the internal condyle of the right femur without difficulty, and bringing the leg quite straight. His recovery was unexceptionally good, the knee-joint giving no sign that it had been wounded, complete mobility being restored rather more quickly than after M'Ewen's operation. With regard to the proceeding upon the left, performed on the same day, for the first and only time I failed to complete the transverse osteotomy of the femur above the condyles, and it happened as follows. It will be recollected that this bone had twice been fractured at the seat of operation, and was in the outwardly curved position known as genu varum. Under these conditions the bone must necessarily have been unusually dense and hard, and particularly so on the outer surface of the bone at the convexity. The operation was commenced and carried on in the customary way, until I had, as I thought, made a sufficient division of the femur with the chisel, which having withdrawn, I attempted to fracture the remaining undivided layer on the posterior aspect of the bone, when to my surprise, instead of the bone cracking, the internal lateral ligament gave way, and the leg at once fell into the desired position. It will naturally occur to most minds that I used undue force in my endeavour to fracture the bone, and that this had not been sufficiently severed with the chisel, owing to the unusual density of the compact layer. This latter fact is obvious, but I was not conscious of using any unwonted force to effect the necessary fracture of the undivided bone. However this may be, the limb was in the position I intended to place it by my operation, and to my mind it would have been simply affectation, from an unwillingness to own oneself checked, that could make any one proceed with an operation when the desired effect had been attained in another way. I have seen the lad recently; he is quite straight, and I shall watch with interest to see if relapse in either the genu valgum or varum again occurs. All

the remaining operations have been in accordance with that devised by, and now universally called after, Dr. M'Ewen of Glasgow. Having performed almost eighty operations after this method without any accident or incident, I have naturally nothing but the highest praise to bestow upon it, as in my hands a safe, simple, and certain operation in all ordinary cases of genu valgum or genu varum. That casualties have happened, and some of them even fatal, I am of course aware; but the only events amongst my own that I have to narrate are that in Case 17 a very tiny splinter of bone necrosed and came away through a sinuous track at the site of the operation wound, the patient being in no way inconvenienced by it; and in Case 4 a considerable-sized piece of the chisel broke off and was left in the bone—a matter apparently of no moment, for in this, as in another osteotomy, the after progress gave no indication of anything unusual having occurred. Again, I may affirm that no patient has been made even temporarily ill by the operation, and not one has caused me a day's uneasiness. In all cases I have operated under the spray and with full Listerian precautions—precautions perhaps unnecessary, but even to those who regard cleanliness as all-in-all for the well-doing of surgical operations, I know nothing that ensures such strict attention to cleanliness as Listerism; and before Lister's views and practice were known I had experienced deep suppuration in two cases of Adams' operation upon the neck of the femur, one eventually dying, as will be seen more at length later on. I have the strongest grounds for adopting this plan, since it ensures the well-doing of my patients most certainly, and in this operation, at all events, exercises no ill effect, whatever baneful influence the spray may exert when large flesh wounds are made.

In comparing the results of osteotomy for genu valgum with, on the one hand, forcible straightening (Guerin's plan), and, on the other, gradual straightening by appliances after tenotomy, two of the cases which bear on these points are of interest. In Case 2, shortly after Professor Guerin had visited London and had explained his practice at several of the hospitals, I decided to try what force would effect in conjunction with deep tenotomy. Accordingly, upon this patient, with full Listerian precautions, I divided the biceps tendon and the external lateral ligament, making a sufficient dissection to ensure that I effected what I intended. I followed this up by forcibly extending and straightening the leg. This being accomplished, I secured the limb in this position on a M'Ewen's Liston's splint. A severe pyrexial attack followed this step, and the lad became so ill that on the fifth day I was forced to abandon this treatment. Convalescence

quickly followed, with, however, scarcely any improvement in the position of the limb. So six weeks later I did M'Ewen's operation; and here comes in the interesting feature in the case, that he went through this and the subsequent after treatment without any pyrexial attack and without pain. Of course the absence of all strain and tension in the latter proceeding and their presence in the former afford a sufficient explanation of the different effects upon the patient of the two operations.

The other is No. 42 in the table. Originally seven or eight years ago an out-patient of mine, I had treated him on the then approved plan by tenotomy and gradual straightening, with splints having a ratchet joint at the knee. Having brought the legs straight, after several months he was given irons and allowed to walk. I saw the patient at intervals afterwards, feebly struggling to walk; in truth, he was, though his legs were straight whilst in the irons, not one whit better as regards being cured than when I first took his case in hand; for directly the irons were taken off, one could put his legs either back to their knock-kneed position, or place them straight, but in this position a full inch separated the external condyle of the femur from the outer facet of the tibia, the elongated internal condyle and the inner facet alone being in contact. Thus, as a result of four years' treatment, the only change produced had been great stretching of the external lateral ligaments of the knee and contiguous structures, producing of course a thoroughly lax state of the knee-joint, preventing even his standing without his irons, with which he was as it were balanced upon his internal condyles, whilst if held up without his irons, his feet slipped apart and the genu valgum returned.

Feeling quite sure the lad would never walk without mechanical supports as he was, I deliberately proceeded to undo the work of the previous years, putting his legs in plaster bandages in their original knock-kneed position. It took fully a year for the external lateral ligaments to contract; then I admitted him, and subjected him to M'Ewen's operation. All went well, and within the past month he walked to the hospital from some distance to show me how well he was. He wore no support of any kind; his legs were quite straight; and I need scarcely add he was mightily proud of his walking powers; for having been a shockingly rickety, puny child, I know that he had never known what walking really meant before.

Through the exertions of Mr. Jessop, who has very kindly hunted up the patients, I have seen or heard from very many. I know of only two relapses, Nos. 18 and 34. The former has been again cured, whilst the latter is again in hospital, and probably

long before this article is in type will have been again operated on.

Taken as a whole, this series of M'Ewen's operations is most satisfactory, judging from the condition of those patients whom I have recently examined. All were, with the exceptions given, in good health and with perfect use of their limbs, although all bear the trace of the operation in an outward curve, more or less decided, in the lower fourths of their thighs.

Operations on the Femur for Genu Varum.

It would perhaps have been better, except for the sake of accuracy, to have tabulated these two cases with those of genu valgum, as the operation is the same supra-condyloid one of M'Ewen. The first case, which also appears in the next table under operations for bent tibiæ, was extremely deformed, and walked with the greatest difficulty. The combined operations were very successful in bringing her legs straight, and she can walk well as regards distances, but, as in some other cases, the previous long-continued use of iron supports had produced such a lax state of the ligaments of the knee-joints that her style of walking is not good.

Operations for Anchylosis of the Hip-Joint.

There are ten of these, performed upon nine patients. In six of them the neck of the femur was divided, of which again two were chiselled through, and four sawn through on Adams' plan. In the remaining four cases, the site selected for making the section was below the trochanters, in consequence of the evidences of destructive changes in the articulation. Of the three earliest operations performed (shown by the table to have been in 1876–78) two, by the way, being on the right and left hips of the same patient, I followed the several steps of the operation, as Mr. Adams first directed, even to effectually closing the small external wound with lint steeped in styptic colloid. Twice was this proceeding followed by deep-seated suppuration; and one patient, a highly strumous girl, eventually died from the shock of an amputation at the hip-joint, performed when very much exhausted in the hope of saving her life. These operations were therefore done before I commenced to employ the antiseptic system of Lister, under which, as I have previously stated, all my osteotomies since 1879 have been performed.

When intending to divide the neck of the femur, having tried both saw and chisel, I give the preference to the former, feeling

when using the saw a greater certainty that I am making the section in the proper line,—a point of no little moment in this particular operation. In the case of the patient in whom I divided both femoral neck-bones, the eventual improvement was very gratifying, as in addition to anchylosis of both hip-joints, very many of the other joints, both great and small, were crippled by rheumatic adhesions. Both hip-joints were rigidly fixed in a position of rectangular contraction. Suppuration followed the first operation, but not the second; and in this limb I made continuous efforts to obtain a false joint, but to no purpose, for firm union occurred. In both limbs the position was completely satisfactory, and I have heard of her recently. She is able to walk some two miles without over-fatigue. Her mode of progression is curious, being a combination of a jerk with a kind of semicircular swing; moreover, she very seldom falls. In selecting the site for dividing the bone in these anchylosed hips, I think Mr. Adams quite correct in the stress he lays that a good neck to the bone, as evidenced by an almost normal projection of the trochanter major, is necessary in the cases suitable for his operation; for which reason the rheumatic cases, as a class, are pre-eminently the ones for it. It would be quite misleading to suppose that equally good results cannot be obtained when the section is made below the trochanter. I believe a better result than Case 3 in this table it is almost impossible to obtain by osteotomy. This patient, when admitted, had been deformed since childhood, at which time she had hip-disease, accompanied by numerous abscesses, and the large resulting scars attest their severity and extent. The trochanter was flattened, and the head of the bone thrown higher up on to the pelvis; the thigh was flexed to an acute angle, as well as being markedly adducted, and rotated inwards; the hip-joint was firmly anchylosed. She had not walked without crutches since her joint became diseased; indeed, owing to the amount of contraction it was almost an impossibility. I chiselled through the femur below the trochanters, the bone being so hard that the chisel's edge was seriously chipped, the fragments, some of good size, being buried in the bone, but never in the after-treatment of the case making their existence in the patient's body in any way apparent. After the completion of the dressing the limb was placed in a Thomas splint and fixed in the *abducted* position, a factor in the after-treatment of these cases the importance of which, I think, is unrecognised; for just as a condition of fixed *adduction* causes *apparent* shortening by tilting that side of the pelvis upwards, so by inducing union of the fractured bone in the *abducted* position this side of the pelvis is permanently depressed, and in this way some of the

real shortening can be concealed, to the relief of a corresponding amount of false sole to the boot.

The recovery of this girl was uninterruptedly good, and in less than six months she walked without support, and for the past eighteen months has been a nurse at a provincial hospital, doing, as she tells me, all her work without fatigue, and affirms that the leg operated upon is the stronger. She walks without limp, runs up and down stairs naturally ; and finally, although there is fully an inch of real shortening, yet, owing to the amount of permanent abduction, she requires scarcely any additional sole to her boot. I said she convalesced without any drawback, and yet there was one cause of anxiety, and this was lest the sharp edge of the upper fragment should come through the skin ; for so extreme had been the previous flexion, that the sharp point of this upper fragment was thrust against the skin just below Poupart's ligament, external to the femoral vessels ; and although by constant care this threatened trouble was warded off, yet the still somewhat sharp edge of bone may be felt.

None of the other cases in this table call for particular comment; all have done well as regards the operation, many were very greatly benefited, some have passed out of sight. The last one operated on, although quite convalescent, has not given up all support. Her case is a typically good one in all respects.

Operations for Curved Tibiæ.

All these operations have been performed upon rachitic bones, except Case 3, where the patient had a very sharp outward bend at the junction of the upper and middle thirds of the leg, compensatory to a genu varum of the other leg, which had been cured by M'Ewen's operation four years previously ; here, as the femur was unaffected, I divided the tibia and fibula, the patient as usual convalescing without a drawback and going out with a very straight limb. The remaining cases were operated upon at the point in the lower fourth, where, as is usual in rachitic tibiæ, the curvature is most marked. My plan is to produce an oblique section of this bone, and having fractured the fibula, to slide the lower fragment upwards until it is in good line with the upper. By this manœuvre there is less separation of the divided surfaces, and at the same time a larger cut surface of bone severed, from which callus will be produced, and thus failure of union which has resulted from osteotomy for rickets (especially when a wedge of bone has been removed), is, I believe, rendered almost an impossibility. Union has taken place quickly and satisfactorily in all of these operations.

Unclassed Operations.

Both the cases in this table are of interest. The first had more than a year previously sustained a Pott's fracture, which had united only partially reduced. The man complained of constant pain in walking, and of inability to walk any distance. I chiselled through the fibula at the site of the former fracture, and then strongly wrenching the foot, succeeded in bringing it into almost its normal position. When the man was last seen, some three months afterwards, the foot kept its good position, and he bids fair to have a useful foot. The second case was also one of osteotomy of the fibula, but for an opposite state of things. Here, on account, apparently, of infantile paralysis, a varus twist of the foot had been acquired, and apparently maintained by a hypertrophied external malleolus, which interposed a mechanical impediment to the return of the foot to its natural position. Although I succeeded in putting the foot into fair shape, I do not think the patient gained much, as the foot was an old paralysed one and a source of pain. She has passed out of sight, and whether finally she was improved or not I cannot say.

My warmest thanks and acknowledgments are due, and are gratefully given, to Mr. Jessop for collecting the notes and for contriving to produce so large a number of the patients for my inspection.

December 22, 1884.

Note communicated by Mr. D'Arcy Power, Curator of the Museum.

Through the kindness of Dr. Gross, the superintendent of the Newington Infirmary, the left knee-joint of M. A. A. (No. 36, table of operations on the femur for genu valgum), who died 14th December of acute puerperal mania in that institution, has been added to the Museum of this Hospital.

After death the limbs were so nearly parallel to each other that when the condyles of the femur were approximated, there was only an interval of about three inches between the two internal condyles. The scars of the operation were visible in the skin at a point two and half inches above the articular borders of the internal condyles.

On removing the skin over the joint in this specimen, the patella was found to lie wholly upon the external condyle. The superior articular border-surface of the tibia formed a horizontal

line with the lower surface of the femur, which latter bone articulated rather more posteriorly than is the case in a normal joint. The shaft of the tibia was curved laterally, so that its convex border was internal; the sharp edge of the shin had become rounded off. Along the inner border of the tibia were two well-marked ridges of bone.

On raising the patella after cutting through the ligamentum patellæ, the great size of the articulating surface presented by the external condyle was very noticeable. Including the patellar surface it measured no less than three and a half inches in length. The articular surface of the patella was loosely united to that of the external condyle by fibrous bands, the result of old inflammation, but the movements of the joint were in no way interfered with by these adhesions. The outer margin of this condyle was lipped as in rheumatoid arthritis, and the cartilage covering it was pitted in such a manner as to resemble the pearly concretions seen in oyster shells.

The patella had only one articular facet. Whilst the leg remained extended the external condyle was alone visible; on flexing the limb, however, the joint moved through an angle of 45°, its further flexion being restrained by fibrous material in the neighbourhood of the crucial ligaments resulting from the matting together of the ligamenta alaria et mucosum. When the knee was bent and the patella raised, the internal condyle came into view. Its articular surface was much smaller than that of the external condyle, measuring one inch and a half in its longest diameter. In no part did it articulate with the patella; its surface was covered with smooth cartilage.

The two condyles of the femur were upon nearly the same plane, the external being if anything slightly the longer. They were separated by a very wide notch, the space between them being filled up by synovial membrane.

After reflexion of the quadriceps extensor the subcrureus was seen to arise from the external surface of the femur in correspondence with the lateral deviation of the patella. The shaft of the femur was bent antero-posteriorly with a slight lateral twist, so that its axis almost forms a spiral.

The internal condyle was hypertrophied, although its articular surface was small. It was roughened anteriorly and united to the shaft of the femur by callus. It appeared as if its base had been pushed upwards on to the femur, so that at its point of union with that bone there is an abrupt raised line. The increased width of the intercondyloid notch was due to a new formation of bone filling up the gap formed by the forcible separation of the condyles as a result of the operation.

THE HISTORY OF THE FIRST TREATISE ON RICKETS.

BY

NORMAN MOORE, M.D.

Glisson's treatise on rickets was published in 1650, and is justly regarded as one of the monuments of English medicine. It has all the marks of an original work, the result of careful thought and long-continued observation. At the time of its publication the author was professor of physic at Cambridge, and he had also lectured at the College of Physicians. He was well known at his university and in London for his active pursuit of the study of medicine. Seven other Fellows of the College knew of his investigation of rickets, and had contributed written observations on the disease; while two Fellows, Dr. Bate and Dr. Regemorter, had been deputed by the seven to aid in the composition of a book on the subject. Each of the three was to write a part; but as the work progressed, it was found that Glisson had made such complete observations, and written so much more than the others, that by common consent he undertook to bring out the book, courteously asking Bate and Regemorter to allow him the advantage of their criticism and observations. The whole was done without secrecy, within the possible knowledge of all the Fellows, and these seven physicians communicated with one another with all the liberality which distinguishes true members of the republic of learning. The preface of Glisson's "De Rachitide" states explicitly that he had been at work for more than five years, and gives the history of the work. Every statement of the preface is undisputed, and rests on the united testimony of the seven doctors—Sheafe, Bate, Regemorter, R. Wright, N. Paget, J. Goddard, and Trench.[1]

[1] De Rachitide sive Morbo Puerili qui vulgo The Rickets dicitur, Tractatus; opera primo ac potissimum Francisci Glissonii Doctoris et publici Professoris Medicinæ in alma Cantabrigiæ Academia et Socii Collegii medicorum Londinensium, conscriptus: adscitis in operis societatem Georgio Bate et Ahasuero Rege-

Dr. Wright died in 1646, but the other six were all well-known men in practice in 1650. Dr. Sheafe had been a Fellow for thirteen years, Dr. Regemorter for seven. Dr. Bate, who had been a Fellow for ten years, had attended Charles I. at Oxford and Oliver in London. Jonathan Goddard, a doctor of medicine of Catharine Hall, was chief physician to the army, and had recently served in that capacity on Cromwell's Irish expedition. It is further worthy of note, in relation to the subject of this paper, that of the seven doctors, three had graduated at Leyden—Regemorter in 1635, Paget in 1639, and Wright in 1642.

Glisson died in 1677, and during his lifetime the credit of the first complete elucidation of the disease was never denied him.

In 1684, Dr. Whistler, then President of the College of Physicians, printed in London a short treatise on rickets, which he stated in the title-page was a reprint of his graduation thesis at Leyden on the subject in 1645. If his statement were true, then his would be the first printed work on rickets.

In 1876, in a thesis for the degree of M.D. at Cambridge, I made the following remark on Whistler's essay :—" Dr. Whistler, for whom this discovery is sometimes claimed on account of a thesis read at Leyden in 1645 (I have only seen an edition of it printed in London in 1684), ended his career by taking advantage of his presidency to defraud the College of Physicians. His thesis does not allude to any definite observations of his own, and has not the general aspect of an original work. If he read it in 1645, this was the very year that the plan of Glisson's book was made public. On the title-page of Whistler's reprint are the words, ' Ob defectum exemplarium novis typis conservandas hasce theses authos voluit ; ' and as it came out in the year of his death, but, I think, not after that event, it may indicate that he desired late in life to obtain more merit for his university exercise than it deserved. Glisson died in 1677 ; and though Whistler had been a Fellow of the College of Physicians from 1649, there is no history of any controversy during Glisson's life. I am of opinion that if Whistler did write on rickets in 1645, he was indebted to Glisson." [1]

I adhere to the opinion expressed as to the value of Whistler's work and its title to a place among medical discoveries, but it is my duty to publish the fact that his assertion as to his publication in 1645 is true. On November 22, 1883, I received the following letter from our learned Harveian Librarian :—

mortero Medicinæ quoque Doctoribus et pariter Sociis Collegii Medicorum Londinensium. Londini. Typis Guil. Du-gardi ; Impensis Laurentii Sadler, et Roberti Beaumont : apud quos veneunt in vico vulgo-vocato Little Britain. 1650.

[1] The Cause and Treatment of Rickets. London, 1876.

"40 Finsbury Square, E.C.,
November 21, 1883.

"Dear Dr. Moore,—I have just come upon a copy of Whistler's inaugural dissertation on rickets, the original of 1645, in the College Library. It had long been missing, and had got to the back of one of the deep narrow cupboards in the Library, where it had been presumably for a quarter of a century or more. It proves, therefore, that you, and far more Dr. Gee, have been unjust in your inferences about Dr. Whistler as to his dissertation.

"Whistler was a bad man, and I have no sympathy with him; but his essay on rickets, printed in 1645, and therefore five years before Glisson's book, is a fact, and can no longer be denied. —Believe me, yours very truly,

"William Munk.

"Norman Moore, Esq., M.D."

The copy of Whistler's thesis mentioned by Dr. Munk is a small quarto of eighteen pages. In the new Catalogue of the British Museum another example of the work is named. This I have also examined, and it agrees in every particular with the College of Physicians' copy.

The title states that the disputation on the rickets was held on October 18, 1645, at Leyden, by authority of the Rector, the Rev. Dr. John Polyander à Kerchoven, for the degree of doctor of physic by Daniel Whistler, Anglo-saxonicus orientalis. Whistler calls himself an oriental Anglo-Saxon because he was born at Walthamstow, in Essex.

At the base of the title-page is a rude cut of a bird with the motto, "Nil penna sed usus." Below this are the name of the town and printer, "Leyden, from the shop of Wilhem Christian Boxius," and the date 1645. The zoological features of the bird are not very distinct, but from a comparison of several similar woodcuts it may be determined to be an ostrich holding a horse-shoe in its beak. The bird's supposed power of digesting iron seems to have made Dutch booksellers think it an appropriate symbol of the capacity for assimilating knowledge in its toughest forms. Most men who have searched for information in the pages of inaugural dissertations will feel the force of the simile. A bird identical in form, and with the same motto, is to be found on the title-page of several Leyden dissertations of the same period as Whistler's; for example, on that of David Balfour of Scotland on the nature and cure of small-pox and measles, in 1634; on those of John Hattem on intermittent fever, and of Walter Immerseel "De morbis occultis," in 1638; on that of

Robert Wright of London in 1642; and on that of James Steen on dropsy in 1648. The design is found with more than one publisher's name below it, for while the dissertations of Balfour, of Hattem, and of Wright are issued by Wilhelm Christian, that of Steen is issued by Justus Livius, and that of Immerseel by Jerome de Vogel. There are many dissertations printed by Wilhelm Christian, but Whistler's printer calls himself Wilhem (not Wilhelm), and has the additional surname of Boxius.

On the back of the title-page is the dedication :—

Viris ornatissimis, spectatissimisque
D. Johanni Whistler,
D. Radolpho Whistler,

Fratribus germanis,
Mihique consanguinitatis, et amoris vinculo
conjunctissimis, plurimumque adeo colendis,
Gratitudinis et observantiæ.
Ergō.

Inaugurale hoc exercitium.

Do.
Dico.
Dedico.

DANIEL WHISTLER,
Auth. et Resp.

It is a pity that the graceful custom of commemorating the author's teachers or kindred is sometimes omitted in modern academical dissertations, and it is due to Whistler to point out that the dedication of his thesis is a generous and natural one to members of his own family, and not a servile tribute to some powerful person.

The title-page of the reprint of 1684, as may be seen in the autotype, is a reproduction of the words of that of 1645, the woodcut of the bird being omitted, and its place marked by a horizontal line, while at foot are added the words—

Ob defectum exemplarium novis typis conservandas hasce
Theses author voluit.

Londini, Ex Typis Thomæ Flesher 1684.

The dedication was omitted in the reprint, and there was one other trifling alteration. The dissertation of 1645 ended with

DISPUTATIO MEDICA
INAUGURALIS,
DE

Morbo puerili Anglorum,

quem patrio idiômate indigenæ
vocant

The Rickets,

QUAM

Deo ſuppetias ferente,

Ex authoritate Nobiliſſimi Domini Rectoris Magnifici,

D. JOHANNIS POLYANDRI à KERCHOVEN
SS. Theologiæ Doctoris, ejuſdemque Facultatis in Illuſtriſſimâ Acad. Lugd. Bat. Profeſſoris primarii,

Decreto Illuſtriſſimæ Facultatis Medicæ, & Ampliſſimi Senatûs Academici conſenſu,

Pro Gradu Doctoratûs, ſummiſque in Medicinâ Privilegiis conſequendis,

Diſcutiendam proponit

DANIEL WHISTLER, Anglo-Saxonicus-Orientalis.

Ad diem 18. *Octob. Horis & Loco conſuetis.*

LUGDUNI BATAVORUM,
Ex Officinâ
WILHEMI CHRISTIANI BOXII. 1645.

Ob defectum exemplarium novis typis conſervandas haſce Theſes Author voluit.

Londini, Ex Typis *Thomæ Fleſher*, 1684.

DISPUTATIO MEDICA
INAUGURALIS,
DE

Morbo puerili Anglorum,

quem patrio idiômate indigenæ
vocant

The Rickets,

QUAM

Deo ſuppetias ferente,

Ex authoritate Nobiliſſimi Domini Rectoris Magnifici,

D. JOHANNIS POLYANDRI à KERCHOVEN
SS. Theologiæ Doctoris, ejuſdemque Facultatis in Illuſtriſſimâ Acad. Lugd.-Bat. Profeſſoris primarii,

Decreto Illuſtriſſimæ Facultatis Medicæ, & Ampliſſimi Senatûs Academici conſenſu,

Pro Gradu Doctoratûs, ſummiſque in Medicinâ Privilegiis conſequendis,

Diſcutiendam proponit

DANIEL WHISTLER, Anglo-Saxonicus-Orientalis.

Ad diem 18. *Octob. Horis & loco conſuetis.*

LUGDUNI BATAVORUM,
Ex Officinâ

seven corollaries or additional theses which the candidate maintained—

Whether it be best for the health of children to be suckled by their own mothers.
Whether children may sometimes be bled.
Whether the blood circulates.
Whether the distribution of the blood is from propulsion only without attraction.
Whether sometimes emetics and bleeding are useful in dysentery.
Whether in apoplexy cupping-glasses may be applied to the head, but never in hypochondriasis.
Whether bleeding in pleurisy should be done on the affected side.

In the place of those on the last page of the reprint are the words:—

Hoc tantum huic novæ editioni addere visum est
Curatio indicat morbum
Curatur de osbtruentibus Hepaticis, Spleneticis, &c.

Ergo est Morbus ab Obstructione viscerum primario.

"Curatio indicat morbum" is a very unsafe maxim, though often maintained in medical discussions now-a-days, and it leads Whistler far enough astray as to the true pathology of rickets.

The autotype shows briefly, what an exact comparison proves, that Whistler did print a dissertation on rickets at Leyden in 1645, and that he reprinted it faithfully in 1684.

The reasons have already been given why it was not unlikely that Whistler, as a young doctor, should have chosen a subject much talked of in London at the time, owing to the existing investigations of Glisson.

It is worth while to state the actual contents of the fourteen pages of the dissertation.

It has seventeen divisions. The first sets forth that the disease treated of is endemic in England, as scurvy is in the Baltic, plica among the Sarmatians and Poles, goître in the Alps, lues venerea among the Indian nations.

The second clause states that, from many symptoms separately observed of old, a compound or pathognomonic unit is observable, "unknown (as far as I know) to the ancients." Twenty-six years, more or less, before, the disease had been first observed, and the name *the rickets* said to have been adopted from the usage of those who treated it empirically; others say

it was from a verb in the Dorset dialect, *to rucket*, to breathe with difficulty, and the author himself proposes as its Latin name *Pœdosplanchnosteocaces.*

The third division names seventeen diagnostic symptoms, viz. :—

1. Swelling of the abdomen, chiefly on the right side, under the hepatic region.
2. Enlargement of the epiphyses of the joints; whence some propose the names for the whole affection *Pœdarthrocaces* and *Pœdarthroncias.*
3. Nodosities grow out on the sides where the cartilages join the ribs.
4. General softness of the bones ; whence the name proposed by some, *Pœdosteocacen.*
5. Increased size of the head when hydrocephalus is added ; whence some one has proposed the name *Pœdocephalarthroncian.*
6. Flaccidity of the soft parts.
7. Retarded dentition, and decay of the teeth when they are cut.
8. Narrowness of the chest, prominence of the sternum and irregularity of its surface.
9. Laboured breathing, a slight cough, and phthisis.
10. Slight fever of no definite type.
11. Unequal and feeble pulse.
12. Urine thicker than natural, varying in colour and density.
13. Viscid dejections and vomit.
14. Middling or bad appetite.
15. Sleep moderately or too much.
16. Often clever and precocious if they have not hydrocephalus.
17. Sometimes spots on the face, chest, and joints. These, however, may be due to an inherited scorbutic or syphilitic constitution.

The next paragraph begins with some high-flown remarks about the aid anatomy gives to medicine, and goes on to describe the post-mortem appearances. The liver, mesenteric glands, and sometimes the thymus, spleen, and kidneys, are swollen. The lungs are scirrhus, and often adherent to the side of the chest, and ulcers are often found in them. Water is found in the cavities of the thorax and abdomen. The dura mater adheres to the skull. The muscles are wasted, but not the face.

Part V. begins by saying that the viscera and bones are the main parts affected, "unde nostri nominis *Pœdosplanchnosteocaces* huic affectui imponendi nobis audacia est."

It is disputed which is the primary seat of the disease. A most learned man (vir consummatissimus) had maintained that

the affection consisted in a defect of penetration of the nutritive juice appropriate to the bones, on account of the too great density or imporosity of the bones themselves. This Whistler thinks cannot be the case.

Part VI. is a further discussion of the pathology of the disease. Too copious an afflux of serosity causes the epiphyses to swell, while the viscera swell from getting too much of the thick nutritive part of the blood.

Part VII., beginning "The cause therefore," sums up the result of the pathological discussion, which was set forth at length in VI., while VIII. is the same proposition, but in another form, beginning "The disease itself seems to consist."

IX. states weakness of the pulse to be the antecedent cause, and discusses the origin of the cause, as to which several hypotheses are proposed. It has been well observed that the disease rarely attacks infants brought up on milk.

Clause XI. is in italics, and is a full definition of the disease, repeating in eight lines the main points of pathology and treatment already mentioned.

The next paragraphs, XII., XIII., XIV., XV., discuss the causes of some of the chief symptoms. The swelling of the abdomen may be due to the large liver and spleen, or to fluid in the peritoneum; the chicken-breast is due to the morbid condition of the lungs; the difficult breathing, to the narrow chest.

Clause XVI. lays down six points of prognostic:—

1. Those all die who have been affected from birth or before.
2. Females get well more quickly than males.
3. Those with hydrocephalus, in whom the cerebral sutures separate, die.
4. Those who can bear movement of the body best most easily recover.
5. Those whose feet are attacked are cured most easily, and also those attacked at a more advanced age.
6. Those in whom the neck can scarcely hold up the head rarely survive; also those with much difficulty of breathing; those with suppuration of the lungs and phthisis, never.
7. A small, unequal, and especially a weak pulse, is a bad sign.

Part XVII. contains two pages and a half on treatment, in which a multitude of drugs are suggested.

It is to be observed that in all these seventeen sections Whistler lays personal claim to but one thing—the invention of the word *Pœdosplanchnosteocaces.* Without naming them, he alludes to suggestions of other authorities on the disease, and to the views of one especially learned man. He nowhere states any observa-

tions of his own, while his style and expressions are such that, had he any to assert, it is clear he would have made the most of them.

The line of Manilius which is quoted at the end of Glisson's preface, "Ornari res ipsa negat contenta doceri," was not in Whistler's mind as he wrote. He repeats and elaborates his few fragments of information. A fair example of his style is :—

"Hactenus hujus morbi famulos, quasi atrienses digito monstrari : at intimiores ejus, et quasi cubicularios satellites, qui à secretis sunt, et in soñum pectusque admittuntur, familiaris sola aperit dissectio. Conscribamus jam auxiliares milites, quos nobis suppeditat regina anatome, ad novum hoc monstrum debellandum."

There is a vagueness about his whole essay, an absence of facts and a redundance of theory, which shows that Whistler had little to tell of the rickets from his own observation.[1]

Glisson's book, on the other hand, bears in every part the marks of originality and patient observation; "defunctos quos dissecuimus observata hæc nostra anatomica," are the phrases which precede the account of the post-mortem appearances. This part of Glisson's book alone would be sufficient evidence that he had really worked out the subject for himself. I have translated it at length.

These, our anatomical observations, are divided into those which are observable before the body is opened, and those which are only discoverable on dissection.

I. Of the first kind are those which are observable at once when the body is uncovered.

1. Abnormality in size of the parts, the head especially larger and the face fuller with respect to other parts. And this, indeed, has appeared in all those dead of this disease which we have hitherto seen; one only excepted, who, together with this affection, had ulcerated lungs, and was the subject of phthisis. This one, indeed, had also, through the greater part of his illness, a somewhat enlarged head and full face; but about a fortnight before his death the fleshy parts about the head suddenly shrank and a facies hippocratica appeared, to the astonishment of all observers at the rapidity of the change.

2. The external members and the muscles of the whole body are found to be slender and wasted, as if consumed by atrophy

[1] The inaugural dissertations of that century sometimes contain accounts of post-mortem examinations made by the candidates themselves. Thus Clopton Havers (of Catharine Hall) tells that he had seen the autopsy after the pericarditis of Mr. Shuter, a lithotomist, and had himself made a post-mortem examination of a girl with a spleen on the right side. *Disp. Med., Utrecht*, 1683.

or tabes; and this, as far as we know, has been invariably observed in those who have perished of this disease.

3. The whole skin, as well the true skin as the membrana carnosa and adiposa, seems loose and pendulous and lax-like, so that you would think that they could hold much more flesh.

4. Around the joints, especially the wrists and the ankles, certain swellings are discovered, which, if opened, are found to be not in the fleshy or membranous parts, but in the ends themselves of the bones, especially in their epiphyses; and if you scrape these prominences of the bones, you easily notice that they are of the same substance as the other parts of the bones.

5. The joints, the limbs, and the condition of all the external parts are less firm and rigid, and less inflexible than is common in dead bodies, and especially the neck after death scarcely becomes rigid, or at any rate much less than in other bodies.

6. The chest externally is thin and very narrow, especially on the arm-pits, and looks as if compressed at the sides; the breast-bone being somewhat pointed, like the keel of a ship or the breast of a chicken.

7. The ends of the ribs, where they are united with the cartilages of the sternum, are knotty, in the same way as the wrist and ankle joints of which we have spoken.

8. The abdomen, externally, with respect to the parts contained, is small; internally, with respect to the contents, seems somewhat prominent and swollen.

II. The abdomen opened, we have noted these things:—

1. The liver, in all dissected by us, larger than natural, but not ill-coloured, hardened, or diseased by other obvious change, excepting, of course, some bodies in which, before death, other diseases existed as complications; for example, dropsy and extreme wasting.

2. The spleen, for the most part, in size, colour, and substance, has been not diseased; although we would not deny that it might appear otherwise, on account of complication with other diseases.

3. We do see serous water poured out into the abdominal cavity, but neither often nor very much.

4. The stomach and intestines were somewhat filled with wind beyond the normal condition, which may, perhaps, partly account for the tension of the upper hypochondria above recorded.

5. The mesentery sometimes is involved, and sometimes its glands are a little larger than natural, if not strumous; for the rest, we can say nothing certain about the pancreas, but we suspect that some obstruction, if not scirrhus, may exist; but this we leave for the inquiry of others.

6. The kidney, ureters, bladder, unless there was some other disease, are healthy. We noted in general, concerning all the viscera contained in this part of the abdomen, that although the parts containing them are found to be much wasted and emaciated, they themselves are as full and large, if not fuller and larger, than is found in healthy people.

III. The sternum removed, the following points are to be observed in the chest:—

1. Some adhesions of the lungs to the pleura were found in all cases which we have hitherto examined. Nevertheless, we believe that the disease may exist without any adhesion of this kind, although it really comes on during the progress of the disease before death.

2. Consolidation of the lungs was, as often found, consisting of thick viscid black blood, especially in the adherent parts. Many hard swellings were found, sometimes in one lobe, sometimes in several lobes of the lungs, though not always. Abscess and empyemata were also often found.

3. Some of us assert that they have once seen strumous glands so numerous that they seemed to equal, if not to exceed, the lungs themselves in size; but these were situated between the lungs and mediastinum, and stretched from the thymus to the diaphragm.

4. In the cavity of the thorax we sometimes saw serous fluid, more frequently indeed than in the cavity of the abdomen; not, however, in all cases.

5. Some of us also saw this affection complicated with a great empyema, and at the same time phthisis. The sternum being removed, the left lung was found wholly occupied by an abscess, and on all sides of the pleuræ were found to be adherent. The swelling being lightly compressed, abundant yellow, thick, and fœtid pus flowed through the trachea into the mouth itself. The outer layer seemed thicker where the lobes of that side were firmly adherent, and thus so fused the pleuræ that the separate lobes could hardly be distinguished. The same membrane included both lung and abscess, which, opened, brought to view the great size of the abscess, which, on the calculation of those standing by, contained at least two pounds of pus. So great an abscess in so little a body must cause astonishment. But that occupied the whole of the left side; the parenchyma of the lungs of that side was corrupt, half putrid, and as if infiltrated with pus.

6. The thymus in childhood is always found to be large, and perhaps a little larger in those who have died of this disease.

IV. The skull having been cut round with a saw and its cap raised, we observed the following:—

1. The dura mater firmer and adherent to the cranium in more places than is the case in adults. Perhaps this may be seen in children other than those affected by this disease. We believe, however, not so much. Nevertheless, it is certain that in many new-born infants there exist many curved attachments of the pericranium with the dura mater, which are afterwards broken and can scarcely be noted.

2. Between the dura and pia mater, and in the ventricles of the brain itself, we found serous fluid in some which we dissected, whence it is obvious that this affection may be complicated with hydrocephalus.

3. The brain in others dissected by us we found firm, free from disease, and without fluid.

4. And, lastly, we have observed in some bodies recently opened by us that the carotids and jugular veins were larger than natural, while the arteries and veins going to external parts seemed much smaller than natural.

Whether, indeed, this is constant in this disease, we cannot yet assert. We suspect that the circumstance is constant, but it did not occur to us to look out for this from the beginning of our study of the anatomy of the disease.

These observations are obviously original; and it is to be noted that though Glisson had done so much more than any of his fellow-labourers, he never seeks to obtain special credit for himself, nor distinguishes his own observations to the disadvantage of theirs. Numerous as have been the subsequent writers on rickets, few have described the external appearances better than Glisson—the large head, the flabby muscles, the enlargements of the long bones, the beads on the ribs, the pigeon-breast (of which further an excellent drawing is given), the protuberant abdomen; how little there is to add, and, what is more surprising, how little to take away in all he says of these.

The description of the abdominal organs, and that of those of the thorax, bear all the marks of an investigation carefully carried out, and noting everything without asserting that every morbid change found was an actual part of the disease. He had observed the large size of the thymus in childhood, and was not misled by it; and he had also noted the important fact of the wide adhesion of the dura-mater to the calvaria in children.

The last note as to the size of the vessels, though stated with all proper reservation, shows how an hypothesis as to the pathology of rickets had come into Glisson's mind, and had almost misled his observation. In the prognosis, his very first remark has the same ring of genuine observation, so wanting in Whistler —"This disease in its own nature is not fatal."

More examples are hardly necessary to prove that Glisson's book of 416 pages is full of original observation. Whistler's thesis lays no claim to anything of the kind. He nowhere says, "I made a dissection;" nowhere states precise observations of his own. He speaks of rickets as having been discussed by learned men, and in his allusion to a very learned man who had peculiar views as to the nutrition of the bones, it seems possible that Glisson himself is the person alluded to, with an imperfect apprehension on Whistler's part of Glisson's hypothesis as to the pathological method of malnutrition in rickets, which is first suggested in the last clause of Glisson's remarks on the morbid anatomy, and much further elaborated later in his book.

Whistler makes no claim in his thesis to be the discoverer of rickets. It would have been useless, had he wished it, to make any such claim at a time when so many of the most active medical minds of London were discussing the subject, and when an elaborate work on it was in actual preparation.

He does claim to be the originator of the name *Pœdosteos-planchnocaces* for the disease. This is all he claims, and this must be allowed. The name is not to be found in any previous writer, and, for practical purposes, Whistler is its sole user, as well as its inventor.

Dr. Gee has shown that the "Angliæ Flagellum" of De Garencieres contains nothing on rickets. Arnold Boot's chapter "De tabe pectorea" of his "Observationes Medicæ" of 1649 gives evidence of a knowledge of the talk prevalent on the subject of rickets, and entitles Boot to no more than the credit of having observed that the disease is to be seen in Paris and in Ireland, as well as in London.

The name "rickets" was in popular use thirty years or more before Glisson's book. Whistler's thesis was printed five years before it, but nevertheless the credit of the elucidation and first complete description of the disease is due to Glisson. He worked out the subject thoroughly in full clinical and anatomical detail, and his book is a great and lasting addition to medical literature.

Of Whistler it must be said that his dissertation of 1645 is the first printed book on the subject, and that it was accurately reprinted by its author in 1684.

The discovery of the original edition of his dissertation entitles him to no laurel branch, but it does remove what seemed a stain from his memory. For the credit of our College, I wish that the researches of Dr. Munk could clear away every other blot from Whistler's name.

OBSERVATIONS ON ANÆMIA.

BY

VINCENT HARRIS, M.D.

Although it is no longer customary to believe that the various processes of oxidation which occur in the body take place in the blood itself, yet it should not be forgotten that the blood is a tissue just as much as are the solid parts of the body. It is made up of numerous corpuscles, differing among themselves somewhat, contained in a plasma of complicated chemical composition. The alterations produced in the latter by disease have been over and over again demonstrated—the increase of certain of its constituents, the decrease of others, as well as the presence of certain substances which are entirely, or almost entirely, unrepresented in health. Many of these conditions of the blood, however, are, as it were, from the point of view of the blood, mere accidents.

The fact, however, that the blood is itself really a tissue, and not a mere chemical fluid like the urine, suggests that it must be subjected to diseases of its own, or to what may be called primary diseases of the blood. These conditions are often summed up under the generic term Anæmia.

It comes to pass, therefore, that Anæmia is thus defined.[1] It "is a name applied to a condition in which there is diminution of the solid constituents of the blood, and in particular of the red and white corpuscles, attended with pallor of the general surface and of the mucous membranes, palpitation, feebleness and rapidity of pulse, panting respiration, sighing and yawning, headache, restlessness, functional disturbance of the organs of sight and hearing, tendency to faint, and general debility."

This definition, it will be seen, includes a very large number of morbid conditions, many of them not very important from the standpoint of the blood as a tissue. It includes temporary and accidental changes, which may come on in almost any disease, and in which anæmia is secondary and only symptomatic. It comprises, however, two chief sets of cases: (1) in which the solids of

[1] Theory and Practice of Medicine. Bristowe, ed. v. p. 593.

the plasma are diminished, and (2) in which the corpuscles, both red and white, are diminished. It is unlikely that (2) can occur without (1); but the division means that the character of the affection is, that the prime change in the first class is in the plasma, and in the second in the corpuscles. It is to the latter class of cases (to which the term anæmia is restricted by some authors[1]) that I propose to draw attention in the present paper.

There can be no reasonable doubt that the number of coloured and colourless corpuscles varies in each individual from time to time under varying physiological states, and indeed modern methods of research have enabled very accurate estimations of such variations to be made. So also, in cases of anæmia, careful periodical examinations of the blood have been undertaken by Hayem, Gowers, and many others, which have proved not only an enormous diminution in many cases, but an actual, although gradual, increase of the corpuscles under appropriate treatment. Coupled with the diminution in numbers must be taken the fact that in many cases a considerable number of the corpuscles are smaller than natural, indicating in the blood the presence of too large a proportion of immature corpuscles. Hayem has estimated that in consequence of this diminution in size, as well as in numbers, the total area of corpuscles capable of taking up oxygen may sink from 5,000,000 in a cubic millimetre in health to 800,000 in a cubic millimetre in severe cases of anæmia.

When the body loses large quantities of blood from hæmorrhage, the method by which the total number of corpuscles is diminished is sufficiently evident; but when, as in a large number of cases of anæmia, no such direct means can be traced, the way in which the number of corpuscles is diminished is not by any means so clear. We may indicate, however, the three ways in which such a diminution is possible. Firstly, there may be a diminished production of coloured corpuscles by the corpuscle-producing tissues; secondly, there may be an increased destruction of the coloured corpuscles (with a normal production); and thirdly, both of these conditions may be combined. In anæmia we have no proof that the second cause of paucity of blood corpuscles is in action, although it may be supposed to be potent in severe cases of malarial fever, and so we are obliged to believe that the diminished production of corpuscles is the chief if not the only way by which the blood is found so deficient in corpuscles in anæmia, or at any rate that the increased destruction of corpuscles acts only in a secondary degree.

In order to understand the cause of the insufficient production of corpuscles, it will be necessary first of all to inquire into the sources from which they are derived; and on turning to the

[1] See Gamgee, Physiological Chemistry, vol. i. p. 138.

investigations of modern workers on the subject, we find that two chief sources appear to be almost universally acknowledged, viz., (*a*) from the red marrow of bone, in which they are derived from large nucleated protoplasmic cells, and (*b*) from the spleen. It will be thus seen that modern histologists trace the origin of the red corpuscles directly from the tissues. No doubt other tissues besides those just indicated also take a share in the process. The supposed origin of the coloured corpuscles from the colourless corpuscles, which appeared to be so firmly established, is now disputed, and Klein observes about it in his last histological work that there is no conclusive evidence of this mode of origin. Whether this be the case or not hardly concerns us here, as there is no evidence that the colourless corpuscles are either diminished or increased; and if they were the only source of the coloured corpuscles, we should still have to ask why the absolute number of corpuscles is diminished, and why the hæmoglobin is lessened?

Taking, therefore, the first two as the chief sources, and neglecting the third and other possible sources of the coloured corpuscles, it is evident then that diminution of the number of corpuscles produced must depend upon imperfect nutrition of the corpuscle-producing organs and tissue; and in cases where anæmia occurs without obvious cause—the so-called idiopathic cases—there must be, to begin with, malnutrition of these organs and tissues. Healthy nutrition depends upon a due supply of blood, containing all that the organ or tissue requires to make up for its protoplasmic waste and secretion, as well as upon a healthy condition of the nerve supply, which controls not only the blood pressure within the organ, but also presides over the due protoplasmic metabolism, which results in secretion as well as in destruction and building up of the tissue itself. It would be useless to deny the possibility that a primary nervous derangement of the corpuscle-producing tissue might be sufficient of itself to cause anæmia, or that the nervous element may not enter into the production of all cases. It will be shown, however, that the other element, *i.e.*, a due supply of blood of a proper composition, enters into, even if it be not itself the actual cause of, most of the cases of which we are treating, and that the organs suffer from an insufficient supply of the bodies required for food.

Let us now turn to the clinical side of the question. We find a number of out-patients, constituting, it may be, a small, but at the same time a fairly constant proportion, suffering from anæmia, and apparently from nothing besides. They suffer from all symptoms included in the above definition, and yet there is frequently nothing to account for their condition. For the purpose of finding whether the statistical method could throw

any light as to the causation of the condition, and without entering upon the subject with a bias in favour of any theory, I have investigated and noted cases of anæmia occurring without any apparent cause thoroughly, and have tabulated the cases. In the appended table will be found a classified list of one year's out-patients (new letters) seen by me at Victoria Park Hospital, in which the numbers suffering from the chief affections are contrasted in parallel columns.

TABLE I.

A Classified List of a Year's Out-Patients.

	Anæmia.	Phthisis.	Bronchitis.	Dyspepsia.	Debility.	Morbus Cordis.		Other Affections.	Totals.
						Mitral.	Aortic.		
January . .	12	40	83	61	8	10	6 (16)	19	239
February .	14	32	77	37	3	8	4 (12)	17	192
March . .	14	35	85	31	2	5	4 (9)	18	194
April . . .	15	40	68	42	3	5	3 (8)	28	204
May . . .	17	40	74	75	6	5	5 (10)	24	246
June . . .	16	30	44	53	11	6	3 (9)	7	170
July . . .	12	37	50	45	6	3	1 (4)	16	170
August . .	4	12	11	11	...	...		2	40
September .	20	49	48	31	5	5	3 (8)	22	183
October . .	16	29	42	37	7	13	2 (15)	15	161
November .	10	34	71	32	14	7	2 (9)	10	180
December .	9	24	33	26	1	4	2 (6)	9	108
Totals . .	159	402	686	481	66	106		187	2087

It will be seen that out of a total of 2087 patients, about 160 were cases of anæmia, the proportion being about 8 per cent. These were chiefly cases of idiopathic anæmia, all those cases in which anæmia occurred coupled with some other affection, and they were many, being omitted.

The table was made with the idea, first of all, of finding out the ordinary proportion of cases of idiopathic anæmia among the other out-patients; and, secondly, to see whether time of year had any influence in increasing such a proportion; but it will be seen that the same proportion, or very nearly the same, was maintained throughout the year, with the exception that there were a few more than usual in June and September.

Next, as to the possible cause of the pallor and general bloodlessness.

Sex.—Nearly all the cases were females; and indeed, of 140, no less than 114 of which an account is given in Table II. were of that sex. The male cases and several doubtful ones were omitted, as there appeared to be a question as to whether some were not tubercular, or suffering from gastric ulcer, or what not.

Age.—More than half the cases occurred in girls of ages varying from 15 to 20; less than a third, *i.e.*, 41, in the next decade, and only 10 between 30 and 40. Thus most of the cases would come under the head of what is called chlorosis.

In a similar table of cases of anæmia kindly lent me by my colleague Dr. E. Clifford Beale, 81 out of a total of 91 cases seen in twelve months were of the female sex; 35 occurred in ages up to and including 20; 27 in ages from 20 to 30; and 16 between 30 and 40.

Occupation.—A very notable fact about this was the great number of the total number who had no occupation, that is to say, who lived at home. The patients at the hospital are, as a rule, of rather a better class than those at ordinary general hospitals, and of the whole number observed, very few could have their condition traced to their occupation. This will certainly accord with the experience of most, that chlorosis is a condition observed among the well-to-do classes; so that occupation can scarcely be termed, as it usually is termed, a strong exciting cause.

TABLE II.—Of Cases of Anæmia.

Age.	Total Cases.	Sex.	Occupation.	Loss of Flesh.	Catamenia.	Family History.	Bruits in	Remarks.
15	4	F.	3 at home; 1 at chemical work.	2	Amenorrhœa, 4.	None of consumption.	...	One under treatment twice in same year; all improved; one in three weeks.
16	11	F.	7 at home, 1 fitter; 1 boot-sewer; 1 servant; 1 dress-maker.	In none noted.	Frequent menstruation in 1; amenorrhœa in 4; scanty menstruation in 1.	In one, father died of consumption.	3	One patient three separate times under observation; three twice; all appeared to improve.
17	11	F.	3 at home; 1 machinist; 1 boot-fitter; 1 draper's assistant; 1 umbrella-maker; 1 dress-maker; 3 servants.	,,	Amenorrhœa, 4; scanty menstruation, 2.	One very bad; in a second, father died of consumption.	2	One under observation three times; three twice; improvement in all cases.
18	15	F.	6 at home; 1 servant; 1 dress-maker; 3 feather-workers; 1 printing office; 1 boot-fitter; 1 machinist; 1 waitress.	,,	Amenorrhœa, 3; scanty menstruation, 3.	...	1	One under treatment four times.
19	9	F.	3 at home; 1 boot-sewer; 1 dressmaker; 2 servants; 1 machinist; 1 waitress.	1	Amenorrhœa, 2; irregular menstruation, 1.	One patient's father died of consumption.	...	
20	13	F.	5 servants; 1 box-maker; 1 crapefolder; 2 tailors; 1 book-folder; 1 telegraphist; 1 machinist; 1 fur-worker.	...	Amenorrhœa, 2; irregular menstruation 1.	One patient's mother died of consumption.	2	Four under treatment twice.
15–20	63	...	...	...	...	...	...	
21	13	F.	4 at home; 2 milliners; 2 machinists; 1 chairmaker; 1 shop assistant; 1 teacher; 1 fur-sewer; 1 servant.	...	Amenorrhœa, 3; scanty menstruation, 2.	...	2	Three under treatment twice; one three times.
22	9	F.	5 servants; 1 tailor; 3 at home.	...	Amenorrhœa, 2; irregular menstruation, 3.	...	2	One under treatment three or four times.
23	4	F.	1 at home; 3 servants.	...	Scanty menstruation, 1.	Good.	1	
24–30	15	F.	6 married; 1 barmaid; 1 shop-assist.; 1 confect.; 1 ironer; 1 at home; 3 machinists.	...	Irregular menstruation, 2.	One bad.	2	
20–30	41	...	...	...	...	...	...	
30–40	10	F.	8 married; 1 charwoman; 1 housekeeper.	2	...	...	...	A woman æt. 32, with extremely rapid action of the heart, pulse over 200, suckling; one recovering from rheumatic fever.
							15[1]	

[1] In many cases a bruit of some description was observed; this number indicates those in which very loud murmurs were noted. Dr. Beale observed a basic murmur in 40 out of 91 cases, and an apex murmur in six cases.

Of the other causes most commonly given, viz., want of light, want of fresh air, late hours, and sedentary habits, all are more or less excluded in my cases, as it will be seen that if the majority have no laborious occupation and are well-to-do, there is not much likelihood of these causes acting to any marked degree; and indeed, of the other causes, such as uterine or menstrual disturbances, emotional affections, and the like, it will be admitted that some might predispose to the condition, but that it "is by no means clear that any of them can lay claim to being an exciting cause." *Want of appetite and unsuitable or insufficient diet,* however, were almost invariable symptoms, and appear to have been very possibly exciting causes. The most common derangement of appetite is absolute want of it, or a liking for sweets and pasty, coupled with a strong distaste for meat, a dislike to vegetables or a craving for pickles, spices, &c. As regards the statement of Watson that chlorotic girls "will eat cinders, eggshells, sealing-wax, slate-pencil, and such trash," it might be well believed, although probably hysteria would be found as a rule superadded to the former condition.

Two remarkable facts observed in the above cases, as also by nearly every authority on anæmia, are: (1.) That the patients almost always remain stout; do not waste, or even increase in weight; that the tone of their flesh remains firm, and that the skin is well filled out and smooth; (2.) that the patients, almost without exception, are improved by the administration of iron (the preparations employed in my cases being the citrate of iron and ammonium, the citrate of iron and quinine, tartarated iron, or a mixture of liq. strychniæ and perchloride of iron).

The only parallel disease in which health is quickly restored on the administration of a certain drug which supplies what the blood is found to lack is Scurvy, when citrate of potassium or similar salt speedily removes the disease. Now, in scurvy the want of fresh vegetables in the diet appears to be the exciting cause, so surely does the administration of certain salts restore the health. It appears that it was formerly thought that the iron administered as medicine in anæmia acted much in the same way as do the salts given in scurvy, from the following extract taken from Watson's "Principles and Practice of Physic," vol. i. p. 52, which epitomises Dr. Owen Rees' views:—

"The iron of the blood resides in the colouring matter dissolved in the liquid, which is enclosed in the colourless envelope of the corpuscles. The blood is fed by the chyle. The chyle, like the blood, separates, when removed from the body, into two parts, serum and crassamentum. The serum of the blood contains no iron; the serum of the chyle contains iron in abundance.

The crassamentum of the blood contains iron; that of the chyle only such a trace of it as may be accounted for by the adhering serum. Again, the specific gravity of the chyle is far below that of the liquor sanguinis. Hence, on the mingling of these fluids an endosmotic transmission of iron in solution will take place into the corpuscles. It follows that if the specific gravity of the liquor sanguinis be anyhow lowered, or that of the chyle much increased, the supply of iron to the corpuscles will be so far impaired."

Have we to do with so simple a condition of affairs in anæmia as in scurvy? Scarcely; because in anæmia the iron administered cannot act in so simple a manner as Dr. Rees suggested. It should be remembered that the iron of the blood exists built up into the molecule of hæmoglobin (or of the molecule of hæmatin, as has been suggested), and so cannot simply filter into the corpuscle, and remain there in the manner above described. In anæmia we have a diminution in the amount both absolute, and also in some cases—so, it is said—relative to the number of the coloured corpuscles, and with it also a diminution of the iron circulating in the blood.

Considering the condition of the tissues in anæmia with reference to the iron, it might be that with the same excretion of iron as in health a diminished ingestion of iron in the food would account for the diminished number of corpuscles produced by the corpuscle-producing tissue; in other words, to continue our account of the manufacture of coloured corpuscles, that the reason why the blood supplied to the organs and tissues concerned in this manufacture is insufficient to nourish it to the high degree necessary to maintain its corpuscle-producing function is, that it contains an insufficiency of iron, and such an idea certainly receives support from the improvement and actual increase in the number of corpuscles resulting during the administration of iron. This explanation of the good effect of iron is the one which, under some form or another, is received generally, and is good as far as it goes, but it appears hardly to cover the whole ground. In the first place, in anæmia the diminution of hæmoglobin in circulation seems to be too great to be accounted for by the supposition that the amount of the iron eliminated by the excreta is greater than that taken in by the food. The actual amount of hæmoglobin may be diminished from 13.5 grammes per cent. in health, to 8.3 grammes per cent. in chlorotic anæmia; and if that supposition were correct, there would be evidence of greatly increased elimination of iron in the sweat, urine, and fæces of anæmic patients; and until we have direct evidence that this is the case, it cannot be received as probable, especially as

there is constipation, as a rule, in this affection. I would suggest, therefore, that in these cases the iron is not actually eliminated from the body, but withdrawn from the circulation, the coloured corpuscles being broken down in a normal manner, but not renewed in sufficient numbers to keep up the due proportion of corpuscles in the blood.

In the growth of infants it would certainly appear that the coloured corpuscles derived their iron in part, at any rate, from some store in the tissues, possibly in the liver, as the total blood increases from about ½ lb. at birth to 2 lbs. in nine or ten months, and with the blood, the iron contained in it, the only source of ingested iron during those months being milk,[1] which contains the merest trace. In the case of the early meroblastic embryo, too, the hæmoglobin of the coloured corpuscles must derive its iron from the store iron contained in the yolk. If the newly-formed coloured corpuscles in the spleen and elsewhere normally obtain their iron in part from the remains of previous corpuscles which have been broken down and again used up by the gland tissue for the production of new ones, so that to the greatest extent the same iron is used over and over again for the same purpose, just in the same way as certain constituents of the bile appear to be used over and over again; then it will not be necessary to suppose that anæmia is due to insufficient ingestion of iron alone (which would be very difficult to prove), but that it is due to the insufficient supply to the corpuscle-forming tissue or organ of some other substance which ought to be taken in as food and supplied to it in the blood.

In order to maintain its healthy function protoplasm has need of all kinds of food, viz., of albuminous, fatty, starchy or saccharine, salts, and water. Anæmic girls are usually inclined to stoutness, and therefore evidently eat sufficient of carbohydrate, or of fatty food, or of both; and indeed we may generally find that their chief diet consists of tea, bread-and-butter, and pastry and sweets, but they avoid meat of all kinds and vegetables, such as cabbage. This would again appear to be explained by supposing that in meat and vegetables the iron of the food is principally contained, and in refusing meat they refuse iron; but, as above stated, the explanation would seem to be inadequate. Is it not rather that the malnutrition of the tissues is due to insufficient supply of albuminous food, and that as a

[1] According to the analysis of Mr. Dimmock, F.C.S., made for me in Professor Redwood's laboratory, cow's milk (average) contains .0078 per cent. of FeO; samples of London water a mere trace of iron; each yolk of fowl's egg contains about ½ gr. of $FeSO_4$ when the contained iron is estimated in that form.

consequence they are unable to obtain the iron from the already broken-up corpuscles? whereas when iron is administered in anæmia, it is carried to the corpuscle-producing tissue in a form more easily used by the tissues, and so more easily worked up into hæmoglobin than the store iron already in the tissue derived from the previous corpuscles. In anæmia from lactation, from purulent discharges, and the like, we have, however, actual proof of the drain of iron, contained as it is in the fluxes of these conditions. But even here we have also a greater drain of albuminous materials from the body, and thus it appears that the two factors are closely correlated, viz., the elimination of albuminous substances from the body and the elimination of iron and the ingestion (and digestion) of albuminous substances and the ingestion of iron. It seems scarcely likely that where both the albuminous principles of the food and the iron of the food are scanty that anæmia is due to the latter only, supposing elimination of iron not to be excessive; and again, that where there is enormous elimination of albuminous materials and a lesser but still abnormal elimination of iron, as in the case before noted of lactation, purulent discharges, or in Bright's disease, that the anæmia is due to the latter alone.

The gist of the matter appears to be this, that it is useless to depend upon the administration of iron *alone* in the treatment of idiopathic anæmia. Iron when given to these cases acts, as it were, as a stimulant to the corpuscle-producing tissues, and should not be depended upon for cure. With it should be exhibited albuminous foods, meat, eggs, milk, &c., while at the same time the digestion should be carefully looked after in order that these foods should really reach the tissues. One does not think of feeding a patient permanently upon stimulants.

And so if iron be depended upon for the cure when the medicine is left off, the same condition recurs, and hence we see so often anæmic patients return again and again to be treated. If the present view of the chemical nature of hæmoglobin be true, it is impossible to believe that iron acts in the manner it is ordinarily supposed to act in anæmia and chlorosis, and its administration ought to be looked upon as a temporary expedient. No doubt, light, good air, a quiet mind (although many anæmic patients are only too apathetic), together with the best general hygienic conditions, considerably increase the probability of permanent cure.

ON A CASE

IN WHICH

MILK WAS THE VEHICLE OF THE INFECTION OF SCARLET FEVER.

BY

S. D. DARBISHIRE, M.D.

In the spring of 1882 I had the opportunity of investigating the causes of a circumscribed outbreak of scarlet fever, which formed a small part of a far larger number of cases occurring in Oxford at that time, with the result that there was no doubt that the infection of the fever, in the group of cases which came under my notice, was carried in milk to the different houses.

The circumstances of the milk supply were these. Three cows were kept by those who sold the milk, and nine houses were supplied morning and evening; these nine houses containing eighty-five persons in all. From this it appears that the numbers are small, and in so far the conclusions drawn may be less convincing than if larger numbers were being dealt with; yet I think that, in some points at least, notwithstanding this drawback, the results are sufficiently interesting and important to deserve being recorded.

At the time that the circumstances under investigation took place, scarlet fever was almost epidemic. During the previous winter, and still in the spring, the number of cases in the town generally had been and were in excess of the average. Also just at that time, during this particular epidemic wave, sore throats were very prevalent (these sore throats were of an indifferent character, follicular tonsillitis and pharyngitis, with nothing specific in their nature).

The houses supplied with the suspected milk were all situated

in the same neighbourhood, but by no means close together, being separated from one another by wide intervals occupied by other houses. I made inquiries at twenty-two houses not supplied with this milk, chosen haphazard from the neighbourhood, with reference to the occurrence of any scarlet fever or throat disease during this time, with the following result: that in the twenty-two houses, containing 177 persons, there had been ten cases of more or less mild sore throat, no case of scarlet fever or diphtheria. Comparing this with the nine houses containing eighty-five persons, among whom there were eighteen cases of sore throat, many severe ones, two cases of diphtheria and ten cases of scarlet fever, it is evident that there must have been some special reason for this excess of disease, and that one had to do with some definite cause apart from the general atmospheric or endemic influence.

The drainage arrangements of the nine houses were, with one notable exception, of the same general character as the other houses in the neighbourhood, and may be safely considered as having no share in the origin of the disease. The house which constituted the exception was not connected with the sewers; all soil pipes and waste pipes emptied into cesspools under the house, and the earth around the cesspools was so saturated with liquid filth, that when, at a subsequent date, the pools were emptied by pumping on one day, they were found half full again on the next with sewage matter which had drained in from the surrounding earth. In this house there was one case of severe sore throat followed by pyæmia and death; the fatal termination being probably in great measure due to the mal-hygienic condition above described.

The nine households obtained their milk exclusively from the same source, with the exception of three, whose supply was supplemented from other purveyors, among whose customers, however, there turned out to be, on inquiry, no extraordinary number of cases of throat illness.

Now as to the milk supply itself, the three cows which produced the milk were kept in a paddock of about an acre in extent situated in the town, surrounded on three sides by houses, and separated on the fourth by a wall from an open space of considerable extent. They were fed on oilcake and hay and pastured on the paddock; they were out of doors all day and night, except in very inclement weather, and otherwise were only brought into the shippon for milking purposes. The cows were quite healthy; two of them came into milk in October 1881, one at the end of January 1882. One of them had had garget fifteen months ago, but was quite well at the time of inquiry.

The shippon was fairly well arranged and of average cleanliness; it might have been better, but there was nothing exceptionally bad about it. There was a pigstye adjoining it and a heap of decomposing manure a few yards from the door; not advisable adjuncts, but still often seen in yards from which good milk is sent out.

The water used for watering the cows was obtained from pumps, one, an old one, in the middle of the field, which delivered a wholesome water; another, lately sunk near the shippon, whose water contained a slight excess of chlorides, making it a suspicious drinking-water. The cows were tended by one man, who lived in a cottage at the bottom of the field with his wife and two children—a two-roomed cottage with a wash-house outside. I was informed that the milk-cans and utensils were always washed in the outhouse and afterwards hung up in the open air during the time they were not being used, and that they were never brought into either room of the cottage. I must here say that this was not strictly true on all occasions, for I saw the cans standing in the shippon at a time when no milking was being done; and I ought also to say that these inquiries were made some time after the events, and while various rumours were afloat, and blame was being attached to various people, the cowman among the number.

The milk was never stored, as there was generally barely enough at each milking for all the customers, and no milk was taken into the cowman's cottage except for the consumption of himself and his family.

So far there was no fault to find with the milk, and the only complaints which I heard among the customers were that it was sometimes watered.

Now in the house to which the cows and paddock belonged there was a case of diphtheria in a young lady, beginning on February 26. She was removed to the Infirmary on March 1. She had been in the habit of teaching at a Sunday-school in a part of the town where scarlet fever was known to be prevalent.

On March 3 I was called to see the child of the cowman. She was suffering from scarlet fever; the rash was out vividly on her legs and forearms, faded on the trunk; her throat was very sore with diphtheritic membrane on the tonsils.

This condition corresponded with what the mother told me, that the rash had appeared on February 28. The fever had therefore begun on the 27th. The child was immediately, on 3d of March, removed to the Local Board Hospital; the mother and the other child went out of Oxford altogether, and the cowman left his cottage to sleep in lodgings near, and only

came to attend to the garden, the care of the cows having been handed over to another man engaged for that purpose exclusively.

The cowman's other child must have had the fever when he was taken away on March 3, or at all events a few days afterwards, for he was brought back, March 24, suffering from uræmia and scarlatinous nephritis (he was desquamating at the time), and died March 26. The cottage was immediately (March 3) disinfected with sulphurous acid and thoroughly cleansed, whitewashed, &c. The cowman returned to his duties with the cows on March 11, and lived in the cottage.

So that I found that, from February 27 to March 3, there was a case of scarlet fever in the cowman's cottage; there was no attempt to isolate the case, and the whole cottage was practically infected. The case in the house of diphtheria, February 26, must be looked upon as a case introduced from outside, just as that of the cowman's child was; and it serves to point out that the infection from the neighbourhood was of a dual character, whether one considers scarlet fever and diphtheria as the same species of disease, or that the infection of each often travels together and thrives under similar circumstances.

Now, on looking at the dates of the occurrence of the cases of throat illness in the houses supplied with milk, it appears that no case occurred till March 10, on which day 2 cases of sore throat and 1 of scarlet fever occurred.

On March 11, 1 case of sore throat.

On March 12, 2 cases of sore throat and 1 of scarlet fever.

On March 13, 4 cases of sore throat and 2 of scarlet fever.

March 14, no cases.

On March 15, 1 sore throat and 1 scarlet fever.

March 16, 2 cases of sore throat, 1 of scarlet fever, and 1 of diphtheria.

On March 17, 1 case of sore throat.

March 18, 1 sore throat.

Then March 21, 22, 23, each 1 case of scarlet fever.

March 24, a sore throat.

March 25, a case of scarlet fever; and

March 27, a sore throat.

The cases of fever which began on the 21st and 23d were in the same house as one of the cases of March 13, and were almost certainly infected from that one. The case of the 22d was in the same house as the three other cases which occurred on the 13th, 15th, and 16th, and the case of the 25th was in a boy who had been with the case of March 13.

The general features of this sequence of events are these: that for six days after the source of infection in the cowman's cottage

was removed, no case of throat illness occurred. (In the term "throat illness" I mean to include scarlet fever, diphtheria, and simple sore throat.) From the 7th to the 15th day after that removal, there occurred 14 cases of sore throat, 6 cases of scarlet fever, and 1 case of diphtheria, or 22 cases of throat illness altogether. The remaining 4 cases of scarlet fever were, as I have suggested above, probably caught from some of the earlier cases, and the 2 cases of sore throat may have been independent of the milk supply, though it ought to be mentioned that the case of sore throat of March 27 occurred in a house to which the milk had been supplied up till the 26th, some days after it had been stopped at the other houses.

Arguing from these facts, it seems fairly certain that the illness in the various houses was connected with the case of scarlet fever in the cowman's cottage. This, the source of infection, was near to the starting-point of the milk supply for five days, from February 27 to March 3 inclusive, then followed six days of immunity, and on the 7th day after removal of the source of infection, there cropped up case after case of sore throat and scarlet fever. The six days' interval of immunity is in accordance with what is known of the incubation period of scarlet fever. Keeping all this before one's mind, it is impossible to disconnect the presence of the case of scarlet fever at the dairy from the cases of throat illness in the houses supplied with milk from it. Is it possible that the man himself could have been the means of carrying the infection round? I think not; for, among his other duties, he acted as odd man at the house to which the cows belonged, and used to carry coals every day into each room; and out of the 25 inmates, 18 of whom were between the ages of 17 and 23, only 4 had sore throats. There is nothing left to be the vehicle of infection but the milk. How the milk itself became infected during the five possible days while the child was ill at the cottage, it is not easy to say. The cans were said to be washed in the outhouse; but when I saw the outhouse, it did not look as if it had been used lately, and had the appearance of a tool-house or lumber-shed rather than of a wash-house; and when I visited the child on March 3, the mother was washing-up various articles in the dwelling-room.

The actual manner of the infection reaching the milk is a question which must be left open; at the same time it ought to be borne in mind that during those five days there was very free and direct communication between the milk and utensils and the cottage, which was thoroughly saturated with the infection of scarlet fever.

While surveying the general features of this circumscribed

epidemic, and considering the details of the individual cases, there are several points which seem to me sufficiently remarkable.

In the first place, on the one case of scarlet fever there follow 29 cases of throat illness among 85 persons using the milk. Of these 29 cases, 10 are scarlet fever, 1 diphtheria, and 18 cases of sore throat. Now, though it is quite possible, nay, even probable, that some of these cases formed a part of the general liability to sore throat which existed at the time, they cannot all be put down to that; and allowing 5 cases to have been due to general causes, which is the proportion calculated from the statistics collected from the 22 houses in the neighbourhood, there remain 13 still which may fairly be attributed to the scarlatinous infection. One often sees scarlatina and sore throats together in one house, but it is not often that one has the privilege, as in this case, of seeing them connected in a manner independent of contiguity, and only associated through the direct line of infection. It makes one think seriously whether many cases of sore throat, which the physician is apt to pass over as slight ailments, or which are, perhaps, not considered severe enough to consult a doctor about at all, are not really scarlet fever, and do not often act as the focus of infection, from which many serious and even fatal cases may arise.

Another very remarkable, and at the same time startling, observation which I made was this: that of the 10 cases of scarlet fever, 7 were not recognised at the time as being scarlet fever. Three of these 7 cases were not seen by a medical man; the mother noticed the rash, but as the children did not seem to be very ill, she did not seek advice. One of the 4 remaining cases was seen by a medical man, but not till three or four days after the illness began. The remaining 3 cases were under the observation of medical men who were in a large and varied general practice, and were perfectly well acquainted with the ordinary appearance of scarlet fever, and yet the disease was not detected.

Two of these cases were recognised afterwards by the desquamation of the skin, and one by acute nephritis. Of course, if these cases had occurred in a house in which other cases of scarlet fever were then or had lately been, they would have been recognised doubtless; but occurring alone and isolated, they escaped detection. This seems to point to one way at least in which scarlet fever becomes endemic in a district, there being so many cases which escape observation in the first instance.

The explanation of these facts seems to lie in the great diversity of the appearance and symptoms of scarlet fever. It is easy to recognise an ordinary case of the fever, but there are many cases in which the symptoms are so obscure, that, if they are seen

apart from other cases, or when not otherwise led up to, it is almost impossible to recognise them.

For instance, one case, not recognised at the time, was that of a lady who had given birth to a child ten days before. Her symptoms were sore throat, feverishness, no notable rash, and slight delirium at night, the whole lasting three or four days altogether. A few days later her baby, two weeks old, had a rash, which was not thought anything of at the time, but which was not at all unlike that of scarlet fever, and was followed by profuse desquamation. In the mother's case no desquamation was noticed, but on April 10, a little more than four weeks after her suspicious feverish attack, she was discovered to have acute desquamative nephritis. This patient left Oxford on March 16, and stayed with her mother and sisters at Hampstead. These all had sore throats, which in one of the sisters was followed by nephritis about four weeks later on. From the date of the occurrence of these secondary cases, especially of that which was followed by nephritis, it seems nearly certain that the infection was taken from the lady who came from Oxford during the nephritis, and not before.

Of the cases of scarlet fever it was to be observed that they were of very different degrees of severity, apart from the very variable character of the symptoms. One case, which ended fatally, was of a very malignant type; the fever was high and general prostration great; diphtheria followed, and pyæmia. Four of the primary cases were followed by nephritis; the other cases were of a benign character.

The cases of sore throat were characterised generally by their severity, and in some of the milder cases of the local throat affection by a disproportionate amount of constitutional disturbance and depression.

Now although, as I remarked at the beginning of this paper, the extent of this outbreak and the numbers affected were small, and the conclusions arrived at could not, therefore, have the dignity and certainty of the results of similar investigations on a larger scale; yet I think the circumstances, taken altogether, form a very vivid and truthful picture of one method at least by which the poison of scarlet fever can be, and undoubtedly often is, spread in our midst, and give a glimpse into the workshop of disease, such as we only too seldom have the opportunity of obtaining.

Note.—In illustration of what I said above, that the infection was taken during the nephritis, and not before, I may mention a a case in which it appeared as though it were the case that there

was a period during which scarlet fever was not infectious after desquamation had ceased, but followed by a nephritis, during which it again became capable of passing on the disease. Not perhaps that the case ever became altogether non-infectious, but that there was a time after the peeling had ceased to be noticed during which the infection was at all events less active, followed by a nephritis, when the infection became again more virulently active.

The case was this:—One child out of a family of four contracted scarlet fever, and was attended by her regular nurse, who had never had the fever, but, having disobeyed orders by nursing the child during the first night of her illness, was obliged to continue doing so, as she had to be considered infectious from that time. The other children, after an interval of nine days, being considered safe from that dose of the infection at all events, were removed to another house, and the child and nurse were left alone at home in a state of complete isolation. The case was a mild one, and the child had done peeling by the tenth day of the fever. On the twenty-fifth day the child was sick and appeared puffy under the eyes; the urine contained albumen and blood. On the twenty-seventh day the nurse sickened with the fever. So that she had escaped the infection all through the efflorescence and during the peeling, and it was only on the twenty-seventh day of the child's fever that she succumbed. On my asking her questions as to when she began to feel ill, she said she first felt nausea on the morning of the twenty-third day when she was pouring away the child's urine, which, she remarked, had a very peculiar and unusual smell; this day was probably the beginning of the child's nephritis, and as the nurse declared the rash on the twenty-seventh day, five days after she noticed the change in the child's urine, it is tolerably certain that she took in the infection when the child was suffering from nephritis. This seems to me to point to the probability of the proposition which I enunciated above being true, namely, that scarlet fever becomes infectious again during an attack of nephritis, or if it had never ceased actually to be infectious, that it acquires increased activity of infection during that complication. If this is in accordance with the universal experience of others, it forbids one to pronounce a case free from danger to others until all trace of the nephritic desquamation, if such an accident had happened, has vanished.

AURAL POLYPI.

BY

A. E. CUMBERBATCH.

Perhaps few patients are more neglected by the surgeon in general practice than those suffering from aural polypi. Nor is this surprising. The busy practitioner, after removing a polypus, finds his efforts to destroy its root attended with but scant success, and in disgust abandons further treatment. The failure is due partly to want of patience, partly to imperfect knowledge of the best methods of effecting a cure. Yet few cases of ear-disease will better repay treatment than those of aural polypi. A few words, therefore, on the treatment of these growths may be of service to those who have had little opportunity of studying ear-diseases, and less time for reading books on the subject. The writer must not, however, be understood to imply that the plan of treatment advocated is necessarily the best in all cases, but only that it has produced the most satisfactory results in his hands.

Aural polypi are developed in the course of chronic suppuration of the middle ear, or acute inflammation of the external auditory meatus. Most commonly they arise in the tympanic cavity; less frequently in the meatus; rarely from the membrana tympani. In the tympanic cavity they generally arise from the mucous membrane of its posterior half; in the external meatus, from the postero-superior wall, most often near the membrane.

They vary greatly in size, being sometimes so small (in the tympanic cavity) as to require the microscope for their demonstration, sometimes so large as to project beyond the meatus.

In colour they vary from the deepest red to a pale yellowish grey. The latter are smooth, the former often raspberry-like in appearance. They may be pedunculated or sessile.

In structure they are either mucous or fibrous, very rarely myxomatous, and covered with an epithelium, which varies greatly, but is generally ciliated, though not necessarily over its entire surface.

Aural polypi can only be confounded with malignant new growths when the latter spring from the tympanic cavity.

If the malignant growth is recent, it is not possible to make a certain diagnosis at first, but its rapid return after removal, the readiness with which it bleeds, the microscopic examination, and, later, the infiltration of the neighbouring glands, will eventually render the diagnosis easy. Before proceeding to remove a polypus, its point of attachment should, if possible, be ascertained. If the growth be small, this can easily be done ; but if of large size, some care may be required to determine this.

A blunt-pointed probe carefully introduced into the meatus, and swept round the tumour, will meet with no obstruction when the polypus arises in the tympanic cavity, but will be stopped at its point of attachment if growing from the meatus. In the former case also the polypus is more freely movable than in the latter.

Treatment.

I.—*Polypi Growing from the Tympanic Cavity.*

When the tumour is large, firm, and of a greyish colour, it is best removed by means of a pair of small dressing forceps. Fixing the patient's head, seize the tumour, and keeping the blades of the forceps firmly applied with the left hand, with the right rotate the instrument till the tumour is twisted off at its root. Care must be taken that the patient does not suddenly withdraw his head, else there is danger of bringing away the ossicles with the growth.

When the polypus is large but soft, it is best removed by Wilde's modified snare. The most satisfactory wire to use, on the whole, is fine iron wire. Making a loop of the requisite size, and bending it at an angle to the point of the instrument, introduce the largest size speculum possible into the meatus, and passing the snare through it, insinuate the loop of wire over the polypus, and cut it off. Sometimes the base of the tumour is so tough that the wire fails to sever it completely. If so, rotate the instrument a few times, and make very gentle traction. If this still fails to bring away the tumour, cut the wire close to the meatus, and leave it there. In a day or two the tumour will slough. This is a better plan than bearing too forcibly on the bar of the snare, thus probably breaking the wire. Till practice has taught the operator how far to introduce the snare, he must

be careful not to do so too deeply, otherwise he exposes the patient to two dangers: the first, that of injuring the membrana tympani; the second, that of passing the wire into the tympanic cavity when there is a large perforation present, and including the malleus in the loop. These risks can be easily avoided by removing the tumour in several pieces.

The subsequent bleeding is readily stopped by syringing the ear with warm water, and then pressing a plug of absorbent wool firmly against the stump, which should be touched with a saturated solution of chromic acid, when the bleeding has ceased.

The chromic acid should be applied four or five times, with a small piece of absorbent wool wrapped round the points of a fine pair of forceps or roughened probe, and kept in contact with the stump from ten to fifteen seconds at each application. This is to be repeated every fourth or fifth day.

In addition, the patient should be instructed to syringe the ear with warm water night and morning, and, after drying the meatus with a handkerchief, to incline his head, and instil a lotion consisting of 10 grains of boracic acid to 1 ounce of absolute alcohol. This should remain in the ear from five to twenty minutes; the longer the better.

If the lotion cause much pain, which occasionally happens, it may be diluted somewhat at first. Equal parts of liq. plumbi sub acetatis and absolute alcohol answer equally well as a lotion, but unless care be taken to syringe the ear thoroughly, the lead adheres to the stump, and thus interferes with the application of the chromic acid. Under this treatment the root of the polypus slowly shrinks, and finally disappears; the discharge ceases, and, if the edges be not callous, the perforation in the membrana tympani closes.[1]

The time required for a cure varies greatly; speaking generally, from a few weeks to several months.

In few cases will treatment fail to effect a cure; but failure will occur—first, where the polypus springs from diseased bone, unless this can be removed; secondly, where it has existed for a very long time; thirdly, where the whole of the tympanic mucous membrane has been converted into a mass of polypoid granulations; and, lastly, in advanced phthisis.

II.—*Polypi Growing from the External Auditory Meatus.*

These are readily extracted with a fine pair of urethral forceps, or, if of large size, can be removed by the snare.

[1] The galvanic cautery is more expeditious than chromic acid for destroying the stumps of a polypus, but is not very safe if unskilfully used, and the battery is very troublesome to keep in order.

The subsequent treatment is the same as that already given.

Polypi arising in the tympanic cavity, and only projecting a little beyond the membrana tympani, and those arising from the membrane itself, should be treated by the application of chromic acid, and the lotions before mentioned, without any attempt at removal, as the operation is a difficult and painful one, even in the hands of an expert. In operating on children and nervous persons an anæsthetic is necessary. The following two cases are good illustrations respectively of success and failure in treatment:—

Alice B. was seen at the aural department of the hospital on August 12. She states that she has had a discharge from the left ear for several years. It arose in the course of a severe cold and sore throat. About a week previous to coming to the hospital, she had great pain in the ear, followed by a cessation of the discharge. The pain has now subsided, but the discharge has returned. On examination, the meatus is found somewhat narrowed by œdema, and rather tender. At the upper and back part of the passage a bulging exists, and on cleansing the ear, a small polypus is seen springing from its apex. These almost entirely obscure the view of the membrana tympani; the diagnostic tube, however, indicates that the membrane is perforated.

A saturated solution of chromic acid was applied, and a lotion of boracic acid and alcohol (10 grs. ad ℥i.) was given, to be used night and morning.

August 15.—Has had a great deal of pain the last forty-eight hours. The meatus is so narrowed that it is impossible to obtain a satisfactory view. Ordered to foment with a hot sponge frequently, and to drop into the ear lotio. plumbi cum opio. of the hospital pharmacopœia.

August 19.—Œdema of meatus has subsided; no pain; polypus smaller. This was again touched with chromic acid, and the original lotion ordered to be resumed.

Under the application of the chromic acid twice weekly, the polypus almost disappeared, and only a small red point indicated the site of the growth. A large perforation at the upper and back part of the membrana tympani was then discovered, and a sessile polypus in the tympanic cavity not quite reaching to the level of the membrane. This was also touched with chromic acid once a week.

September 19.—Polypus rising in the meatus gone, that in the tympanic cavity much smaller; discharge less. Ordered to continue the lotion and return on October 21.

On that date the ear presented the following appearance:—All discharge had ceased; a small irregular ridge (probably bony)

showed where the growth in the meatus had been, and a white depressed scar closed the former perforation in the membrane.

Miss P—— was seen November 15. She states that she has had a discharge from the left ear for two years and a half, during which time she has been gradually becoming deafer. On examination the right meatus was found obstructed with wax, on removing which, normal hearing was restored to that ear. In the left meatus was seen a soft polypus of pinkish hue, which, on removal, was found to have escaped from the tympanic cavity, through the upper and anterior part of the membrane. Chromic acid was applied to the pedicle, and boracic acid and alcohol lotion ordered. The chromic acid was only applied once a week, owing to the distance at which the patient lived.

December 14.—No sign of polypus, but the discharge still continues. Instead of the lotion, she was told to blow powdered alum into the meatus once a day.

January 12.—Discharge less; slight return of the polypus. This was again touched with chromic acid.

January 15.—Discharge the same. Stump of polypus still visible. Ordered powdered boracic acid in place of the alum. This not proving satisfactory, lotions of borax and zinc, alcohol with and without liq. plumbi subacetatis, were used, and liq. ferri perchloridi was applied to the stump, but without success.

On February 5 the patient was anæsthetised, and a probe passed through the perforation into the tympanic cavity. Roughened bone was felt at its upper and anterior part. As this gave no sign of being loose, nothing further was attempted. Thus matters remain. The stump of the polypus can readily be destroyed for the time being, but, if left alone, soon begins to grow. As it is impossible to ascertain the extent of diseased bone, and as, moreover, the hearing power, tested by the watch, has increased from ½ inch to 14 inches, the writer is not inclined to attempt an operation, but prefers to leave it to time for the dead bone to be cast off.

ON PERICARDIAL EFFUSION.

BY

THOMAS W. SHORE, M.B.

I am indebted to Dr. Gee for his courtesy in allowing me to publish the following cases, and for the kind assistance he has given me in preparing this paper by supplying references to authorities on the area of cardiac dulness in pericardial effusion.

I publish this paper because pericardial effusion is a condition not always easy to diagnose, and to raise the question of exploratory puncture in cases of doubt.

J. H., aged 15, a marble polisher, was admitted to Luke Ward on August 9, 1884.

He stated that he had been short of breath all his life, and could not run about or sustain much exertion.

He had never had rheumatic fever.

He had scarlet fever when a child, but had no other illness.

He stated that he had been ill about one week, his illness beginning acutely with pains in the abdomen and chest, headache, shivering, and giddiness. He did not vomit, and had not done so since he was taken ill.

Four days before admission he began to cough, and his shortness of breath became worse.

His bowels had been open regularly, and he had had no diarrhœa.

His mother stated that a few days before he was taken ill, a painful lump was noticed in his left axilla, following upon a bad sore on one finger of the left hand.

He had not complained of any pains in any of the joints.

On admission, on August 9, the patient's condition was as follows:—

He was fairly well nourished; his face was dusky and somewhat livid; he had considerable dyspnœa; there was no stridor or stertor; the alæ nasi were in action. The temperature was

100.2°; the pulse was small, irregular, and intermittent. He had an enlarged and inflamed gland in the left axilla.

Chest had the general shape and appearance which one usually associates with emphysema. Over both lungs anteriorly and posteriorly the percussion note was not good, but there was no absolute dulness, and only general sonoro-sibilant râle was to be heard.

The heart's apex-beat was not to be felt; the sounds were faint, and no murmur or friction was heard.

Abdomen was rather full. The spleen was not palpable. The liver could be felt nearly down to the level of the umbilicus. There was no ascites.

The urine was of sp.gr. 1035, acid, contained no albumen.

The legs were not œdematous; the skin was somewhat congested.

There was no dilatation or pulsation of the veins of the neck. He had no clubbing or marked congestion of the fingers, and no difference between the radial pulses of the two sides.

Aug. 10.—Temperature 101.2°. He had much dyspnœa. He coughed and expectorated a small quantity of rather viscid mucus. The pulse was very irregular and intermittent. The patient had complained of much abdominal pain during last night, and he appeared to have least pain and dyspnœa when lying on his right side.

Aug. 11.—Temperature last night 101.2°; this morning 100.8°; dyspnœa as before. Bowels had acted twice. The stools were loose and yellowish.

Aug. 13.—The heart-sounds were inaudible; pulse was intermittent and irregular. He had much dyspnœa, and some lividity of the face and extremities. There was no opisthotonos.

Aug. 13.—Much dyspnœa and lividity; coughed a good deal, and expectorated some mucus.

The area of cardiac dulness was increased upwards to the second rib on the left side, and extended about two fingers' breadth to the right of the sternum. The apex-beat was not palpable. The heart-sounds were very faint. Down the sternum there was to be heard occasionally *a rough friction sound*, not of respiratory rhythm. Over both lungs, anteriorly and posteriorly, there was much sonoro-sibilant râle. The liver was palpable down to the level of the umbilicus, He had some diarrhœa. The quantity of urine passed in twenty-four hours was one pint. Ten minims of tinct. digitalis every four hours were prescribed.

Aug. 14.—Friction sound not heard; urine three-fourths of a pint.

Aug. 15.—Delirious at night; had much dyspnœa. Coughed

a little. Cardiac dulness extends to the right nipple; no friction heard; only very faint heart-sounds.

Aug. 16.—No marked change. Tincture of digitalis increased to 15 minims every four hours.

Aug. 19.—Since the last note he had continued in much the same condition. Temperature ranging from 99° to 101°; urine averaging a pint daily; dyspnœa rather less; heart-sounds heard somewhat better. Cardiac dulness occupied about the same area; no apex-beat palpable; pulse had the same irregular character. Five grains of citrate of caffein every four hours were prescribed in place of tincture of digitalis.

Aug. 22.—No marked improvement. Citrate of caffein increased to 8 grains every four hours.

Aug. 24.—Less dyspnœa; no lividity. Urine averaging now 4 to 5 pints daily; no albumin in the urine; generally better since the increased dose of citrate of caffein. The gland in the axilla is now suppurating and discharging.

Aug. 26.—Citrate of caffein diminished to 5 grains three times daily.

Aug. 31.—There is less sonoro-sibilant râle in the lungs; dyspnœa more; no lividity; physical signs in connection with the heart about the same.

Sept. 1.—More dyspnœa, especially at night, and when lying in any position except on the right side; gland in axilla now healed up; heart-sounds inaudible.

Sept. 3.—Much dyspnœa; inspiratory recession of lower parts of the chest; no stridor. Percussion note over right lung posteriorly was somewhat impaired, and the breathing sounds were weak at the base; a few sonoro-sibilant râles heard over both lungs, especially at right base; liver much depressed: area of dulness in front of chest was very large. In the line of the anterior fold of the left axilla it was at the level of the seventh rib. From that point its upper margin extended in a curved line, passing just to the left of the left nipple till it reached the sternum at about the level of the lower border of the second rib. From that point the upper margin passed in a curved line to the right, just to the right of the right nipple, till in the line of the anterior fold of the right axilla it was at the level of the seventh rib, and in the mid-axillary line on the right side it met the upper margin of the liver-dulness at the level of the eighth rib. Its form was pyramidal, with the apex at the manubrium. The heart-sounds were faintly audible; no apex-beat to be felt, even when patient lies well over on his face. At the margins of the dull area in front of chest was heard some sonoro-sibilant râle.

Sept. 6.—Dyspnœa increasing; some slight lividity; physical signs in chest much the same as before.

Sept. 8.—Dyspnœa more; lividity now much more marked.

Sept. 10.—Dyspnœa and lividity more; especially troublesome at night and on lying back; patient prefers to lie on right side.

Sept. 12.—More dyspnœa and lividity; pulse and physical signs as before, except that the breathing sounds were not heard so well on the right side.

A consultation being held as to the desirability of making an exploratory incision or puncture in the cardiac region, it was decided to wait till the next day.

Sept. 13.—Dyspnœa and lividity more. The patient now looked extremely ill, and could scarcely rest in any position. Physical signs as on September 3.

A second consultation being held, it was resolved to make an exploratory incision in the cardiac region. This was done by Mr. Willett under chloroform; an incision was made in the fourth left intercostal space about one inch to the left of the sternum, and just as the chest wall had been perforated and serum had begun to flow out, the patient ceased to breathe and died.

Post-mortem examination (forty-four hours after death).—The incision in the chest wall was in the fourth left intercostal space, about one inch to the left of the sternum, and opened into the left pleura, which contained about 1½ pints of clear serum. The right pleura contained about the same quantity.

Occupying the greater part of the front of the chest, and extending backwards nearly to the vertebral column, was the enormously distended pericardium. It corresponded in shape and situation nearly to the area of dulness mapped out during life.

The outer surface of each pleura was adherent to the outer wall of the pericardium, and the left lung was adherent to its pleura internally, but not to the chest wall.

On incising the pericardium, two pints of clear serum were let out. The parietal part of the pericardium was much thickened with inflammatory deposit, a very thick layer of which covered the whole heart.

The heart was not dilated, and all its valves were healthy.

The liver was much depressed, and the peritoneal cavity contained a little serum.

The points of interest in this case are the physical signs which were associated with a large pericardial effusion, and the questions of diagnosis which arose in consequence.

The physical signs usually present in cases of pericardial effusion are:—

1. Some displacement of the *seat* of the heart's apex-beat, usually upwards and to the left.

2. Some change in the *force* of the apex-beat. It is often weak, but rarely entirely absent, and can usually be felt well on leaning the patient forwards.

3. The cardiac impulse is often diffused over the cardiac area.

4. The precordial dulness often extends to the *left* of the seat of the apex-beat. This is considered to be pathognomonic.

5. The cardiac sounds are usually well heard, though they may be weaker than natural.

6. The area of cardiac dulness is enlarged. The area of dulness depends upon the size of the effusion and upon the amount of retraction of the lungs which takes place in consequence. Upon the shape of the area of dulness in pericardial effusion authorities differ. The views of Skoda are those usually accepted. The collection of fluid first takes place at the base of the heart, and the loose pericardial sac in this region is first distended, so that the first increase of dulness is upwards vertically; the subsequent increase takes place laterally, so that the dulness extends to the left of the apex-beat, and to the right of the sternum; and with a large effusion the area of dulness is *triangular* with the apex *upwards*.

According to Stoffella, the first increase of dulness is at the base and vertical. Then lateral extension occurs at the base, and the dulness tends to become triangular with the base *upwards* and the squared apex downwards. With a still larger effusion the whole pericardial sac becomes distended, and the area of dulness becomes triangular with the base *downwards*.

Dr. Gibson, in "Reynold's System of Medicine," says that the fluid collects in the lower part of the pericardial sac, and that the area of dulness when the effusion is large is pear-shaped or pyramidal.

Da Costa states that the shape of the dulness is pyramidal, and Dr. Flint that it is pyriform.

Dr. Rotch of Boston has made some experiments by injecting fluid into the pericardial sac post-mortem, and has found that the increase of dulness, with a small collection of fluid, is *laterally*, and not vertically; and that with a large collection the dulness, though it distends the sac chiefly laterally, does so vertically also. He then compares his results with the opinions generally held as to the area of dulness in dilated heart, and thinks that more stress should be laid upon finding dulness in

some particular place, rather than on the shape of the dulness. He considers dulness to percussion in the fifth right intercostal space, about an inch from the sternum, to be diagnostic of pericardial effusion.

The objections to the experiments of Dr. Rotch are, that the fluid injected was melted cocoa-butter, which would soon solidify, and not therefore obey the laws of fluids; and that he injected the lower part of the pericardial sac and not the upper part, and therefore the first collection of fluid in his experiments would necessarily be in the lowest parts and laterally. In percussing fifty normal chests, I found absolute dulness to percussion in the fifth right intercostal space in four, relative dulness in twenty-one, and good resonance in twenty-five; so that it appears that the test recommended by Dr. Rotch is not a certain one.

In the case described above, the area of dulness in pericardial effusion of large size was pyriform with the apex upwards, and in two other cases, to be related in the sequel, the area of dulness was more or less triangular with the apex upwards. In all the cases I have seen with undoubted large pericardial effusion, the area of dulness had the form ascribed to it by Skoda.

We know that liquids are good conductors of sound, and bronchial breathing is often well heard over a pleural effusion. One would therefore expect, on physical principles, that the heart-sounds would be well heard in pericardial effusion, and so they are as a rule. But it appears from the case just related that the cardiac sounds may be so badly conducted as to be barely audible, and the case seems to show that this occurs when the effusion is large. This probably is dependent on two causes: (1) the thickness of the layer of fluid through which the sounds have to be conducted, for fluid, though a good conductor, is not so good a one as solids; (2) the feebleness of the heart's action, brought about as a direct result of the size of the effusion. The latter, I think, was the chief cause in the case of J. H., for his pulse was always feeble, irregular, and intermittent.

The fact that there was no cardiac impulse in the case of J. H. is to be explained in the same way, and the absence of any impulse, even when the patient was turned on his face, was probably dependent on the extent of the effusion.

The diagnosis in this case rested between (1) pericardial effusion; (2) dilated heart; (3) some mediastinal growth, including abscess, lying partially in front of the heart; (4) a localised pleural effusion.

Dilated heart was extremely improbable. I do not know of any recorded instance of dilated heart, not covered by lung, in

which the apex-beat was not to be felt; and the area of dulness in this case had scarcely the shape of dilatation of the heart. Moreover, the history was that of an acute illness and the patient was slightly febrile; and acute dilatation of the heart, though it does sometimes occur in young subjects, is a rare affection; and, lastly, on one occasion there was heard a rough friction-sound over the sternum, not of respiratory rhythm, and though this was heard on one day only, it could not be explained on any other hypothesis than that of pericarditis with a large effusion.

Next, as to mediastinal growth, the age of the patient rendered any new growth, other than abscess, extremely unlikely. There was some ground for entertaining the idea of abscess. His illness had begun acutely; there was some elevation of temperature. Just prior to his illness the patient had had a wound on one finger of the left hand; a gland had inflamed and subsequently suppurated in the left axilla, and the possibility of enlarged mediastinal glands, which had gone on to suppuration and abscess, was therefore entertained.

The objections to this view were that the physical signs were almost as marked on admission as on the day of death, and a large abscess would have taken more time to form than a week or ten days; secondly, the temperature was not of the hectic character; and, thirdly, there was no œdema of the surface, such as one usually sees in cases of deep-seated suppuration.

Lastly, a pleural effusion localised to the cardiac region is rare; nor would such an effusion in the left pleura have explained the extensive dulness to the right of the sternum; and if there had been a localised effusion in the right pleura giving rise to dulness continuous with the cardiac dulness, one could not explain the absence of the apex-beat and the extremely weak heart-sounds.

By a process of exclusion, then, the diagnosis of pericardial effusion was rendered highly probable, and the fact of a friction-sound having been heard on one occasion strongly confirmed this.

In connection with this case Dr. Gee has kindly lent me the notes of another case, which was under his care at the Children's Hospital in 1875, of which the following is an abstract:—

The patient was a girl, aged 2 years and 4 months. She was taken ill on July 2, 1875, with symptoms of fever. She continued to be feverish, with rapid breathing and slight cough, till admission on July 9. She then presented the symptoms and physical signs of pneumonia of the upper lobe of the right lung. The heart's apex-beat was not very distinct, and the cardiac sounds were natural. The physical signs in the chest continued as before, with the addition of coarse crepitation at the right

apex, till July 14, when the following physical signs were noted in the cardiac region :—The apex-beat could not be felt. The right margin of the cardiac dulness was not definable on account of the dulness over the upper lobe of the right lung. Its upper margin extended to the third interspace. There was no distinct dulness to the left of the left nipple. Within the left nipple, and from there to the sternum, there was a loud friction-sound, which, close to the sternum, was undoubtedly of cardiac rhythm. The cardiac sounds were not well heard.

The spleen could be well felt below the margin of the false ribs.

On July 15, the apex-beat was not palpable. The cardiac dulness did not extend above the third rib on the left side, nor beyond the left nipple; and to the right dulness was marked for two fingers' breadth to the right of the sternum.

On July 16, the temperature, which till then had ranged between 100.4° and 103.2°, had fallen to 98.4°, but the patient's distress continued.

On July 17, the temperature still kept about normal, but there was no corresponding general improvement in symptoms. The apex-beat could not be felt. There was some impairment to percussion in the second left intercostal space, but the absolute dulness began in the third space. There was no dulness to the left of the left nipple. The sternum was dull, and the dulness at the right upper lobe of the lung was strikingly more marked inside the nipple line than outside it. The cardiac sounds were distant. They were heard just below the ensiform cartilage and within the left nipple, but not at all at the base or over the dull area to the right of the sternum. No friction. The liver and spleen were very distinctly palpable, being much depressed.

From this time the child's distress and dyspnœa continued to get worse. No further change in the physical signs was noted. The patient died on the morning of July 20.

Post-mortem examination (ten hours after death).—The dulness in front of the chest reached upwards on the left side to the first interspace; to the left it reached as far as the left nipple; to the right it was almost absolute to the right nipple. Beyond that it was comparatively resonant.

On removing the sternum, &c., the pericardium was seen to extend as high as the manubrium, and on each side as far as the junctions of the costal cartilages with the ribs. The outer surface was vascular. There were seven ounces of sero-purulent fluid in the pericardial sac, and there was fenestrated lymph and bands of lymph all over both surfaces.

The upper lobe of the right lung was pneumonic, the lower

and middle lobes being somewhat collapsed. There was also some collapse of the left lung and a little fine granular lymph on the left pleura, but no pneumonia.

The liver and spleen were much depressed.

The physical signs in this case were strikingly like those in the case of J. H., viz., absence of any palpable apex-beat, the large area of dulness to the right of the sternum, the considerable depression of the abdominal organs, liver, and spleen, and the extremely weak cardiac sounds.

A third case of pericardial effusion is that of A. B., aged 15, who was in Luke Ward at the same time as J. H.; and his case, which was diagnosed as a dilated heart with mitral disease, was found post-mortem to be such a case, but associated with pericardial effusion, which was not even suspected during life.

The patient had had rheumatic fever three years ago. He was admitted to Luke in March 1884. He was then slightly livid. There was no dyspnœa. The veins of the neck were enlarged and pulsating. The chest was prominent, but especially over the cardiac region. The antero-posterior measurement of the chest was increased. Heart's pulse heaving; apex-beat outside nipple-line in the sixth space; a systolic thrill at the apex; the percussion dulness reached above to the second space on the left side. To the right it extended to about half an inch inside the right nipple, and it had a triangular form with the apex upwards. There was a systolic murmur at the apex. The liver was much depressed.

He improved under treatment with diuretics, and was discharged relieved in about a fortnight.

He was readmitted to Luke on August 6, 1884, on account of dropsy, and dyspnœa, and cough.

He had much dyspnœa, cough, and expectoration of mucopurulent matter. He was livid. The veins of the neck were full and pulsating. He had physical signs of general bronchitis, and the physical signs on examination of the heart were very much as when he left the hospital in March. The area of dulness was the same; the heart-sounds were well heard; there was a loud systolic apex-murmur. The liver was depressed. No friction-sound heard.

For about one month after readmission the patient improved, the dropsy and bronchitis disappeared, and the heart's action was quieter.

About the middle of September the dropsy began to increase again, and attacks of intense precordial pain having the characters of angina pectoris began. These were relieved by nitrite of amyl.

During all this time there was no marked change in the cardiac physical signs; the dulness remained the same, and the murmur was well heard over the whole cardiac area.

The attacks of angina became more frequent on the 26th of September, and amyl nitrite did not always relieve them.

On the morning of the 27th of September a very bad attack of angina came on, and continued in spite of treatment till his death at 9.45 A.M.

Post-mortem examination.—On removing the anterior part of the chest walls, the pericardium was found to be distended so as to occupy nearly the whole of the front of the chest. On incising it, it was found to contain about a pint of clear serum. The pericardium itself was very dense and much thickened with fibrous tissue, apparently organised lymph, and its inner surface was quite smooth.

There was some fibrous tissue over the surface of the heart. The heart was dilated and hypertrophied, and the mitral valve was clearly incompetent, and was covered with vegetations. The tricuspid valve was also incompetent.

The liver was much depressed and beginning to be nutmeg.

The kidneys were hard and congested.

The question of puncture of the pericardium in cases of doubtful pericardial effusion is one of vast importance, and the three cases which I have related seem to me to raise this question in a very forcible manner; but I think that they are not sufficiently definite to enable one to lay down any hard and fast rules to guide one in the procedure.

Without attempting to lay too much stress on the point, I think the operation is justifiable for purposes of diagnosis when the physical signs are such as to render the presence of dilated heart improbable, and when the suspected effusion is obviously endangering the life of the patient.

The heart has been punctured in cases of suspected pericardial effusion with no ill effects, but, on the other hand, instant death has resulted in such a case.

Perhaps the day will come when exploratory puncture in the cardiac region by physicians of experience may be practised with as little danger to the patient as puncture of the pleura is at the present time.

GASTROSTOMY IN MALIGNANT DISEASE OF THE ŒSOPHAGUS.

BY

T. WHITEHEAD REID, Esq.

The treatment of cancerous obstruction of the œsophagus by permanent catheterism applies to cases seen at a far earlier stage than those now under consideration.

The retention of a flexible tube passed through the mouth beyond the seat of stricture should undoubtedly be tried in cases where the patient is able to swallow liquids at all; but too much caution cannot possibly be exercised in dealing with these cancerous strictures. A red rubber sound and the lightest of skilled surgical hands should alone be allowed; and should the patient be under the influence of an anæsthetic, far more care is required even than that exercised in the treatment of urethral strictures under similar conditions. The pericardium has been perforated, a bronchus entered, or a fatal septicæmia induced by the passage of hard bougies in even dexterous hands. One has seen post-mortem cases of ragged ulceration of the œsophagus, where, had a bougie been used, the result must have been traumatically fatal, and yet during life with no indication to lead one to suspect the existence of such extensive disease—cases where one would have dreaded to have employed catheterisation. Bronchial symptoms most certainly counter-indicate any attempts of the kind; but often discretion is better than counter-indications.

It may be true that no stricture is really impassable to the minutest whalebone bougies extant (half a millimetre in diameter), but it is certain that many cancerous occlusions of the œsophagus contain dangerous ulcerations in close proximity to vital parts peculiarly intolerant of the finest bougies. I would prefer to make a capillary puncture into the stomach itself to guiding a bougie through the wall of an ulcerated œsophagus.

The operation of gastrostomy has steadily grown in favour

since Mr. Howse so strongly advocated and successfully practised its division into two stages, and since Mr. Bryant insisted on a mere puncture with a tenotomy knife for opening the previously attached stomach.

From the time (1849) of Sédillot's first gastrostomy for cancer of the œsophagus till Mr. Cooper Forster performed the operation in England, the attempts to establish a permanent gastric fistula were peculiarly unfortunate; for beyond a certain amount of relief afforded for the remaining few days or hours of life, but little real good was done. Gradually the operation has been performed earlier, better methods have been employed, and antiseptic precautions taken, while progressively encouraging results have been obtained.

Those who have watched to the bitter end cases of complete obstruction of the gullet from disease, who have seen the pangs of insatiable thirst, and viewed the horrors of slow dying from starvation, cannot but rejoice that such need no longer be the inevitable termination of such cases. It is surely just as imperative on the surgeon to avert such a painful climax by a timely gastrostomy, as to perform tracheotomy for admission of air to a starved lung, or to do a colotomy for a bowel obstructed by disease.

The report by my friend Mr. C. B. Gabb (in the *Lancet* for April 14, 1877) of the gastrostomy performed by Callender on a case of cancer of the œsophagus shows well the after troubles and dangers of the old method of operating, as also the complications likely to arise from endeavours to pass bougies, especially in advanced cases and within too near a period of operating. Such attempts must, prior to the gastrostomy, court disaster, and after the operation, in malignant disease are unwarrantable. Though the power of swallowing frequently improves after the operation, the gastric fistula having once been established, feeding by the gullet should be discountenanced.

As now executed, the operation itself is neither so difficult nor so dangerous as was formerly supposed, and every consideration points to the advisability of a more frequent resort to it at a far earlier period; not as a last resource, nor as a mere matter of euthanasia, but as an undertaking full of encouragement for the prolongation of life and staying of the progress of disease by establishing a state of physiological rest for the part morbidly affected.

My friend Dr. Wilks of Ashford tells me he operated last autumn on a female patient, æt. 64 years, who had been rapidly emaciating. When he first saw her, she was only able to swallow a few drops of liquid at a time with great difficulty, and she also

had a bad cough. He made a semilunar incision below the margins of the left ribs, and reached the stomach without difficulty at the edge of the left rectus, where the fascia was exceedingly tough, so that he incised it vertically towards the umbilicus. He stitched the stomach with many separate stitches to the skin, and stitched up both incisions in the fascia, leaving a long suture in the wall of the stomach to steady it for the second operation. The wound was covered with a pad of boracic lint, wool, and bandage. The patient did well for four days, when the cough caused great pain at the site of the vertical incision in the fascia above mentioned, vomiting ensued, and the patient died five days after the operation.

At the post-mortem it was seen that the operation *per se* was quite successful; the stomach was firmly adherent to the skin everywhere; but a piece of omentum had become strangulated in the vertical incision in the fascia mentioned previously. There was no peritonitis generally, nor about the stomach, but only around the piece of omentum. The œsophagus was completely obstructed by a cancerous mass, which was very friable, and tore readily. This case would undoubtedly have been successful but for this unfortunate accident.

In the *Lancet* for November 3, 1883, I reported a successful case of gastrostomy performed for scirrhous stricture of the œsophagus in its lowest portion. This woman, æt. 43, after the operation gained, during the eleven weeks she was in the Kent and Canterbury Hospital, 16¾ lbs., and two months afterwards, when I saw her in Dr. Church's wards, having been transferred to St. Bartholomew's Hospital, she was quite plump and comfortable,—a wonderful contrast to the poor starved and wretched being I had admitted in a dying condition from the workhouse six months previously. By the operation she enjoyed life eight months longer than she otherwise could have done, and suffered a less painful death than that she had every prospect of.

The somewhat brief and necessarily imperfect account given at the time in the *Lancet* of this case, and the conviction, from the cases I have seen at the Canterbury hospital during the last seven years, that these poor sufferers might more often be relieved surgically, may warrant my mentioning these details of an operation now well recognised.

As a dresser of the late Mr. Callender during his first year of office as full surgeon, I strictly followed his teaching with regard to patients about to undergo a serious operation, by placing them for a few days prior to the operation under the same conditions as those which were to obtain after the operation.

Jane N. for four days prior to the first stage of the opera-

tion was placed in the small ward she was to occupy afterwards, with the same nurse to attend her; her urine was drawn off at regular intervals; she was fed entirely by the rectum with peptonised meat suppositories (50 grains in each), alternated (to avoid the thirst induced by the suppositories given alone) with peptonised beef-tea or milk; her temperature was taken regularly, and all her surroundings were similar to those which were to obtain after the operation and between its two stages. The result was, that though her temperature was 99.7° two days before the operation, it never went above 99.4° afterwards; and during the five days between the two stages she was quiet and composed, being well accustomed to her position, and apprehensive of no ill; the edges of the stomach consequently united to the wound by first intention, and the one dressing first applied remained on till this was accomplished.

On the fifth day the wall of the stomach was held up and punctured by a tenotomy knife; a No. 12 catheter was introduced into the viscus, and 5 oz. of peptonised beef-tea given to make sure all was right; but the rectal alimentation was continued as previously, and only very gradually withdrawn, the stomach being allowed by almost imperceptible steps to supplement the rectum; and even then for days all food was digested before it was injected into the viscus by means of a funnel tube and catheter.

The patient weighed 5 stones 6½ lbs. before the operation, having lost 1 lb. during the eight days she was waiting.

On the ninth day from the opening of the stomach she weighed 5 stones 8½ lbs., and was well enough to be shown to the members of the East Kent district of the South-Eastern branch of the British Medical Association. She enjoyed 14 oz. of peptonised beef-tea in their presence, but told them that peptonised milk-gruel was more agreeable to her stomach.

With regard to the operation itself, the patient was anæsthetised by bichloride of methylene from a Junker's apparatus, and no sickness occurred at the time, nor afterwards.

Antiseptic precautions were taken; a warmed weak carbolic spray, 1 in 60, being employed, and balls of absorbent cotton-wool wrung out of carbolic acid solution, 1 in 60, used instead of sponges.

The abdominal wound, nearly three inches in length, was made one finger's breadth from, and parallel to, the cartilages of the eighth and ninth ribs, and extended towards the tip of the tenth rib cartilage (a point always to be felt distinctly as a projection movable on the ninth cartilage, to which it is attached by a broad ligament).

Three small vessels only required ligature, and fine chromic

catgut was used for this purpose. The portion of the stomach selected was that which presented itself in the wound. No attempt was made to drag out the viscus or search for the cardiac end, as no importance was attached to the position of the opening beyond its future relation to the skin wound; and though it was imagined at the time that a portion of the anterior wall near its lesser curvature and not far from the œsophagus was secured, it proved eventually to be the centre of the greater curvature, rather nearer the pyloric than the cardiac end, that was actually fixed. A large vein had to be carefully avoided in passing the sutures through the surface of the organ.

The stomach was held in position by two carbolic silk ligatures, so passed as to avoid entering its mucous surface, which, from its looseness, there is really little fear of including, and a portion of the viscus about the size of a half-crown piece was attached to the skin wound, exclusive of the cut edges of the parietal peritoneum, by sixteen stout interrupted chromic catgut sutures, closely applied and passed in the same manner as the two silk ones. The edges of the skin wound were brought into apposition by five similar sutures. There was no tension nor dragging on the wound, but the parts were secured exactly in the position they were found when the abdomen was opened. The only trouble was the protrusion of the left lobe of the liver, which occurred on opening the peritoneal cavity and during inspiration; but this was kept well out of the wound by upward pressure of the finger of a colleague during the bringing of the skin edges together.

A small piece of protective covered the wound, which was dressed with three soft and warmed iodoform absorbent cotton-wool pads in absorbent cotton gauze, and over all the ordinary antiseptic dressing and bandages.

When all was healed, after the fifth day, the fistula lay well out of the way, protected by and under the costal cartilages.

There was never at any time any soreness from regurgitation of food, nor any digestion of the edges of the wound, nor escape of gastric juice, by reason of the smallness of the opening made into the stomach. This is a very important point so far as the comfort of the patient is concerned, and is very justly insisted on by Mr. Bryant.

As proved experimentally on a cadaver a few days before the operation, the incision planned came directly on to the stomach. There was consequently no searching for the stomach, no unnecessary disturbance of the natural relation of parts, and nothing but the viscus and the left lobe of the liver came into view. The stomach was not drawn out of the wound at all,

but secured *in situ;* consequently the parts all fell together naturally afterwards, so that there was no necessity for an outer ring of sutures including the peritoneum, as suggested by some operators.

For the subsequent history of this case I am indebted to Drs. Church, Moore, and West, and to Messrs. Bowlby and D'Arcy Power for allowing me to examine the specimen before it was put up for the Museum.

Extract from Faith Ward Book, vol. vi. p. 869 :—

Jane N., admitted August 3; died December 6, 1883.

On May 10 gastrostomy at Canterbury Hospital. For five months before that she had great difficulty in swallowing; no food returned, and she was much emaciated.

Still vomits a little watery fluid; no epigastric pain.

The opening is just where the outer border of the left rectus touches the margin of the ribs.

Nov. 18.—Tent in wound last night passed easily; expanded well; no pain in abdomen.

Nov. 29.—Cervical glands much enlarged on the right side; pain in hypochondriac region relieved by morphia.

Dec. 6.—Patient died of inanition; during the last few days of her life she expectorated great quantities of fœtid material.

Through the kindness of Dr. Norman Moore, I am able to give the following account of the post-mortem examination (Post-mortem Book, vol. x. p. 294) :—

Jane N., æt. 43, admitted August 3, 1883; died December 6, 1883, under Dr. Church; post-mortem December 7; Ward Faith. "Stricture of œsophagus;" body wasted; scar of gastrostomy; head not examined. Œsophagus normal to about two inches from stomach, then thickened and ulcerated; the growth stopped at the cardiac opening, not going into the stomach. Lungs: emphysematous; a few old tuberculous concretions. Heart: atheroma of mitral valves; left ventricle hypertrophied; right ventricle dilated; atheroma considerable at beginning of aorta. Stomach adherent to skin; slight adhesion to liver. Kidneys: rather small; capsule adherent; surface granular; cortex cloudy and coarse. Organs of generation: small polypus on fundus uteri.

I am indebted to the courtesy of Mr. D'Arcy Power for the following description of the specimen, which he has placed in the Museum :—

Series XV., No. 1846B.—"Œsophagus and stomach from a case of cancer of the œsophagus in which gastrostomy was performed eight months before death.

"The œsophagus is narrowed and ulcerated for a distance of $3\frac{1}{2}$

inches above its cardiac extremity; the ulceration has commenced at a point opposite the bifurcation of the trachea, and has extended downwards. It has not invaded the stomach. The ulceration at its upper part has perforated the walls of the œsophagus, and has exposed a bronchial gland, which appears as a black mark extending transversely across the tube. The stomach appears to be normal; the gastrostomy opening is situated at the lowest point in the greater curvature, midway between the cardiac and pyloric orifices, *i.e.*, about $8\frac{1}{2}$ inches from each.

"The skin, with its orifice, and a portion of the costal cartilages adherent by the results of old inflammation to the greater curvature of the stomach, are left *in situ*. The cancer is of the scirrhous type. There were no secondary growths; no glands were infiltrated."

In addition to these notes of the case, the observations of Dr. Church during the patient's five months' residence in St. Bartholomew's Hospital are interesting.

He says the operation was perfectly successful, as for many weeks she could fairly enjoy life. There was occasional difficulty in feeding her from contraction of the wound, but the insertion of a laminaria tent for a few hours always overcame the difficulty for some weeks. A No. 8 catheter was used for feeding; at times the passage of this was painful, but until a few days before death there was no tendency for food to run out of the wound. After I saw her, on October 1, 1883, at the hospital, Dr. Church said she began to complain of occasional pain about the epigastrium, and towards the end of October she began to be much troubled by a very nasty taste in her mouth, and the presence of much frothy ill-smelling expectoration; she began at the same time rapidly to lose flesh; the stomach then began to reject the food introduced into it, and she gradually sank and died without much suffering.

At the post-mortem it was noticed that the walls of the œsophagus at the stricture were about a quarter of an inch thick and that its mucous membrane was gone, and sloughing was going on in the mucous surface; there was no infiltration of neighbouring parts nor glands. The posterior and lower portion of one lung was gangrenous.

She really died of septicæmia from the absorption of putrilage from the cancerous œsophagus, and not from starvation.

A FEW CLINICAL OBSERVATIONS UPON THE ACTION OF PILOCARPIN.

BY

SAMUEL WEST, M.D.

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1. *Upon the Night-Sweats of Phthisis.*—I have recently been testing the action of this drug in many cases of phthisis at the Chest Hospital, Victoria Park. The remedy was administered in the evening in solution by the mouth, commencing with one-twelfth of a grain of the nitrate of pilocarpin. If, after a day or two's trial, this was not found sufficient, the dose was increased to one-sixth of a grain. In many cases the smaller dose was effectual. If a sixth of a grain was not enough, the drug was discontinued and some other remedy used.

The effect in some cases was very striking. The sleep-sweats stopped entirely, and continued absent as long as the medicine was taken. This result was, however, the exception; for, like most of these remedies, pilocarpin seemed to lose effect after a time; but the time varied greatly in different individuals. Idiosyncrasy greatly affected the action of the remedy. In healthy persons the administration of one-sixth, and in some of one-twelfth of a grain, produces perspiration in the course of a few minutes; but in night-sweats this initial perspiration is sometimes entirely absent, or so slight as not to be noticed by the patient; in others, slight sweating follows and lasts a few minutes, but the night-sweats are controlled. In others, again, the initial sweating is more abundant, but in them also the night-sweats do not occur. It is the exception in these cases for the ordinary proper sweating to be produced. Salivation was absent, or, if present, so slight as to cause no complaint.

My observations result in this conclusion, that although there

is no more certain remedy for night-sweats than atropia, still that pilocarpin is a fairly reliable drug, and that it is admissible where atropia is contra-indicated or not tolerated.

2. *In Bronchitis.*—In a few instances the drug has been used where the secretion was scanty and difficult to expectorate, and it was thought that a freer secretion would loosen the cough. In no case, however, did it appear really beneficial. The secretion was increased, but the difficulty in coughing and in breathing not lessened; and in two cases such troublesome salivation arose that the patients begged to have no more.

The experience of this remedy in bronchitis is, therefore, so far not encouraging.

3. *In Asthma.*—A lady of 63 years of age had suffered from chronic bronchitis for a period of about three years. At the early commencement of her illness, which was bronchitic, she suffered much from asthma, the paroxysms of which were very frequent and distressing. She tried many remedies, but the only really active drug was morphia, of which she took about one-third of a grain daily. As time went on, the bronchitis became the more prominent feature of the case, and the asthmatic paroxysms occurred with diminishing frequency. She developed, however, the morphia habit, and was constantly under its influence, although she took, it was true, only a small amount daily, about one-third of a grain, once, or at the most twice, in twenty-four hours. But even this small quantity was more than she could tolerate. She became feverish, irritable, and was constantly drowsy; and from time to time suffered from headache and uncontrollable vomiting, which seriously affected her nutrition. She was now with great difficulty persuaded to abandon the morphia, which she did abruptly and completely, under the promise that some other drug should be substituted. When her next paroxysm of asthma came on, I administered one-sixth of a grain of pilocarpin by the mouth. She was at the time in great distress, struggling for breath, and cyanosed. Her pulse was small, wiry, and irregular, and the artery greatly contracted. A few seconds after the administration of the dose the pulse was felt to become suddenly fuller and more regular and the artery to expand, and at the same time the patient exclaimed, "It is going." In a few minutes more she was in comparative comfort, and rapidly improved. In two or three subsequent attacks a similar effect was produced by the same dose. It was further remarkable that after this period the attacks of asthma became much less frequent, and that although the bronchitis did not greatly improve. This may suggest the possibility of coincidence; but on each of the occasions the effect was too marked to

be misinterpreted. With the exception of morphia, pilocarpin was the only effectual remedy, though the list of asthmatic drugs had been almost completely exhausted.

4. *In Renal Disease.*—In several cases of granular kidney I have used the drug with very great advantage, especially in the later stages. The most marked instance of its good effect occurred in a Dutchman, aged 46, a painter. His was a perfectly typical case of granular kidney. The patient was admitted for general failure of health and strength. With rest and iron he greatly improved, and after about six weeks left; but fourteen days later was readmitted in great suffering. The pain was chiefly precordial, and shortly after admission a very loud pericardial friction developed. The patient at the same time had great headache, and passed but little water. He recovered from the immediate effects of the pericarditis, but the chief symptoms which troubled him during the last portion of his life were headache and very great restlessness. These symptoms were always associated with and apparently caused by a great diminution in the amount of urine excreted.

On May 26, the notes run as follows:—This afternoon the patient was much worse; he had passed only 8 ounces of urine during the previous part of the day. A single dose of the pilocarpin mixture (= $\frac{1}{12}$th of a grain) was administered by the mouth, and as this did not seem to produce any effect, a double dose was given (gr. $\frac{1}{6}$) soon after. This caused copious sweating ten minutes after its administration. The patient passed 10 ounces of urine, and soon after fell asleep. Some nitrite of amyl had been previously given by inhalation, but without relief. The next day the same relief followed a similar dose. For the next fortnight the patient continued fairly well; but on June 7 he became much worse again. Patient in great distress to-day; has passed only 4 ounces of urine since last night (14 hours). Twitchings constant and well marked; pericardial friction less loud; pilocarpin (gr. $\frac{1}{4}$) was administered on account of great diminution in the amount of urine and restlessness. It produced sweating in about 15 minutes, and the patient passed shortly afterwards 15 ounces of urine, and was much relieved. Half an hour later he had half a drachm of cannabis indica, and slept then comfortably for three hours.

This treatment was pursued throughout when the symptoms mentioned arose, and always with very great benefit, the urine being increased, the pulse becoming softer, and the patient's restlessness diminishing, so that he fell asleep quietly. I can feel but little doubt that this drug was in the present case the

means of prolonging life for some weeks, and of rendering the patient's condition at any rate comparatively tolerable to himself.

5. *In Myxœdema.*—I have administered the drug to two patients suffering from this affection. In one the remedy could not be tolerated. It was a very marked case, in a woman æt. 36, and she complained of the medicine producing so much giddiness that it had to be discontinued. In the other, a woman æt. 46, it appeared to do great good. She took one-sixth of a grain three times a day for about two months. Up to that time she had been steadily getting worse, but with the commencement of this treatment she began to improve. The features became more distinct. She was, as she said, much more like herself; so much so, that she did not get herself photographed, as she had been instructed to do. Her speech was more distinct and her answers more ready; and the hair, which had completely fallen off, so that the scalp was quite bald, began to sprout afresh. The improvement, which dated from this treatment, has been maintained, and at the present time she is no longer a marked case of the disease. Her features have lost a very great deal of their puffiness, and the skin of her hands and arms is really thinner than usual. Her hair is now a couple of inches long and fairly thick.

This improvement may have been a coincidence, and be one of those periods of improvement which Sir W. Gull has described even without treatment; but I believe that so marked an improvement is very rare indeed, and it is remarkable that it it should be coincident exactly with the use of the remedy. Similar improvement has been described by other observers, in a few cases, as due to the use of this remedy.

6. *In Scleroderma.*—In the case described in the *Clinical Society's Transactions,* vol. xvi. p. 252, I gave pilocarpin regularly for some time, but it produced no amelioration. It was of interest that the subcutaneous injection produced the usual sweating over the few non-affected parts, but that the affected parts remained perfectly dry, even when one-fourth of a grain or more had been injected.

AN INQUIRY

INTO SOME OF THE

CONDITIONS OF ABDOMINAL OBSTRUCTION,

LEADING TO THE CONCLUSION THAT RUPTURE OF THE INTESTINAL WALL TENDS TO TAKE PLACE IN ONE PLACE AND IN A CERTAIN MANNER.[1]

BY

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The object of this paper is to show that certain results obtained in the course of experimental injection and inflation of the large intestines in the dead subject are in complete accordance with the view now generally held, that, in cases of abdominal obstruction, the cæcum is the spot at which the chief strain of the obstruction is expressed, and that it is the cæcum which most usually gives way. The question of how far experiments made on the dead subject are applicable to the living, as forming the subject of a larger inquiry, will be dealt with on a future occasion, and those points arising in the course of the experiments here related which may be fairly included under this head will also be reserved for future consideration. The following extracts from various authorities may be considered as proving that the general consensus of opinion is in favour of the view above expressed.

Mr. Arthur Durham, in an article[2] on "Obstruction from Constriction," remarks: "It is worthy of note that even in cases in which the seat of constriction is in the sigmoid flexure or rectum, the greatest fæcal accumulation and corresponding discomfort are observed in the cæcum."

[1] This paper was read as a Graduation Thesis for the M.B. degree at Cambridge.
[2] Art. "Intestinal Obstruction," Dict. Medicine, ed. R. Quain, London, 1883.

Mr. Henry Morris thus describes[1] the results of a post-mortem examination in a case of epithelioma of the colon:—

"The cæcum was flaccid, but of large size. Its peritoneal surface greyish-black in colour. There was no actual perforation though the muscular coat was exposed. The cæcum, as is usual, was the spot at which the chief strain of the obstruction was expressed."

Dr. Stephen Mackenzie remarks,[2] after recounting a case of annular stricture, "It is the cæcum, as pointed out by Dr. Bristowe,[3] that usually gives way."

Before proceeding to narrate the experiments made and the results sought to be deduced from them, it will be useful to explain why the subject of injections was investigated, and what was the original aim and extent of the inquiry, a portion only of which is dealt with in this paper. These questions may be shortly answered as follows:—The use of large injections in cases of abdominal obstruction is well known to be attended with certain risks. It was in the hope of establishing some definite rule of practice that would either remove entirely or greatly modify these risks, that injections were made the subject of an experimental inquiry.

An opportunity for watching the treatment of two acute cases of abdominal obstruction by means of large enemata occurred in the wards of St. Bartholomew's Hospital in 1881. These cases were under the care of Dr. Andrew, and were reported by Dr. King in the St. Bartholomew's Hospital Reports[4] of that year. It will suffice for the present purpose to mention that the enemata of olive-oil employed were administered by means of an ordinary double-action stomach-pump, and that the largest amount injected on any occasion was five pints.[5]

It appeared at the time that it would have been of material assistance in these cases to have had some definite rule of practice with regard to the quantity of fluid it is safe to inject into the bowels, and the pressure at which such injection can be safely carried on. Now, the question of quantity evidently depends not only upon the average contents of the large intestines, but upon how far the fluid injected will penetrate; that is to say, upon whether it can pass through the ileo-cæcal valve or not. This disputed question will not be dealt with at length here, as

[1] British Medical Journal (961), May 31, 1879. [2] Ibid.

[3] Dr. Bristowe, Theory and Practice of Medicine, 4th ed., 1882, p. 699. "In stricture of the colon, the greatest degree of dilatation is often found, not in the portion of bowel immediately above the stricture, but in the cæcum."

[4] St. Bart. Hosp. Reports, vol. xvii., 1881, p. 277, *et seq.* Art. "Two Cases of Intestinal Obstruction," reported by Dr. D. A. King.

[5] St. Bart. Hosp. Reports, vol. xvii. p. 282.

it is hoped that it will form the subject of a later paper. It will suffice to state that in the experiments made the ileo-cæcal valve was proved to be invariably incompetent in the dead subject; a result confirmed by those attained by Dr. Hall and related in his contributions[1] to the "Journal of Medical Science." The difficulty caused by this complication was surmounted by the method adopted, as will hereafter appear.

Researches into the literature of the subject led to the conclusion that the attention paid to injections and the records of experiments made with regard to them were in no respect in accordance with their real importance.

There is no need to enumerate the names and works of all those who have written on enemata; the majority of writers were found to have contented themselves with giving a general account of enemata and their uses, with at most a bare statement of the amount of fluid such enemata should contain.

This is well exemplified by the article[2] on enemata in one of the most important medical works lately published.

Further, this view is confirmed by the short historical sketch prefixed to Dr. Hall's paper on this subject.[3] This paper, to which frequent reference will be made, contains an account of several injection experiments made on the dead subject and of several cases in which Dr. Hall successfully applied to the living the knowledge thus gained, with many valuable practical suggestions for the treatment of those cases to which he considered enemata applicable.

Now, it will be found, on careful perusal of Dr. Hall's paper,[4] that he agrees with all other previous writers and experimenters,[5] from the time of Oribasius to the present day, in treating the subject of injections from the single point of view of quantity. The quantity of fluid that may be safely injected and the maximum contents of the large intestines is insisted upon, but in no case has the question of tension been alluded to.

Yet it soon became manifest, as a chief result of these investigations, that the real question was not one of quantity but of tension; not how much fluid can be injected into the intestine, but at what pressure injection can take place with safety; for it is clear that the result of injection must ultimately depend not

[1] Monthly Journal of Medical Science, Edin., pp. 1–9, 1846.
[2] Art. "Enema," Dict. Med., ed. R. Quain, London, 1883.
[3] *Loc. cit.*, p. 6.
[4] A. B. Hall, *loc. cit.*, p. 6.
[5] Cf. Prof. Mosler, Contrib. Greifs-Wald. Med. Soc., Berlin klin. Woch., Nov. 10, 1846. Utility of the Introduction of Large Quantities of Fluid into the Intestinal Canal in the Treatment of Internal Diseases. *Vide* Med. Times and Gazette, 1874, vol. i. p. 14.

upon the quantity injected, but upon the pressure which produces rupture. At first the two questions of quantity and tension were regarded as of nearly equal weight, and an attempt was made to solve them both at one and the same time; in other words, to determine the maximum contents of the large intestine by the injection of a known quantity of water at a uniform pressure. This was soon found to be impracticable owing to the difficulties and sources of error due to the method employed. It became evident that the two questions of quantity and tension must be treated apart, and tension as the most important was dealt with first.

With this view the course of procedure adopted as well as the apparatus employed was remodelled, water injection being replaced by air inflation; and in a later paper it is hoped to establish, not only within what limits of internal pressure rupture occurs, but to demonstrate the applicability of the results obtained on the dead subject to the case of the living. Meantime, in the course of the experiments, certain results were attained as regards the behaviour of the large intestines under internal pressure; and it is the immediate purpose of this paper to establish the following proposition: that rupture of the wall of the large intestine in the dead subject, when subjected to internal pressure, takes place in one place and in a certain manner.

In dealing with this proposition the following system and method will be employed. First, from a consideration of the known laws of pressure in the class of bodies to which the intestines belong, it will be sought to show *à priori* that rupture would be expected to occur in a particular manner and in a particular place. That it does so occur will be shown by a full description of the exact manner in which rupture was observed to take place during the course of the experiments. This description will be followed by a narrative of the course of procedure adopted and the experiments undertaken, showing the difficulties and sources of error encountered, and the important alterations introduced into the methods employed by which they were surmounted.

The results of the experiments will then be considered in detail as leading to the establishment of a principle logically deducible from them. This principle thus experimentally established will be found to agree with the conclusion already deduced from the theoretical laws of pressure previously considered. Further, this conclusion being in exact accordance with the results observed[1] in cases of abdominal obstruction, the general conclusion will be enunciated that in cases of abdominal

[1] Pages 129, 130.

obstruction, rupture of the wall of the large intestine tends to take place in one place and in a certain manner.

First, then, with regard to the class of bodies to which the intestines belong, and the laws determining the result of pressure applied to them.

The large intestines may be considered as being sacculated or irregularly formed cylinders, diminishing in diameter from the cæcum to the rectum. They will therefore be subject to those laws of pressure which hold good in the case of cylinders of irregular form. Their structure has been described at length in the anatomical works.[1] It will be sufficient for the present to point out that the sacculations present in the large intestines, from the cæcum to the commencement of the rectum, are due to the longitudinal muscular fibres situate beneath the peritoneal investment, being collected into three distinct bands shorter than the subjacent coats to which they are intimately attached.

The laws of pressure in cylindrical tubes may be briefly stated as follows. In the case of any cylindrical tube the strain per unit of section varies at a given diameter as the pressure and at a given pressure as the diameter.

On distension any sac tends to assume the form of maximum content, that is, to become spherical. In the case of a cylinder, the section, which alone need be considered, tends to assume a circular form. Accordingly, on distension of a cylindrical tube, the first and chief strain will fall on any structure tending to limit the assumption of circular form. Therefore, when the assumption of circular form is limited by bands forming sacculations or folds, these bands will be subjected to the first and greatest strain, such strain being proportionate to the magnitude of the fold or sacculation thus formed.

Again, a longitudinal band on the wall of a cylinder forming internal folds, and having its structural strength lying in the direction of the long axis of the tube, will be subjected to a strain across its structural strength, and hence under pressure will tend to split longitudinally.

If there should be more than one band of this kind, that band forming the largest pleat or fold will be subjected to the first and greatest strain, and consequently, *cæteris paribus*, will be the first to give way. It was noticed, when injecting water into the intestines, that the longitudinal bands of muscular fibre with the peritoneum investing them on the cæcum and transverse colon gave way and continued to split in a longitudinal direction up to the time of complete rupture of the intestinal walls. This first rupture was so much more readily and easily observed when

[1] Quain, Anat., vol. ii., Art. "Intestines."

inflation was employed that several experiments were devoted to its special study. The method adopted with water will be described in the history of the course of procedure;[1] that with air was briefly as follows:—Lund's air inflator was introduced into the rectum with a manometer in circuit between the force-pump and anus. The abdomen having been opened, and the small intestines partially removed to obtain a clear view, the ileum was closed, about four inches above the junction of the large and small intestines, by tying in the tube of a second or terminal manometer. On inflation the air passed through the ileo-cæcal valve directly, bringing the two manometers to the same level; when the pressure attained a sufficient height, rupture commenced at the centre of the anterior longitudinal band on the cæcum. This rupture included the peritoneal coat lying over the band, but did not involve the subjacent circular muscular coats. The rupture extended rapidly in both directions along the length of the band, the edges becoming separated to the extent of an inch or more. This first rupture, beginning in the anterior longitudinal band in the cæcum, appeared very shortly afterwards on the free border of the transverse colon, and rapidly extended throughout the whole length of the intestine from cæcum to sigmoid flexure. The other longitudinal bands became involved, in like manner, before final rupture of the remaining coats took place. When the bands forming the sacculations gave way the intestine assumed a more circular contour, and the circular muscular coat, laid bare by the rupture of the coats lying over it, protruded in the gap thus produced, and gradually stretching with the continued distension, became thinner and thinner till it finally gave way at some point in the cæcum, thus completing the rupture of the intestinal wall.

Rupture of the intestinal wall under pressure then occurs in two stages, the first incomplete or partial, the second complete. The first or partial rupture, which occurred invariably when the intestines were not too diseased, or too softened by post-mortem changes, to be capable of supporting any degree of internal pressure, has not, so far as it has been possible to ascertain, been previously described, although from the very structure and form of the intestines, as is evident from the preceding account of the laws of pressure in cylinders, its occurrence should be looked upon as a mechanical necessity whenever the gut is subjected to similar conditions of internal pressure.

Having thus described in detail the first and final rupture of the intestines when subjected to internal pressure, and shown that this result is in complete accordance with the theoretical

[1] *Vide* p. 144.

laws previously stated, it remains to be shown that the experiments made were sufficient for the proof of that result; that is to say, that the sources of error had been considered and duly provided for. In order to do so the experiments made will be first briefly stated in a tabular form, then the difficulties and sources of error met with, the means adopted to overcome them, and the development of the methods employed will be pointed out and commented on.

The experiments were carried out partly at Victoria Park Hospital, and partly at St. Bartholomew's.

Before considering these experiments, which follow in a tabular form, some observations are necessary.

It has been stated above that the question of the applicability to the living subject of the results obtained by experiments on the dead will be considered at length on a future occasion.

For the present, the following points may be dismissed as falling under this head :—

The influence of the abdominal walls on the contained viscera.

The effect of subjecting the abdomen to internal pressure as regards place[1] of ruptures and degree of bursting pressure.

The condition of the living gut as compared with that of the dead subject, whether altered by post-mortem changes or the presence of disease.

The determination of the limit of internal pressure within which rupture of the intestinal wall occurs.

The incompetency of the ileo-cæcal valve in the dead subject. This last, though shown to be an invariable result, will form the subject of a later and distinct inquiry; for the present it has been eliminated by the method adopted, which was as follows :— The abdomen having been opened, the ileum was closed about four inches above the junction of the large and small intestines by the insertion of a terminal mercurial manometer, with the object of obtaining a twofold result; first, the power of readily ascertaining when the fluid injected passed the ileo-cæcal valve; and, secondly, by comparing this terminal manometer with that one placed in the circuit between the injector and anus, to detect any leakage from the gut. It will now suffice to state, as applying to the whole of the experiments, that in all cases the abdomen was opened, and that the large intestines were tested either *in situ* or when removed from the body, with the same result as regards the place and manner of rupture. The experiments themselves may be considered as falling into two main groups :—

[1] Some experiments on this subject will be found recorded in the table

First, the first fourteen (1 to 14), in which it was sought to determine the maximum content of the large intestine at a known and uniform pressure.

Secondly, the remaining ten (15 to 24), in which tension alone was considered, and injection and inflation were practised to study the production of rupture and to confirm certain results attained in the course of the preceding experiments.

The manner in which rupture was found to occur has already been described at length.[1] It apppears on examination of the table of experiments that the cæcum was the place in which the chief strain of the pressure was expressed.

For the first or partial rupture observed in the fifteenth experiment was found to commence in the cæcum in all the nine (16 to 24) succeeding experiments.

While final or complete rupture took place in the cæcum in the three cases[2] in which the intestines experimented upon were normal in character.

[1] Page 134. [2] Experiments 19, 20, 21.

Number of Experiment	Sex.	Age.	Cause of Death.	Date of Death, Ann. 1883.	Date of Post-mortem, Ann. 1883.	Place.
1	M.	19	Morbus cordis, ascites	29th January, 9 p.m.	30th January, 5 p.m.	V. P. H.
2	M.	35	Phthisis	30th January, 8.30 p.m.	31st January, 5 p.m.	„
3	F.	27	„	1st February	2d February, 5 p.m.	„
4	F.	29	„	7th February, 3.30 p.m.	8th February, 5 p.m.	„
5	F.	57	„	12th February, 8.30 a.m.	13th February, 5 p.m.	„
6	F.	35	„	19th February	20th February, 5 p.m.	„
7	M.	37	„	21st February, 6 a.m.	22d February, 5 p.m.	„
8	F.	12	„	24th February, 7.30 p.m.	26th February, 5 p.m.	„
9	M.	...	Morbus cordis	6th March, 12 a.m.	7th March, 4 p.m.	„
10	F.	38	Phthisis	7th March, 6.30 p.m.	8th March, 3 p.m.	„
11	M.	35	„	8th March	9th March, 3 p.m.	„
12	M.	30	„	9th March, 4.30 p.m.	13th March, 5 p.m.	„
13	M.	32	„	15th March, 9.30 a.m.	16th March, 2 p.m.	„
14	M.	...	Morbus cordis	... ...	2d April, 4 p.m.	„
15	M.	...	...	... ...	5th April, 4 p.m.	„
16	M.	32	Morbus cordis, ascites	26th May, 5 a.m.	27th May, 12 noon.	„
17	F.	17	Morbus cordis	28th May, 8 p.m.	29th May, 5 p.m.	„
18	F.	...	Phthisis	... ...	2d June, 5 p.m.	„
19	M.	...	„	14th June, 2 p.m.	15th June, 4 p.m.	„
20	M.	33	Fracture of skull	22d August	23d August, 2.30 p.m.	St. B. H.
21	M.	...	„	25th October, 11.50 a.m.	26th October, 2.30 p.m.	„
22	M.	42	Phthisis	26th October, 4.35 a.m.	27th October, 2 p.m.	„
23	M.	...	Injury to chest	26th October	29th October, 3 p.m.	„
24	M.	3	Diphtheria	3d November, 10.20 p.m.	5th November, 12.30 p.m.	„

No. of Exp.	State of Body: Abdomen, Thorax, &c.	Apparatus: Application and Method.	Injection or Inflation.	Part Tested.
1	Abdomen and thorax opened; heart and lungs removed; œsophagus divided opposite second dorsal vertebra.	Rectum everted; strong needle, carrying ligature, passed round wall; tube tied into anus, and connected with pipe from hospital main; mercurial manometer in circuit between anus and main pipe.	Injection, water	Large and small intestines from anus to œsophagus, where divided
2	Abdomen and thorax opened; no organs removed.	Apparatus as before in first experiment.	,,	Anus to mouth
3	Abdomen and thorax opened; thoracic organs removed.	Introduction and fixation of tube as before; stomach pump for injection; merc. manometer in circuit.	,,	Anus to pylorus, which was closed by ligature
4	Abdomen and thorax opened; thoracic organs removed.	Introduction and fixation of tube as before; injection by stomach pump; merc. manometer in circuit.	,,	Anus to pylorus
5	Abdomen and thorax opened; thoracic organs removed.	Introduction and fixation of tube as before; injection by water column $3\frac{1}{2}$ ft. by jar of 9 pints capacity raised by cord over pulley; merc. manometer in circuit.	,,	Anus to ileum
6	Abdomen and thorax opened; thoracic organs removed.	Introduction and fixation of tube as before; injection by jar and water column.	,,	,,
7	Abdomen opened in median line, and then sewn up after insertion of tube of second merc. manometer into ileum, 4 inches above ileo-cæcal valve.	Introduction and fixation of tube as before; injection by jar and water column.	,,	,,
8	Abdomen opened and then sewn up, after insertion of tube of terminal manometer into lower end of ileum.	Introduction and fixation of tube as before; injection by jar and water column.	,,	,,
9	Thorax opened; upper half of sternum removed.	Tube inserted into abdominal cavity through opening in linea alba; injection by stomach pump.	,,	Cavity of abdomen

Intestines.				Results and Remarks.
In sitû or Removed.	Contents.	Condition.	Ileo-cæcal Valve.	
In sitû	Liquid	Natural	Incompetent	The water filled the large and small intestines and stomach, finally escaping into thorax through the cut end of the œsophagus. Ileo-cæcal valve incompetent.
,,	...	Post-mortem softening	,,	The water injected per anum finally issued by the mouth, having traversed the whole length of the alimentary canal. Ileo-cæcal valve incompetent.
,,	...	Ulcerated	...	Intestines (large) much ulcerated, gave way at an ulcer in splenic flexure.
,,	...	,,	...	Intestines extensively ulcerated; cæcum gave way at an ulcer. Much leakage in course of large intestine. Variations in pressure during stroke of stomach-pump noted.
,,	Solids in quantity	Natural	Competent, then incompetent	Ileo-cæcal valve at first blocked by fæces, and thus rendered competent; then, as water acted on the fæces, incompetent.
,,	Liquid in small quantity	Ulcerated	Incompetent	Ileo-cæcal valve incompetent. Water infiltrated walls of colon, which was extensively ulcerated. Intestine gave way finally at an ulcer in cæcum.
,,	Solids in small quantity, hard nodules	,,	,,	Water passed through ileo-cæcal valve. Intestines extensively ulcerated, gave way at an ulcer in transverse colon. Intestinal walls infiltrated by water.
,,	Liquid in small quantity	,,	,,	Water passed through ileo-cæcal valve. Gut gave way at an ulcer in middle of transverse colon. Intestinal walls infiltrated by water.
...	Solids	,,	...	Abdominal cavity injected. Water escaped into thorax through diaphragm, filling both pleural cavities. Some infiltration of abdominal wall spreading from point of insertion of tube. Fæces expelled from rectum, urine from bladder. No hernial protrusion. Intestines flattened by pressure of the water injected.

No. of Exp.	State of Body: Abdomen, Thorax, &c.	Apparatus: Application and Method.	Injection or Inflation.	Part Tested.
10	Thorax opened; upper half of sternum removed. Abdomen opened; large intestines divided just above anus, and removed from body.	Tube inserted into abdominal cavity through opening in linea alba, secured by harelip pins and figure of 8 ligature; injection by jar water column 4 ft. high, tube introduced through ileo-cæcal valve; rectum clamped.	Injection, water	Cavity of abdomen; large intestine, 4′.7″ long.
11	Thorax opened. Pleural cavities opened; organs *in situ;* two last ribs not divided. Abdomen opened; colon removed from body with lower 6″ of ileum.	Tube introduced by incision 3″ long; jar water column 2′·61 ft. in height; water injected by jar, water column tube inserted into ileum; distal end of gut elevated to allow air to escape, then closed by clamp.	,,	Cavity of abdomen; colon from cæcum, 42″ long.
12	Thorax opened; upper half of sternum removed; lower half left *in situ.* Abdomen opened; colon removed from body.	Tube introduced through umbilicus attached to pipe from main; colon washed through with water to expel contents, then injected through ileo-cæcal valve by jar and water column 2′·6 ft.	,,	Cavity of abdomen; colon from cæcum, 3′.2″.
13	Thorax opened; upper half of sternum removed; organs *in situ.* Abdomen opened; large intestines removed from body.	Tube introduced through umbilicus, secured by needles and figure of 8 ligature; connected with main pipe; injected by jar and water column after contents expelled by injection of water.	,,	Cavity of abdomen; large intestines, 5′.3″ from rectum, divided near anus
14	Thorax opened; thoracic organs removed. Abdomen opened; large intestine removed from body close to anus.	Tube introduced into rectum; jar and water column; portions of gut clamped off as they successively gave way.	,,	Large intestine
15	Abdomen opened; large intestines removed from body; rectum divided low down.	Tube introduced into rectum; jar and water column; manometer in outside circuit; manometer terminal in ileum.	,,	Large intestine, 69″

Intestines.				Results and Remarks.
In situ or Removed.	Contents.	Condition.	Ileo-cæcal Valve.	
Removed from body	Solids and liquid, expelled by injection with water	Ulcerated	...	On injection of abdominal cavity, the water made its way through the diaphragm into the right pleural cavity, immediately below and to the right side of the muscular slip proceeding from the ensiform cartilage (cf. Gray, "Anat.," p. 260, 10th ed., 1883); none passed into left pleural cavity, owing to dense adhesions there between base of left lung and diaphragm. No hernial protrusion. Slight infiltration of abdominal walls. Gut gave way first at an ulcer in cæcum, then in transverse colon; these pieces successively clamped off. Rectum was the last to give way.
„	Contents expelled by injection of water after removal	Natural	...	On injection of abdominal cavity, water was seen oozing through diaphragm in position similar to that in above (Expt. No. 10). No hernial protrusion. Slight infiltration of abdominal walls. Fæces expelled from anus. Fluids drawn from stomach through intestine. Gut gave way in cæcum. Walls infiltrated by water.
„	Solids; contents expelled by inject. of water subsequent to removal	Ulcerated	...	On injection of abdominal cavity, water made its way through diaphragm into left pleural cavity below centre of base. No water penetrated into right pleural cavity, owing to dense adhesions at base of right lung. No hernial protrusion. No infiltration of abdominal walls. Gut gave way first in cæcum at an ulcer, then in transverse colon. Walls infiltrated by water.
„	Solids removed by washing out	Natural	...	Water made its way into thorax through diaphragm, into left pleural cavity below centre of base. Dense adhesion on right side prevented escape into right pleural cavity. No infiltration of abdominal walls. No hernial protrusion.
„	Liquid in small quantity	Slight P.M. softening	Incompetent	Ileo-cæcal valve incompetent. Intestine gave way first in cæcum, then in transverse colon, then in sigmoid flexure.
„	„	Contracted; ulceration slight	„	Ileo-cæcal valve incompetent. First effect of distension noticed; longitudinal muscular band anterior wall of cæcum gave way, splitting longitudinally. Water infiltrated walls of gut. Gut gave way finally in descending colon at an ulcerated spot.

No. of Exp.	State of Body: Abdomen, Thorax, &c.	Apparatus: Application and Method.	Injection or Inflation.	Part Tested.
16	Abdomen opened; large intestines removed from body; upper part of rectum divided.	Tube introduced into rectum; jar and water column; manometer in circuit and terminal as before.	Injection, water	Large intestine, 60″
17	Abdomen opened; large intestines removed from body, sigmoid flexure divided.	Tube introduced into distal lower end; manometer as before; jar and water column.	,,	Large intestine, 40″
18	Abdomen opened.	Lund's air inflator tube introduced into anus; manometer in outside circuit; manometer terminal in ileum 4″ above valve.	Inflation, air	Large intestine, whole length
19	Abdomen opened; small intestines removed to obtain clear view.	Lund's air inflator tube in anus; manometers as before.	,,	,,
20	Abdomen opened; small intestines removed.	Lund's air inflator in anus; force pump; manometers as before.	,,	,,
21	Abdomen opened; large intestines removed from body, divided at ileum 6″ above valve and at sigmoid flexure.	Lund's air inflator tube in lower end of gut; force pump; manometers, (*a*) in circuit, (*b*) terminal.	,,	Large intestine, ileum 6″ to sigmoid flexure
22	Abdomen opened; large intestines removed from body, divided at sigmoid flexure.	Lund's air inflator tube in sigmoid flexure; force pump; manometers, (*a*) in circuit, (*b*) in ileum.	,,	,,
23	Abdomen opened; large intestines removed from body, divided at sigmoid flexure.	Lund's air inflator tube in sigmoid flexure; force pump; manometers, (*a*) in circuit, (*b*) in ileum.	,,	,,
24	Abdomen opened; large intestine removed to sigmoid flexure.	Lund's air inflator tube; force pump.	,,	,,

Intestines.				Results and Remarks.
In situ or Removed.	Contents.	Condition.	Ileo-cæcal Valve.	
Removed from body	Solids in very small quantity	P.M. softening, greasy and fatty	Incompetent	Ileo-cæcal valve incompetent. First effect of distension; rupture, longitudinal, of ant. long band in cæcum, followed by similar band on colon. Gut gave way finally in transverse colon and cæcum, where circular muscular coat was exposed by this rupture. Walls infiltrated by water.
„	Solids in small quantity	P.M. softening, otherwise natural	„	Ileo-cæcal valve incompetent. Ant. longitudinal muscular band in cæcum gave way, the rupture spreading longitudinally, and involving the superjacent peritoneal coat. Walls infiltrated by water.
In situ	Liquid and small amount of solids	Ulcerated	„	Ileo-cæcal valve incompetent. Longitudinal band over cæcum gave way as before, followed by similar rupture of bands in colon. Gut gave way finally at an ulcer in splenic flexure.
„	Solids and liquid	Natural	„	Ileo-cæcal valve incompetent. On distension, longitudinal muscular bands in cæcum and transverse colon gave way simultaneously; first, that on free border (the anterior), then the others. Final rupture in cæcum, where band ruptured.
„	Some solids	„	„	Ileo-cæcal valve incompetent. On distension, rupture of longitudinal muscular band on free border of cæcum, followed by that of the other bands. Final rupture in cæcum, where peritoneal coat stripped off.
Removed	Solids	„	„	Ileo-cæcal valve incompetent. On distension, rupture of longitudinal muscular band, with superjacent peritoneum, on free border of cæcum. Final rupture by giving way of exposed circular muscular and internal coats at same spot.
„	Liquid	Ulcerated	„	Ileo-cæcal valve incompetent. On distension, rupture of longitudinal muscular band on cæcum (free border), followed by final rupture at an ulcer on wall of cæcum.
„	Solids	P.M. softening	„	Ileo-cæcal valve incompetent. On distension, the longitudinal bands gave way, as in preceding experiment, first on cæcum, then on transverse colon. Final rupture, occurring first in transverse colon.
„	Solids and liquid in small quantity	Natural	„	Ileo-cæcal valve incompetent. On distension, rupture of longitudinal muscular band and superjacent peritoneum on free border of cæcum; then similar rupture in band on transverse colon. The latter sketched by Mr. Godart. *Vide* accompanying sketch.

The whole of the experiments made have been given in the preceding table.

At first it was sought to determine directly the amount of fluid that could be injected into the large intestines at a known and uniform pressure. The water was injected by an ordinary stomach-pump from a jar of known capacity, through a tube tied into the anus, a mercurial manometer being inserted in the circuit between the pump and anus to register the pressure employed.

The variations of pressure occurring during the stroke of the stomach-pump were so considerable that that instrument was discarded in favour of a water column of known height. This column was obtained by suspending a jar of nine pints on a pulley in such a manner that it could be raised and lowered to any height required, the jar being connected by an india-rubber tube with the manometer and injection-tube previously in use. This apparatus afforded a means of injecting water at a uniform given pressure; but consideration of the numerous sources of error arising from the use of water injection led to the conclusion that it was impracticable to solve in this manner not only the question of content at a given pressure, but even the question of tension, that is, bursting pressure. Accordingly air inflation was adopted instead of water injection. The instrument employed for this purpose was, with one modification, namely, the substitution of a metal force-pump for a rubber ball, that devised by W. Lund, of Manchester, for the inflation of the intestines in colotomy. A full description of W. Lund's instrument was given in the "British Medical Journal."[1]

The special merits of the instrument are its simplicity and facility of application, and the fact that a tight joint is obtained at the anus by simple pressure of an india-rubber disc, which can be readily kept in place by a heavy weight,—a matter of no small importance, considering that under pressure air escapes eight hundred times as rapidly as water.

The method adopted with air has already been described in the account of the manner in which rupture took place. It will suffice to state that inflation was found to entirely overcome the difficulties which had been encountered during the use of water injection, and which finally led to its abandonment.

At the same time the experiments undertaken with inflation were found to confirm these results already attained in the course of the experiments with water.

The difficulties and sources of error avoided by the adoption of air inflation were—

[1] British Medical Journal, May 1883.

First, those connected with the introduction of a sufficient length of tube into the anus and of making a tight joint there.

Secondly, that the action of the water injected on the coats of the intestine had to be taken into account, for this after a time infiltrated the walls of the gut, and making its way beneath the peritoneal coat, escaped in all directions; this action being especially noticeable in the cases where the inner coats were diseased.

Thirdly, those arising from the previous contents of the intestines. These were either fluid, solid, or gaseous, in mixed and varying proportions. The fluids could be dealt with alone, having merely to be estimated; the solids presented more difficulty, for they both blocked the injection tube on its introduction, and by being forced upwards into the ileo-cæcal opening blocked it temporarily, thus simulating competency of the valve; but the gaseous contents were the most troublesome of all, for they broke the continuity of the water injection by forming large bubbles at the bends of the gut, which interfered seriously with the readings of the manometers employed, as well as with the circulation of the fluid pumped in.

The expulsion and estimation of the solid and liquid contents was attempted, but found impossible when the intestines were *in situ*, and impracticable when they had been removed from the body.

Inversion and rotation of the body were tried as a means of displacing the gaseous contents, but did not prove satisfactory, causing much loss of time without any commensurate advantage.

It is possible that the failure of previous writers to determine the capacity of the large intestines was owing to their want of due consideration of the importance of these two points, namely, the action of water on the coats of the intestine and the presence of previous contents. For instance, Dr. Hall[1] maintains, as the results of one of his experiments on the dead subject, that three pints of fluid injection was sufficient to fully distend the large intestines.

Now, though the experiments made to establish directly the actual content of the intestine, and related in this paper, are not for the above reasons thought worthy of confidence, yet it will be seen from the result of mathematical calculation that the amount thus stated by Dr. Hall must be altogether insufficient.

For in the standard anatomical works the length and diameter of the great intestines is given as follows:—

Total length, 5 feet.

[1] *Loc. cit.*, p. 6.

Average diameter, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches.

If, then, the great intestine be considered as a rigid cylinder, incapable of distension, $1\frac{1}{2}$ inches in diameter and 5 feet long, what will be its content expressed in pints? The area of the cross section of the cylinder (*i.e.*, the area of a circle $1\frac{1}{2}$ inches in diameter) = 1.76789 square inches. This area multiplied by the length, 60 inches = content 60 × 1.767 = 106.02 cubic inches, and this = 3 pints, or more exactly 3.06 pints.

Again, an imperial gallon = $277\frac{1}{4}$ cubic inches, a pint = $\frac{1}{8}$ imperial gallon = $\frac{277\frac{1}{4}}{8}$ = 34.66 cubic inches. Therefore 3 pints = 104 cubic inches almost exactly.

So that the actual content of such a cylinder is 3.06 pints = 106.02 cubic inches. But it is manifest that the large intestines are not rigid cylinders, but very distensible,[1] and $1\frac{1}{2}$ inches is but their minimum diameter, therefore three pints cannot, as Hall maintains, be sufficient to distend fully the large intestines, unless aided by previous contents, of which he makes no mention.

One of the chief results attained in the course of these experiments, apart from those which will, as before stated, not be considered here, was that the portion of intestine between the anus and sigmoid flexure was invariably the last to give way. This result was confirmed by testing the whole length of the large intestines and successively clamping off the portions that gave way, the intestines being tested on some occasions *in situ*, and on others when removed from the body.

Having established this fact, the intestines in subsequent experiments were often removed from the abdomen from above the ileo-cæcal valve to the upper border of the sacrum.

Now it is worthy of remark that the liability to rupture in the case of the two parts of the intestines which are equal, or nearly so, in diameter is widely different. This difference in the case of the rectum and cæcum is fully explained by the textural differences between them. In the rectum[2] the coats are thicker, the circular muscular coat being very thick. The longitudinal muscular coat forms a uniform layer over the whole calibre of the bowel, and does not form internal folds or sacculations. The internal folds, folds of Houston, present in the rectum, being composed of mucous membrane only freely movable on the walls of the gut, are no way analogous to the internal folds present in the cæcum and colon. Therefore the

[1] Bristowe, Theory and Practice of Medicine, 4th ed., 1882, p. 698. In cases of fæcal accumulation . . . "the dilatation is sometimes so great that the colon measures from ten to twelve inches in circumference."

[2] Quain, Anat., vol. ii., Art. "Large Intestines."

coats of the rectum may be considered as being not only individually thicker and stronger, but also more distensile[1] than those of the cæcum. Having now passed in review the experiments made, the difficulties and sources of error encountered and overcome, and the important alterations introduced into the methods employed, the following principle may be stated as their logical result.

That the great gut in the dead subject, when gradually distended by inflation or fluid injection, gives way first at the anterior longitudinal band of the cæcum. That finally complete rupture of the intestinal wall occurs in the cæcum at some point in the course of one of the fissures thus formed.

This principle is seen to be in complete accordance with the results deduced *à priori* from the consideration of the known laws of pressure in the class of bodies to which the intestines belong. Further, this principle thus theoretically and experimentally established is corroborated, as already shown, by the results of post-mortem examinations made on cases of abdominal obstruction in which the large intestines have been exposed to similar conditions of internal pressure.

So that the general conclusion is manifest, that, in cases of abdominal obstruction, rupture of the intestinal wall tends to take place in the cæcum, and in the particular manner described.

[1] Cf. Bristowe, *loc. cit.*

SOME CASES OF WOUNDS OF THE EYE.

BY

ROBERT J. COLLYNS.

THE following cases have occurred in the Ophthalmic Wards during my term of office as Ophthalmic House-Surgeon, and I am indebted to Mr. Power and Mr. Vernon, under whose care the patients were, for permission to publish these notes.

CASE I.

Wound of the Sclerotic and Ciliary Region.

Harry B., aged 2½ years, was admitted on April 18th, under the care of Mr. Power.

About half an hour before admission the boy had been struck in the right eye by a piece of glass, which was thrown over a wall. When brought to the hospital, the patient was in no pain, and was apparently unconscious of any injury to the eye.

On opening the eyelids, which were not wounded, a triradiate wound of the sclerotic was displayed. The centre of the wound was situated about two lines from the outer and lower part of the corneal margin, just over the ciliary region. From this centre three cuts diverged: one extended to the edge of the cornea; the other two divided the sclerotic in the opposite direction. A small bead of vitreous protruded through the central part of the wound. There was no external hæmorrhage. Tension, query, diminished. Before the accident the boy had alternating squint, the eye generally used for fixing objects being the left. In other respects the boy was perfectly healthy.

A cold-water compress was applied over the right eye; both

eyes were bandaged, and the patient sent to bed. The right eye was kept bandaged, except during the few minutes when the compresses were changed, for seventeen days. It was impossible to keep both eyes completely closed, for when both were bandaged up the boy cried incessantly, until he had so disarranged the dressings as to be able to look out under the bandage over the left eye. So long as he was allowed to do this he was quite contented.

The wound gradually closed without any signs of inflammation or irritability of the left eye, and had so far healed on May 6th, *i.e.*, seventeen days after the accident, that the boy was allowed to have the right eye open for a short time each day. Soon he was allowed to run about the ward with both eyes free, and he left the hospital on June 20th, a month after admission, with the eye in the following condition:—"A cicatrix now indicates the position and shape of the wound, which has completely healed. Some enlarged conjunctival and sclerotic vessels are seen running up to the cicatrix. Vision in the right eye has not been affected, and sight appears to be eqnally good with either eye. The squint persists, and the boy rarely fixes with the right eye."

When this patient was first seen, there was much discussion whether the eye should be removed, partly or entirely, or left to take its chance. Seeing that the wound involved the ciliary region, and that wounds of this part of the eye are exceedingly dangerous from their liability to cause inflammation, not only in the injured eye, but in the other also, it was felt that there was no inconsiderable risk in leaving it. However, as the wound was not very large and not very ragged, and as there was reason to believe that the piece of glass had not entered the eye, it was decided to pursue the course mentioned above. The result so far has been perfectly satisfactory, for at the end of August the eyes were in the same condition as when the boy left the Hospital, and vision remained as good as ever.

Case II.

Punctured Wound of the Sclerotic and Ciliary Region.

George C., aged 14 years, was admitted on May 23d, under the care of Mr. Vernon.

About 8 p.m. on the evening before admission, a boy threw a handful of "gravel and pieces of glass" into the patient's face from a distance of one or two yards. At first he could open neither eye, but on doing so after bathing them with cold water,

the left eye was seen to be "red with blood." Tea-leaf poultices had been applied prior to admission.

When seen on 23d, the condition of the left eye was as follows:— A large effusion of blood extends beneath all the ocular conjunctiva, except at its upper and inner part. There is a punctured wound of the sclerotic, situated a quarter of an inch from the margin of the wound to its inner and lower side. The edges of this angular wound are separated by vitreous, and the bottom of it is occupied by a piece of the choroid or ciliary processes. Vision is not impaired appreciably. Tension not appreciably reduced. There is no more than a scratch on the lower eyelid, which hides the wound in every position of the eye except when it looks directly upwards.

The left eye was closed by a cold compress, but the right was left open. The effused blood was rapidly absorbed, and had disappeared entirely in a few days, when the vitreous was observed to protrude from the wound like a small glass bead, and the edges of the aperture seemed to be rather more widely separated. Seven or eight days after the accident, several enlarged conjunctival vessels were observed running in the direction of the wound, and the bead of vitreous was covered by an opaque film, which appeared to be connected with the edges of the conjunctiva. This film became further developed in a few days, and a covering was formed over the aperture, attached all round to the conjunctiva. This covering gradually contracted, and reduced the swelling caused by the prolapsed vitreous, allowing the edges of the wound to be more closely approximated. The patient left the Hospital on June 9th, *i.e.*, eighteen days after the accident, with the wound quite healed. The vision, however, was not so good as in the right eye. V. R.E. $= \frac{5}{5}$; L.E. $= \frac{5}{7 \cdot 5 0}$.

In this case, as in the preceding one, the question of abscission or enucleation arose; but since the preceding case had done so well, and the wound in this case was small, and there was no evidence of the lodgment of a foreign body in the eye, it was left to take its chance. Although the result was scarcely as satisfactory as in the other case, for the vision was slightly impaired, the treatment was not to be regretted. There was no sign of any disturbance in either eye a month or two after the injury; and since the patient has not come back to us, as he was told to do if any untoward symptom occurred, I presume all has gone on well.

It cannot be said, however, that either of these patients is free from danger yet, for in some such cases slow inflammatory changes take place in the choroid or other parts of the injured

eye, which may not only lead to its own destruction, but place its fellow in great danger from sympathetic ophthalmia. Other complications may also arise, and the following case may be cited as an example.

J. P., aged 13, was admitted on January 12th, 1883, under the care of Mr. Vernon. The patient had received a blow in the right eye from a stone. On admission he was very pale and faint. There was a perforating wound of the right lower eyelid, and a three-cornered cut in the sclerotic, over the ciliary region, below and to the outer side of the cornea, about a quarter of an inch in extent. The vitreous was oozing through this wound, and tension was reduced to — 3. The patient could count fingers.

Four hours after the accident the wound was closed by fine silk sutures in the conjunctiva, and eserine drops were used. The eye remained quiet, and the wound healed with some staphyloma in its neighbourhood, but without any symptom of sympathetic ophthalmia.

Tension became normal, and the boy could see equally well with either eye. V. = $\frac{6}{12}$ with either eye.

A fortnight after his departure the boy returned to the hospital complaining of pain in the injured eye. There were some large conjunctival vessels in the vicinity of the scar of the wound; the eye was tender and tension — 1. Vision was reduced to $\frac{6}{60}$. The right lens was becoming cataractous, and presented several cortical striæ, which, however, did not radiate from the part of the lens nearest the wound. Ophthalmoscopic examination discovered nothing abnormal. The boy remained in the hospital two or three weeks, during which time the conjunctival congestion subsided, and the eye became apparently quiet. He returned again four months later. The anterior chamber contained blood, and vision in the right eye was reduced to perception of light. There was no evidence of sympathetic ophthalmia, and no history of recent injury to account for the condition of the right eye. The eye was excised four days after admission, and was found to be full of blood, and the retina was extensively detached. No further trouble followed the operation.

The two first cases teach us, I think, that slight wounds of the ciliary region are not to be regarded with such dread as they have been by some ophthalmic surgeons, who advise that every eye of which the ciliary region is wounded should be removed. This is going too far, at any rate in hospital practice, where the patient is under constant supervision, and where operative measures can be taken on the slightest warning of danger. Under less favourable circumstances, however, the expectant treatment cannot be so often adopted, and removal of the injured

eye will be the safest course, as it is in all cases of severer wounds of the ciliary region.

Case III.

Wound of the Cornea—Prolapse of the Iris.

Albert H——, aged 13. Admitted June 16th, under the care of Mr. Vernon.

On June 11th this boy was struck in the eye by a piece of china thrown at him by another boy. On admission there was a wound about a quarter of an inch long dividing the inner and lower part of the corneo-scleral junction. Through this wound the iris has prolapsed, and that part of it which is outside the anterior chamber is covered with lymph. The pupil is rendered pear-shaped. There is no evidence of general iritis, and the whole eye looks quiet. The lens is not wounded.

A few hours after admission the prolapsed portion of the iris was removed and the adjacent parts freed from the angles of the wound. Atropine drops were instilled.

On the day following the operation there was some conjunctival congestion with pain and photophobia. This was the last of his troubles, however, and the patient made a rapid recovery. The pupil enlarged and assumed a more rounded shape under the influence of atropine, a fine adhesion of the iris to the lowest part of the wound gave way, and the wound healed kindly.

I saw this boy ten weeks after the accident, and both eyes were perfectly quiet. He could see as well at a distance with one eye as with the other.

Case IV.

Wound of the Sclerotic and Cornea—Prolapse of Iris.

T. S——, aged 24, a labourer. Admitted on August 15th, under the care of Mr. Vernon.

On the evening of August 13th, whilst passing some men cracking stones in the road, a piece of flint flew into the patient's left eye from a distance of about three yards. He judges the stone to have been about the size of a marble, with sharp points. Immediately after the accident the patient could see scarcely anything with the left eye. There was no bleeding. The man was kept awake by pain all night. Next morning he found that he could see with the left eye nearly as well as before the accident. He was sent up to the hospital by the medical man

whom he had consulted. On admission, two days after the accident, the left eye presented the following appearance :—Some conjunctival congestion ; collapse of the anterior chamber; tension—1. A triradiate wound involves the sclerotic and cornea; its centre is situated at the lowest part of the cornea, just inside its vertical meridian; one cut runs outwards and upwards, dividing the cornea to the extent of about a quarter of an inch, and almost reaching its outer margin ; the other two cuts are each about a quarter of an inch in length, and divide the sclerotic as they diverge from one another in an inward direction. The wound is deepest at the central part, and the incisions become more superficial as they diverge; so that it is uncertain whether the ciliary processes are actually wounded, although two of the incisions are situated over the ciliary region. The edges of the wound are in apposition, and there is no evidence that any of the vitreous has escaped. The cornea is clear. The iris is drawn into the wound, but does not protrude, and the pupil is rendered oval in consequence. The lens is transparent and has escaped injury. Cold compresses were applied over the left eye, and both were closed. Eserine drops were put in twice a day. During the next few days the patient suffered pain occasionally, which was relieved by leeches. The anterior chamber filled again with aqueous, and a kind of cystoid cicatrix was formed between the edges of the wound, in the neighbourhood of which the cornea became hazy and the conjunctiva congested.

On the eighth day after the accident there was so much chemosis, and the eye looked so angry, that Mr. Vernon decided to operate. He removed as much of the iris as could be withdrawn through the wound, the corneal edges of which he had separated with a thin, narrow spatula. The angles of the wound were carefully freed from iris and the edge of the cornea stitched to the conjunctiva below by a fine silk suture. Atropine drops were put in, and fairly firm pressure made on the eye.

Pads wrung out of iced water were used during the next few days, and as soon as it was thought safe to lessen the pressure, Leiter's tubes, through which iced water circulated, were substituted, and kept on day and night.

The silk suture came away on the seventh day, and from this date the eye slowly but steadily improved. The blood which escaped into the anterior chamber at the time of the operation was rapidly absorbed; the conjunctival and deeper congestion persisted for several weeks, but gradually diminished as the wound healed and a cicatrix formed. Leiter's tubes were used

for a fortnight, and both eyes were kept closed for the same time, after which the patient was allowed to use the right. A week later he began to have the left uncovered for a short time each day.

A month after the operation the condition of the eye was described as follows:—Many corkscrew vessels are still present. A firm cicatrix remains to mark the position and extent of the wound. The cornea is flattened and the anterior chamber shallow. The iris, which is somewhat discoloured yellow, is drawn towards the cicatrix, and a small, irregular pupil at the bottom of the anterior chamber is the result. Tension normal. V. R.E. = $\frac{5}{5}$; L.E. = $\frac{5}{30}$. Up to this time there had been no sign or symptom of sympathetic ophthalmia. The patient was allowed to go out of doors at first with the eye covered, and afterwards without this protection; and whether it was due to the action of cold air or not is uncertain, but a fresh attack of inflammation, indicated by great conjunctival congestion and pain, occurred in a few days' time. The inflammation continued in spite of the patient's return to bed, the application of iced-water pads, and the use of leeches and exhibition of mercury. Moreover, the conjunctival and some deeper vessels of the right eye became enlarged, and there was some photophobia, which afforded a suspicion of sympathetic irritation; in consequence of which the left eye was removed on October 2d, *i.e.*, nearly seven weeks after the accident.

After excision it was found that the ciliary body had not been actually wounded, though the wound had approached as near as possible without doing so. The lens was not injured, and there was no foreign body in the eye.

The irritable condition of the right eye persisted after the operation, and five days afterwards the patient suffered pain in the eye accompanied by photophobia. The conjunctival and sclerotic vessels remained enlarged, the cornea became slightly steamy, and the iris reacted very little to light. Vision also was much impaired, and the patient could read only $\frac{5}{20}$.

Atropine was put into the eye, and next morning posterior synechiæ were visible and the pupil irregular.

The patient was given mercury until the gums were affected; leeches were used to relieve pain, and the eye was kept closed. During the next few days the vessels became more distended, and the conjunctiva more œdematous. The pupil, however, became circular again, and the cornea did not suffer.

At present (October 18th) the eye looks better; the chemosis is less, the cornea clear, and the pupil dilated and round. The patient has very little pain, and says his vision is improving.

Case V.

Wound of Cornea and Sclerotic by Entrance of Piece of Iron—Prolapse of Iris.

G. G., aged 18, labourer, was admitted on August 30th, under the care of Mr. Vernon.

Whilst the patient was at work on the morning of 30th August, a fragment of cast-iron flew into the left eye. There was a little bleeding at the time of the accident.

On admission, the left eye is somewhat collapsed and flatter than its fellow. A slightly angular wound, about one-third of an inch long, divides the corneo-scleral junction at its upper and inner part, and extends into the sclerotic at either extremity, but does not reach the ciliary region. The iris has prolapsed into this wound, and rendered the pupil pear-shaped. The anterior chamber is more than half full of blood. Tension much reduced. Vision reduced to perception of light.

The prolapsed portion of iris was removed through the wound, and the blood allowed to escape from the anterior chamber. At the time of the operation it was thought that the lens had escaped after the accident.

The patient suffered considerable pain after the operation, and next morning the eyelids were œdematous and red, and there was much chemosis. The cornea was steamy, and blood and lymph were present in the anterior chamber near the wound.

Sept. 2d.—The patient suffered pain again last night, but leeches gave relief. This morning the conjunctiva is more œdematous, and the cornea more hazy; and although the wound appears to be healing, there is evidence of suppuration in the deeper parts of the eyeball, and excision is advised.

After excision it was found that the vitreous was becoming disorganised throughout and suppurating in the central part; no trace of the lens was found; the wound had not reached the ciliary body, but a ragged piece of iron rather larger than a barley-corn was found in the vitreous at its posterior part, and it was in the track of this foreign body that suppuration had commenced.

There had been no suspicion of sympathetic ophthalmia, and no further trouble ensued.

These three cases (Nos. 3, 4, 5), although they at first presented some features common to all, viz., a wound of the cornea and adjacent sclerotic, without injury to the ciliary body, but with prolapse of the iris, differed widely in their subsequent course. They resembled each other, too, in that the wounds were inflicted

in much the same way by somewhat similar missiles, any of which might have lodged in the interior of the eye. An attempt was made in each case to save the injured organ. In the first case (No. 3), it was perfectly successful. Here we had a linear wound through which the iris protruded; but this was the whole extent of the mischief, and after removal of the protruding portion of iris, the case did exceedingly well. This is, I believe, the ordinary result of such treatment in similar cases, and such measures offer the great advantage over an attempt to replace the prolapsed iris, that there is next to no chance of iritis or of irritation, and secondary mischief resulting from implication of the iris in the wound.

The attempt to save the eye in Case No. 4 bid fair to be successful, but we were doomed to disappointment. In this case the wound was a much larger one, and more serious, in that it approached so near the ciliary body. In this case, too, as there was no evidence that a foreign body had lodged in the eye, and the patient told us he saw the piece of stone which had struck him, it was decided only to remove the piece of prolapsed iris, which seemed to be setting up some inflammation, after a few days in hospital, and to leave the rest to nature, assisted by the application of cold. The case progressed favourably, and in a month's time the eye appeared to be perfectly quiet, and vision was in great measure retained. Then, for some reason which is not clear, a fresh outbreak of inflammation took place, which threatened to involve the other eye, and excision was performed. Even this did not stop the sympathetic irritation which had commenced in the right eye, but iritis suddenly made its appearance five days after the operation. The eye remained in a precarious condition for several days, but at the time when this paper was sent to the press, there was great hope that the eye would recover and vision be restored.

The hope that by similar treatment the eye in Case No. 5 might be saved was short-lived. The wound itself was hardly more dangerous than that in Case No. 3, but there were very decided differences. The anterior chamber was half full of blood, and the whole eye collapsed from escape of the aqueous and lens. Although the patient was confident that no fragment of iron had entered his eye, there was considerable uncertainty about it, but it was decided to give him the benefit of the doubt. The eye was excised three days afterwards, and a piece of iron, which had caused suppuration, was found. Such will be the almost invariable termination of cases where there is a foreign body in the eye, and excision of every eye in which we are sure there is a foreign body should be the rule.

Case VI.

The following case is of interest as a rare occurrence:—

Alfred E., aged 12, was brought to the hospital on the evening of the 4th of July with a small fish-hook transfixing the right cornea. The hook had swung into the eye whilst attached to the line of another boy. It had entered the anterior chamber through the cornea at a spot situated about a line inside its vertical meridian, and just above its horizontal meridian, and its point had emerged at a spot about two lines below. There was no evidence that the iris was wounded.

The hook was pushed on until the barb protruded through the lower opening. The shaft of the hook was then divided behind the barb, and withdrawn through the wound of entrance. Both eyes were bandaged up. Next day the margin of the iris was attached to the upper wound, and the pupil was rendered irregular in consequence. There was no sign of inflammation. After the use of eserine the adhesion between the iris and cornea gave way, and the pupil became circular. Under the influence of atropine it dilated fully. This boy left the hospital on July 13th, with perfect vision, and without any trace of the injury.

ON GANGRENE OF UTERINE FIBROIDS, FOLLOWED BY EXPULSION.

BY

JAMIESON B. HURRY, M.B.

Of the questions relating to the natural history of fibroids none are of greater interest than the processes by which they are spontaneously expelled from the uterus; and of the questions relating to their treatment, few are of more importance than the means we possess of bringing about this expulsion.

The difficulty in treating uterine fibroids varies greatly; in general, those which are pedunculated admit of being readily removed, while large tumours which are sessile or imbedded in the uterine walls cannot be meddled with without considerable risk. For the latter variety, when it has been decided that operative treatment is desirable (which will only be the case in a small proportion of instances), the process of inducing gangrene with a view to enucleation has been of late years widely advocated.

There have lately been two such cases in "Martha," in both of which a large uterine fibroid became gangrenous previous to expulsion. The issue in one was favourable, in the other not; but there are points in regard to history and treatment of sufficient interest to justify the publication of the cases. I am indebted to Dr. Matthews Duncan for permission to use the clinical notes.

The first case is that of a woman admitted with a large bleeding fibroid; she appeared at death's door, owing to the intense anæmia and weakness. Very large doses of ergot of rye were given (cf. notes of the case), and a few days later the tumour began to slough, and eventually complete expulsion took place, followed by rapid recovery.

In the second case, a small portion of the fibroid was cut off, and soon after inflammation and gangrene of the whole tumour

supervened, a large sloughing mass being removed from the interior of the uterus by volsella. The patient did well, and continued to improve for five weeks, at the end of which she appeared and felt in good health. Just before she purposed leaving the hospital, however, and without apparent cause, abdominal pain came on, rapidly progressing to peritonitis, septicæmia, and death. Whether the unfavourable termination was in any way connected with pyæmic infection or not is difficult to say. It is true there was a case of malignant disease of the uterus in the ward at the time, but this hardly explains how the woman, who escaped death from septicæmia when her uterus was distended with a mass in an extreme state of decomposition, should five weeks later, when apparently in good health, rapidly succumb.

Case I.

C. J., æt. 38, charwoman; married sixteen years; five children, the last two years ago; two miscarriages, the last four years ago. The catamenia commenced at 16, and have been regular at intervals of five weeks. They have lately become very profuse, and often last a fortnight. The last two months she has been getting much worse and obliged to keep her bed. The loss has now been constant for 2½ weeks.

Dec. 29, 1883.—Admitted to "Martha" on account of the flooding and great weakness. The patient is intensely anæmic; the conjunctivæ, lips, and tongue are extremely pale. Pulse 96. Resp. 32. Bowels open daily; micturition natural. Tongue clean; appetite not good; says that she has lost flesh. Chest: lungs healthy. Heart's apex half an inch outside the nipple line; first sound thumping; impulse forcible; a loud anæmic murmur heard over the left base.

Dr. Matthews Duncan's examination:—The abdomen appears natural, except a slight prominence occupying the hypogastric region. This prominence is found to be a rounded, hard, displaceable, somewhat tender, dull, dumb tumour. Per vaginam, the cervix uteri is soft, somewhat patulous, and has solidarity with the hypogastric tumour. The probe enters the uterus, its cavity being directed to the left side and behind the tumour, 3 inches. The patient was put on large doses of ergot of rye, on cod-liver oil, and iron.

Dec. 30.—There is a slight loss. Pulse 96. Bowels open. Urine acid; contains a trace of albumen.

Jan. 4.—The loss continues, several large blood-clots coming away during the night. The symptoms of intense anæmia are

present; patient complains of feeling faint and giddy—tinnitus aurium. Pulse 96, very compressible.

Jan. 6.—The loss continues. The tumour in the hypogastrium reaches to within a hand-breadth of the navel. Percussion over it gives imperfect resonance, and shows it to be tender. There is some pain during micturition. Pulse 96. Resp. 38.

Mr. Willett saw the patient in consultation with Dr. Matthews Duncan. It was decided that the extreme anæmia and weakness of the patient would make it undesirable to attempt any operation such as öophorectomy in order to stop the bleeding, but that if her condition improved, it might be desirable to run the risk in order to prevent recurrence at the future periods.

Jan. 8.—Patient is worse. Pulse 100. Resp. 42. Some vomiting after sitting up; complains of inability to read owing to dizziness. There is intense pallor of the skin and mucous membranes. There is still a very loud, probably anæmic, systolic murmur over the left base. Stools natural; no melæna. Per vaginam, nothing fresh to be felt. The pain in micturition continues. She was ordered pil. ergotinæ ter die, in addition to ext. ergotæ liq. ℥ss. 6tis horis. To have 4 oz. of brandy daily.

Jan. 10.—The loss is again very free. Mr. Gell, with the help of Dr. Gowers's hæmocytometer, kindly examined the patient's blood, and found it to contain only one-third the normal number of red corpuscles in one c.mm., while the number of white in the same quantity was natural. Urine 1016, acid; contains a little pus; albumen a cloud. Six oz. of port-wine added to the diet.

Jan. 14.—The patient looks better. Pulse 96. Res. 24. The bloody discharge has ceased. Bowels open three times.

Jan. 16.—The anæmic murmur is less distinct; very little loss; patient is evidently making blood.

Jan. 18.—Doing well; eats and sleeps well. Bowels open. Pulse 80.

Jan. 21.—Feels well; tongue less pale; there is a tinge of colour in her cheeks. She complains of numbness of the extremities. No pain now on micturition. The abdominal tumour is as it was on January 6. Urine acid; no albumen, no pus.

Jan. 23.—Very slight loss; otherwise she seems to be doing well. Bowels open. Urine acid. No albumen; mucus.

Jan. 28.—Patient looks better, though the loss has never quite ceased. Pulse 85. Tongue clean. The anæmic murmur is still audible, but less loud. Urine 1020, acid, clear; alb. a trace.

Jan. 30.—The loss of blood is again free; complains of pain in lower abdomen. Pulse 120. Bowels open. Tongue still pale.

Jan. 31.—The discharge is bright red. Pulse 100. Tem-

perature last night 100.6°; this morning 102.4.° The abdominal pain continues.

Feb. 1.—Much the same. Mr. Gell again estimated the number of red-blood corpuscles in the c.mm., and found 2,700,000 instead of the average 5,000,000, thus showing some improvement since the 10th of January. The white-blood cells remain as before.

Feb. 2.—For the last two days the loss has been very free and very fœtid. Something resembling a slough was seen protruding from the vulva and cut off. At 2 P.M. she was brought into the theatre, and a large quantity of horribly fœtid decomposing fibrous masses was removed from the interior of the uterus. A carbolic douche, 1 to 60, was given. Since the 31st the temperature has varied from 99° to 101°.

Feb. 3.—Patient looks better; not much discharge or loss. Pulse 80. Bowels open. The hypogastric tumour is decidedly smaller, extending only about 4 inches above the pubes.

Feb. 4.—On vaginal examination, some shreds of decomposing tissue were felt within the cervix, and removed by means of forceps.

Feb. 6.—The tumour only reaches 2 inches above the pubes. Pieces of slough continue to come away in the douche. Pulse 120. Discharges are still very fœtid. Urine acid, pale, 1020; trace of albumen.

Feb. 8.—Patient was brought into the theatre and some large sloughing masses removed from the interior of the uterus. Pulse 96. Tongue clean. Bowels open.

The temperature since February 2 has been considerably raised, varying between 99° and 101.5°.

Feb. 10.—Has more colour in her cheeks. Pulse 100. Bowels open. Takes well.

Feb. 12.—A large slough was removed from the uterus this morning, and its cavity washed out with Condy. There is still a fœtid, dirty-red discharge.

Feb. 13.—More sloughing tissue was removed from the uterus, and the latter washed out with Condy. The cavity of the uterus measures 4½ inches.

Feb. 15.—A large slough was again removed this morning by uterine volsella.

Since February 8, the temperature has been considerably raised, reaching as high as 102.4° in the evenings, and generally falling to normal in the morning.

Feb. 16.—Patient looks better. Pulse 80. Tongue clean. Bowels open. Temperature normal. There is still some discharge.

Feb. 17.—There is still a faint anæmic murmur heard over

the second left intercostal space. She looks much better. Lips red. The tumour in the hypogastrium has now vanished. Per vaginam, the os uteri is found to be patulous; nothing protrudes through it. Still some bloody discharge.

Feb. 21.—She feels quite well. Tongue clean. Bowels open. The temperature has been normal since February 16.

Feb. 24.—Patient gets up daily, feels quite well, though there is still a very little discharge. Urine 1018, acid; no albumen.

Feb. 25.—Her colour is rapidly improving. There is no discharge. Per hypogastrium, nothing abnormal can be felt. Per vaginam, cervix uteri is patulous; admits the finger readily. Probe could not be introduced more than two inches.

Feb. 26.—Discharged.

A fortnight later she returned to see us, looking a picture of health.

Case II.

J. M., aged 42, admitted to Martha Ward on March 1, 1884. Married two years; no children; no miscarriages. Catamenia commenced at 13, regular and natural till three years ago, when they became profuse. During the last six months the periods have occurred every three weeks, and the loss has been very considerable. Of late there has been a bloody discharge between the catamenia, and large clots have sometimes come away. Patient has noticed her abdomen to be enlarging for the last year.

Complains now of the frequent loss of blood and of a swelled abdomen. No pain. Pulse 85. Tongue clean. Bowels open. Defæcation and micturition natural. She is slightly anæmic in appearance. Her chest presents nothing abnormal.

Dr. Matthews Duncan made a physical examination. Per hypogastrium, a rounded smooth swelling about the size of a large cocoa-nut occupies the whole hypogastric region; it is dull on percussion and dumb. Per vaginam, the cervix is in its natural situation; the finger passes in every direction around a tumour which projects into it. The tumour felt per vaginam is evidently identical with the hypogastric tumour.

March 3.—Pulse 80. Tongue clean. No pain. Temperature normal. Urine 1028, acid; no albumen. A vaginal examination was made, and the cervix dilated with the finger. Ordered pil. ergotinæ three times a day, and a lotion of carbolic acid to be used as a douche twice a day.

March 6.—Chloroform was administered, and the intra-uterine growth drawn down by means of volsella. It was found to have no kind of pedicle, and the whole of it could not be removed. Two slits were made in the cervix, and a

considerable mass thus brought within reach, though numerous manipulations and considerable force were required to do so. From the lower part of the tumour was cut off with scissors a lump about as big as an orange. No hæmorrhage followed.

March 7.—Slept badly; much pain in abdomen. Considerable blood-stained discharge during the night. Pulse 110. Bowels open; skin acting well. The temperature, which has been normal since admission, is up to 100° now. The abdominal tumour extends up to the umbilicus.

March 8.—Much tenderness in the hypogastrium. Slept badly in spite of gr. $\frac{1}{6}$ of morphia. The loss continues. Pulse 96; tongue, red, dry, cracked. Temperature last night, 101.2°; this morning, 101.4°. Ordered a lotion for the mouth consisting of glycerine ʒi, tincture of myrrh ʒi, water to ʒi, to be used frequently.

March 10.—Bad night in spite of morphia draught; much hiccough; tongue very dry, red, and cracked. There is great but not excessive abdominal tenderness; she lies on her back with limbs flexed at the knees. Bowels not open for four days, probably on account of 2 grs. of opium she had been taking daily for two days. There is retention of urine to-day, requiring the catheter. A large quantity of sloughing tissue came away in the douche this morning. On vaginal examination a large growth is felt just within the vulva, which has evidently descended from the uterus through the cervix. It has the feeling of a fibroid. The temperature during the last two days has varied from 100° to 102°.

March 11.—Pulse 120; bowels open; slight pain in the abdomen; tongue very dry and cracked; urine drawn off.

March 12.—The hiccough continues troublesome; occasional retching; pulse 110. The abdominal tumour only reaches to within an inch of the umbilicus.

March 13.—Urine 1019, acid; trace of albumen. Some more pieces of slough came away last night and this morning. Carbolic douche four times a day. Tumour reaches to a point 2 inches below the navel. Her tongue is aphthous; she complains much of thirst. Temperature during last three days between 99° and 100.3°.

March 15.—The urine is drawn off regularly; there is considerable œdema of the labia. The abdominal swelling is rapidly diminishing in size; there is dulness only to 3 inches above the pubes. Pulse 120; bowels open; tongue very aphthous. During the last three days pieces of slough have been removed by means of uterine forceps; the discharge continues extremely offensive in spite of six douches a day.

At 3 P.M. the patient was put under gas and æther, and Dr. Matthews Duncan removed a very large decomposing gangrenous mass. It was firmly grasped by means of volsella and cut off with scissors. On examination it weighed 2 lbs., and was composed of fibrous material in a state of gangrene. A portion of the mass removed appeared to be part of the capsule. Very little hæmorrhage followed the removal of the mass. A carbolic douche was given, and 4 minims of ergotine were injected hypodermically.

March 16.—Slept badly; bowels open three times. Less discharge, but it contains some shreds of sloughing tissue. Pulse 120. In the hypogastrium no swelling can now be felt; the tumour has disappeared. Her temperature has been rising again during the last three days, varying from 99° to 102.4°.

March 18.—Pulse 135; tongue and throat very painful; numerous aphthous patches to be seen on various parts of the mouth. Shreds of slough continue to come away in the douche, which she has many times a day. Per hypogastrium, there is no tenderness; per vaginam, an irregular hardness is felt occupying the os. The discharge is still very fœtid. Urine 1019, acid; contains a cloud of albumen.

March 20.—Four carbolic acid douches given yesterday, but discharges are still very fœtid. Pulse 110; bowels not freely open. Her temperature has been high since the 17th. March 17: M. 100.7°; E. 103°. March 18: M. 102.5°; E. 103.2°. March 19: M. 100.7°; E. 101.4°. March 20: M. 102.4°; E. 103.4°.

March 22.—She seems somewhat better; slept well; pulse 108; bowels open; less discharge; temperature is slowly coming down; mouth still aphthous, but her appetite is improving. Ordered a gargle of pot. chlor. gr. xx. ad ℥i.

March 24.—There are fresh aphthous patches in the mouth. A microscopical examination was made, and the spores and mycelium of oidium albicans found in great abundance. Pulse 100. Bowels open. Urine 1020, acid; albumen a trace.

March 26.—There is now almost no fœtid discharge. Pulse 110; aphthous stomatitis still bad. No trace of tumour to be felt in the abdomen. Temperature has been coming down for four days, and is now nearly normal. Ordered a quinine tonic.

March 28.—The stomatitis is much better. Pulse 115; urine acid, sp. gr. 1016, cloud of albumen; tongue clean; bowels open. There is very little discharge.

April 3.—Pulse 110; appetite improving; tongue clean, moist. Per hypogastrium, no tumour can be felt; no tenderness. Per vaginam, cervix uteri feels irregularly nodulated;

nothing protrudes through it. Probe enters 3½ inches in the natural direction. Urine 1015, acid; no albumen. Since March 26 the temperature has varied from 99° to 101°.

April 4.—Feels better every day, but the temperature is still a little raised. There is very little discharge.

April 6.—Feels well; temperature normal.

April 8.—Urine 1013, acid, trace of albumen; feels much better; no pain. Very slight discharge. Probe enters uterus natural direction 3 inches.

April 14.—Quite comfortable. Gets up daily.

April 17.—Dr. Matthews Duncan:—Considerable induration of a patulous cervix. Vagina around the cervix is indurated, and the whole consequently fixed. Uterus measures 3 inches. ℥ij. of ung. plumbi iodidi to be introduced into laquear vaginæ every night. There is no discharge. Patient feels quite well.

April 23.—Had some pain in the stomach the day before yesterday, and felt shivery all day yesterday. Her temperature last night rose to 103.4°. It is 99° this morning, Pulse 112, full. No loss. The pain in the abdomen is relieved by poultices. Urine 1020, acid; no albumen.

12 P.M.—Feeling cold again this evening, but no rigor. Temperature 104.2°. Pulse 114, good volume. Bowels open. Was sick after. Quiniæ sulph. gr. iij. Tongue red, dry, and cracked. Complains of pain just above the umbilicus; none elsewhere.

April 24.—Feels better. Pulse 112. No pain in abdomen. Had quiniæ sulph. gr. x. last night. Temperature, M. 100.8°; E. 103.2°

April 26.—Dr. Matthews Duncan:—Per hypogastrium, nothing abnormal except considerable tenderness. Per vaginam, nothing new is discovered except tenderness on the right side of the uterus. Patient complains of pain in the abdomen. Did not sleep well. There is some loss. Temperature, M. 103°; E. 103.2°.

April 28.—Tongue very red, dry, and cracked. Pulse 126, small. Bowels open three times. Complains of gnawing pains all over the abdomen. Yesterday's temperature, M. 100.8°; E. 102.4°. To-day's, M. 102.8°; E. 103.2°. She is now taking pil. hydrarg. gr. ij. and pulv. opii. gr.ss. 6tis horis.

April 30.—Feels no better. Pulse 140. Lies on her back with knees drawn up. Abdomen more distended and tympanitic. Skin has a yellowish tinge, but the conjunctivæ are not stained. Pain is much the same, and there is hiccough. Mouth very dry. Temperature yesterday, M. 102.6°; E. 102.6°. To-day's, M. 100.6°; E. 102.6°.

May 1.—Patient looks worse. Vomited twice last night. Suffers much from hiccough. Abdominal walls rigid, prominent, and tender. Bowels open, light-coloured, pea-soupy action. Pulse 146, running. Temperature, M. 101.4°; E. 102.3°.

May 3.—Slept badly; looks worse. Pulse 162, weaker. Abdomen more distended. Urine 1024, acid, trace of albumen. Temperature much as before.

Dr. Matthews Duncan :—Per hypogastrium, there is considerable distension of the abdomen. Per vaginam, the induration and tenderness on the right side have diminished or disappeared.

12 P.M.—Bowels have acted three times this afternoon; action very liquid and pea-soupy. She still takes well, but in appearance has changed much for the worse. Pulse 160, weaker. Hands and arms are cold, but feet are warm. There is scarcely any tenderness on pressure in abdomen, but she complains of pain in the right side. Tongue very dry and brown. Respiration very rapid. A rough pleural sound heard over the base of the heart. Breath sounds harsh over front of chest. Temperature 102.6°.

May 4.—Patient sank gradually, and died at 5 A.M. very quietly.

Post-mortem.—Body somewhat emaciated. Pericardium contained a little bloody fluid. Heart normal. Pleuræ each contained a pint or two of flocculent fluid. Lungs congested. Abdomen greatly distended. Intestines matted together by recent adhesions. There was scarcely any serous fluid in the peritoneal cavity, but several ounces of pus, especially in the pelvis. The intestines were greatly distended. Liver, spleen, and kidneys very soft and friable. All the pelvic viscera were matted together by recent adhesions. Bladder healthy. Uterus enlarged, and contained the remains of the attachment of a tumour at its anterior wall; these remains were not larger than half a nut. Each Fallopian tube contained pus, and was much dilated. There was no para- or peri-metric abscess. Vagina natural. The blood throughout the body was abnormally fluid.

ON

DEGRADATION OF TYPE IN THE INSANE.

BY

T. CLAYE SHAW, M.D.

The reversion to the original type of simplicity, non-complexity, as a result of disease of the brain causing insanity, is a process as striking and noteworthy as it is in a flower left to bloom in conditions unfavourable for development, or the subject of disease. In man the reversion is towards the type of early, undeveloped life, shown, it may be differently, in the emotional and the intellectual side, because in the natural course of development of mind the ideational and the emotional seem to follow different lines; the former is expansive, ramifying into projections of illimitable variety and extent, the latter is shown by repression, contraction in range of demonstrativeness, until in some natures it is subdued almost to vanishing-point. We should thus expect that a retrograde mind would shrink in intellectual comprehensiveness, and abound in emotional demonstration; there will be a smaller range of ideas, and incapacity for the development of new ones; a lessened power of control over the emotions, and a reduction of conduct to the lowest levels of accepted primary glimpses of intelligence; and though the descent will be to a different platform of baseness, equally low or perhaps lower, it will still retain traces of the higher estate from which it has fallen.

The moral fall in the insane is most striking. Take, for instance, the quality of truthfulness. All recognise that the higher an individual is in the moral scale the greater is his abhorrence of deceit, no consideration of consequences allowing interference with the duty of telling the truth. As with individuals so with nations; those in the foremost rank are the ones in which the principle of truthfulness is best recognised and acted upon. Nothing is so painfully prominent in the insane

as their deceitfulness, more especially in women of the hystero-nervous type, and in what is clinically known as "emotional insanity." I would not assert that truthfulness *per se* is an innate quality in the mind; it is probably a result and deduction owing to the finding out by long experience that it is better and safer than deceit. Without doubt deceit is the state of mind originally prompted by desire (which is a primary feeling), and it is only education that develops the product truth, which is a deduction from arguments pro and con. If, then, deceit existed before truth, the latter being dependent for its existence on the growth of memory, the return to habits of lying in the insane is a notable instance of return to the original type. The great aim of life in the savage is the safety of the individual at the expense of others; hence deceit is so often necessary to his existence that no need arises for cultivating truth; but the object of civilisation is the growth of others if necessary at the expense of self, and to carry this out absence of deceit is the mainspring. The insane person, cut off by his disease from his surroundings, is driven to do what he considers best for himself, *i.e.*, what his desires prompt him to do; hence he resorts to artifice and deceit to attain his ends; he says that he has taken food when he is wishing to starve himself; he says that he has been ill-used to account for the bruises that he has inflicted upon himself; he says that you may trust him implicitly, when he will take the first opportunity to commit suicide. Perhaps the fear of death is the one feeling that arouses in the sane mind of civilisation the greatest display of precautions in the endeavour to avoid it; but with the insane this fear has no force; it is met as unconcernedly as in the savage; and this not because the person has lost all appetites, desires, and hopes (for he may still have these strongly in his own disordered direction), but because the elaborated instinct of self-preservation is debased. It is not meant that an insane person whose life is threatened will not fight for it, just as a savage would, but that the absence of any value of the possession of life is shown by the readiness with which he will sacrifice it for a trifle. For instance, he is thwarted in wearing an article of dress, or in his diet, or in some amusement that he had anticipated, and he at once tries to destroy himself, just as the savage does if his prayer to his god is unanswered, or he has been unsuccessful in hunting. In the one, the idea of the possession of life has always been subsidiary to the enjoyment of power and of happiness; in the other, the fear of death, which formerly made all things subsidiary to itself, has now lost its potency, and he accepts even a cruel death with complacency. I have known a suicidal woman ask a person whom she saw carrying a gun to

shoot her whilst she tried to bare her breast to receive the shot; and nothing is commoner than for persons of this class to ask their attendants to give them the means of self-destruction. The same thing applies to cruelty towards others. The savage kills remorselessly and indiscriminately; so does the insane person; and not only so, but on every possible opportunity he will thwart the interests and try to sap the happiness of his best friends. No matter how good the previous education, however exalted may have been the principles inculcated of love, charity and peace, all turns to trickery, hatred, and cruelty when retrograde metamorphosis has set in; just as no plant is raised so high but it will, if neglected or diseased, degenerate, and no breed of animals is so fast, strong, or tame, but will, under unfavourable conditions, become slow, weak, and wild. This must be so with mind as long as it is the growth of the same original germ; only a new creation would change the form of reversion.

Many acts of the insane curiously resemble those of uncivilised persons, or even those of the brute creation. You give them a knife and fork, but they prefer their fingers; they tear up their clothes to alter them for decoration; though other things might be obtained, they prefer ornaments made out of bits of bone or stones carved or ground in the way shown by islanders; and they will paint their faces or score them after the manner of savages.

One great feature of the degradation of the musculo-nervous system is shown in restlessness. A sign of the high civilisation of the present day is stolidity, the repression of the exhibition of excitement or feeling, or of the facial expression of wonder or astonishment; but an acutely insane person is restless, moving about in an unnecessary and purposeless manner, still capable at times of combined and definite movements of a regular nature, but relapsing into incoördinated activity. The restlessness of a general paralytic is of real service to him, for it prevents the formation of bed-sores and promotes the circulation. Again, in those cases of restless melancholia where the circulation is languid and the extremities blue, the constant restlessness is of the greatest service in helping to preserve the nutrition of the muscles. I have generally much more hope of a violent or restless patient than of a torpid or listless one; there is in the former a greater energy of the conditions on which functional life depends.

The sense of decency is one of the most elaborated sentiments of civilisation, but in the insane it is as strikingly perverted. The degradation is here more towards the type of the brute creation than of primitive races, in some of which modesty and virtue are highly esteemed, any breach of them being

severely punished; but the tendency to exposure of the person in an individual of a community where extensive clothing is made a cardinal point must certainly be looked upon as a return to the early form of life where the opposite holds. Nor are conditions of climate responsible for this, for a person suffering from general paralysis will strip himself in the coldest weather, and when his own temperature is not raised, whilst we know that a savage will merely clothe himself for warmth or to show off finery, not from any idea of modesty. The indecent language used in certain forms of insanity, even by women who have been models of purity in ordinary life, is to be viewed as the expression of a mind in which the acquired ideas of propriety are extinguished. When mind is destroyed or is in abeyance, the organic life of the body has still to be preserved. In civilised communities the members supply the missing mind to the impaired one, and assist the organic functions in maintaining the life of the body; but where the knowledge or intelligence is absent, as in savage communities, or where the individual is left dependent on his own exertions, then the simple object of preserving life is the explanation of many acts that are noted as signs of the disease. For instance, one of the most definite and painful of the symptoms of the last stage of general paralysis is the cry, the noise and shouting continuing for hours. And a fortunate thing it is for the patient that his laryngeal muscles are the last to give way, for by them his presence and his wants are forcibly made known. In high civilisation it often happens that an action necessary to the maintenance of organic life is checked and a compensating equivalent of some other kind is provided, but in disease, where the guiding power is in abeyance, the readiest methods for attaining the end assert themselves.

Any one going round a large asylum must be struck with the way in which many patients (especially women) squat on the floor, or dispose themselves in attitudes resembling those of primitive races. When this habit is once formed it is very difficult to get the patient to abandon it; in fact, the habit only ceases when the intelligence returns. This natural method of taking rest is the one best adapted for the safety of an individual whose balancing powers are impaired, or whose attention is too much distracted to attend to them.

In alteration of speech the insane show a serious falling off, for not only does the language become akin to the earlier forms of communication, but it is distinctly more emotional and ejaculatory, that is to say, simple in its range. One of the earliest forms of writing is by hieroglyphics, and symbolical writing is met with,

resorted to by persons who not only had no previous training in it, but were probably unacquainted with it. I have a patient, formerly an excellent writer, who has entirely given up the usual forms of penmanship, and now uses a caligraphy resembling the Chaldean; the man evidently thinks in pictures, and this pictorial mode of thought must give an intensity and reality to the individual that accounts for the tenacity with which ideas are held. Such lunatics are least of all open to conviction from argument. Not only is the form of language changed, but its emotional side becomes more prominent, and therefore more elementary. As brain power becomes impaired, swearing and ejaculation take the place of measured and moderate expression, and the radius, too, of verbal expression becomes contracted. Scope of action and extent of expression are ample according to the number of ideas (how otherwise could a good brain declare itself, or be of any service to the community?); and when partial arrest of brain action occurs, as in insanity, what functions remain must be less complicated in expression and more limited in range. Hence the paucity of ideas in the insane, and the small range of action resulting from them.

Personal cleanliness is much neglected in the demented insane, and the voidance of excreta whenever the sensation of fulness is felt, regardless alike of time and place, is to be noted as significant of return to a primitive state and protective of the organic life of the individual. Appetite or the desire for food is frequently absent in the insane, and is one of the most difficult symptoms to treat, unless viewed from the point we are considering. Except where food is refused from delusion, there may be good grounds for not too hurriedly administering it artificially. An animal will eat only when it is hungry, a savage the same, and many persons in an acute stage of insanity will refuse food simply because they do not feel to want it. I have had two patients who frequently refuse food for periods of four to five days; and I find by experience that it is better to wait till their appetite returns than force unwilling food upon them. If cases of this kind are rightly diagnosed, it is better to follow the lead indicated and wait for the return of the appetite. When illness is produced by excess of alcohol, there is a protective nausea against the continuance of its administration, and in the same way diseases of the brain caused by non-assimilation are best treated by rest. Just as nausea and pain are the dyspeptic's safety-valve, so is the feeling of satiety to the insane.

Acute disease may be regarded as an entity opposed to the life of the individual, and occupying all the media through which that life is continued. Thus a fever, whilst consuming the

existing structures, impairs the appetite and prevents the introduction of material that opposes its ravages; whilst sapping the structure it excludes the introduction of fresh building materials; but as fever is an entity of a definite term of power and time, it is a question between it and the life of the individual which is able to hold out the longer. There are, in fact, two processes going on: the one is natural; the other—the engrafted—is the disease.

So it is in insanity: two forces are in conflict; one, the super-induced inflammatory process, which tends to excessive expenditure of nerve-force in all directions; the other, the natural one, always striving to moderate the force of the enemy and to resume its place after the evacuation of the latter. Hence it is that in brain-disease we are almost always able to distinguish more or less of the natural action going on, because the lesion rarely affects the whole of the organ. It may be conceded that the primary object of the brain in man is that he should think and act chiefly with the view of procuring sustenance and clothing; this in the higher developments becomes the desire for the accumulation of wealth and ends in luxury. In the savage these simple ends are attained by a moderate development of brain, and so beyond a certain point there is no progress and no complexity of ideation; hence his insanity is little more than an exaggeration of his usual manner; but the insanity of developed civilisation retains the latest formed as well as the original simpler and less complex ideas. Incoherence is a return to that simple type which evolves a few sentences only at a time. In the incoherent the range of ideas is small, the same phrases constantly recur, because the brain is brought back to its simpler condition through the suspension by disease of its more developed functions. The suspended function may be one necessary to the preservation of the individual, and if so, then death ensues; but this is rarely the case, and it seems only likely that the higher lines of thought, not the mere fundamental organic reflex, should be the first to suffer. This is so because they seem to depend for their existence on a more delicate balancing of the relations between different parts of the body. Thus food of a certain quality, a definite state of the circulation, numberless other conditions peculiar almost to each person, are essential for the development of the highest brain action, and any slight disturbance of any one of these conditions will incapacitate the person for higher acts and make him turn for relief to simpler and less complex forms of mental action. Thus the wearied scribe or the manipulator of funds betakes himself to shooting or fishing; and it is noteworthy

that the rest so essential to the use of the higher intellectual processes does not seem to be required in the lower forms of mentalisation. Thus the hunter or sportsman never dreams of a holiday, because his strong and natural system having its bent, and sufficing for all his wants, there is no call upon him to apply himself to an artificially-grafted development.

Disease robs men of this higher developed state, because it changes the conditions on which its existence is possible, and leaves only the coarser and more self-depending substratum of organic life. When the disease has subsided, the old processes redeclare themselves, unless the lesion has been of so destructive a nature as to efface tissue. In some instances a re-education has to be commenced, not of the tissue first attacked, but of a part that has taken on a complementary action.

A female patient was a few months ago admitted to this asylum in a state of acute puerperal mania. She could not write, nor even hold a pen, and her brain action was of the simplest character, being limited to meaningless short sentences, in which no connection of any kind could be traced to her previous history or surroundings; the developed cells of her brain responded in an incoördinate manner to the irritation going on there, but without consciousness, and for practical purposes they might as well never have existed. All that remained was her reflex system, and the prominence assumed by this was itself a signal degradation, a resumption of disused, or at least subjected functions. She was unclean in her habits, and at irregular times too, showing that even this reflex organic system was impaired; she was restless, and constantly exposed herself, owing doubtless to unconscious uterine irritation. Hers was, in fact, the nervous manifestation of a baby plus the remains of disordered and almost eclipsed traces of a higher development. As she improved, one of the first signs was in her writing, which was almost from the first good, but very incoherent—that is to say, the memory for signs as merely recognised symbols came back before the coherence, which resulted finally in intelligible writing. It is even doubtful if the writing at first was in response to any definite idea, *i.e.*, if it expressed what she was thinking about; it is far more probable that as her brain became clearer the stored-up reflexes of word-signs, that is, writing, asserted their reappearance in an uncontrolled manner, to be afterwards subordinated to their proper sphere, the purposed expression of ideas, as recovery ensued. The improvement from incoherence to coherence showed recovery of the highest phase of intelligence, so that the course of progress of rehabilitation was from impaired animal function to perfected reflex action, sensori-motor and ideo-motor.

Her illness, the descent through the above-mentioned series, was very short in duration, but the work of repair occupied months.

I have under observation a male patient who dresses himself in a fantastic manner, under the delusion that he is "Jehovah, King of kings." His decoration consists of extracts from texts of Scripture, legends, symbols of his supposed high functions, bejewelled and spangled robes made out of bits of glass and polished pebbles—all in conformity with his delusion, *i.e.*, with a simple or elementary view of the necessities of his delusion; for no reigning monarch would care to live always in his paraphernalia of royalty as this insane copyist does, simply because the life of a monarch, as a monarch, is an intermittent one; but with the lunatic the idea, once formed, is a persistent one; he is always in the presence of his tremendous position; and in this he resembles the savage, whose position, being mainly dependent on his constant personal assertion, makes the wearing of the insignia of office continuous; even in his domestic life a momentary setting aside of his dignity is not to be thought of. How is a delusion of this kind to be regarded as a degradation, an approach to a lower kind of life, because by this must the action that it leads to be judged? It is judged to be so by what we see of early life, with its fondness for assumption of characters which it has not the reason to know it can never attain, and by the psychological tenet that the fully developed mind is a system of correlative adaptation, and that the assumption of an incongruous position shows that the correlative action which determines present facts is impaired; that the brain is not acting as a whole, and that the highest faculties—will, comparison, and memory—are unseated. The action here is the exponent of the mind, but the lunatic king may show more ingenuity in his desecration than the savage, because of the superior character of the former estate from which he has fallen. Decorations, symbols, are in common life far from being significative of the highest form of brain power, for is it not the type of the highest mind to be able to deal with abstractions, to imagine the unseeable, to guess at, even from a distance, the unknowable? The reading a drama is an effort, a task. To witness the same with all its spectacular accompaniments is a relaxation, the temporary placing of oneself on a lower, because simpler, mental state, in which there is no effort; whilst the work of the critic, who has to undress the play and represent it in the cold aspect of language, is again a higher and a more difficult one. Hence it is that the highest gifted individuals often fail in producing a play that takes with the public; they may have the poetical instinct, and may soar into regions where few can follow them, but they can-

not descend to the lower platform where amusement or interest without exertion is wanted.

A case of acute dementia occurring in a previously intelligent person is perhaps the best illustration of the sudden reduction to the simple elementary condition of an actively working organisation. The heroine in the popular story of "Called Back" (although I do not think that the delineation of her case is in all respects a psychologically correct one), from being a person of model mind is suddenly reduced to an elementary condition; though in all the cases that I have seen, not only is the mind impaired, but the body also; the face loses its expression, the lassitude corresponds with the suspension of motor impulse; the very conditions of organic life are reduced to the lowest point compatible with life—the respiration is slowed, the temperature lowered, the circulation flags, digestion is impaired, and the excreta have to be voided by artificial means. Can a more complete reduction to the elementary condition be imagined?

In the state of the hair in the insane there is a noteworthy alteration of a kind suggestive of reduction in class. I do not allude to alteration produced by tricks, such as in persons who depilate in accordance with some delusion, but of change in quality from fineness to coarseness, and of quantity in the thick close masses seen in many chronic lunatics. Moreover, it is not uncommon to see symmetrical white bands or tracts of hair develop themselves during an insane outbreak, and recover themselves afterwards when convalescence takes place. Darwin regarded the shaggy development of hair as a return to the type of the savage, who was supposed to crest his hair to make himself look more terrible in battle. I do not regard it as anything more than a return to a lower type, conditioned, in all probability by the increased and long-continued temperature of the scalp, which is in these cases thickened, and leads sometimes to a greater activity of the hair bulbs, at others to a destruction of them and a consequent baldness. It is a lower and degenerated type of hair, because it is a condition brought on by inflammatory action, which is a condition of lower vitality than a healthy one, and is incapable of producing a result or growth equal in development to the result of a healthy non-inflammatory process.

Knowledge of time and space is slowly developed in children; and in the insane is most prominently impaired. In the sane mind ideas of time and space are acquired by memory, *i.e.*, by experience of work done or space traversed on former occasions. Until the child has gained these experiences, time and space

for it do not exist; and the diseased brain impaired by softening or acute change fails to judge for the individual either where he is or how long he has been there.

That knowledge of time and space is dependent on complete brain action is shown by the physiology of dreaming, where the brain acting only in part, no comparison of its experience can be registered, and therefore no ideas of projection or extension formed. The interconnection of time and space is shown by the German method of calculating distances. In the unravelled brain the process is not one merely of suspension of elaborated functions one after the other. We do not see taken away by disease one function after another, just in the inverse order in which they were placed, like the regular demolition of a structure by taking it down from the summit; but the more fundamental the structure, the greater is the dislocation of mass, and so a lesion affecting the functions at the base of the human nature is more disastrous as regards wreck of the complete mind than a lesion affecting later development of mind. Thus a female patient here was seduced, and immediately fell into a condition of acute dementia, and from being intelligent and handsome, she is now simply vegetative. Here it must have been the shock to the primary or basic ideas of morality, which implicated in their fall all the superadded and intellectual ideas proper. Take, however, a person whose insanity is, say, brought on by overwork, and we see that these fundamental elements are not necessarily at first affected. Many say that the emotional depravity is always first seen in intellectual insanity. I think that very often it is, but not at first necessarily. We can have intellectual insanity without emotional complication, but we do not see emotional insanity without impairment of the intellect.

Is there not, then, such a thing as emotional insanity proper, *e.g.*, where the impulse to do a violent act compels a person to murder, when he will afterwards confess to its being wrong, as in persons of epileptic temperament or affected with hereditary taint? I do not think that a morbid impulse can arise without affection of the intellect, as far as will and judgment go, at the same time. But a man may have the desire to commit a crime from a morbid intellectual process, but he may be deterred from it by the still unimpaired basic intensity of his nature—love, affection, fear of death, &c. The lesion has begun at the highest part, but it may descend to the basement, and what remains is a crumbling mass of disconnected rubbish, left there till death completes the disorganisation. The child's outlet for passion is destructiveness, and in degeneration of mind this impulse reasserts itself. There is here a female patient, formerly

in good position, who has, however, led a very excitable life, and has had much worry in legal matters. Her manners are easy and polished when not in an excited state, but she is of epileptic temperament, sees at times the letters of the book she is reading "turn to blood," and then, without losing consciousness, she smashes whatever is in her reach, just as a thwarted child will break its toys. Afterwards she is sorry for what she has done, but her conduct repeats itself in these tokens of early untutored outbreaks.

Does this aspect of the insane mind help us nearer the advancement of therapeutics? Until we know on what principle shock to the nervous system acts, there must be a large class of cases for which we can do little. Worry, overwork, we can understand being the causes of insanity, but what is the nature of the lesion when a person suddenly becomes demented from some news, or the sight of an object, or from fright? The perfect restoration to their original activity of obscured minds without any other remedy beyond food, rest, and fresh air, point to the same forces that build up the young and growing brain, to which, however, must be added education. In some asylums, education is a great factor in the treatment, and its results are well spoken of. How it acts and should be beneficial will be evident from consideration of the above postulates.

There does not seem to be any disease akin to a specific fever attacking the brain, unless, perhaps, disseminated sclerosis be such, *i.e.*, no blood-poison (unless in the case of poisons affecting the brain, such as alcohol and the class of deliriant narcotics) that we are aware of specially affects the brain, as enteric fever does the small intestine, coming on in a definite way, running a definite course, and attacking a particular part. The opium-eater knows the exact quantity required to produce the effect he wishes, and he knows the time it will last. And the effect of these poisons is to produce a childish state, extending even to the uncertain incoördinate gait. In the first stages of alcoholism, where brain-action is rapid, as in the very early stages of irritation, there may be no subinvolution, but a positive rise in the intellectual scale; but this effect is transient, and if too often repeated leads to destruction and degradation.

Some poisons seem, like disease, to attack the emotional and intellectual sides of mind variously, according to idiosyncrasy. Thus, alcohol in one will at once set up a highly exaggerated emotional state, although intellectual weakness rapidly comes on and is very apparent; but in another the effect is first of all on the intellectual side, and the emotional side will be later, or not at all, developed. Thus, I knew a man who had

been for some time an abstainer, but who, on one occasion, threw aside his new principles, and in one day took a considerable quantity of liquor. Yet he was in company until the time of retiring, and so coherent were his answers, that the question of drunkenness was not even thought of; but the next morning he could remember nothing of what had occurred after the noon of the previous day. Certainly he showed no emotional alterations, and the way in which people were deceived as to his condition shows that the reflex system of his brain must have acted most completely. When memory commences in the child is difficult to determine. Numberless acts are performed apparently in a voluntary manner, but the child has no recollection of them, and it is not until a certain development of brain is reached that conscious memory becomes possible. Just so in retrograde degeneration. Up to a certain point the memory of what has been said and done during the attack may exist, but we find that as the lesion has extended, memory becomes obliterated. The patient remembers up to a certain point of the illness, but after that all is a blank. Is the point where memory is obliterated in the drunkard due to the obscuring of the faculties up to the point of development in which conscious memory arises in the early brain? The development of different faculties of the brain appears to be sudden in their becoming conscious, and equally sudden in their extinction. A person will say, "The first thing I remember when I was a child was so and so;" and the consciousness of certain feelings, *e.g.* the sexual, may be almost exactly defined. Objects excite a conscious impression which is remembered as such, but they must have presented themselves many times before without giving rise to conscious cerebration.

In concluding this paper, I would call attention to the circumstance that the evolution of the brain is different from that of any other viscus. The circulatory, respiratory, and digestive systems enter at once into the full development of their functions; so, after they have once become active, do the sexual ones; but the brain is being continually modified from day to day. This is clear if mind is the manifestation of brain development. Disease of the brain, then, is peculiar as compared with that of other viscera, because of the varying character of the symptoms shown, according to the period in the development of the brain at which it commences.

A CASE OF ENDEMIC HÆMATURIA

FROM THE CAPE OF GOOD HOPE.

BY

ARTHUR DAVIES, M.B.

I am indebted to Dr. Andrew for kindly allowing me to publish the notes of this case.

H. G., a native of Kent, lived from 1875 to 1879 in Cape Colony, at a place called Hanover. In 1879 he went to the Transvaal, where he lived for three years in a low-lying, marshy district. In August 1882, just before arriving at the newly-discovered goldfields on the borders of the Transvaal and Swazieland, and 500 miles distant from where he was formerly living, he first noticed that he passed two or three drops of bright red blood after each act of micturition. For three months the quantity passed remained the same: he was in perfect health, and suffered no pain whatever. In November 1882 he returned to Cape Colony, and in December of the same year he caught a severe cold; his hæmaturia now increased, so that he passed about twenty drops of blood after each act of micturition. He still felt quite well, and suffered no pain; he noticed also that brackish water seemed to increase his hæmaturia. In July 1883 he began to experience for the first time some pain in the hypogastric region, and he suffered pain whilst passing his water. In August 1883 he was appointed a Government time-keeper, which post involved continuous riding on horseback for several hours, so that he passed his water at long intervals; his urine now assumed a brownish colour resembling porter, and he had some difficulty in passing it; the dysuria was caused by the formation of what he calls "clots," which obstructed the passage of the urethra. In the intervals of passing his water he suffered from a gnawing, uneasy sensation at the root of the penis, and he felt weak. In February 1884 he had an attack of inflammation of the bladder, which lasted three weeks; continued

work up to March 1884, when his urine assumed a bright red colour, and he noticed that he passed, after each act of micturition, spawn-like substances and long spiral casts grooved on one side. His dysuria now increased, and owing to the sudden stoppage caused by the obstruction due to the clot-like substances he was compelled to strain whilst passing his urine; the pain at this period also increased, and he experienced a scalding sensation along the urethra immediately after the clots were passed. Was under treatment at Port Elizabeth Hospital for six weeks, where he got stronger. He left the Cape, under advice, in April, and reached England in May of the present year.

Patient attributes his symptoms to having drunk, whilst in the Transvaal, water which had passed through marshy soil; he has also frequently drunk water from wayside pools and ponds which had been contaminated by cattle suffering from a similar disease, called by the natives "red water." Horses and oxen are especially prone to it; and it is very fatal in the former, since they die within twenty-four hours from the time of contracting the disease: occasionally, however, they recover, and in such cases a horse is termed "salted," and is almost three or four times as valuable as one which has not had the disease.

Previous illnesses: Brain fever five years ago; typhoid fever three years ago.

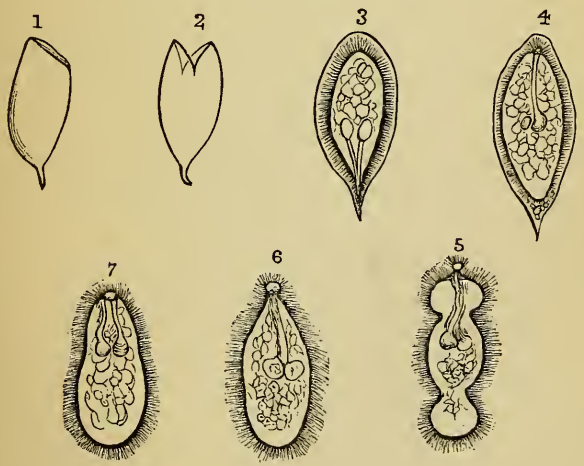
Present condition: Patient is a tall, medium-conditioned subject; complexion sunburnt; looks perfectly well. Bowels open four times. Pulse 80, regular; volume fair. He complains of constant pain at the root of the penis, radiating towards the pit of the stomach and to the end of the urethra; has a difficulty in passing his water, so that at times he is compelled to strain; he passes what appear to be long "clots," which, however, dissolve up in three or four hours; immediately the passage of the urethra becomes patent, he experiences a scalding sensation along it.

Blood: normal; no difference either by night or day. Lungs: normal. Heart: second sound at left base accentuated. Abdomen: liver not felt; spleen easily palpable. Some tenderness in hypogastric region, and occasional pain in the region of the descending colon and sigmoid flexure on passing a motion. There is also some thickening and tenderness in sub-pubic region.

Urine: appearance bright red, of an arterial hue; reaction acid; sp. gr. = 1025; a copious deposit of a pink, flaky mucoid substance, resembling in parts small clots of blood; a large amount of albumen; well-marked reaction with guaiacum; oxy-hæmoglobin bands with spectroscope; microscopic examination shows

a large number of leucocytes and red-blood corpuscles. Here and there are seen flocculent mucoid masses, in which are embedded the blood corpuscles, and numerous ova of the bilharzia hæmatobia. The ova possess brown transparent shells, with a spine placed at the narrow pole of shell. In the ova are seen in some cases living embryos. A distinct head can be made out, in the centre of which is a small aperture surrounded by a circlet of cilia, and leading in some cases into two distinct tubes, in other cases into one tube, terminating in double pyriform mass. The tube is distinctly retractile. Beyond the pyriform mass are seen indistinct granular bodies, whilst between the body wall and shell at its narrow end are sometimes seen granular masses. The embryos are ciliated all over. They are extremely protean in form. In some parts of the field there are seen embryos half in and half out of their shell. In other parts they are lying by the side of the now empty shells. In many cases the embryos are seen to be actively swimming about. They escape either by a lateral aperture or by longitudinal dehiscence of the shell.

The blood and "clots" passed per rectum show exactly similar appearances. The accompanying figures represent (1 and 2) two empty shells, one showing lateral aperture, the other longitudinal dehiscence ; 3 and 4 represent embryos within their shells ; in one the oral aperture is opposite the spine ; in the other it is placed at the broader end of shell; 5 and 6 represent two free embryos, show-



ing a variety in shape ; 6 is the commonest form met with. The oral aperture is seen to open into a long tube, the œsophagus, which terminates in a double pyriform mass. The rest of the body is

granular in appearance. Fig. 7 represents an embryo, and shows more clearly a distinct tube leading from the oral aperture to each of the pyriform bodies, placed almost centrally in the embryo.

In the field several small crystals of oxalate of lime are met with (octahedra).

May 21.—Passed some blood with motions; very scanty. Weight = 11 st. 4 lbs.

May 24.—Again passed blood with motions. Passing bright red urine; pain after micturition.

May 25.—Passed a small quantity of pure blood per rectum, containing ova, with *terminal* spines, and living embryos.

May 27.—Complained last night of gnawing, aching pain in bladder and sub-pubic region. Pain and difficulty on passing his urine.

June 2.—Pain in hypogastric region.

June 3.—Pain the same. No blood passed per rectum; urine has assumed a brownish colour.

June 4.—Yesterday evening complained of severe pain in hypogastric region and along urethra. Passed perfectly clear urine from 8 P.M. to 10 P.M.

10 P.M.—Urine this morning has a bright red colour, with copious deposit of mucoid-looking substance; bladder washed out with Condy's solution.

June 11.—Less pain; passing smaller clots; greatly relieved by washing out of bladder; urine contains abundance of ova and several living embryos. Weight = 11 st. 6 lbs.

June 13.—Great difficulty in passing his water; feels that the urethra is blocked by the clots; much relieved by washing out of bladder. Temperature 98.6°.

June 17.—A good deal of pain this morning; feels well. Bladder washed out. No live embryos seen.

June 21.—Does not micturate so freely; still passes blood; urine of the same colour; in it are ova and embryos. Temperature 98.2°.

June 24.—Pain begins in the morning at about 8 o'clock; lasts till noon, when it gradually goes away, and he is quite free until the evening, when it begins again at the neck of the bladder; always relieved by washing out of bladder; no clots come away; sleeps and takes his food well. Pulse 78; temperature 98°. Urine less deeply coloured; still contains ova and embryos. Weight = 11 st. 3 lbs.

July 1.—Passes water freely; less coloured; no pain; clots very small. Urine acid, 1030, bright red; large amount of albumen, leucocytes, and red-blood corpuscles, with the ova of the bilharzia hæmatobia; no live embryos seen.

July 9.—Is about the same. Urine: live embryos not seen.

July 15.—Passes less blood; has less pain on the whole; has not to strain so much; bladder not washed out now. Weight = 11 st. 4 lbs. No live embryos seen.

July 22.—About the same. Urine: no live embryos seen; still a large number of ova, with leucocytes and red-blood corpuscles. Went out on August 5. Weight = 11 st. 1 lb.

He was at first treated with quinine; afterwards, for several weeks, drachm doses of tinct. kamala, which he took every four hours. He continued taking this until he left the hospital, and the final examination of his urine showed *absence of living embryos*, so that, apparently, the embryos were affected by the kamala. Continued coming to the hospital once a fortnight, still taking kamala. On September 19 he stated that he is not in pain excepting from 10 A.M. to 1 P.M., when he wishes to pass his water, and has a difficulty in doing so. Says he passes clear urine at times, but always a quantity of blood afterwards; feels weak at times. Kamala was changed on this day for salicylate of soda, gr. v. ter die. Urine examined on September 19; showed same appearances, but with *living embryos*.

Readmitted on October 3. Gained 2½ lbs. during last fortnight. Since he left the hospital in August has been on the whole better; found that constant change benefited him; thinks that the salicylate of soda enabled him to pass his urine more easily; still complains of pain of an aching character at the root of the penis in the morning from 10 A.M. to 1 P.M.; has the same scalding sensation, and says that the "clots" whilst passing seem to cut him. He states that he passes his urine in two ways now. In one, the urine is clear with "large clots;" in the other, it is of a bright red colour with "small clots." Still passes occasionally whilst straining small jelly-like substances with blood per rectum; has entirely lost pain in hypogastric region; is not weaker in any way. Urine: bright red in appearance; flaky mucoid deposit containing ova and living embryos of the bilharzia hæmatobia, abundance of leucocytes, and red-blood corpuscles. Spleen still felt.

October 5.—Passed clear urine followed by clots; a good deal of pain.

October 7.—Pain less; clots less formed; passed some blood per rectum; ordered oil of turpentine ℥ 10 out of mucilage and peppermint water.

October 10.—Says he can pass his urine more easily and with less pain; in the urine are still to be found living embryos of the bilharzia; thinks that he passes more blood in the day than at night.

October 14.—Some difficulty in passing a clot this morning; still passing more blood in the day than at night; feels sometimes as if something had burst inside him, and he then passes nothing but pure blood; irritation in urethra less since taking turpentine; passing less blood per rectum.

Remarks.—It appears to be clearly established by Dr. John Harley,[1] that this particular form of helminthiasis is found on the whole of the eastern littoral of the African continent, from the Nile Delta to the Cape of Good Hope, and that it is especially prevalent at Cairo and Uitenhage, which are equidistant from the Equator, and on opposite sides of it. The disease is absent from the West Coast, and from the interior plateau of South Africa. It is also found in the Mauritius, and in the Isle of France, in which latter place three-quarters of the children are attacked with it.

As regards the mode of entrance of the parasite into the human body, Cobbold[2] maintains that the medium of introduction is water taken into the system through the mouth, or else by means of water plants, such as watercress; and there is strong evidence in favour of this view, inasmuch as this disease is prevalent in districts where the rivers are sluggish, and their course obstructed by vegetation; whereas inhabitants living on the banks of rivers which have rocky bottoms are free from the disease. Further, whilst the inhabitants of towns such as Durban, who drink rain-water, are unaffected, coolies from Madras and Bombay and European immigrants are especially prone to contract this disease, since they live on estates where sluggish streams flow through swampy valleys. In such a district lived the subject of this memoir, and the fact that it was after a residence of three years that he contracted the disease (six months being the stated period) is probably due to the fact that he lived, not actually in the valley, but rather on the side of a range of mountains forming the watershed of the valley. It is a curious fact that whilst the immigrants from India suffer from this form of helminthiasis, the Kaffirs, who are also attacked by this disease, are yet more liable to another form of helminthiasis, namely, the common tænia of South Africa. Another mode of entrance of the parasite into the human system is advanced by Drs. Rubidge and Lyle, both resident at the Cape. They state that bathing is a cause of this form of parasitism, and that the animal gains entrance into the system either by the skin or by the urethra. They consider that the so-called Natal sores are produced in this way; but this is scarcely probable.

[1] Medico-Chirurgical Trans., vol. lvi. 1883.
[2] British Medical Journal, 1872.

Cobbold, Leuckart, Wagner, Siebold, and Filippi maintain that the embryo after escaping from its shell does not develop further unless it passes into another host, and from analogy of the case of the distoma lanceolatum he supposes that the intermediary host is some form of gasteropod mollusc. If, then, the parasite, which has reached at that period its cercarian stage, is swallowed by man, it will develop into the mature worm. With this object in view, he has tried experiments on several kinds of animals, such as gammari, dipterous larvæ, lymnaciæ, paludinæ, species of planorbis, roach, and gudgeon, but without success.

Lastly, as regards the symptoms of the above case, they accord closely with Dr. Harley's cases, and with that one recorded by Dr. Simpson[1] in "The British Medical Journal," 1872. There are, however, three points of difference, namely, that neither of the above authors mentions the passing of pure blood with mucoid clots per rectum which contained *living embryos* and numerous ova. The latter are stated by Leuckart to possess lateral spines instead of terminal ones, but in this case, in spite of repeated careful examination, none have been detected. Dr. Harley is inclined to deny their existence, whilst even Cobbold thinks that the figures of Billharz and Griesinger representing ova with lateral spines are exaggerated. Yet he considers that there is a tendency towards such a disposition of the spine. Again, in Dr. Harley's cases, there is no statement of any enlargement of the spleen, which is distinctly palpable in this case. It also differs from Dr. Simpson's patient in the fact that so far from there being any anæmia or debility, this patient appears to be in almost perfect health.

Addendum.—It may be useful to state that the cuticle or shell is stained by picro-carmine, whilst the embryo itself is coloured by hæmatoxylin.

[1] British Medical Journal, 1872.

FÆCAL VOMITING WITHOUT MECHANICAL OBSTRUCTION OF THE INTESTINES.

BY

PERCY KIDD, M.D.

The question of "ileus paralyticus" is one that does not receive much attention in most text-books of medicine. The doctrine implied in this term asserts that there exists a form of ileus which has its origin in a paralytic condition of the intestine. This general statement would probably be accepted by most people; but when we come to analyse more closely the cases that have been described as coming under this head, we find that they vary in important particulars. Some were complicated with peritonitis or some inflammatory affection of the intestine, others were associated with ulceration of various sorts or with malignant disease. There is also an important group in which the ileus was directly connected with a previous intestinal catarrh of unusual severity.

Lastly there remain a certain number of cases in which no definite morbid changes were found after death.

Abercrombie,[1] in his remarks on ileus, gives instances of most of these varieties, and insists that a loss of muscular power on the part of the intestine is competent to produce ileus.

Rokitansky[2] fully recognises the existence of an "ileus paralyticus," and considers it to be due to an atonic condition of the intestine.

Bamberger[3] also discusses this subject at some length. It is sufficient for the present purpose to remember that among the causes of this affection which he enumerates, he mentions the

[1] On Diseases of the Stomach, the Intestinal Canal, the Liver, and other Viscera of the Abdomen, 3d ed., 1837.

[2] Handb. der path. Anat., iii. p. 301.

[3] Virchow's Handb. der spec. Path. u. Ther., Bd. VI. i. p. 226.

serous infiltration of the intestine that is met with in Bright's disease.

Griesinger[1] also seems to accept the idea of an "ileus paralyticus."

Mosler[2] describes an interesting case in which severe vomiting and diarrhœa were followed six days later by symptoms of intestinal obstruction with fæcal vomiting. Peritonitis developed subsequently, and death followed.

At the autopsy the small intestine was greatly distended, the colon empty and collapsed, and there was general purulent peritonitis. There was no obstruction, however, in the whole course of the intestinal tube. Mosler considers that the severe intestinal catarrh led to a paralytic relaxation of the muscular coat of the small intestine, in consequence of which fæces accumulated in the paralysed gut and compressed the colon.

Mercier[3] narrates a fatal case in which symptoms of intestinal obstruction with fæcal vomiting were ushered in by sudden abdominal pain. After death no mechanical obstruction of the intestine could be found.

Lastly, in a recent work Leichtenstern[4] thus expresses himself: "Those rare cases in which, during diarrhœa, tuberculosis of the intestine, typhoid fever, or in the course of a severe intestinal catarrh, death follows with stercoral vomiting, and other symptoms of impermeability of the intestine, while no mechanical obstruction can be found at the autopsy, cannot be explained otherwise than by serous infiltration, degeneration, and relaxing of the muscular coats, especially in the neighbourhood of large typhoid, tuberculous, or dysenteric ulcers, leading to a paralytic condition of the muscular coat, and thereby to arrest of the advance of the contents of the intestine."

The same author mentions peritonitis, whether simple or tuberculous, as one of the causes of "ileus paralyticus." He also states that in rare cases severe injuries to the abdomen, such as a kick from a horse, have been followed by fatal ileus, though post-mortem no mechanical cause for the obstruction could be discovered. In these cases it is difficult to say always whether the paralysis of the intestine is directly due to the injury or to the peritonitis which it occasions.

The influence of affections of the nervous system on the peristaltic contractions of the intestine is well known, and is referred to by several of the writers mentioned above.

[1] Gesamm. Abhandl., ii. p. 668.
[2] Archiv. f. Heilkunde, 1864, "Ueber Ileus," p. 113.
[3] Gaz. med. de Paris, 1867, p. 151.
[4] *Vide* Ziemssen's Cyclop., Eng. trans., vol. vii. p. 585.

It will be seen from these quotations that the doctrine of "ileus paralyticus" was not only held by old authors like Abercrombie, but is also accepted by recent writers on the subject. It was formerly assumed in these cases, as well as in mechanical obstruction, that the stercoraceous vomiting is due to a reversed peristaltic contraction. This, however, is now generally admitted to be a mistake.

Given an obstruction at any point of the intestine, contractions of the gut above must drive its contents in the direction of least resistance. The intestinal contents gradually tend to regurgitate into the stomach, and are then vomited.

If the intestine is paralysed in a part of its course, the result is practically more or less obstruction at this point. Whether the obstruction is permanent or not depends largely, as Rokitansky says, on the length of intestine paralysed.

If a large tract be so affected, the intestinal contents accumulate and their passage is hindered. When, on the other hand, the portion of gut paralysed is small, the muscular contractions of the healthy intestine above may be sufficient to overcome the passive obstruction in the paralysed part.

I wish now to describe a case which comes under the head of "ileus paralyticus."

James L., æt. 44, coach-painter, a slight, poorly-nourished, anæmic man, was admitted into the Brompton Hospital, 25th March 1884, under my care.

He gave the following history:—Twenty-one years ago he had rheumatic fever, a year later gonorrhœa, and seven years ago iritis. For the last few years has suffered from winter cough. Last August he was laid up with pain in his joints and chest and swelling of his ankles, which confined him to bed for four months. Since then he has had cough and pain in his back, which made walking difficult. He has also passed blood in his motions at times, apparently the result of piles. On admission he complained of nothing but pain in the back and cough, with mucous expectoration.

Physical examination:—Heart: apex beat in fifth space just inside the nipple line; impulse diffused and rather weak; cardiac dulness slightly increased upwards and to left. At the apex there was a rather thumping first sound, followed by a short murmur, terminating with a clear second sound. The murmur was conducted a short distance towards the axilla, but was not heard behind. The second sound over the pulmonary artery was accentuated. No other sign of disease was discovered.

The patient improved slightly at first on tonics and cod-liver oil. Occasionally he passed clotted blood in his motions.

About a fortnight after admission he had an attack of acute rheumatism, which mainly affected the left knee. The temperature was soon reduced with salicylate of soda, and in a few days all joint-swelling had disappeared. About ten days later he had a slight relapse of articular rheumatism, the left knee becoming so swollen and painful that a splint was applied to it. These symptoms again yielded to the salicylate.

April 27.—The patient began to vomit after his meals, and continued to do so off and on for the next two days. On the evening of the 30th he vomited a large quantity of dark brown fluid with a distinct fæcal odour. On this day he had one small action of the bowels. Previous to this he had been slightly constipated, but not more so than might be expected in a person confined to bed. On one or two occasions he had had a trifling attack of diarrhœa.

May 1.—At 1 P.M. he vomited several ounces of dark brown fluid with an offensive fæcal smell, after which he was troubled with constant hiccough. His pulse was slow and regular, and his temperature below normal. The abdomen was retracted, but free from pain or tenderness, and no tumour or enlargement of organs could be detected. There was no evidence of external hernia.

At 4 P.M. there was renewed fæcal vomiting. No action of the bowels since the previous day. Large quantities of water and olive-oil were injected into the rectum, but they merely brought away two small solid clay-coloured motions. The patient had a sleepless night, and was disturbed two or three times by fæcal vomiting.

May 2d.—The patient was now greatly depressed, and only partially conscious. His breath had a sweetish, faintly fæcal odour. The abdomen remained retracted and free from pain or tenderness. No tumour could be felt. The cardiac murmur remained unaltered, and some râles were heard over the left lung. The pulse gradually fell to 40, and the temperature remained sub-normal. The urine, which through some mistake had not been previously examined, was found to be loaded with albumen, turning almost solid on boiling. The patient was now unable to take any nourishment by the mouth, and was fed by nutrient injections, but gradually sank into a comatose condition, and died the following morning at eight o'clock. During the last eighteen hours of his life the vomiting ceased.

Autopsy:—On opening the abdomen the small intestines were distended with fluid matter, the colon being empty and collapsed. No mechanical obstruction could be found after careful search. There was no trace of peritonitis. On opening the intestines it

was found that the ileum and jejunum, but especially the former, were much relaxed, and distended with brownish fæcal fluid, quite like that vomited during life. The mucous membrane of this part of the intestine was extremely œdematous, and when scraped with a knife a thin serous fluid trickled out. The colon presented no morbid appearance. The stomach was empty. The pylorus was firmly contracted and somewhat indurated, only admitting the index finger. There was, however, no ulceration, and the stomach was not dilated. The kidneys were in a state of chronic parenchymatous nephritis. The heart showed slight mitral stenosis, the left auricle, and to a less extent the left ventricle, being somewhat dilated and hypertrophied. Other organs healthy. Microscopical examination of the pylorus showed slight connective tissue thickening in the mucosa and submucosa, but no other change whatever.

The interest of this case lies of course in the fact, that although there were repeated attacks of fæcal vomiting, no mechanical obstruction of the intestine was found at the autopsy.

The absence of anything like volvulus may be safely assumed, seeing that during life there was never any tenderness or pain, and at the post-mortem examination there was nothing like peritonitis or enteritis to suggest that a temporary strangulation had existed recently.

It seems most reasonable to suppose that the œdematous infiltration of the ileum and the greater part of the jejunum resulted in a paralytic stagnation of their contents, and that peristaltic contractions of the duodenum and upper part of the jejunum ultimately led to regurgitation into the stomach, there being less resistance in this than in the onward direction. That there was considerable resistance to the passage of fæcal matter through the small intestine is shown by the distended condition of the ileum and jejunum as compared with the empty collapsed state of the colon. It is possible that the vomiting was partly of a uræmic character, but uræmia will not account for regurgitation of the contents of the small intestine into the stomach. As to the nature of the vomited matter, there was no question. I myself witnessed vomiting of a most offensive fæcal character, and others did the same on several occasions.

The fæcal odour of the vomit cannot be explained by decomposition taking place in the stomach, as the amount vomited certainly exceeded the quantity of food taken by the mouth during the last forty-eight hours of his life.

NOTES

FROM

THE ORTHOPÆDIC DEPARTMENT

ON THE TREATMENT OF

LATERAL CURVATURE OF THE SPINE.

BY

W. J. WALSHAM.

It has been the custom of those in charge of special departments at the Hospital to contribute from time to time to the Reports papers on the working and progress of their specialty. As the Orthopædic Department has now been under my care for upwards of two years, I feel I cannot do better than follow so good a custom, and record some of the experience that has fallen to my share.

In the special departments our students have not only opportunities of seeing now and again the rarer forms of diseases and deformities, but, what is of infinitely more value to them, of making themselves thoroughly familiar with the diagnosis and treatment of the more common and everyday affections which present themselves there in such large numbers. The large number of similar cases, moreover, while thus beneficial to the student, affords the medical officer in charge exceptional opportunities of systematically following and comparing the result of particular forms of treatment; and in no department, I conceive, is this of more value than in the orthopædic, as in most of the cases that fall under the care of the orthopædic surgeon it is the question of treatment rather than of pathology or diagnosis about which the widest difference of opinion prevails. Such is especially the case with regard to the treatment of lateral curvature of the spine; and it is this fact that has in great part influenced me in selecting it as the subject of this year's communication.

On no deformity has more been written, or for none perhaps have more various and diverse methods of treatment been advocated. And yet there is no consensus of opinion, as evidenced by the discussions at our societies, and in the medical journals,

as to which of the methods now in common use are attended with the best results. Steel supports, extension and plaster of Paris cases, or poroplastic felt jackets, elastic bandages, posture, and exercises, have each their advocates; all are claimed to be successful, and all, I think I am within the mark in saying, have been denounced as harmful, or at any rate as useless. In this paper it is not intended to propose any new way of treating the deformity, but merely to state the methods that have been followed during the past few years in the department, and to record the result of what I hope is an impartial inquiry as to their merits and demerits.

The number of cases that have come under observation since my appointment in June 1882 have been about 140; of these, 110 were new cases, and of these latter, with few exceptions, notes have been kept. The methods employed have been—1. Extension and plaster of Paris cases, or poroplastic felt jackets. 2. Mechanical support by steel instruments. 3. Exercises and posture; and 4. Elastic tension by bandages and braces. Before speaking of the results obtained from these, a few words on the methods themselves.

1. *Of the plaster of Paris cases and the poroplastic felt jackets* nothing need be said, as the manner of applying the former is well known to all, and a good account of the latter by Mr. Marsh will be found in the Reports for 1882.

2. *Steel supports.*—Various forms have been from time to time ordered, and amongst them may be mentioned Chance's, the old crutch instrument, Adams', Bigg's spiral spring, &c.; but the description of these has been so often given as to need no further repetition here.

3. *Exercises and posture.*—The exercises employed have been directed towards two ends—1st, the strengthening of the muscular system generally, and, 2dly, the bringing into play of those muscles in particular which have a tendency to straighten the curves of the spine. For the first purpose the ordinary exercises described in the works on orthopædic surgery have been used, such as swinging on a bar by the hands, forcibly stretching an india-rubber cord, &c. For exercising particular muscles, the methods advocated by Messrs. Barwell, Roth, and others have had extensive trial. Many, amongst whom is Mr. Adams, maintain that muscular exercises must be "rejected as a system capable of curing lateral curvature." They admit that muscular exercises in incipient or slight cases are of great value for the purpose of strengthening the system generally, but they argue that it is impossible to state "precisely in any given case the exact muscles the increased power of which would act beneficially

upon the curvature," and that it would be impossible to strengthen these muscles, "if they could be selected, without at the same time strengthening other muscles, whose increased action would at least neutralise their effect." It is no doubt true that a general strengthening of all the muscles in debilitated patients can only arrest the curve—which, by the by, is no small gain—and that it may be impossible to *name anatomically* any particular muscle as likely to have any special action on the curve. But it does not appear (in my opinion) that it is impossible to *strengthen* certain muscles which may do so. Now, a patient with lateral curvature of the spine, as has been especially insisted on by Mr. Roth, can be so placed that the curvature is greatly improved, and by a voluntary muscular effort can hold herself in this improved position for a longer or shorter time. To maintain this improved position, certain muscles must be brought into play, and it is clear that if this improved position be frequently maintained, the muscles that are put into action to produce it must be strengthened. For the purpose of further strengthening these muscles, Mr. Roth puts his patients through a series of exercises, during which the improved position is maintained. These exercises have been extensively tried in the department, but I have not been able to assure myself that, by their use, beyond the strengthening of the system generally, the particular muscles holding the spine in this improved position are especially benefited. For the purpose of exercising the muscles, therefore, that tend to straighten the spine, I have trusted to the voluntary efforts of the patient to maintain herself in an improved position rather than to active movements of the body. The patient is placed in drill posture, and the spine, shoulders, and arms are manipulated till that position is found in which the curves are most reduced. At first she can only hold herself in this position for a few minutes at a time; but is able to do so for longer periods as the muscles thus brought into play are gradually strengthened. She should be instructed to be constantly holding herself in this improved position, but she should practise doing so before a looking-glass, or else, as pointed out by Mr. Roth, she may unconsciously adopt a worse position than before. In the severe and advanced cases which too frequently present themselves at the Hospital, but little improvement of the curves can in this way be obtained. Another method employed for exercising the muscles that tend to straighten the curves has been the use of the sloping seat recommended by Mr. Barwell. If a person be placed on a seat raised a variable height on one side, say the left, with the legs stretched out in front so as not to influence the movements of the body, the pelvis is tilted

obliquely to the right, while the spine, if it remained at right angles to the plane of the pelvis, would be also directed to the right. But if, at the same time, she is told to keep herself in the upright position, it is clear she can only do so by bending her spine by muscular action in such a way as to produce a lumbar curve with its convexity to the right, and a compensating dorsal curve with its convexity to the left. Where, therefore, there is, as in ordinary cases of lateral curvature, a lumbar curve with its convexity to the left and a dorsal curve with its convexity to the right, by raising the pelvis thus on the left side by means of the sloping seat, there is a tendency to counteract the existing curves by inducing others, as explained above, in the opposite direction. By thus frequently bringing into action the muscles that have a tendency to induce curves opposite to those already existing, we appear to have a very efficient means of exercising and strengthening them. The sloping seat is of value, moreover, not only for bringing such muscles into play, but by removing to some extent the faulty pressure on the intervertebral substances and articulating processes on the concave side of the existing curves, while pressure is at the same time applied to the intervertebral substances and articulating processes of the convex side. For the purpose of determining the height to which the seat should be raised, I have followed Mr. Barwell in having an ordinary stool fitted with a top that can be raised at one side by a screw while the patient is sitting upon it. As the side of the seat is slowly raised, the curves visibly improve, and in very slight cases disappear altogether, or even have a tendency to assume an opposite direction. The minimum height at which a fair improvement is produced is noted in inches, and other things being equal, the patient is directed to raise her own chair on that side to the same height by placing books, &c., under the legs. The strength of the patient must be taken into account both in prescribing the height to which the seat should be raised and the length of time it should be employed at a sitting. The object being to strengthen the muscles, and not to overtax or exhaust them, it is better to use the seat for too short a time than for too long. As a rule, ten minutes at a time two or three times a day will be long enough to begin with. The addition of half an inch or more to the sole of the boot of the left or right foot, as the case may be, has also been employed in a few cases with a purpose similar to that of the sloping seat. Posture has not only been used as an active agent in the ways mentioned above, but also passively. Thus, rest in the recumbent position for variable periods, but seldom or never exceeding an hour at a time, has

been ordered after exercises, as has also support to the back by the patient sitting in a reclining chair. The many useful chairs that have been made for this latter purpose are generally beyond the reach of hospital out-patients; but a good substitute for such may be made by raising the front legs of an ordinary chair upon half bricks, books, &c., and placing it against the table, or other piece of furniture, to prevent it falling backwards. Before dismissing the subject of posture, it should be stated that all bad habits of sitting and standing, and occupations necessitating such, are advised to be given up.

4. *Elastic tension by bandages and braces.*—The various bandages advocated by Mr. Barwell for making elastic tension on the curves have been tried in a considerable number of cases. Without entering into detail, these may be said to consist of pieces of coutil shaped to the prominences of the ribs or other parts on which it is wished to make pressure, and connected by straps and buckles to a thigh or shoulder piece, as the case may be. The thigh or shoulder piece serves as the fixed point, and is held in position by a softly-padded ring encircling the upper part of the thigh or arm respectively. In the course of the various straps india-rubber rings are inserted for the purpose of keeping the bandage constantly in a state of elastic tension. It is difficult to get the instrument-makers to fit these bandages properly, and the straps and buckles subsequently require a great deal of attention to keep them adjusted. I have endeavoured to improve the bandages by substituting solid rubber for the coutil, and narrow Martin's bandages for the webbing straps and elastic rings. The solid rubber is more easily made to fit the parts on which it is wished to bring pressure to bear, and the elastic tension exercised by the Martin's bandage is more uniform than that by the ordinary straps and rings. For the ordinary shoulder brace I have lately substituted one also made of Martin's bandage. A short description of this, and a woodcut showing its mode of application, will be found in the *Lancet* for May 2, 1884.

Results of Treatment.—For the purpose of comparing results obtained by different methods of treatment in a large number of cases with any accuracy, all will, I imagine, admit the necessity of keeping careful notes of the affection as it first presents itself, and of its subsequent course under treatment. All, moreover, who have had any experience of out-patient practice, where the cases are not only very numerous, but a large class of students have at the same time to be instructed, are aware of the difficulty of doing this. Some points of interest and importance are apt to be forgotten, and the note, perhaps, when wanted for comparison is found to be practically useless. To meet this difficulty

as far as possible I have had charts made containing heads of all particulars concerning which it seems desirable to keep a note. These the dresser of the case can readily fill in from dictation, whilst the various points are being demonstrated to the class. One of these charts is appended, as it may be useful to others. To judge of the progress of the case, the following particulars are kept:—1. The number of the vertebra in the series which deviates most from a plumb-line dropped from the seventh cervical spine. 2. The distance of this vertebra from the plumb-line. 3. The level and prominence of the shoulders. 4. The level and prominence of the angles of the scapulæ. 5. The distance of the angle of the scapula from the plumb-line. 6. The level and prominence of the hips. 7. The amount of rotation of the trunk to the right and left respectively. 8. A cyrtometric tracing of the thorax at the level of the vertebra showing the greatest deviation from the plumb-line.

The whole number of cases under treatment since June 18, 1882, have been about 140. Of these, 110 were admitted as new cases; the remainder, the number of which I cannot accurately vouch for, were transferred as old patients on my taking over the department. Of the 110 new cases I have notes of 98. Of these, 5 were treated by plaster of Paris cases, 15 by poroplastic felt jackets, 6 by steel supports of some kind, and 72 by posture exercises and bandages variously combined. The first 12 cases, of which I have no notes, were treated by plaster of Paris cases, poroplastic felt jackets, or steel supports. The old cases that were transferred to me were mostly wearing felt jackets, plaster cases, or in a few instances steel supports. Several of the 98 patients of whom notes were taken did not, as is unfortunately too common in out-patient practice, present themselves a second time. Others came on two or three occasions only, or ceased attending before their cases could be considered complete; and of others, again, I regret to say a final note was not made at the date of their last attendance.

Of the 98 cases, 34 were slight,[1] 41 pronounced, and 23 advanced or severe. Of the remaining 12 out of the 110 new cases, 2 only were slight, the others pronounced or advanced. The old cases were nearly all pronounced or advanced.

[1] It is, of course, difficult to define a slight, pronounced, or advanced case. Here cases are called "slight" where the curves could be made entirely or almost to disappear by placing the patient in an improved position; "pronounced" where the curves could be thus greatly or much improved; and "advanced" or "severe" where little or no alteration could be obtained. No sharp line of demarcation, it must be admitted, can be drawn between them; but for practical purposes the division, although perhaps artificial, has been found useful.

Of the 72 cases treated by posture exercises, &c. (see Table A.), 33 were slight, 29 pronounced, and 10 advanced. Of the 33 *slight cases,* 14 were cured, 3 greatly improved, 3 improved, 3 did not attend a second time, or ceased attending before the result of treatment had been noted. In 4 the note is incomplete, and 6 are still attending. Of the 3 who were only improved, 1 owned to not thoroughly following the treatment, and of the other 2 a final note was not taken. Of the 6 who are still attending, 4 are improved, and in 2 no improvement has at present taken place. *Of the 29 pronounced cases,* 2 were cured, 1 greatly improved, 12 improved, 3 were not improved, 3 did not attend a second time, or ceased attending before the result of treatment had been noted. In 4 the note is incomplete, and 4 are still attending. In the 2 who were cured the treatment was very thoroughly followed. One of them wore a shoulder-brace in addition to the treatment by posture, &c. In the one that was greatly improved rest for two years on the back had been previously prescribed, during which time no improvement had taken place, but she had not got worse. She was an only child, and her parents were above the class usually met with amongst out-patients. The treatment was thoroughly followed. Her strength rapidly improved and the curves almost disappeared. Of the 12 that were improved, 5 wore a bandage and 1 a Baker's stay in addition; 1 had worn a jacket eighteen months previously without improvement; 1 acknowledged that she had not followed the treatment thoroughly; 1 improved whilst following treatment, but relapsed on discontinuing it. In 5 out of the 12 the final note was not taken. Of the 3 that were not improved, 1 attended only a few times; 1 had previously worn thirteen plaster cases, five felt jackets and a steel support, and 1 five plaster cases and one felt jacket. Of the 4 still attending, 2 are improved, and in 2 no improvement has yet occurred. Of the 10 *advanced cases,* 1 was improved, 4 were not improved; in 1 the note is incomplete; 4 are still attending. The one that was improved ceased attending before the final note was taken. Of the 4 that were not improved, 1 had worn a felt case, and got gradually worse; a second had worn two plaster cases and one felt jacket without improvement. In both the note is incomplete.

Treatment by posture and exercises has many difficulties in out-patient practice. In the first place, it is necessary to instil into the patient or her friends a firm faith in the efficacy of the method itself, or no attempt will be made to carry it out. So imbued are the class of patients generally who apply for relief that some form of support is necessary for the cure of lateral curvature, that evident dissatisfaction is often manifested when

they find that a steel instrument, or at least a plaster case, is not prescribed. But, in the second place, even after the necessary enthusiasm for the treatment has been awakened, the patients, although willing, are too frequently unable, from want of time or the exigencies of their occupations, to properly pursue it. Much disappointment, principally from the above causes, was experienced; and in many cases, as shown above, the treatment appeared to be of little or no service. Where, however, it was faithfully followed, the curves in slight cases rapidly disappeared, and in pronounced cases were greatly improved. In advanced cases little improvement was met with; but, on the other hand, the curves did not get worse, and the health and strength where there was muscular debility were benefited.

Of the 15 *cases placed in poroplastic felt jackets* (see Table B.), 1 was slight, 5 were pronounced, and 9 advanced. In the *single slight case* there was no improvement. Of the 5 *pronounced*, 1 was improved, 2 were not improved; in 1 the note is incomplete, and 1 is still attending. One of the 5 had previously worn a steel spinal support, and 1 a jacket for three or four years, both without improvement. In the 9 *advanced*, 2 were improved, 6 not improved, and 1 is still attending. Three of the 6 not improved had worn plaster and felt for many years previous without improvement.

Of the 5 *cases treated by plaster of Paris jackets*, no improvement was noted; but all the cases were advanced or severe.

The number of cases treated by poroplastic jackets and plaster cases is considerably less than those treated by posture, exercises, &c.; but then the first ten or twelve cases which presented themselves before I began making notes, and the cases transferred to me on taking over the department, were mostly treated by either plaster or felt jackets. The number of cases under observation, therefore, treated in this way, has been more numerous than appears from the tables.

I have no experience of the treatment of slight cases by plaster of Paris, and very little of the treatment of such by felt jackets. In the slight cases in which I have used the latter or seen them used, I cannot say that any marked improvement was produced; and I have certainly seen the curves increased. In pronounced and advanced cases the curves have been arrested, and in pronounced cases, and less frequently in advanced, somewhat improved. Under the use, however, both of felt and plaster of Paris, muscular debility has been induced, and the patients come to rely so much on their supports that it is next to impossible to get them to leave them off. Several of the patients attending the department have worn plaster and felt jackets for years. In

two or three instances they have been persuaded to give them up for a week or two, and to try posture and exercises, but the curves certainly increased, and, at their own urgent request, they were replaced in felt jackets. I cannot say, however, whether in these cases the exercises, &c., were really followed.

Of the 6 *treated by steel supports,* slight improvement occurred in 2, 2 are still attending, 2 were not improved. All of these were pronounced or advanced cases. A few other patients, of whom I have no notes, were also treated in this way, but the numbers are not sufficient at present for the purposes of comparison with the other methods of treatment. The light steel instrument known as Baker's stay I have not included in this category. It can be looked upon as little more than an ordinary stay strengthened by two steel uprights behind. It is an excellent appliance, and is especially valuable for slightly pronounced cases in conjunction with posture and exercises. It has been used in several instances, but only as an accessory to the other treatment.

Bandages and *shoulder-straps* have never been used alone, but always combined with a prescribed course of exercises, directions as to posture, &c. I think they have been of some use, but have not assured myself that it has been much. For those patients, however, who come with a preconceived notion that a spinal support is essential for their cure, they have been found of much service, if only for their moral effect. They allow, being quite devoid of rigidity, of exercises, &c., being followed, at the same time that they satisfy the patient or her friends that something more efficient than "them exercises and postures" is being done for her cure. The india-rubber shoulder-strap has been found especially useful for the stooping so common in incipient and slight cases.

The inquiry, though far from complete, seems, I think, to warrant the following conclusions :—

1. That all slight cases should be treated by posture and exercises.

2. That with these some form of bandage or shoulder-brace may advantageously be combined.

3. That the patient should be warned not to trust to either of the last as very efficient means of cure, but only to look upon them as useful accessories to the treatment by posture and exercises.

4. That pronounced cases should at first be treated by posture, exercises, bandages, &c., and be only placed in rigid supports if the former treatment from any cause cannot be thoroughly followed.

5. That advanced or severe cases in which there is muscular

debility may be benefited by posture, exercises, &c., inasmuch as the curves may be prevented from increasing, whilst the general muscular strength is improved. But in such little or no improvement of the curves must be expected.

6. That pronounced and advanced cases may be prevented from getting worse by plaster of Paris or felt cases, and may, under some circumstances, be slightly improved.

7. That all forms of support have a tendency to produce muscular debility, and lead the patient to rely on them at the expense of the muscles of her back.

8. That even with the use of supports the patient may, under some circumstances, get worse.

These appear to me to be fair deductions from a review of the cases that have been treated of late in the department; but the inquiry, as before said, is still far from complete, and I hope to continue it in a future volume of the Reports.

TABLE A.

Seventy-two Cases of Lateral Curvature treated by Posture and Exercises.

Those marked with an Asterisk also wore a spinal bandage of some kind.

S = slight cases; P = pronounced; A = advanced; C = cured; I = improved.

No.	Date.	Name and Age.	Nature of Curve.	Previous Treatment.	Result.	Remarks.
	1882.					
1	Aug. 14	R. G., 12	S. Dorsal right. Lumbar left.	None.	*C.	Treatment very thoroughly followed.
2	,, 21	A. D., 14	P.	,,	*I.	
3	Sept. 4	A. B., 10	P. Dorsal right. Lumbar left.	,,	*I.	
4	June 26	M. H., 19	P. Dorsal right. Lumbar left.	,,	*I.	
	1883.					
5	April 16	K. S., 16	P.	,,	...	Note not complete.
6	May 7	E. R., 52	A. Single left.	...	Not improved.	
7	,, 7	M. G., 22	S. Single right.	...	C.	Baker's stay, as well as other treatment.
8	,,	M. F., 17	P. Single right.	Jacket 18 months. Not improved.	*I.	
9	,,	F. H. L., 15	P. Single left.	...	Not improved.	Only attended few times.
10	,,	G. S., 11	S. Single right.	...	...	Note not complete.
11	April 2	D. T., 7	P. Dorsal right. Lumbar left.	Rest on back for two years.	Greatly improved.	Treatment thoroughly followed.
12	,, 20	A. F., 11	S. Single right.	None.	C.	

No.	Date.	Name and Age.	Nature of Curve.	Previous Treatment.	Result.	Remarks.
13	1883. April 20	A. S., 20	S. Single right.	...	*C.	Brace. Treatment thoroughly followed.
14	June 4	L. H., 24	P. Dorsal right. Lumbar left.	13 plaster cases. 5 felt jackets. Steel support.	Not improved.	
15	,, 25	A. S., 15	S. Dorsal right. Lumbar left.	None.	C.	Treatment thoroughly followed.
16	July 2	E. L., 11	P. Single left.	None.	...	Ceased attending before note complete.
17	June 25 1882. Nov. 27	M. R., 19	S. Dorsal right. Lumbar left.	2 felt jackets. 2 plaster cases. Not improved.	Greatly improved.	
18	June 11	L. B., 30	P. Single left.	1 felt jacket. 5 plaster cases. Not improved.	Not improved.	
19	1882. June 12	M. A., 18	S. Single right.	...	*C.	Treatment thoroughly followed.
20	1883. April 16	A. G., 19	S. Single right.	...	*Greatly improved.	Brace. Note incomplete.
21	Feb. 19.	A. H., 19	P. Dorsal right. Lumbar left.	...	I.	Improved whilst following treatment regularly; but afterwards neglected it and got worse. Ceased attending before note completed,
22	June 12	L. H., 19	P. Dorsal right. Lumbar left.	None.	*C.	Brace, old form. Treatment thoroughly followed.
23	Oct. 15	A. C., 16	S. Dorsal right. Lumbar left.	None.	C.	Treatment well followed.
24	Sept. 17	E. F., 13	A. Dorsal right. Lumbar left.	None.	I.	Ceased attending before note complete.

25	Oct. 8	E. B., 11½	S. Single right.	None.	*C.	Treatment well followed.
26	Sept. 17	A. K., 12	S. Single right.	None.	Much improved.	Note not completed.
27	Nov. 26	K. P., 11	A. Dorsal right. Lumbar left.	None.	...	Note not completed.
28	Oct. 22	L. K., 16	P. Dorsal right. Lumbar left.	None.	*I.	Treatment not thoroughly carried out.
29	Oct. 29	R. C., 19	A. Single right.	Felt case, getting gradually worse.	Not improved.	Note not completed.
30	...	E. G., 20	S. Single left.	8 mos. Homœopathic. Not improved.	I.	Treatment not thoroughly followed.
31	Nov. 12	E. D., 18	S. Single right.	None.	*C.	Brace. Treatment well followed.
32	Dec. 3	M. S., 21	A. Dorsal right. Lumbar left.	...	...	
	1884.					
33	Jan. 7	G. G., 12	P. Dorsal right. Lumbar left.	None.	I.	Baker's stay.
34	Jan. 21	A. B., 13	P. Single left.	„	I.	
	1882.					
35	July 2	L. H., 16	A. Dorsal right. Lumbar left.	1 felt jacket. 2 plaster cases. Not improved.	Not improved.	
	1883.					
36	Nov.	C. H., 18	S. Dorsal right. Lumbar left.	None.	I.	Note not completed.
	1884.					
37	April	E. A., 14	S. Single right.	„	C.	Treatment well followed.
38	April	A. W.	S. Single left.	„	C.	

No.	Date.	Name and Age.	Nature of Curve.	Previous Treatment.	Result.	Remarks.
	1884.					
39	April	F. S. H.	S. Dorsal right. Lumbar left.	None.	I.	Note not complete.
40	May 5	E. B., 21	P. Dorsal left. Lumbar right.	„	C.	Treatment well followed.
41	May 26	E. W., 20	P. Dorsal right. Lumbar left.	„	*I.	Note not complete.
42	...	R. H., 18	P.	...	...	Not seen second time.
43	Feb. 18	S. K., 14	S.	...	*...	Brace. Ceased attending.
44	Feb. 25	A. P., 15	S. Single right.	...	*C.	Brace. Treatment well followed.
45	March 3	M. A. L., 16	A. Dorsal right. Lumbar left.	...	Not improved.	
46	March 3	S. P., 16	S. Dorsal right. Lumbar left.	...	...	Note not completed.
47	March 17	E. A., 14	S. Single right.	...	C.	
48	March 24	M. W., 16	P.	None.	I.	Note incomplete.
49	April 4	H. B., 55	S.	...	...	Note not completed.
50	May 12	C. P., 16	P. Dorsal left. Lumbar right.	...	...	Only attended once.
51	April 21	E B., 11	P.	..	I.	
52	May 19	L. L., 20	P. Dorsal right. Lumbar left.	...	...	Note not complete.
53	May 27	L. S., 10	S. Dorsal right. Lumbar left.	...	...	Only attended once.
54	June 16	M. K., 13	P. Dorsal right. Lumbar left.	...	*...	Note not complete.

	1884.					
55	June 24	S. O., 18	P. Dorsal right. Lumbar left.	...	I.	Note not complete.
56	July 14	T. C., 15	S. Dorsal right. Lumbar left.	...	...	Only attended once.
57	Aug. 11	E. D., 12	S. Single left.	...	...	Still attending.
58	Aug. 11	E. M., 18	S. Dorsal right. Lumbar left.	None.	*I.	Do.
59	Aug. 18	A. D., 17	S. Single left.	...	...	Do.
60	Sept. 22	K. D., 12	S.	...	C.	
61	Sept. 22	O. S., 17	P.	...	...	Do.
62	Oct. 20	M. A. E., 16	A.	...	...	
63	Sept. 1	L. A., 12½	P. Dorsal right. Lumbar left.	...	...	Do.
64	Sept. 1	K. M., 15	A. Dorsal right. Lumbar left.	...	...	Do.
65	Sept. 8	A. A., 13	A. Single right.	...	...	Do.
66	Sept. 22	E. M., 16	S.	...	I.	Do.
67	Sept. 22	E. Y., 20	P. Dorsal right.	...	I.	Do.
68	Oct. 13	E. P., 10	P. Single left.	...	I.	Do.
69	Oct. 20	E. T., 11	S.	...	*I.	Shoulder-straps. Still attending.
	1882.					
70	July 10	E. B., 19	S.	...	...	Note incomplete.
	1883.					
71	June 29	M. A. M., 15	P.	...	*...	Loin bandage. Incomplete.
72	Nov. 10	E. P., 10	S.	None.	C.	

TABLE B.

Fifteen Cases of Lateral Curvature treated by Poroplastic Felt Jackets.

No.	Date.	Name and Age.	Nature of Curve.	Previous Treatment.	Result.	Remarks.
	1882.					
1	Dec. 4	M. A. S., 15	S. Single right.	None.	Not improved.	
	1883.					
2	Jan. 22	M. G., 12	A. Dorsal right. Lumbar left.	Felt jackets.	Improved.	
3	Jan. 22	L. G., 24	P. Single left.	None.	Not improved.	
4	March 14	J. A. M.,	A.	„	Not improved.	
	1882.	17				
5	Nov. 13	E. N., 18	A. Dorsal right. Lumbar left.	„	Slightly improved.	
6	July 2	L. H. 27	A. Dorsal right. Lumbar left.	Plaster and felt jacket many years.	Not improved.	Could not leave off jacket; tried a short time.
	1883.					
7	June	A. A.	A.	Jackets.	Not improved.	
8	Sept. 10	M. A. T.	A. Single right.	Plaster case and felt jacket four years; not improved.	Not improved.	Exercises without jacket half-hour at a time; could not leave off jacket.
	1884.					
9	March 3	R. G., 16	P. Single left.	...	Improved.	Note not complete.
	1883.					
10	May 1	E. P., 19	A.	...	Not improved.	
11	Sept. 29	E. G., 49	P.	Spinal support; not improved.	...	Still attending.
12	Oct. 20	J. A., 7	A.	...	...	Still attending.
13	...	C. A.	P.	...	...	Note incomplete.
14	...	L. W.	A.	4 plaster cases; 2 jackets; worse.	Not imp oved.	
15	1882.	A. T., 11	P.	Jackets three or four years.	Not improved.	Note incomplete.

TABLE C.

Six Cases of Lateral Curvature Treated by Spinal Instruments.

No.	Date.	Name and Age.	Nature of Curve.	Previous Treatment.	Result.	Remarks.
	1882.					
1	July	A. B.	P. Dorsal right. Lumbar left.	None.	Not improved.	Note incomplete.
2	Dec.	A. T., 14	P.	,,	Not improved.	
3	Dec. 11	E. M., 13	P. Dorsal right. Lumbar left.	None stated.	Improved.	Steel spring, Bigg's.
	1883.					
4	June 29	M. A. M, 13	A.	None.	Improved.	Note incomplete.
5	Oct. 30	H. B.	A.	,,	...	Double rack ; still attending.
	1884.					
6	Oct. 6	S. C., 12	A. Dorsal left. Lumbar right	,,	...	Chance's instrument ; still attending.

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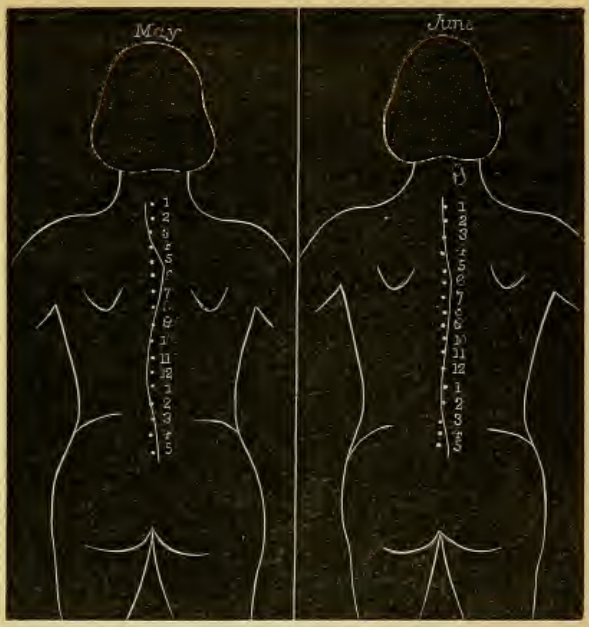
CASE 62.



The figure diagrams in the charts for use are traced of course on a white ground.

HIPS.						
	PROMINENCE OF.		ROTATION OF SPINE.	CHEST RIBS.	GENERAL HEALTH.	TREATMENT.
	L.	R.				
	...	...	Slight.	Nil.	Fairly good.	Exercises, Posture.
	...	...	Slight.	...	Better.	Exercises well followed.
	...		Very slight.	...	Good.	Well set up. Practically no curves visible.

SPECIMEN CHART OF LATERAL CURVATURE.

(*Referred to on page 212.*)

CASE 62.

The figure diagrams in the charts for use are traced of course on a white ground.

DATE.—May 5, 1884.

NAME.—E. B. AGE.—21. ADDRESS.—

OCCUPATION.—Housemaid.

HISTORY.—Has noticed shoulder growing out on right side for six months, and has suffered from pain in right side. Has had to carry heavy pails.

FAMILY HISTORY.—No history of curvature.

NATURE OF CURVE.—Slight lateral curve to right in upper dorsal region, and slighter compensating to left in lower dorsal and upper lumbar. Much improved by position.

PELVIC OBLIQUITY.—No permanent; occasional habitual.

LEGS, LENGTH OF.—Equal.

KNOCK-KNEE.—None.

FLAT-FOOT.—None.

PREVIOUS TREATMENT.—Constitutional only.

TREATMENT.—1. GENERAL.—Hst. quinæ et ferri t. d.

2. LOCAL.—Posture, reclining chair, exercises; exercises ten minutes three times a day; rest half-hour after exercises.

DATE.	VERTEBRÆ.		SHOULDERS.				SCAPULÆ.						HIPS.				ROTATION OF SPINE.	CHEST RIBS.	GENERAL HEALTH.	TREATMENT.
	GREATEST DEVIATION FROM PLUMB-LINE.		LEVEL OF.		PROMINENCE OF.		LEVEL OF ANGLE.		PROMINENCE OF.		DISTANCE FROM PLUMB-LINE.		LEVEL OF.		PROMINENCE OF.					
1884.	DORSAL.	LUMBAR.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.	R.				
May 5.	5th ½ inch.	2d ¼ inch.	...	½ inch.	...	¼ inch.	...	½ inch.	...	½ inch.	2½ inch.	2½ inch.	¼ inch.	...	...	...	Slight.	Nil.	Fairly good.	Exercises, Posture.
May 19.	5th ¼ inch.	2d none.	...	¼ inch.	...	...	...	¼ inch.	...	¼ inch.	...	...	=	=	...	...	Slight.	...	Better.	Exercises well followed
June 30.	None.	...	...	...	...	...	=	=	=	=	...	...	...	...	...		Very slight.	...	Good.	Well set up. Practically no curves visible.

WHY DO MEDICINES SOMETIMES FAIL TO ACT?

BY

T. LAUDER BRUNTON, M.D., F.R.S.,

AND

J. THEODORE CASH, M.D.

Of late years the systematic investigation of the action of drugs in physiological laboratories has been greatly extended, and has yielded very useful results, most of the important drugs recently added to our materia medica having been introduced into medical practice in consequence of their physiological action having been first ascertained by experiment upon animals. But when we come to administer drugs to patients suffering from disease, we are not unfrequently disappointed in the results we obtain, not only from new medicines of recent introduction, but from those which have been in use for centuries, and whose reputation has been thoroughly established.

These failures are apt to induce some persons to regard therapeutics as a subject essentially uncertain in its nature, and to relinquish any hope of ever obtaining a definite knowledge of the action of medicines in disease. If we consider the subject a little more carefully, however, we shall readily see that therapeutics is no more uncertain than chemistry, although the conditions, under which a reaction occurs between the medicine administered and the body of a patient on a sick-bed, are more complicated than those under which reaction occurs between two chemicals in the laboratory.

So long as we deal exclusively with complex conditions, we cannot hope to ascertain the action of drugs in disease with any amount of certainty. The object for which we must strive is to study the action of medicines under various conditions, so that when we administer them to our patients we shall be certain of effecting the purpose we desire. We must not confine our experiments to animals in a normal condition; we must try to analyse the circumstances under which drugs are to act when

given to a patient; and by testing the effect of these conditions one by one upon animals, we may hope at length to obtain a definite knowledge of the effect of drugs in disease.

One of the most important conditions influencing both chemical and pharmacological reactions is temperature. Thus the substances which compose gunpowder, however intimately they be mixed together, show no tendency to unite chemically at ordinary temperatures, but at a sufficiently high temperature they combine with explosive violence. The first step in the making of such drugs as corrosive sublimate or calomel is to prepare sulphate of mercury; and though sulphuric acid does not attack metal at ordinary temperatures, yet it does so when heated, forming a salt. Nitric acid attacks mercury and forms a nitrate at ordinary temperatures; when heated, this salt is decomposed, nitrous fumes being given off, and red oxide remaining behind; as the temperature is raised, the oxide itself is decomposed into oxygen and metallic mercury. In such processes as these the effect of temperature upon the behaviour of chemical substances is clearly marked. Its influence is, we think, no less distinct upon the reaction between drugs and animal tissues or organs, although the range through which the temperature can vary without destroying the vitality of the tissues is much more limited than in the case of inorganic substances.

A good example of the effect of temperature in modifying the reaction between a drug and an animal tissue is afforded by the behaviour of a muscle poisoned by veratria.

Fig. 1.—Contraction of frog's gastrocnemius poisoned by veratria. Stimulation by a single induction shock. Temperature 25° C.

The effect of this poison upon muscle at ordinary temperatures is to strengthen its contractile power, and to prevent the ready relaxation by which the contraction is succeeded in the normal muscle. The consequence of this is that a frog poisoned with this substance can spring as well or better than a normal one; but after the spring is over, instead of the legs being drawn up close to the body ready for action again, they remain stiff and extended.

The extensor muscles, instead of relaxing after their work is done, remain contracted, so that the flexor muscles are unable to act. After a while the rigidity passes off, and the legs are drawn up close to the body; but now the flexor muscles having been used, remain in a contracted condition, and the animal is unable to spring again until the spasm of the flexors has passed off.

There are very few such striking examples of the action of a drug upon an animal as that of veratria. But this effect is one that occurs only at ordinary temperatures. If the poisoned muscle be cooled down, the veratria effect is diminished, and may disappear altogether; the same is the case when the temperature is considerably raised. This is seen by an examination of the accompanying curves, which appeared in a paper we have previously published.[1]

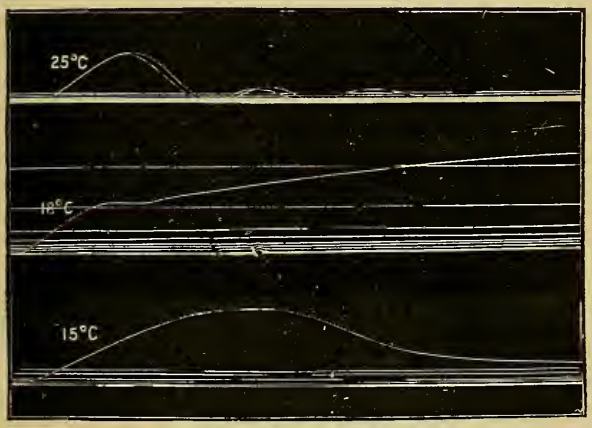


Fig. 2.—The lowest muscle curve is taken from a veratria muscle cooled to 15° C. The middle curve is taken from the same muscle at room temperature; the uppermost curves from the same muscle heated to 25° C.

The salts of barium, applied locally to frog's muscle, have an action closely resembling, though not identical with, that of veratria. They frequently cause a very similar alteration in the muscular contraction, and this is removed, like that of veratria, by exposure to heat or cold. The variations in temperature which are requisite to destroy the action of barium upon muscle are much greater than could possibly occur in the mammalian body.

[1] On the Action of Heat and Cold on Muscles Poisoned by Veratria. Journal of Physiology, vol. iv., No. 1.

At the same time it must be remembered that the doses with which we experimented were enormously greater than those which would be used in medicine. It seems not improbable that the effect of a very small dose might be removed by a much less extensive alteration in temperature. Neglect of the temperature at which experiments have been made is one cause of the contradictory results which have frequently been obtained in the investigation of the action of different drugs. Thus atropine was found by Bowditch and Luciani to increase the systolic contraction of the frog's heart; while Gnauck, on the other hand, obtained an exactly opposite result, and found that both atropine and hyoscyainine diminished ventricular contraction. At Kronecker's suggestion, the research was taken up anew by Schapiro,[1] who repeated the experiments at different temperatures, and found that both observers were right, and both were wrong. When the experiments were made at a low temperature, 7° to 8° C., atropine amplified the contractions of the heart, as stated by Bowditch and Luciani; but when the temperature rose about 15° C., atropine had an exactly opposite effect, and diminished the contractions, as stated by Gnauck.

The effect of seasons of the year upon the antagonistic action of drugs in the body was observed by Ringer,[2] who found that while pilocarpin antagonises the action of muscarin, and atropine antagonises aconitine upon frogs in summer, it has no such action in winter. Similar observations were made by Pantelejeff[3] in regard to atropine and quinine.

In summer, quinine arrests the frog's heart in diastole; atropine subsequently administered causes the pulsations of the heart to recommence. In winter, quinine acts much more slowly upon the heart, and atropine increases instead of antagonising its action.

The opinion expressed by various authors, that the action of drugs may be largely varied by climate, has often been received with distrust. There seemed to be no very definite reason for supposing that climate should exercise this action, and so any difference that might exist was apt to be ascribed to other causes. The statement of Lisfranc, that the inhabitants of southern climates tolerate much larger doses of barium than those of northern climates, is at first sight curious, and one may be inclined to be sceptical regarding it. There seems no obvious reason why an inorganic substance like barium should act differently in Italy and in England, although one might be inclined

[1] Centralblatt f. d. med. Wissenchaft., August 1884, No. 33.
[2] Journal of Physiology, vol. iii. p. 115.
[3] Centralblatt f. d. med. Wissenchaft., 1880, p. 529.

to grant that such a modification might perhaps occur in the case of more complex and less stable organic substances. The marked effect of heat upon voluntary muscle poisoned by barium, however, seems to indicate that the resistance opposed to the action of the drug by inhabitants of warmer countries may be due to the higher temperature, and we have found experimentally that cold retards the fatal effect of barium upon guinea-pigs.

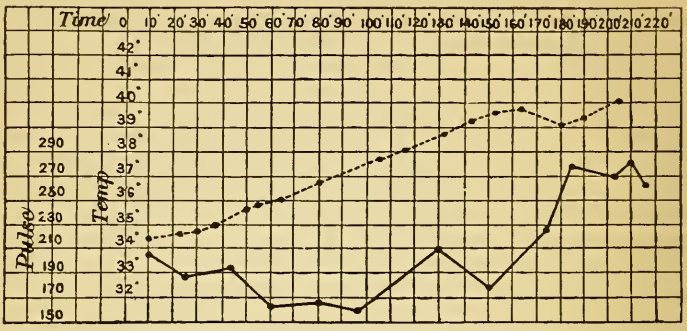
It must be remembered that the temperature of the human body and of that of mammals in general is not absolutely constant, but oscillates up and down, although it is quite true that these oscillations occur within narrow limits. Thus John Davy found in a transit from a hot to a temperate climate, that when the mean temperature of the air had fallen 20° F., the temperature of the body fell 1.58° F., and Brown-Séquard noticed in eight healthy people a rise of 2° F. in travelling from France with an atmospheric temperature of 46.4° F. to the equator when the temperature was 85.1 F.[1]

The temperature of the body also varies with the time of day; the daily maximum, according to most observers, being in the afternoon, and the minimum in the early morning. These daily variations are much less than those already mentioned as occurring from change of climate, and possibly they are too slight to have any marked effect on the action of most medicines; yet, in any attempt to ascertain precisely the causes why the medicines we administer fail at one time and succeed at another in producing the action we desire, we must bear in mind the possibility of their action being altered even by such small factors as diurnal variations in temperature.

Very remarkable is the effect of temperature on the action of guanidine. This substance at ordinary temperatures, *e.g.*, 18° C. (64.4° F.), produces fibrillary twitchings and convulsions in frogs. At high and low temperatures, however, it has no effect. Thus, if three frogs are poisoned in exactly the same way, and one be placed in iced water but little above 0° C. (32° F.), another in water at 18° C. (64.4° F.), and another in water at 32° C. (89.6° F.), the first and the third remain unaffected, whilst muscular twitchings and convulsions make their appearance in the second. Another curious point in regard to the action of temperature is that moderate rise of temperature, within certain limits, increases the effect of the drug, although a great rise completely destroys it. Thus, if in addition to the frogs already mentioned, another be poisoned and placed in water at 25° C. (77° F.), the convulsions are more violent than at 18° C., although when the temperature is raised to 32° C. the

[1] Wunderlich, Medical Thermometry, Syd. Soc. ed., p. 114.

poison ceases to produce its usual action, and five times the normal dose may be given without doing any harm.[1]



The unbroken line shows the pulse-rate, the dotted line shows the temperature in the axilla in all the figures.

Fig. 3.—Shows the effect of rise of temperature alone. At the 195th minute both vagi were cut; the section was not followed immediately by any apparent effect. After eight minutes more, the pulse-rate rose slightly and then fell.

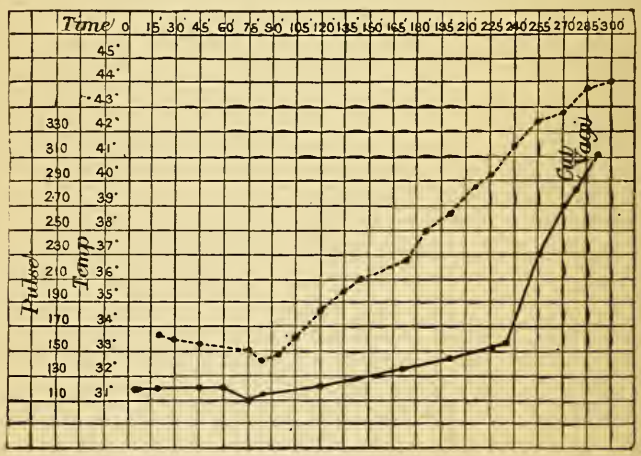


Fig. 4.—Shows the effect of rise of temperature after injection of digitalis. At the 45th minute .75 cc. (12 minims) tincture of digitalis were injected, and another similar injection was made at the 55th minute. At the 65th minute the heating was begun.

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[1] Luchsinger, Physiologische Studien. Leipzig, 1882. In a paper which only came into our hands after the completion of this sketch, Hess and Luchsinger (Pflüger's Archiv, vol. xxxv. p. 174) state that in the case of rabbits poisoned with chloral, alcohol, mercury, and other substances, great elevation of temperature accelerates, slight elevation retards or diminishes, the action of the drug.

No doubt febrile temperatures have a great effect in modifying the action of medicines administered for the cure of disease. We have studied this point with reference to the action of digitalis upon the cat,[1] and found that the effect of the drug upon the pulse-rate was either greatly diminished or completely abolished after the temperature had risen above a certain point.

In the present paper we propose to describe some experiments upon another factor modifying the action of drugs, viz., food. The practical object which we had in view was to ascertain whether the effect of remedies employed in disease might not be very much influenced by the large quantities of beef-tea often administered to patients. Beef-tea is a complex substance and contains many ingredients. Our inquiry regarding it is by no means complete, for in the present paper we deal with only one of its constituents, viz., salts of potassium. These form, however, a very important constituent,—so important that Bunge was led by his experiments to regard the action in toxic doses at least as very similar, if not identical.

In a former paper[2] we have shown that the peculiar effect of barium on voluntary muscle is antagonised by potash; it seemed natural to conclude from this result that potash administered at the same time as barium might antagonise its usual action in the case of warm-blooded animals and prevent death.

	Dose of Barium Chloride.	Dose of Potassium Chloride.	Result.
	Gram.		
1.	.1 per kilo. body-weight	None.	Died.
2.	.015 „ „	...	Recovered.
	.05 „ „	...	Recovered.
	.1 „ „	...	Died.
3.	.045 „ „	None.	Died.
4.	.08 „ „	None.	Died.
5.	.06 „ „	KCl .075 per kilo.	Recovered.
6.	.05 „ „	KCl .174 per kilo.	Recovered.
	.05 „ „	None	Died.

From the above table it appears that the lethal dose of chloride of barium is between .04 and .08 per kilogram body-weight in guinea-pigs. In one case in which potassium chloride was administered with a dose of .06 barium chloride, the animal recovered from the immediate effects of the barium; and in a second case where .174 per kilogram potassium chloride was administered, a dose of .05 per kilo. barium chloride did not kill. On repeating the same dose of barium on the succeeding day by itself, death ensued.

[1] Practitioner, October 1884, p. 272.
[2] Phil. Trans., Pt. i., 1884, p. 225.

These experiments show, we think, that potash does to a certain extent antagonise the usual action of barium. A number of other experiments have also given us indications of antagonism between these substances, but the results were not so definite as in these experiments, death being delayed only two hours, or even less. A much more extended series of experiments would therefore be required to ascertain the precise limits of antagonism.

The action of barium upon guinea-pigs seems to depend to some extent upon individual idiosyncrasy, some animals appearing to be more tolerant of it than others.

Idiosyncrasy is one of the bugbears of therapeutics. It is at present impossible to tell with absolute certainty what effect a drug will produce upon any individual even when it is administered in health, and when its effect is not interfered with by alterations in climate or by disease. We know perfectly well that in ninety-nine cases out of every hundred, or even nine hundred and ninety-nine out of every thousand, certain drugs will have a definite action. Thus five grains of aloes will purge, two grains of quinine or calomel may be given without producing any disagreeable results; but every now and again we meet with individuals whom purgatives, even in enormous doses, will not affect at all, and with others in whom all the symptoms of poisoning by quinine or mercury are produced by such small doses as those just mentioned. We find something analogous to the idiosyncrasies which sometimes cause a variation between two individuals of the same species, in the difference between the effect produced by certain drugs or morbid agencies upon different species or genera of animals. Thus rabbits are apparently little affected by belladonna, whilst dogs are readily affected by it. French sheep and house-mice are readily affected by anthrax, whilst Algerian sheep, rats, and field-mice offer great resistance to it. It seems to us not improbable that such differences as these may partly depend upon the different chemical composition of each animal, and the different proportions of the various saline constituents of their bodies.

It has been found that, by giving an animal food containing a larger proportion of common salt than usual, the amount of sodium chloride in its body can be increased. When the quantity of salt contained in the food remains nearly the same every day, as much is excreted in the urine as is contained in the food, and thus the quantity in the body remains constant. If a larger quantity be now given with the food, a corresponding rise does not occur in the quantity excreted; the salt becomes stored up in the organism for two or three days, and then the excretion rises, so as to counterbalance the larger consumption; the

amount in the body remains constant, but at a higher level—if we may so term it—than before. If the quantity contained in the food be now reduced, a corresponding reduction does not occur in the urine at once; the excess which has been stored up in the body is gradually eliminated, and then, after two or three days, excretion and consumption again counterbalance each other. The amount in the body is again constant, but at a lower level. It occurred to us that we might be able to increase the proportion of potash in the body in a similar manner by giving food containing an excess of potash salts. We thought that if this plan were successful the animal might be rendered less susceptible to the influence of such drugs as are to some extent antagonised by potassium, or perhaps entirely protected from their usual action.

The following experiments show that, although our hopes of entirely counteracting barium by previously feeding animals with potash were not fulfilled, yet such an amount of protection was bestowed, that animals fed with potash remained alive, in many instances, for a longer time than those poisoned with an equivalent dose of barium, but had not been so protected. In one case, after 2.26 potassium chloride (per kilo. of body-weight) had been administered in the course of three days, there was complete recovery after poisoning with .05 (per kilo.) barium, the same dose being fatal in an unprotected guinea-pig.

	Dose of Barium Chloride.	Dose of Potassium Chloride.	Result.
1.	.066 per kilo. body-weight.	Had taken about 3 grms. KCl with food in ten days.	Recovered.
2.	.086 „ „	Had taken 1.5 grm. KCl with food in three days.	Recovered temporarily, but died of exhaustion caused by purging from barium.
3.	.086 „ „	Had taken 2.5 grms. KCl with food in five days.	Died in 67′.
4.	.10 „ „	Had taken 3 grms. KCl with food in eight days.	Living seven hours after administration of barium, but died in course of night.

This result seems to indicate that there may have been some

foundation for the old idea that it was possible by the previous use of an antidote to protect the organism to some extent from the effects of the poison. The protection thus afforded, however, appears to be limited, both in regard to the quantity of poison and also its nature. The effect of veratria upon muscles is very similar to barium, and is counteracted in much the same way by potash salts; but the following experiment shows that the usual effect of veratria upon the organism is not counteracted by a considerable quantity of potash. In the guinea-pig we estimate that the lethal dose of veratria is from .004 to .006 per kilo. body-weight; fatal in about two hours.[1] One guinea-pig (of 678 grms.) which had received 2.125 grms. potassium chloride in all in five days, died in 80′ after the administration of .007 veratria per kilo. body-weight. This is slightly in excess of the usual dose, which lies somewhere about .005 per kilo. for guinea-pigs. We found, however, that repeated administration of the drug on successive days seemed to develop a tolerance of the animal towards it, so that a dose which would have been fatal in the first instance was recovered from when preceded by smaller doses.

On summing up the results of the experiments upon barium and potash, it is found—

1st. The effect of barium upon muscle is counteracted by potash.

2d. The effect of barium on the body is counteracted to some extent by potash administered at the same time.

3d. The effect of barium upon the body is counteracted within certain limits by potash given in the food for several days previously.

4th. It seems possible that the idiosyncrasies of different species of animal, or of individuals of the same species, both in regard to the action of drugs upon them and in regard to their susceptibility to infection, may depend on the relative proportion of inorganic salts contained in their bodies.

It is evident that the indications afforded by these experiments open up an immense field of research both in pharmacology and pathology, and one which it would take many years to investigate completely.

We have been able to do little more as yet than to enter the precincts of it, and only one step has been made in ascertaining

[1] Rossbach, Handbuch d. Arzneimittellehre, pp. 756–771. According to Rossbach the lethal dose of veratria for cats, fatal in about two hours, is .005 for one animal. Estimating the weight of a cat at 3 kilos., the lethal dose per kilo. would be about .0016, so that cats are much less tolerant than guinea-pigs.

the effect of beef-tea upon barium salts, viz., of the former upon muscles poisoned with the latter.

From the following curves it is evident that beef-tea removes the effect of barium upon muscles in much the same way that pure salts of potash would do:—

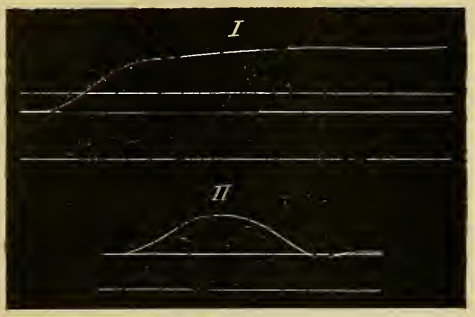


Fig. 5.

I. Curve of gastrocnemius of frog. The muscle has been 20′ in barium chloride solution 1–600.
II. Curve of the same muscle after 30′ in chloride of potassium solution 1–60c.

At the same time there appears to be a distinct difference between the beef-tea and the potash salts, for the latter quickly reduce the height and duration of the muscle curve below the normal, while beef-tea does not, at least when it is given in similar concentration.

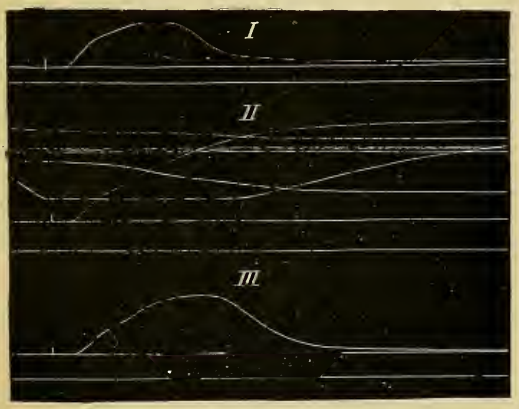


Fig. 6.

I. Curve of gastrocnemius of frog.
II. Curve of the same muscle after immersion for 20′ in barium chloride solution 1–500.
III. Curve of the same muscle after immersion for 20′ in diluted Liebig's extract 1–300.

As beef-tea agrees to a certain extent with potash salts in their effect upon muscles poisoned by barium, it is natural to expect that beef-tea may also modify the action of barium upon the body generally, and perhaps antagonise to a certain extent the usual action of barium. We have not yet been able to test this experimentally by giving beef-tea or meat extract, either along with barium or mixed with the food, for several days previously. Nevertheless, it appears advisable to publish the results of our experiments as far as they have gone, rather than to wait for their completion, because the inquiry is one which can be conducted at the bedside as well as in the laboratory.

The experiments on the alterations produced by beef-tea or meat extract in the action of barium salts would be, after all, only preliminary to a far more extensive study, even were they complete.

Barium is at present rarely or never prescribed as a medicine, and any alteration in its action which beef-tea or meat extract could produce would be at present only of theoretical interest. But the question is a widely different one when we come to deal with digitalis, convallaria, caffeine, broom, juniper, and other cardiac tonics and diuretics, as well as quinine, salicin, salicylate of soda, and other antipyretics.

In cases where these are administered, the patient is not unfrequently very weak and low, so that beef-tea, or a strong solution of Liebig's extract, is often given in considerable quantities for the purpose of maintaining strength. Ringer has already shown[1] that the effect of veratria on the frog's heart is antagonised by potash salts, and it is possible that when we give large quantities of beef-tea along with cardiac tonics we may thus be undoing with the one hand what we are doing with the other, and neutralising, by the kind of food used, the action of the medicine to which we trust for the patient's recovery.

An extensive series of experiments on animals is still required in order to lessen, so far as possible, unnecessary trials upon patients; yet, at the same time, a large amount of valuable information might be obtained by medical men observing whether digitalis and caffeine, for example, are most successful when the diet consists chiefly of milk and farinaceous food, or whether the addition of beef-tea, or the old-fashioned nutrient wine-whey, interferes with or increases the efficacy of these remedies.

[1] Practitioner, January 1883, p. 17.

EXTENSIVE SARCOMA OF THE VERTEBRÆ, SACRUM, ILIUM, AND STERNUM.

BY

H. LEWIS JONES, M.B.

Amy C., aged 9 years, a ruddy and well-nourished girl, was admitted into Mary Ward, under Dr. Gee's care, on the 14th of January 1884.

She complained of pains in her right hip and knee, which had troubled her for a month, and she had been in bed for a week before admission. Her temperature was 101°, and a little albumen was found in her urine. At the end of a week she was better, the pains were gone, and her temperature was normal. The improvement, however, was not permanent; her pains returned, and were felt all over her body, now here, now there. She became febrile, her temperature reaching 103° or 104° at times, and the albuminuria continued, and there was puffiness of the eyelids.

Treatment with salicylate of soda did not relieve her pains nor reduce the temperature.

She was several times carefully examined, especially for signs of commencing caries of vertebræ, but without definite result. There was no optic neuritis.

In February her appetite failed her, and she rapidly grew very thin. On March 2 she passed her urine involuntarily, and her abdomen was noticed to be rather tumid. Next day her parents removed her, preferring that she should end her days at home, and she died at the end of March.

For the further history of the case I am indebted, through Dr. Gee, to Dr. Percy Warner of Woodford, who attended her during the rest of her illness, and also made the post-mortem examination. He says—

"The lower extremities were completely paralysed as regards motion, and sensation was very imperfect, occasionally entirely absent. She complained of a good deal of pain in her left leg all the time; for the last few days she could be moved almost

without causing her any pain, but before that cried out at the slightest attempt to move her.

"Incontinence of urine and fæces have been present the whole time. A bed-sore appeared over the left ilium, after lying on her side for a whole day; it was apparently connected with the condition of the bone, but I did not examine to see if the bone could be felt.

"She complained of tenderness in one spot on the cranium. Her eyeballs were very prominent.

"*Post-mortem.*—(Cranium not opened.) Externally: much wasting; lower extremities œdematous; some ecchymosis near left knee.

"Over left ilium a bed-sore extending beneath the subcutaneous tissue and over right ilium and trochanter.

"Over right sterno-clavicular articulation a swelling which had appeared during the last few days of life.

"Subcutaneous tissue very œdematous; abdomen much distended.

"On opening the abdomen, it was found to contain some fluid. No peritonitis.

"Lungs: both considerably adherent, otherwise healthy. Pericardium distended with fluid; heart natural. Liver and pancreas healthy. Kidneys: enlarged, soft; several minute abscesses near cortex. Pelvis of kidney and ureters contained pus. Bladder enlarged, coats thickened.

"Spinal column: on making a section, all the vertebræ below the fourth dorsal were found infiltrated with soft sarcomatous-looking growth, the bone being more or less absorbed; there were one or two nodules of growth in the upper dorsal vertebræ; the meninges of the spinal cord were thickened by growth on the outer surface of the dura mater for about two inches in the lower dorsal region, but there was no growth into the cavity of arachnoid, and the spinal cord was healthy.

"The sacrum was entirely infiltrated; the left ilium was infiltrated throughout; soft, easily cut with a knife, and about an inch in thickness. The inner surface of the right ilium was eroded and softened, with a large mass of growth resting on it under the psoas muscle, and infiltrating it to some extent; there was also a smaller growth under the psoas on the other side. Several of the ribs were enlarged by the growth (apparently subperiosteal) on their inner surface. Right sterno-clavicular joint completely disorganised, and first piece of sternum infiltrated throughout. Both hips and shoulder-joints were healthy, and there was no external evidence of growth into any other joint. The lumbar glands were the only ones affected."

The new growth of the vertebræ was examined microscopically by Mr. D'Arcy Power, who reported that it was a small round-celled sarcoma.

The great extent of the disease in this case is remarkable, all the vertebræ from the fourth dorsal, or even higher, being affected, and also the sacrum, both ilia, several ribs, and the sternum; and such a distribution of the disease is a powerful argument in favour of the disease having commenced simultaneously at many points in the bony skeleton. There was no tumour anywhere perceptible, and no angular curvature of the spine; in fact, during the period of two months, during which her chief symptom was pain in various parts of the body, there was nothing to give the clue to a correct diagnosis.

It is not easy to explain the early albuminuria or the changes found post-mortem in the urinary organs, though these latter changes may have been in part due to the state of the function of micturition after she became paraplegic.

In the museums of the Royal College of Surgeons, of St. Bartholomew's Hospital, and of Guy's Hospital there are no specimens which exactly correspond to the present case, the nearest approach being a series of specimens at the Royal College of Surgeons, No. 1677 to 1683, of "medullary cancer," from the body "of a Frenchman who died scrofulous." The specimens are portions of frontal bone, of a vertebra, of ilium, sternum, and rib with new growths; but in these specimens there is nothing equal to the very extensive disease of the present case, although the distribution of disease in the two cases is almost identical, and is again paralleled by No. 1132 in the St. Bartholomew's Museum, which is a specimen of soft cancer of vertebræ, the ribs, sternum, and iliac bones being also affected.

Judging from the specimens in the three museums mentioned above, it would appear that the commonest malignant disease of the vertebræ is carcinoma, secondary to disease elsewhere, and especially following scirrhus of the breast, while primary malignant disease of the vertebræ is usually sarcoma.

In 1841 Mr. Cæsar Hawkins published in the "Medico-Chirurgical Transactions" a paper on cancer of the spine. He gives four cases of his own, and alludes to eight or nine more from other writers. Of these cases, fully one-half follow scirrhus of the breast; two of his own coming under the same category; and he quotes one from Cruveilhier following encephaloid disease of the testis.

Mr. Hawkins' third case is one of tumour of the neck, springing from the third and fourth cervical vertebræ, and causing left hemiplegia; and his fourth case is one of malignant tumour of nasal

bone, in a boy aged four, followed by secondary growths in the form of many subperiosteal fibrous nodules springing from the bodies of the vertebræ.

Dr. Percy Warner tells me that he saw a case at Guy's Hospital very like the present one, in a younger child. The symptoms of cancer of the vertebræ are fairly uniform: first pains in some part of the body, usually in the lower limbs, followed by paraplegia, with pains or painful spasms in the paralysed limbs.

I am indebted to Mr. Butlin's kindness for a reference to a paper by M. Charcot (Union Medicale, 1865, New Series, xxvi. p. 195) on the symptoms of secondary cancerous deposits in the vertebræ following scirrhus of the breast. Out of thirty-five cases of scirrhus, six were followed by cancerous deposits in the vertebræ, after varying intervals of time, both when the breast had been removed and when it had not (in one of Mr. Hawkins' cases so much as six years after the breast had been removed). Charcot calls the symptoms by the name of painful paraplegia, and says that it begins with lumbar pains shooting down the legs, nearly constant, with exacerbations, worse at night, and felt in all the nervous ramifications; no analgesia or anæsthesia, and a difficulty in walking, which soon becomes a paralysis. He says the sphincters are unaffected. This was not so in the present case, nor in many of the other cases; but in Charcot's cases the bones affected were the lumbar vertebræ, which might explain the discrepancy.

It is clear that the symptoms must vary to a certain degree with the position and extent of the disease, although there is usually no direct implication of the spinal cord.

In women who are or have been suffering from scirrhus of the breast, one should not disregard persistent complaint of pain in back or legs, especially if there be emaciation as well; and if such symptoms are followed by paraplegia, the diagnosis is almost certain.

It is worth while to bear in mind that there may be, as in the present case, extensive disease of the bodies of many vertebræ, without tumour or prominence of vertebral spines, and angular curvature is as often absent as present.

The paralytic symptoms certainly do not depend upon compression of the cord. In the present case the spinal cord seemed healthy, the only lesion within the spinal canal being a thickening of the dura mater for two inches in the lower dorsal region.

A part of the vertebral column is preserved in the Museum, No. 517a.

A CASE OF EPILEPSY,

WITH REMARKS.

BY

HOWARD H. TOOTH, M.B.

The following case was brought under my notice a short time ago, and though not by any means remarkable, yet it seems to me to possess several points on which it may be instructive to dwell.

A boy aged 15 has been subject to fits for five years. No, exciting cause can be given for the first fit. Has never been a robust child. He may have fits two or three times a day, but the interval lately has been more like a fortnight. The fits at first were always at night-time, but now they are always in the day. There is always a definite aura, a feeling of "pins and needles" in the left hand, passing rapidly up the arm till unconsciousness supervenes. He volunteered the information that he had sometimes been able to arrest the fit completely by grasping the wrist tightly with the right hand. There is some paresis of the left arm and leg, but no loss of sensation. The knee-jerk on the left side is considerably increased. No facial paresis. During the fit he is said to fall backward, with the arm flexed, and the head and eyes drawn to one side (?) left. He never bites his tongue, though he constantly passes his water in the fit. After the fit he suffers from frontal and parietal headache, more particularly on the right side. As to his eyes, the pupils are equal, and the fundus quite natural. In intelligence he is not very bright, and has rather a vacant expression. His memory is bad, and his temper rather capricious.

His father died of "apoplexy." No history of fits or mental disease in the family.

As to treatment, I gave him bromide of potassium and perchloride of iron; and acting on the hint he gave me, ordered him to have a strap loosely round his left wrist, which he was to tighten the moment he felt the sensation of formication. This treatment was very successful, for in the first week after its application he had been able to ward off the fit at least twenty-three times, and up to the present time—during a period, that is, of two months—he has not had a fit at all. As not unfrequently happens in such

cases, however, he complains that the sensation has made its appearance occasionally in the right hand. This has made it necessary for him to wear a strap on that wrist also.

Among the many points that a case like this presents, not the least interesting is the well-defined unilateral aura, and that power of inhibiting the fit by a ligature above its apparent point of origin. Of course, this is a symptom of great antiquity, and no doubt gave rise to the old theory of the peripheral origin of epilepsy.

Assuming the truth of the theory so admirably formulated by Dr. Hughlings Jackson in his Croonian Lectures, that an epileptic fit is essentially an explosion of nervous energy having its origin in the higher centres of the brain, and spreading down from these to centres on a lower level, it is not difficult to conceive the origin of a definite sensational aura. For in the above case, for instance, the paresis of the left side points to some affection, to speak in as general terms as possible, of the right side of the brain, possibly in the region of the ascending parietal convolution. The point of attack there is probably that part of the convolution devoted to the appreciation of common sensation in the left hand, for it is surely quite reasonable to assume that the sensory tracts have their projection on the cortex, in much the same way as have the motor tracts. As the result of stimulation of a sensory nerve in any part of its course is a sensation referred to the peripheral termination of the nerve, so here the first effect of the discharge is the peculiar sensation in the hand. Not so easy of explanation, however, is the phenomenon of arrest by ligature. *A priori*, one might suppose that if the stimulus at the centre produces its effect at first solely on the peripheral endings of the sensory nerve, therefore any stimulus applied to the periphery of the same nerve or nerves might produce some modifying influence in the region of the centre attacked. Something of this kind evidently does happen, for the fit may sometimes be arrested by other stimuli than ligature, *e.g.*, a smart pinch, prick, or by an encircling blister. So, also, it is well known that compression of the carotid will sometimes arrest a fit, and this has been used by Brown-Séquard as an argument in favour of the vascular theory of epilepsy. But is it not more likely that the pressure acts as a stimulus to the vagus, which is in the sheath of the carotid, or possibly to the skin of the neck? As to the nature or mode of action of this modifying influence we can say little. Gowers suggests that the afferent impulse caused by the ligature suddenly raises the resistance in the nervous matter in the neighbourhood of the point of attack. This theory is borne out by two classes of cases. If the application of the ligature is continued for a sufficient length of time, this resistance will often become permanent, and the aura

will cease of its own accord, so to speak, at the position of the ligature. Again, the aura may be transferred from its original situation to another point, showing that the instability of the nervous matter is general, and tends to manifest itself in a new part as fast as the old seat of attack is removed.

There is one other point in this case to which I would draw attention. The patient, during the fit, micturates, but does not bite his tongue. Now, tongue-biting is very rightly regarded as an important symptom of an epileptic attack—indeed, often the only evidence that a patient has had a fit. It is a very common symptom. Out of 37 cases (14 males and 23 females) that have been under my notice lately, 18 presented this symptom alone. Out of the same number 4 passed their water involuntarily during the fit, and these were all males. In 12 cases the two symptoms were combined; 3 were males and 9 were females, and of the latter involuntary defæcation was added to the two other symptoms in 3 cases: 4 cases presented neither symptom. So that we have involuntary micturition as a solitary symptom comparatively often among the males, while among the females it occurs often, but always combined with tongue-biting. Of course I do not lay much stress on these figures, as the numbers are too small for any safe generalisation. Involuntary micturition, like the tongue-biting, takes place during the stage of clonic convulsions. If it were due simply to mechanical compression of a distended bladder, one would expect it to happen much oftener. One would look for it more frequently in the severe fits than in the milder ones. Such, however, is not the case, for in 1 of the 4 cases in which it occurred alone the fits were, if anything, mild, while the fits in the other cases were not remarkable for their severity. Involuntary passage of fæces is a much less common symptom, which is rather odd when the close connection between the two centres is considered.

Gowers notices that involuntary micturition and defæcation are more common in nocturnal attacks than in those occurring in daytime. Of all the cases of these kind that I have records of, I find that only one had fits in the daytime solely; the rest had them at night only, or indifferently by day or night.

To sum up, tongue-biting is admitted to be an important symptom in epilepsy. Hysterical patients almost never bite their tongues. Involuntary micturition I believe to be as certainly an epileptic phenomenon as tongue-biting, though less common. It is sometimes present when tongue-biting is not—hence its value. It is by no means easy always to distinguish epileptic from hysteroid attacks; therefore any symptom which can be put down as certainly epileptic cannot fail to be of great use.

TRAUMATIC CEPHALHYDROCELE.

BY

THOMAS SMITH.

Case I.

Alfred N., 8 months old, was admitted into President Ward, October 8, 1883. He is reported to have fallen down an area two months since. The child was ill-nourished and rickety, drowsy, and taking little notice of anything. Respiration hoarse, and accompanied by some recession of the chest-wall. Temperature 103.6°.

On the right side of the head above the ear was an oval swelling with fluid contents, projecting about three-quarters of an inch above the general level of the scalp, measuring 1½ by 2 inches. On pressure, one could feel at the bottom of the swelling beneath the fluid a flat surface, which was taken to be the surface of the skull. The edges of the swelling were well defined, and the tumour presented many of the appearances of a cephal-hæmatoma; but owing to the condition of the child no very careful examination of the swelling was made at that time.

The day after admission the temperature rose to 105°, and on the following day the child died in convulsions.

Mr. Rickman Godlee has been so kind as to furnish me with the previous history of this patient.

Two months before coming into St. Bartholomew's the child fell about eight feet out of a window on some bricks, striking its head and fracturing the skull. When admitted to the North-East London Children's Hospital, there was a large fluid swelling

on the right side of the head, obscuring the bones beneath. There was collapse, irregular breathing, followed by convulsions, most marked on the left side of the body, and inability to swallow. Six days after admission an impulse was noticed in the swelling when the child cried. On the twelfth day the tumour was punctured with an exploratory needle, drawing off about half a drachm of blood-stained fluid of a serous nature, producing but little change in the swelling, which at this time pulsated very distinctly.

The child gradually recovered; and three weeks after the accident it was noted that a distinct impulse could be felt all over the tumour, and that an edge of bone could plainly be felt around the margin of the swelling. For two months the patient remained under Mr. Godlee's care, and he was discharged wearing a gutta-percha shield to protect the tumour. One week later he was admitted under my care into St. Bartholomew's, where he died.

Post-mortem examination. — On reflecting the scalp, the tumour was found to contain a serous fluid, bounded externally by the pericranium, and limited on its deeper surface by the dura mater. There was a large gap in the vault of the skull corresponding in size with the external swelling.

Though it was not established by examination that the cavity of the tumour communicated with the sac of the arachnoid, yet the Registrar, who conducted the examination, was of opinion that such a communication existed.

The bones of the skull were thinned, the ribs beaded, and the articular ends of the long bones enlarged.

It is recorded that there was no disease of the brain or its membranes, and that the other viscera were normal.

Case II.

Alice S., æt. 3, admitted into Lawrence Ward, April 18, 1884. A strumous child, with chronic synovitis and contraction of left knee-joint, and strumous disease of one phalanx on the left hand. When four months old she fell on her head, and was taken to the London Hospital, where she lay one week unconscious, as her friends state. She was discharged on account of an outbreak of fever in the ward.

She is an anæmic-looking child, with enlarged glands in the neck, in full possession of her mental faculties, with no sign of paralysis or deficient innervation. At the back part of the skull, on the right side, is an irregular opening in the skull, surmounted

by a soft pulsating swelling with fluid contents. It extends as an elongated oval from the occipital protuberance forwards and outwards over the right parietal bone, measuring $4\frac{1}{4}$ inches in its greatest length and $1\frac{1}{4}$ in width.

An opening in the skull corresponds in extent with the external swelling. The edges of this opening in the bone are sharp, very well defined, a little upraised, and irregular in outline.

On firm pressure, such as can reasonably be employed, one cannot come to the bottom of the swelling, or meet with any sense of resistance such as would be communicated by the dura mater. The mental condition of the patient differs in no respect from what one would expect to meet with in a strumous child of the same age.

The accompanying diagram is intended to show the position and outline of the hiatus in the cranial bones.

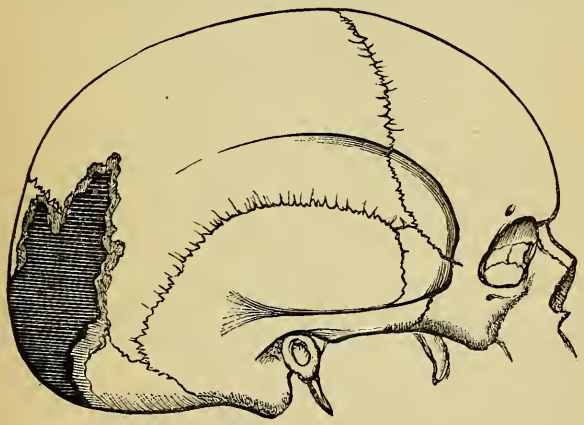
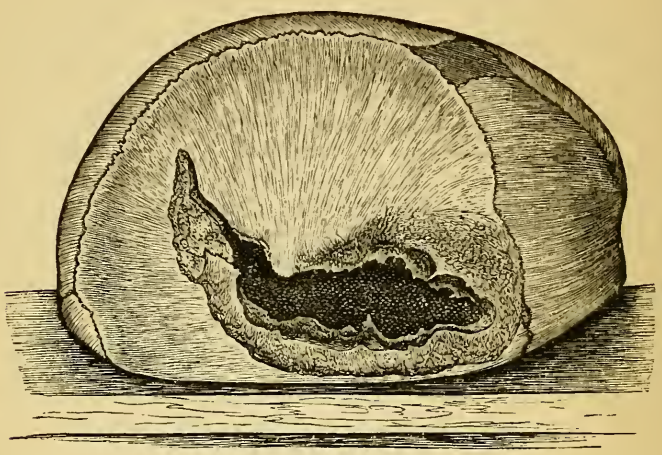


Diagram of skull, Case II., showing the position and dimensions of the opening in the skull.

Of these two cases it is to be remarked, that the size of the gap in the skull is too considerable to be accounted for by fracture alone. Nor can the opening in the cranium represent a piece of detached bone—it is too irregular in shape, and too jagged in outline. There must have been some considerable removal of bone by absorption subsequent to the fracture.

It is to be observed that the bones at the margins of the opening in the skull in Case I. are slightly everted, and the tables of the

skull are separated from one another, and the interspace slightly hollowed out, as shown in the accompanying woodcut.



Drawing of skull from Case I.

I have adopted the name at the head of this paper from an essay by Professor Conner of Ohio, contained in the "American Journal of Medical Sciences" for July 1884. He uses the term to characterise accumulations of serous fluid found beneath the scalp, communicating with the interior of the skull, and occurring in consequence of fracture of the skull.

In this country I believe but four cases of this lesion have been recorded—one by Mr. Erichsen,[1] two by Mr. Clement Lucas,[2] one by Mr. Haward.[3]

Dr. Conner, in the paper referred to above, gives two cases occurring under his own observation, and has collected from various sources many others which he has published in the form of a table. This table I have ventured to copy and slightly to modify by omitting the last three cases[4] and adding three other cases.

In this table we have a series of twenty-two cases, where, after a simple fracture of the skull, a collection of serous fluid has formed

[1] Science and Arts of Surgery, 6th edition, vol. i. p. 423.

[2] Guy's Hospital Reports, 1876, p. 363. Ibid., 1878, p. 329. Ibid., 1881, p. 91.

[3] Lancet, July 17, 1869.

[4] The three cases I have omitted from Dr. Conner's table are all instances of compound fracture of the skull, two being gunshot wounds, and one the result of trephining. They do not fall into the same category with the cases I wish to describe.

beneath the scalp, communicating with the interior of the cranium. The nature of the fluid and its relations to the brain and cavity of the skull has been ascertained by puncture or pulsation during life or by examination after death. Though the tumour was not observed to pulsate in every case, yet in all cases it contained fluid indistinguishable from cerebro-spinal fluid, as ascertained by puncture; and in every instance where the fluid was removed by tapping it was quickly reproduced.

The age of the patients is noteworthy; with the exception of two children aged twelve and sixteen respectively, all the others were three years old or under. One may therefore conclude that, if not altogether confined to children, at all events the lesion is little likely to occur in adults.

Professor Conner suggests that the close adhesion of the dura mater to the skull in young children renders it more liable to laceration at the time of fracture than in adults. This may reasonably account for the initial escape of the cranial fluid from the cavity of the skull; but it does not sufficiently explain the non-union of the fracture in some instances, and the complete disappearance of considerable portions of bone, as observed in my own cases, and in a less degree in one of Mr. Lucas's. I think it is certain that in some instances there has been removal of bone by absorption, accounting for the permanency of the opening.

Mr. Bowlby has suggested to me that this absorption may be due to injury to the growing centre of one of the cranial bones—an explanation which would account for the lesion being confined to young children.

Mr. Warrington Haward expresses an opinion from the post-mortem appearances in his case, that had the child lived the tumour would have been cut off from the cavity of the skull by union of the fracture.

I agree with Mr. Lucas in thinking that it does not appear that this is the usual course of events. In one of Mr. Lucas's cases the skull was found open after death a year and nine months after the injury, and in his second case the child is presumably alive, more than five years after the fracture, with the fissure in the bones unclosed. In one of my own cases the hole in the skull was found very widely open two months after the fracture. In the other patient, still alive, there is now, two years and nine months after the accident, a large opening both in the skull and dura mater.

The source of the fluid, as observed by Mr. Lucas, is certainly in some instances from the cerebral ventricles; in one of his cases the tumour was found on post-mortem examination to communicate freely with the lateral ventricle; and this connection was noted in two cases in the accompanying table. In Mr. Haward's case it is

No.	Reporter.	Authority.	Sex.	Age.	Location of Fracture.	Time of Appearance of Tumour after Receipt of Injury.	Operative Treatment.	Result.	Time of Death.	Cause of Death.	Remarks.
1	Marjolin.	Vivien, Thèse de Paris, No. 440, 1883.	M.	16 mos.	Upper and posterior left parietal region.	4 months.	2 tappings.	Recovery	...	...	Pulsation noticed.
2	Haward.	Lond. Lancet, July 17, 1869.	M.	19 mos.	Right frontal region.	At once.	1 tapping.	Death	12 days after puncture.	Meningo-encephalitis.	Pulsation noticed.
3	Geraldes.	Mal. Chirurg. des Enfants, 1869, p. 730.	M.	14 mos.	Posterior right parietal region.	A number of days.	2 tappings, 1 free incision.	Death	20 days after first tapping.	Meningo-encephalitis.	
4	Potain.	Vivien, *op. cit.*	F.	7 mos.	Posterior right parietal region.	Unknown.	3 tappings.	Death	18 days after first puncture.	Meningo-encephalitis.	
5	Erichsen.	Surgery, Am. ed., 1878, vol. i. p. 534.	...	Child.	Left side of skull.	Very soon.	2 tappings.	Death	10 days after injury.	Meningo-encephalitis.	Child hydrocephalic.
6	Lucas.	Guy's Hosp. Reports, 1876, p. 363.	F.	2 yrs.	Left temporal region.	About 2 weeks.	1 aspiration.	Death	21 months after injury.	Meningo-encephalitis.	
7	Emery.	Bul. de la Soc. Anatom., 1876, p. 36.	...	2 yrs.	Frontal region.	Unknown.	1 tapping six months after fall, followed by free incision.	Death	...	Erysipelas and meningitis.	
8	Schmitz.	Handb. der Chir. Billroth & Lücke, L. 30, S. 152.	...	5 mos.	Lower right parietal region.	10 days.	3 punctures and compression.	Unknown	...	...	Removed from hospital while under treatment. Mistaken for hæmatoma.
9	Weinlechner.	Jahrbuch f. Kinderheilkunde, B. 18, S. 367.	M.	3 yrs.	Left parieto-occipital region.	Soon.	None.	Recovery	...	...	When first seen by Weinlechner, boy was 15 years old, and an epileptic. Pulsation noticed.
10	Weinlechner.	Jahrbuch f. Kinderheilkunde, B. 18, S. 367.	F.	7 mos.	Right parietal region.	Immediately.	None.	Recovery	...	...	Died some months later of smallpox. Pulsation noticed.
11	Weinlechner.	Jahrbuch f. Kinderheilkunde, B. 18, S. 367.	F.	4 mos.	Left parietal region.	Immediately.	None.	Recovery	...	...	Was living more than five years later. Pulsation noticed.
12	Weinlechner.	Jahrbuch f. Kinderheilkunde, B. 18, S. 367.	M.	23 mos.	Posterior right parietal region.	Unknown.	2 punctures.	Death	9 days after second puncture.	Meningitis.	Pulsation noticed. Nothing known as to cause; hydrocephalic. Post-mortem showed communication with lateral ventricle.

13	Weinlechner.	Jahrbuch f. Kinderheilkunde, B. 18, S. 367.	M.	7 mos.	Right parietal region.	Unknown.	3 punctures with cataract needle.	Death	6 days after third puncture.	Meningitis.	Cause unknown. Fissure present in parietal bone.
14	Billroth.	Langenbech's Archiv. f. klin. Chir., B. 3, S. 398.	F.	At birth.	Right parietal region.	Several days after delivery.	5 punctures, 2 iodine injections.	Death	6 days after fifth puncture.	Meningitis.	When seen by Billroth was 2½ years old. Injury produced by forceps at time of delivery. Post-mortem showed communication with right lateral ventricle.
15	Kraussold	Langenbech's Archiv. f. klin. Chir., B. 20, S. 828.	...	9 mos.	Right occipito-parietal region.	Unknown.	2 punctures.	Recovery	...	...	Case not seen until 9 months after injury. Pulsation noticed.
16	Reckitt.	London Lancet, June 4, 1881.	M.	2½ yrs.	Right temporo-parietal region.	2 or 3 days.	1 aspiration.	Recovery	...	...	Squinting noticed at time of detection of tumour; disappeared after tapping. Persistent paraplegia from spinal injury.
17	Lucas.	Guy's Hosp. Reports, 1880–81, p. 91.	M.	23 mos.	Left frontal region.	17 days.	1 tapping with hypodermic needle.	Recovery	...	...	Pulsation noticed.
18	Conner.	American Journal of Med. Sciences, July 1884.	M.	12½ yrs.	Right occipito-parieto-temporal region.	At once.	5 punctures, 1 aspiration.	Recovery	...	...	
19	Conner.	American Journal of Med. Sciences, July 1884.	M.	27 mos.	Right parietal region.	At once.	None.	Recovery	...	...	Child hydrocephalic and rachitic.
20	T. Smith.	St. Barth.'s Hosp. Rep., 1884.	M.	8 mos.	Right parieto-occipital region.	6 days.	None.	Death	2 months.	...	Ill-nourished, neglected, rickety. Child died in convulsions two days after admission. Fall on head from a height.
21	T. Smith.	St. Barth.'s Hosp. Rep., 1884.	F.	3 yrs.	Right parieto-occipital region.	Not known.	None.	Alive	...	...	Three years after injury in fairly good health; but a strumous child, with diseased knee-joint. Still pulsates; free communication with interior of the skull. Fall from a height.
22	Weinlechner.	Med. Times and Gazette, 1884, Dec. 6.	F.	16	Right parietal eminence.	Not known.	1 puncture.	Alive	...	...	Tumour the size of a fist. Large hole in skull; raised margin. Pulsating freely.

also stated the handle of the scalpel could be passed through the fracture into the substance of the brain.[1] In the first case recorded in this paper no such communication was found; but in the second patient, still alive, it is probable that it exists, for there is evidence of a cavity within the skull communicating freely with the external tumour.

The mortality in the cases recorded has been large, and if the table be studied, it will be noted it has not been favourably influenced by treatment. Ten deaths occurred from meningitis among twenty-two patients, and none of the survivors can be said to have been *cured*.

Though a carefully executed aspiration may be needful to establish a diagnosis, and is little likely to do harm, it cannot be regarded as a curative measure; while other more heroic methods that have been employed, such as setons and injections, are, of course, objectionable.

The diagnosis of cephalhydrocele is comparatively easy when once the possible existence of these tumours is recognised, and should there be any doubt as to the nature of a permanent swelling containing fluid, and occurring after fracture of the skull, the doubt can be dispelled by the use of the aspirator with small risk to the patient; and it may be that without this means of investigation it is impossible to determine the nature of the swelling, as in some cases the communication with the cranial cavity is so small or so indirect that the external tumour cannot be observed to pulsate.

Though so few cases of cephalhydrocele have been described, it may well be doubted if the number of recorded cases adequately represents the frequency of the lesion. For I bear in mind, even in my own experience, cases that have passed from under my care with, as was supposed, unabsorbed cephalhæmatomata, and some of these bore a very suspicious resemblance to the first case recorded in this paper.

[1] In a skull recently exhibited at the Pathological Society by Mr. Rickman Godlee, this communication also existed.

A NOTE

ON

THE CAUSE OF PYREXIA IN CASES OF SIMPLE FRACTURE,

AND ON THE

INFLUENCE OF THE NERVOUS SYSTEM IN THE PRODUCTION OF TRAUMATIC FEVER.

BY

ANTHONY A. BOWLBY.

I wish to call attention very briefly to a factor in traumatic fever which is, I think, too apt to be overlooked. I allude to the nervous system.

At the present day there is a very general tendency to seek the cause of all rise of temperature in the presence of micro-organisms —bacteriæ or micrococci; and to such an extent has this tendency advanced, that the influence of the nervous system is by some authors absolutely denied, by many more ignored. Now, lest I should be misinterpreted, let me say at once that I entirely agree with those who state that septic changes produce pyrexia, and that I fully appreciate the advantages to be derived from keeping wounds sweet, clean, and aseptic. What I wish to claim is, that all traumatic fever is certainly not septic in origin, but is due to the influence of the injury upon the nervous system.

Now it may seem to some that this opinion needs but little evidence to support it, and most practical surgeons are fully aware of the influence that trivial matters unconnected with the wound exercise over the general well-being of the patient. But so long as there is a wound, it is open to those who differ from them to

say that this rise of temperature is really due to the absorption of septic material, and that even though the discharge be perfectly sweet, septic changes are in progress. That I may not seem to be merely imagining such an argument, I will give but one quotation from the "Surgical Pathology and Therapeutics" of the most eminent of the Continental surgeons—Billroth. At page 93 he says: "If a wounded patient has fever, it is for me a proof that there is decomposition going on in his wound, and that the products have passed into the blood, whether the wound smells or not. . . . I feel convinced that traumatic fever, like any inflammatory fever, essentially depends on a morbid state of the blood."

I agree that this is often the case; but I contend, and hope to prove, that in a vast number of cases this fever is entirely dependent on the influence of the nervous system.

It is evident that, in order to prove this point, it is necessary to deal with injuries in which there is no external wound, for the condition of the latter is always open to criticism.

I have therefore chosen simple fractures, as being both suitable and numerous enough to enable me to deal with considerable numbers, and not with isolated cases.

It is now some years since I noticed that simple fractures were almost always accompanied by pyrexia; but as, until the present year, I have not had sufficient opportunities or time to investigate the subject, I have had to postpone writing until the present occasion.

I do not, however, pretend that I have in any way dealt with the question at all exhaustively, and merely hope in the present paper to direct attention to a point which seems to be too little recognised.

I have for my purpose taken seventy consecutive cases of fracture of the lower extremity.

Of these, eight were children under ten years of age, and sixty-two were adults.

Amongst the adults there were only three cases in which the temperature did not rise above 98.6°.

In the remaining fifty-nine patients, the temperature rose to a varying extent.

In thirty it did not rise above 100°, the average temperature being 99.7°.

In twenty it rose to between 100° and 101°, the average temperature being 100.2°.

In nine it rose to a point over 101°, the highest temperature being 103°, and the average 102°.

Taking all fifty-nine cases together, the highest temperature was reached within the first twenty-four hours in thirty-two instances;

in the second twenty-four hours, in twenty-one; in the third twenty-four hours, in four; and in the fourth twenty-four hours, in two.

In a large proportion of cases in which the temperature was taken within a few hours of the injury, the temperature was found already raised. In several patients the temperature was subnormal for some hours after the accident. This was most marked in old people, and in fracture of the femur.

On account of previous alcoholic intemperance, gastro-intestinal disturbance, &c., the temperature in many cases rose after the patients had been confined to bed for a few days; but these I have not included in the above, though they are all worthy of attention. The temperature, however, often remained high for several days, sometimes for more than a week.

In the eight children under ten years, in three there was no pyrexia, and the average temperature of them all was 99.2°. I confess that this immunity on the part of children much surprised me, considering how often a child's temperature will rise from but very trifling causes, and I am not able to offer any satisfactory explanation of the fact, although it may be remarked that fractures in children are generally transverse, accompanied by but little displacement, and by but little laceration of the soft structures.

It is very evident that in the above cases there could be no question of a septic condition of the wound, for no exposure to the external air occurred in any one, and no fracture suppurated. I submit, then, that these facts of themselves disprove the statement that traumatic fever is due to septic changes alone.

On the other hand, if not due to sepsis, is it due to influence of the nervous system? And first, can the nervous system influence the temperature? It has been shown by German experimenters that after division of the nerves of a wounded limb septic changes will still induce fever, and from this the deduction has gravely been drawn that traumatic fever is independent of, and under no circumstances influenced by, any cause acting through the nerves. This certainly seems the height of absurdity. Why should we conclude that because fever can occur after division of the nerves of a limb, therefore where these are intact they have no influence, whilst in proof of the power of the nervous centres to cause either a greater or less production, or a greater or less loss of heat, we have abundant evidence in physiology? Surely the system which is capable of keeping the body at an equable temperature in the extremes of heat and cold may, without the presence of septic changes, occasionally err in the direction of increased or diminished production.

And here I must just point out a weak point in the arguments of those who see no cause for fever but sepsis. To what do they

attribute the fall of temperature in shock? I believe that they themselves would allow that this was due to inhibition of the cerebro-spinal centres. Why, then, if these can err in one direction, may they not err in the opposite?

And the rise of temperature in fracture is really the rise that follows on shock. It is the old fever of "reaction," a name which is now but seldom used. And in fracture accompanied by much pain and fright, just as in other severe injuries, the temperature may fall. The rise, as I have pointed out, frequently occurs within a few hours,—at a time when, the shock having passed off, reaction has set in. But the fever of reaction may be prolonged or excessive, and in some cases varies much from day to day. And in cases of fracture, especially in old people, this variation may also be noticed.

In addition to the shock of the accident and the subsequent reaction, I think that fever may also result from *tension* in the fractured limb, due to extravasation of blood. There can be no doubt in my mind that tension pure and simple can induce fever, and I have seen the temperature rapidly reach 102° after a splint has been too tightly placed on a deformed limb, and as quickly subside on its removal. But tension can only act through the nervous system, and is quite independent of septic changes.

And after tension there is yet another cause for fever apart from sepsis, and that is *pain*. In most fractures there is pain, and I think I have observed that the temperature is liable to be highest in those patients who suffer most from their injuries. Not necessarily in those who complain most, for that is quite another thing. Have we then any other evidence that pain can cause fever? I think we have. Some years since I noticed the greatly increased frequency of the pulse in children who suffered much pain during the dressing of wounds, and from the consequent fright and dread of being touched; and it struck me that in them there might be a rise of temperature as well as an increase in the heart's action.

I therefore took the temperature of a child aged eleven years, who always suffered exceedingly during the dressing of the wound caused by an excision of the hip. Every morning for three weeks this patient's temperature rose from about 99.6° to 102° or 103°, and some times higher, soon after the dressing commenced. In half an hour it was again at its previous level.

I repeated this experiment on another child aged eight years whose knee had been excised, and with a precisely similar result; her temperature frequently reached 102°. Since then I have seen several similar cases; and, on the other hand, have often failed to find any rise in cases apparently of identical nature. I have, then,

no doubt that pain *per se* can cause a rise of temperature; and this, again, is another instance of a cause acting through the medium of the nervous system. Nevertheless, all pain does not produce pyrexia, but, on the other hand, when excessive, and more particularly when transmitted from organs in connection with the sympathetic trunk, it produces shock and depression of temperature; as, for instance, in renal and hepatic colic strangulation of the intestines, &c. And if the above-mentioned causes can act in cases of fracture, so also may they in injuries which are liable to be the seat of septic changes, and therefore a rise of temperature in such cases does not by any means imply the presence of sepsis, and the traumatic fever which may follow on any operation wound may be merely the result of reaction, and independent of the state of the wound.

I think it is only by looking at the whole question of traumatic fever from a broader point of view that we shall arrive at any satisfactory conclusion in regard to its causation. The theory of sepsis is not sufficient. How does sepsis account for the greatly increased evening temperature as compared with that of the morning, especially in cases of hectic? Why does this evening temperature so constantly exceed that of any other time of the twenty-four hours if simply due to septic absorption? We have no warrant for supposing that absorption from a wound is more active at one time of day than at another, and the sooner we recognise the influence of the nervous system in the production of pyrexia, the better for our patients and pathology at large.

CASES FROM MR. SAVORY'S WARDS.

BY

EDGAR W. WILLETT, M.B.

Case of Fracture of Sixth Cervical Vertebra—Death on the Eleventh Day.

Richard W., aged 45, brewer, was admitted into Kenton Ward at 7 P.M. on November 20, 1883, with the history that, as he was walking past a warehouse in the City Road, the chain of a crane broke and about three hundredweight of goods fell on him; he was stunned by the blow, but recovered his senses shortly, and was brought to the hospital and admitted. It was then found that he had complete paralysis of both legs and of all muscles below those supplied by the brachial plexus; there was total insensibility of the trunk as high as the third intercostal space; breathing was entirely diaphragmatic; the muscles of the abdomen were soft and flaccid; there was great pain in the arms and wrists, though these could be moved, and there was a sensation of his feeling cold all over. Hot bottles were placed near his legs; his condition did not admit of his neck being examined.

Nov. 21.—He passed a fair night; he still has great pain in his arms. As he has retention of urine, it is drawn off every eight hours. The specific gravity was 1018, and it was normal; bowels not open.

Nov. 22.—To-day he had a very severe attack of dyspnœa, became dusky, and seemed on the point of death, so that his depositions were taken; he however recovered later in the day.

Nov. 23.—Breathing better; the intercostals move slightly; temperature hitherto below 100°; bowels open slightly, after an enema.

Nov. 26.—Passed a restless night; pain in the arms, which still continued, was relieved by a morphia draught ($\frac{1}{6}$ gr.) The temperature rose to 104° last night, but fell to 101.2° this morning. A large bulla, 8 inches long by 2 inches wide, has formed along the outer side of the left thigh; there are also bullæ on both feet.

Nov. 27.—Much weaker this morning. As the bowels have not been open since 23d, an enema was given, but this was returned at once unchanged. The blister on the thigh has burst.

Nov. 28.—Passed a very restless night, and was delirious, but is not so this morning; one-sixth grain of morphia given subcut. at 7 A.M.

Nov. 30.—Very delirious last night in spite of morphia and pot. bromid gr. xxx.; is better this morning, but very weak.

Dec. 1.—Became much weaker, with quick and shallow breathing, at 8 P.M. last night; he could not speak, but remained conscious till 10 P.M., when his breathing became laboured. He died quietly at 10.30 P.M., ten days after the accident. Temperature at 8 P.M. was 105° F.

Post-mortem examination (eighteen hours after death; leave could only be obtained to examine the back of the neck).—There was no bruise or other external sign of injury to be seen, though an irregularity could be felt over the sixth cervical spine.

An incision was made over the spines of the cervical and upper dorsal vertebræ; the occipital bone also was exposed; the heads of the two upper ribs on either side were cut through, and the two upper dorsal, all the cervical vertebræ, and most of the occipital bone (the foramen magnum was untouched), were removed together. After the muscles had been stripped off, it was found that there was an oblique fracture, extending completely through the body of the sixth cervical vertebra, with rupture of the interspinous ligaments between the fifth and sixth and sixth and seventh spinous processes. There was also softening and complete disintegration of the cord for about the space of one inch opposite the seat of fracture; this was apparently due to inflammation subsequent to the injury, and not to the direct action of the blow. There were also signs of effusion of blood into the membranes of the cord at the time of injury.

The chief point of interest in this case is the length of time the patient survived after receiving so severe an injury, death not occurring until the eleventh day; the immediate cause of death being pneumonia with pleuritic effusion.

TEMPERATURES OF RICHARD W——.

Day of month	Nov. 20	21	22	23	24	25	26	27	28	29	30
Day of disease	1	2	3	4	5	6	7	8	9	10	11
Morning temperature .	...	100°	99.7°	98°	98°	98.6°	101.3°	100°	101.8°	102.6°	102.6°
Evening temperature .	97.7°	97.6°	98°	99.2°	101.5°	104°	101°	103°	104°	104.6°	105°

Case of Depressed Compound Fracture of Skull without Symptoms of Compression—Recovery.

Jesse B., aged 24, labourer, admitted into Kenton Ward on January 12, 1884, with a scalp wound over the upper part of the junction of the left parietal and temporal bones; the wound, the edges of which were irregular, was about two inches in length, was situated a little in front of the parietal protuberance, and ran more or less parallel to the middle line of the vertex. It was caused by an "iron corbel," which fell a distance of twenty feet; he was not rendered unconscious by the blow. On admission the hæmorrhage, which had not been severe, had ceased; he was quite conscious, and could stand; the pupils were equal, and reacted to light; there was no sickness or any other symptom of compression. On examining the wound, the bone was found to be bare, and at the anterior and lower part of the wound a depressed fracture could be plainly felt, the outer table being apparently the only part affected. He was seen by Mr. Savory and Mr. Marsh, both of whom were of opinion that, in the absence of all symptoms of compression, nothing should be done; the wound was dressed with a pad of dry lint, and subsequently with oiled lint.

He made an uninterrupted recovery without any symptoms, the wound granulating up rapidly. Except on the evening of January 15 and on the morning of January 17, when the temperature rose to 100° F. and 100.5° F. respectively, it remained constant at 98.6° F.

He was discharged on February 19, when the wound was nearly healed, though the depression could still be felt under the skin; the wound was covered by a thin scab.

Nov. 12.—He came to the hospital to-day to show himself. He says that the wound did not become firmly healed until about two months after his leaving the hospital. During this time several minute pieces of bone worked their way out. With the exception that he says he felt a little dizzy in his head occasionally during the hot weather, he has felt no bad effects at all since the accident; the right arm is as strong as formerly, and he can do his work as a labourer in the building trade. A marked depression under the scar can still be plainly seen and felt.

Case of Intussusception reduced by Injection of Warm Milk, the Intussusception recurring the Next Day, and again Reduced by Injection—Recovery.

Agnes G., aged 1½ years, a small but fairly well-nourished child, was quite well early on September 14, 1884; she was taken

ill suddenly between 8 and 9 A.M., with vomiting and pain in the abdomen; she was brought to the hospital and seen by Mr. Shore, the house-physician on duty; she was then in fair condition, had a good pulse, vomited, but did not seem to be in much pain; nothing could be felt in the abdomen. Pil. hyd. ī cret. et rheo. gr.iiss. ordered.

She was brought back to the hospital at 4 P.M. She had been in more pain, had vomited frequently, and had passed slime and blood from the bowel, of which there was some to be seen on the napkin; the abdomen was not distended, but the typical "sausage-shaped" swelling could be felt on the left side of the abdomen, the lower end reaching well down into the left iliac fossa, the upper end indefinite, but extending up under the ribs; nothing was to be felt per rectum.

Owing to the fact that Dr. Gee's wards were full, the child was admitted into Lucas Ward. A hot bath was administered, and brandy ʒi. with tr. opii ɱss. given by the mouth. As there was no change, at 5 P.M. about a pint of warm milk was injected into the rectum by means of a soft No. 10 red rubber catheter, at the end of an ordinary enema syringe; the catheter was inserted for about 10 inches. A good deal of resistance was met with, but the injection caused no distress, and the child fell asleep during the operation. While the milk was being injected the abdomen was gently rubbed, and the swelling gradually disappeared from below upwards, until it could no longer be felt under the ribs. Brandy ʒi. and tr. opii ɱss. was ordered every four hours for the first twelve hours, after which milk was given in small quantities.

Sept. 15, 11 A.M.—The child has passed a quiet night, and has taken milk; she sat up and seemed quite well, and cried for bread-and-butter at breakfast-time. Bowels open three times; the first time milk only was passed, subsequently the motions contained fæces. No tumour to be felt in the abdomen; no sickness since yesterday afternoon. Temperature, 97.8°.

2.30 P.M.—At 1 P.M., after one teaspoonful of custard-pudding, the child vomited; a tumour can now be felt in exactly the same position as on admission; nothing to be felt per rectum, but blood and slime followed the examination. Mr. Willett and Mr. Baker saw the child in consultation with Mr. Marsh, agreeing with him that an injection of milk should again be given, and that if this did not succeed, that abdominal section should be performed at once.

Under chloroform, Mr. Marsh injected a pint of warm milk, with the same result as on the previous day, namely, that the swelling slowly disappeared. The child was put to bed, and

brandy and opium in small doses given as before; she was slightly sick once, shortly afterwards.

Sept. 16.—Child has passed a quiet night; no sickness; is fed only on milk; bowels open twice.

Sept. 18.—Child still doing well; egg and custard ordered.

Sept. 23.—Child discharged, apparently quite well. The temperature remained normal throughout.

A certain amount of interest is attached to this case, owing to the doubt that was entertained as to whether the intussusception was completely or only partially reduced by the first injection; the total absence of symptoms for eighteen hours may be regarded as a sign of complete reduction; on the other hand, the speedy recurrence of the tumour, accompanied by vomiting, suggests the idea of a small portion having remained unreduced.

The successful reduction of at any rate the greater portion on the first occasion, and presumably of the whole on the second, was no doubt due to the fact that both injections were given early, before irritation had had time to lead to anything like adhesive inflammation.

Another point of interest is, that whereas post-mortem examinations generally prove the intussusception in children to have commenced at the ileo-cæcal valve, the tumour was always confined to the left side.

ON A MODE OF CYST FORMATION IN THE MAMMARY GLAND.

BY

G. B. FERGUSON, M.D.

It will often happen that some one particular section of some growth or structure will show points of interest unrevealed, or only partially revealed, by the sections immediately following or preceding it. Thus it was that although somewhat numerous sections of a typical fibro-cystic tumour of the breast, removed in the Cheltenham Hospital by my colleague Mr. Bubb, were made and examined, a single one, and a single one only, afforded a nearly complete and unmistakable picture of one of the modes of mammary cystic formation. In the section itself, below the part drawn, nearly normal gland tissue was visible. On the opposite side were numerous cysts; and the interest of the drawing stands in this, that it illustrates the part of the specimen where the exuberant gland tissue is caught, as it were, in the very act of forming cysts. The method of this processs is very apparent. Firstly, there is a cellular proliferation whereby an acinus is somewhat closely packed. Thereafter ensues expansion of the acinus, with internal production of papillomatous cellular in-growths, until, the external wall condensing more and more, and the cells gradually restricting themselves to two or three layers on the internal wall (the remaining cells having probably coalesced to form the mucous contents), at last a perfect cyst is formed. The most of these changes are, I submit, to be seen in the illustration, which was drawn, for the most part, with the aid of a camera lucida, and represents a magnification of two hundred diameters. (Scale of woodcut = two-thirds.) The sections,

after due previous hardening in chromic acid solution and spirit, were cut with the aid of the facile æther-freezing apparatus of Mr. Groves. The particular one illustrated was stained with hæmatoxylin, though in the case of some of the others, more striking,

if less instructive results were gained by staining first with picro-carmine, and afterwards with iodine green. After the latter process the glandular tissue and the cells generally were very noticeable in their colouration of bright green amid the carmine fibrous tissue.

This probably common method of cystic formation from glandular acini, though mentioned by some pathological authors, is wholly passed over by others, and it was this want of general reference that suggested my illustration and remarks. In Mr. Birkett's valuable article on diseases of the breast in Holmes's "System of Surgery," for instance, cysts are of course referred to, but these cysts are those "of ducts and sinuses," "duct cysts, retention cysts," but nothing is there written regarding the production of cysts from glandular tissue. The like may be affirmed of Dr. Green's excellent pathological summary and of Rindfleisch's "Pathological Histology."

It is true that in Sir James Paget's "Surgical Pathology" (third edition) this method of cystic formation is by no means unreferred to, as the following citation will make plain :—"Some, and probably the majority, of the cysts of the mammary gland are certainly dilated portions of ducts; others seem to be abnormal transformations of the elementary structures of the gland." This on p. 396; the following on p. 427 :—"Such cysts may be formed by the dilatation of parts of ducts; but it is possible that some of the cysts that bear vascular growths are derived through transformation and enormous growths of some elementary structure of the gland."

Brief references to this method may also be found in Ziegler's "Pathological Anatomy" (Macalister's translation, p. 104), and in Coates's recent comprehensive Manual, p. 209. None of these excellent authors, however, having supplied illustrations or descriptions of the process of the cystogenesis from gland tissue, it will not, I trust, be thought that the present illustrative and descriptive attempt has been wholly superfluous.

STUDIES OF MICROBES

AT THE

BIOLOGICAL LABORATORY OF THE HEALTH EXHIBITION.

BY

THOMAS MOORE.

The microscopic fungi, looked upon quite recently as "mere scientific curiosities," are rapidly becoming of paramount importance in medicine; and they bid fair to revolutionise the treatment of many diseases, as they have already upset preconceived notions of their pathology.

Over surgical practice also they have gained a remarkable ascendancy; for, since the publication of the researches of Lister on their relation to septic diseases, the treatment of wounds has pretty much resolved itself, in one way or another, into methods for keeping the discharges and tissues free from them; and quite recently, in Germany, a practitioner was actually fined for not treating a wound antiseptically.

In fermentation and putrefaction, owing mainly to the labours of Pasteur, their rôle is undisputed; and here it is mainly beneficial, their functions appearing to be[1] "to bring back all the materials of organised and living nature to the gaseous state," or at all events into more simple compounds, that they may be fitted to become the food of plants.

"Whenever and wherever there is decomposition of organic matter," says Duclaux, "the work is done by these infinitely small organisms. They are the important, almost the only, agents of universal hygiene; they are universal scavengers." They are everywhere—in the earth, the air, the water. The surface of the soil is especially rich in bacilli and micrococci. Owing to their lightness

[1] Duclaux, Exhibition Handbook on Fermentation.

—a small moist bacterium has been estimated to weigh the ten-thousand millionth part of a milligramme—they exist in myriads in the atmosphere, carried on the "motes of the sunbeam," as Tyndall has shown. They abound in all water, even in the purest distilled; indeed without moisture they cannot grow, so that if it be extracted or driven off from organic matter in which they are present, their development ceases.[1] It is said that conserves made with sugar do not ferment, that condensed milk does not turn sour, and that dried and salted meat does not putrefy, because these substances do not contain sufficient water for their development.

They beset our bodies, being found on the skin and mucous surfaces, especially those of the ear, mouth, and intestines, ready, immediately on the death or disease of a tissue, to swarm inwards and produce putrefaction; but it is important to note that nearly all observers agree that they are never found in healthy blood or tissues.

They appear to have a preference for certain kinds of food, or perhaps, as they are supposed to be vegetables, it should rather be said that they flourish best in certain soils; and each one produces a secretion peculiar to it. Take the fermentation of beer,[2] for example. The torula cerevisiæ, or yeast fungus, taking its food from the wort, converts the sugar into alcohol, carbonic acid, glycerine, succinic acid, &c., whilst various other compounds are formed from the breaking up of the nitrogenous matter. Again, beer exposed to the air may be attacked by the mycoderma vini, an organism very like the yeast plant, which grows on the surface of beer and wine. This, with the assistance of oxygen from the atmosphere, not only burns up any sugar there may be in it, but also the alcohol, dextrine, and even some of the nitrogenous compounds of the beer, especially those to which it owes its flavour, making it insipid and flat. The mycoderma aceti, another micro-organism which grows on the surface of beer, can turn the alcohol into acetic acid; and when the alcohol has all gone, it may next attack the vinegar it has itself produced, and convert it into water and carbonic acid. Or if the lactic ferment—so called because it consists of a bacillus often found in milk—obtain access to the wort, it will, living at the bottom of the fluid, turn the sugar into lactic acid. After, or even during, the lactic fermentation, the butyric fungus, an actively moving bacillus which lives in the fluid, may make its appearance. It turns sugar or lactic acid into hydrogen and carbonic acid, and produces an acid identical with that of rancid butter, viz., butyric acid. And this acid may, in its turn, be

[1] Ziegler's Pathological Anatomy.
[2] Exhibition Handbook on Fermentation.

destroyed by various mucediniæ, such as pencillium and aspergillus.

Whether bacteria are the causes of disease in man, is a subject on which there is still much difference of opinion; nor is this greatly to be wondered at, when it is considered that it is only four or five years since Koch pointed out, in his work on the "Traumatic Infective Diseases,"[1] the proper methods of staining and observing them.

Many, and among them men of great eminence, appear to consider the matter settled in the affirmative. Some, whilst acknowledging their constant presence in certain affections, consider them the products, and not the causes of disease; whilst others, again, pooh-pooh the whole thing, declaring that they have nothing to do with the morbid processes, and are "mere adventitious products;" within the last month a physician of some repute in the provinces has written a book on "Medical Fashions," among which he includes "Bacterio-mania" and "Bogey Germs."

In view of this uncertainty, and of the probable importance in the future of a knowledge of the life-histories of these interesting little plants, after taking some preliminary lessons from Professor Klein at the Brown Institution, I spent my summer holiday in the Biological Laboratory of the Health Exhibition, in order to learn, as accurately as possible, what is known about them.

Here all the methods of growth and modes of examination introduced by Koch were daily carried on under the most able direction of Mr. Watson Cheyne; and the interest taken by the great number of medical men who attended the demonstrations there given testified to the hold the bacterial theory has attained on the profession.

It is with the hope that some of the hints I there gained may be useful that I am writing this paper, and I only propose here to endeavour to give such information as was most frequently asked for by visitors to the laboratory. For full details of the apparatus used and of the modes of cultivation and staining,[2] I would refer to the articles which appeared in the "Lancet" and "British Medical Journal" during the months of August and September. An excellent account is also given of the latest researches on the subject in Dr. Klein's recent work on "Micro-organisms in Disease."

The microscopical apparatus used is of the greatest importance, for unless appliances of this kind are of the best, and specially

[1] Translated for the New Sydenham Society by Mr. Watson Cheyne, 1880.

[2] The cultivation apparatus used in the laboratory may be obtained at Allen & Sons' of Marylebone Lane, and the staining materials at Martindale's of New Cavendish Street.

adapted to the work to be done, the results attained by investigators will be disappointing. As several microscopes and many lenses of different kinds were lent to the laboratory by some of the best makers, there were ample opportunities of testing them.

As regards stands—it is important to have a steady one—Powell & Lealand's, with a smoothly-working rack-and-pinion movement to the stage and sub-stage, was excellent in this respect, and of perfect workmanship, but expensive. R. & J. Beck's "Pathological," with a mechanical glass stage, is pleasant to work with, and although comparatively cheap (£15, 10s.), answers the purpose admirably. Buyers should take care that the hole in the glass stage, which was too small in those exhibited, is large enough to allow all the object to be seen without moving the slide. Swift's "Nelson Model," which had an excellent fine adjustment —a desideratum for any microscope which is to be used with high-power lenses—was a favourite with some of the workers in the laboratory. It is fitted with a spring to prevent the object-glass from being turned down on to the specimen and smashing it, as happened under another microscope during one of the demonstrations to the only preparation of the "comma" bacillus in the laboratory. Zeiss's stand (supplied by Baker of Holborn) is the one recommended by Koch and used by Klein. Having a large flat stage, it is the best for looking at cultivations on glass plates with; but it has the drawback that there is no mechanical apparatus for moving either the object or the sub-stage condenser, which has to be done by the finger and thumb.

An achromatic condenser is an absolute necessity. Some bacteria which show well under a high power with it are absolutely invisible without it. It is also necessary to have it properly focussed, or they are not clearly seen. Tubercle and other bacilli stained with fuchsine may look quite dark if the condenser be too low, but have a beautiful magenta tint if it be all right. On this account it is better to have it fitted to a sub-stage with a rack-and-pinion movement. To use it, the object should be first brought clearly into focus with a lens of low power, say ½, and the condenser should be screwed up and down, until, at the same time, the image of a bar of the window by daylight or the flame of the lamp after dark is also brought into focus "sharp." If after this a lens of high power be put on without moving the condenser, the bacteria are clearly seen as soon as the former is focussed. In looking, with a low power, at cultivations of colonies on glass plates or slides, it is best to lower the condenser out of focus.

Before commencing to use the microscope for the day, the condenser should be centred, as when the microscope is put away it generally gets out of gear. If the microscope is not moved, one

centering is enough for a day; but there must be a fresh focussing for every object looked at, as slides differ in thickness. It will save much trouble and disappointment if, for this kind of work, *i.e.*, with high-power lenses, care be taken that no cover glasses be more than .004 inch in thickness, and that the slides are fairly thin also. Some of my preparations at the laboratory were spoiled by thick slides supplied there.

Powell & Lealand's achromatic condenser is an excellent one, but it costs eight guineas; they make a high-angled non-achromatic one for two guineas, but it is of no use for bacteria. Beck's is nearly as good for £3, 10s.; and Abbe's is a very good one for £2, 15s. The latter is fitted to Zeiss's microscope, and is used by Koch and Klein. It, however, is not achromatic, and although it renders the bacteria plainly visible, it sometimes produces unpleasant rainbow appearances around sections of tissue.

Diaphragms of various sizes are indispensable, for unstained bacteria should be looked at with little light; whereas stained bacteria require an amount of light varying from a very little to even as much as the lens will bear. The revolving one fitted to Powell & Lealand's microscope works very well, and is especially useful for testing lenses, as it is marked so as to register the degrees of light admitted. Beck's Iris diaphragm is most pleasant to use, as the amount of light admitted can be easily varied by merely pressing the lever with which it is fitted. Zeiss's fitted to Abbe's condenser is also a very good one.

As regards lenses, the high power is the most important for this kind of work; and, as Dr. Gibbes[1] says, it ought to be an immersion, as dry glasses over $\frac{1}{8}$ "work too close" to be useful. There were many of this kind in the laboratory, and a trial was made of them under the direction of Mr. Cheyne, who is an excellent microscopist. They were tested with "podura" scales and with histological objects, both under low and high eye-pieces, and with varying amounts of light.

Of the oil immersion, Powell & Lealand's $\frac{1}{12}$ (price £16) was the best, and Zeiss's $\frac{1}{12}$ (price £16) second. The two mentioned above were about equal with a medium amount of light and under a low eye-piece; but with much light and a high eye-piece the former was certainly the better glass. A $\frac{1}{16}$ by Reichert (price £8, 15s.) was a good glass under ordinary circumstances, but did not bear increased light at all well.

Of the water immersions, Beck's $\frac{1}{10}$ (price £6, 18s. 6d.) was the best, and would show most things fairly; Siebert's $\frac{1}{15}$ (price £3, 15s.), from Baker's, was a fair glass, and being very cheap, and having an easily worked correction collar, is useful.

[1] Practical Histology.

There can be no doubt as to the superiority of the oil or homogeneous immersion over the water lenses. The latter did not[1] define so well, nor did they bear the test of the high eye-piece. A great drawback to a water immersion is that it cannot be worked without a correction collar, which is a great nuisance, as it often takes minutes to get the object clearly defined with it. The collar is not absolutely necessary for an oil immersion, as it may generally be focussed at once without it; but it is better to have one, as it is useful sometimes.

An objection to all immersion lenses is that the oil or the water spoils the specimen if it gets under the cover glass. Although this cannot happen if it is sealed with Hollis's glue, it is nevertheless well to have a dry lense of medium power to look at specimens as soon as they are put up, to see whether they are worth keeping. Beck's $\frac{1}{6}$ or $\frac{1}{8}$ are very good and cheap. Powell & Lealand's $\frac{1}{4}$ is excellent, as are also Zeiss's 'D and Swift's $\frac{1}{5}$. With good illumination, the light being focussed with the condenser in the way described above, most bacteria, especially the larger kinds, can be seen distinctly with these glasses.

A good low power, say $\frac{1}{2}$, is also necessary for focussing the light before using a high power, and for looking over prepared sections. Many colonies of bacteria in the tissues stand out as deeply stained spots under a $\frac{1}{2}$ inch which would never be found if looked at first with a high power.

It should be borne in mind that most of the foreign lenses are made to work with a 6-inch tube, whilst the English microscopes are fitted with a 10-inch, though some German lenses are made for the latter.

Of the microtomes, the most useful was "Swift's Ether Freezing," which could be screwed on to the table by a kind of clamp. Beck's, on the same principle, was good, and the freezing apparatus uses less ether, but it only rested on the table, and consequently was not so steady. Fraser's of Edinburgh was also a good one.

Although the use of the microscope is very important in distinguishing bacteria, a knowledge of their mode of growth in artificial cultivations is even more so. Many, especially the micrococci, are morphologically indistinguishable from one another when looked at separately, but when grown as colonies show well-marked peculiarities. Some produce colour, some liquefy the culture medium if it be a solid, and others exhibit marked individualities in the shape of their colonies.

[1] For explanation see Carpenter on the Microscope.

Many cultivation media are used, both fluid and solid, but for growing colonies the latter kind is indispensable. The one most generally useful—called the gelatine in this paper—is composed of lean meat 1 lb., gelatine 100 grammes, peptone 10 grammes, sodium chloride 1 gramme, and water 1 litre. Agar-agar (or Japanese isinglass), 10 to 20 grammes, may be used instead of the gelatine, where it is necessary that the bacteria (*e.g.*, tubercle bacilli) should be grown at the temperature of the body, and a solid medium is required, as gelatine melts at temperatures above 25° C. An objection to Agar-agar is that the distinction between the different colonies is not so well marked, when grown in it, as in gelatine. Solidified blood serum and hydrocele fluid[1] will not liquefy at higher temperatures, and are sometimes of use.

Colonies[2] may be grown in gelatine in test tubes, and on glass plates or slides. These, and all other glass apparatus used, should be sterilised, as well as the cotton-wool for plugs, by heating in a hot-air chamber for three hours at least at a temperature of 140° C. Dishes and the hands of the operator should be washed in a solution of bichloride of mercury (1 to 1000).

Directions for sterilising the gelatine and filling the test tubes are given in the works before quoted, and need not be repeated here. I may mention, however, two different modes of sterilising. Klein boils the contents of each tube over a Bunsen flame for three or four minutes, but it was found in the laboratory quite sufficient to put them in an iron crate, in a steaming apparatus for five or ten minutes, at the temperature of boiling water, which is much less trouble. Either mode is efficacious. Whichever be used, however, after the tubes are sterilised, they should be put in an incubator, and kept there for a few hours—twenty-four or less—until any spores which may be present have germinated. The tubes should then be exposed to heat again to kill whatever bacteria are present, and the process of alternate sterilising and incubating may be repeated three or four times, to make sure that no spores are left.

In inoculating a test tube, care should be taken to hold it horizontally, or fungi will fall in from the atmosphere when the plug is out. The inoculation may be performed with a platinum needle set in a glass handle, which should be heated to redness, and allowed to cool, immediately before being used. The tube to be inoculated should be held between the fore and middle fingers of the left hand, with the plug towards the palm. If another tube be used to get a cultivation from, it should be held between the

[1] See Micro-Organisms in Disease.
[2] See British Medical Journal and Exhibition Handbook.

middle and ring fingers of the same hand, but nearer the tips than the first tube, that both may be seen together, and care must be taken to keep both horizontal. The cotton-wool plugs should then be taken out of the test tubes, one after the other, with the forefinger and thumb of the right hand, and placed between the ring and little fingers of the left, and the needle then dipped into the substance to be inoculated, so as to take up a minute portion on its point, and pushed gently into the gelatine for about an inch. It is best to have a fine needle, as a coarse one may crack the gelatine. Dr. Klein uses a freshly drawn out capillary glass pipette, which he thrusts through the cotton-wool plug,[1] to lessen the chance of contamination from the atmosphere; but the former plan seems to answer perfectly, and is certainly less trouble.

Single colonies may be obtained by cultivation on glass slides. These, after being sterilised by heat, are placed on a stand on a plate and covered up with a bell glass or another plate, as quickly as possible; and a piece of filter paper, moistened with a solution of bichloride of mercury, should be placed at the bottom of the dish to keep the air damp. Flat glass covers were used in the laboratory, but I prefer them bell-shaped, as moisture, which always condenses on them, will run down the sides of the latter, but may fall from the top of the former on to the slide, and spoil the cultivation. If flat covers be used, moistened paper should be put at the top instead of on the bottom, when there will be no "drip;" but then the cultivation cannot be seen, unless the cover be lifted, and every time this is done there is risk of contamination from the air. Next a small quantity of liquefied gelatine is carefully poured from one of the prepared test tubes, so as to form a thin layer on the slide, and allowed to cool. The inoculation is then performed with a platinum needle, sterilised as before. After it has been dipped in the substance to be inoculated, the gelatine is stroked with it gently, so as to form the letter H. Colonies then grow along the track of the needle, if the slide be kept at a proper temperature.

The best method of getting at the forms of single colonies is to introduce a minute portion of the organism to be examined into a tube of sterilised gelatine, shake it up, pour it out on a glass plate, so as to get a thin layer of the gelatine, and then cover up with a bell glass, as in the slide cultivations. After a time single colonies will be found here and there, which may be looked at with a hand lens, or under a low power of the microscope. This method is useful for separating the different kinds of bacteria, and thus

[1] See Micro-Organisms in Disease.

making "pure cultivations," as minute portions from any of the colonies may be picked up by a fine sterilised platinum needle under a low power, and used to inoculate tubes of gelatine with.

The number and kinds of bacteria in a given quantity of water may be tested in this way. If a drop be introduced into a tube of gelatine, liquefied at the temperature of the body, and the contents of the tube be well shaken, so as to diffuse the bacteria, and then poured out on a sterilised glass plate, and kept under a cover, the bacteria will grow and form colonies, wherever they are caught by the solidifying material. Each colony will represent a single bacterium in the drop of water, and the numbers may be counted, and the species recognised and cultivated if required.

Slides may also be used for testing the purity of a cultivation, or for separating different kinds of bacteria in a cultivation from one another. Thus, if a sterilised platinum needle be dipped in the substance to be examined, and drawn rapidly along the gelatine which has become solid on a slide, bacteria will grow along its track; and it will be found that, in many parts, single ones only will be left, which will rapidly grow into colonies. If more than one kind be present, the different species may readily be distinguished under a low power of the microscope, by the different appearances of the colonies; and pure cultivations can then be obtained by inoculating tubes or other slides from them.

In many instances fluid cultivations are of use, the materials commonly employed being meat infusions, with or without peptones, and milk. The last named is especially useful, as different bacteria produce different alterations in it, as seen by the naked eye, *e.g.*, the bacterium lactis eats up the lactic fermentation which results in the separation of the milk into curds and whey. The bacillus of blue milk does not curdle it, but produces a blueish colour, which will be more intense if the milk be acid. The butyric bacillus converts it into a dirty brownish and somewhat glairy fluid, without coagulating it; whilst a micrococcus, which is frequently found in milk as obtained from the cow, grows readily in it, but does not produce any alteration visible to the naked eye.

Potatoes are also useful for cultivations, and the method of using them is very simple. A potato is cleaned and washed in a solution of bichloride of mercury (1 to 1000), steamed till cooked, cut in two by a knife thoroughly sterilised by heat, and placed in a dish with a cover, as described above. The inoculation is then performed as for slide-cultivations.

Each microbe has a favourite temperature, at which it grows best. This is generally about blood-heat, and the bacilli of tubercle and glanders will not increase at one much lower. Most

forms grow well at the temperature at which gelatine remains solid (about 24° C.), and even as low as 17° C., but below this they do not flourish, and growth is generally suspended at zero, to revive again with increased warmth. Some grow luxuriantly at temperatures a little higher, but when the warmth gets too great, say 50° to 60° C., they are weakened, their protoplasm becomes granular, their rejuvenescence at a more suitable temperature becomes more difficult, and they ultimately die. The fatal temperature, according to Duclaux, averages from 50° to 60° for micrococci, 55° to 60° for yeasts, and 70° to 100° C. for bacilli ; and all die at the temperature of boiling water. Spores, however, resist a temperature of 120° C., and even more.

It will be seen that several characteristics must be taken into account before we can arrive at a distinction between the different kinds of micro-organisms, especially those which are morphologically similar. Thus :—

1. The microscopical appearances can separate micrococci, bacilli, and bacteria from one another, and can distinguish those kinds which have marked peculiarities in shape.

2. Cultivations in gelatine, in test tubes, or on glass slides or plates, can separate others.

3. The temperature at which they grow best characterises some.

4. The different rapidity of growth at the same temperature is characteristic of others. Thus the micrococcus of milk grows, at the same temperature, as much in a week as the micrococcus of erysipelas does in a month, although the appearance of their colonies in test-tube cultivations is very similar.

5. Some grow best in acid, and others in neutral media; some in solid material, and others in liquids.

6. Some flourish when exposed to the air (aerobies), and others away from it (anerobies) ; and the former often prefer the surface of a liquid, whilst the latter remain floating about in it, or sink to the bottom.

7. The appearances of others when grown on potatoes or in milk are characteristic.

It will be useful perhaps to give a few examples of the different modes of growth of some organisms. In the coloured plate the test-tube cultivations, as seen by the naked eye, are in the middle ; on one side are the single organisms highly magnified; and on the other, colonies from slide cultivations as seen under a low power.

On the coloured Plate are three micrococci, very similar when seen singly, but quite different in colonies. The test-tube cultivations as seen by the naked eye are in the middle : on one side are the single organisms highly magnified ; on the other, colonies from slide cultivation as seen under a low power.

A. The Micrococcus of Pneumonia.

a

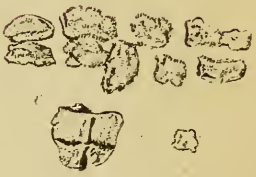
b

c

B. The Micrococcus of Acute Osteo-myelitis.

a

b



c

C. The Micrococcus of Erysipelas.

a

b

Slide Cultivations.

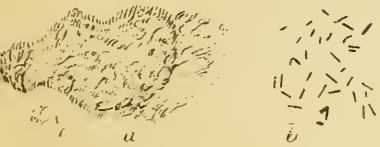
D. Bacterium Lactis.

a

E. Bacillus of Blue Milk

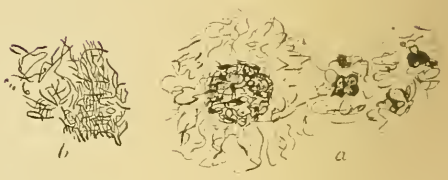
b a

F. Butyric Bacillus



a b

G. Anthrax Bacillus.



b a

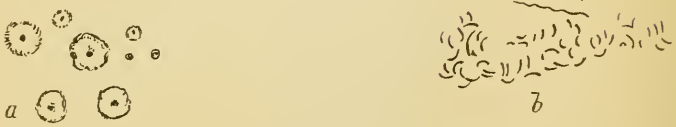
. Bacillus of Mouse Septicæmia.

a b

I. Bacillus of Tubercle.

b a

K. Koch's Cholera, or Comma Bacillus.



a b

A. The micrococcus of pneumonia in a test tube grows along the track of the needle, and also on the surface, where it is raised up like a button. It has been called the "nail cultivation." On slides it forms irregular oval or circular colonies, many of them potato-shaped.

B. The micrococcus of acute osteomyelitis. The gelatine is liquefied at the top, and a whitish scum forms on the surface. Most of the organisms sink to the bottom of the liquefied portion, forming an orange-red precipitate. On slides the colonies are irregular in shape and yellow, and the gelatine around them is liquefied.

C. The micrococcus of erysipelas forms small round colonies along the track of the needle, without any growth on the surface, as the micrococcus pneumoniæ does.

On the uncoloured plate are three organisms found in milk, to which allusion has before been made, in which they set up fermentative changes.

D. The bacterium lactis is oval. In a test tube it forms a slender stem along the needle track, and a thin transparent expansion on the surface of the gelatine, with concentric rings. It forms circular and oval colonies on a slide.

E. The bacillus of blue milk is rod-shaped, and often has a transparent hyaline capsule around it. It liquefies the gelatine at the surface, and produces a colour change—blue green by reflected, and smoky brown by transmitted light. Its colonies on slides are very similar to those of bacterium lactis.

F. The bacillus butyricus forms a scum on the surface of the gelatine, and liquefies it, producing also a disagreeable odour. Its single colonies are peculiar, the bacilli rapidly spreading out on the surface of the gelatine, and liquefying it.

And next four quite dissimilar organisms.

G. The bacillus anthracis in the animal body forms short rods, but when cultivated produces long threads made up of numerous shorter rods, and there is frequently the formation of spores in them. In a tube cultivation it liquefies the gelatine and throws out fine thread-like growths from the needle track, which gradually fill the whole of the liquid part. Its single colonies are circular, and composed of tortuous coils of thread-like bacilli, more densely packed in the centre, and spreading out towards the circumference.

H. The bacillus of mouse septicæmia is very small, and found especially in the white corpuscles of the blood. In tube cultivations it forms a very delicate cloud, spreading out from the needle track, and the single colonies are small and very irregular in shape.

I. The tubercle bacillus is peculiar in all ways. The single or-

ganism generally presents a beaded appearance, and is the only one (except that of leprosy) which is stained magenta by Ehrlich's method. On the surface of the blood serum, on which it should be cultivated, it forms dry, white, scaly growths, which slowly enlarge. The single colonies are mostly S-shaped, and show the individual bacilli plainly.

K. Koch's cholera bacillus, about which there is now so much disputing, is like a comma without a head, or rather is crescent-shaped, and is sometimes found in screw-shaped threads. It liquefies the gelatine in a test-tube cultivation at the point of inoculation, forming a funnel-shaped cavity at the surface, as though the gelatine had evaporated. The single colonies also liquefy the gelatine, forming circular rings, but do not spread far, as the butyric and others do.

The foregoing illustrations are sufficient to show how important a knowledge of the differences in growth of bacteria under cultivation must be; and there is great scope for investigation in this direction, and especially as to how they are affected by being grown in different media.

For instance, Buchner asserts that the virulent anthrax bacillus may be so cultivated, at 35° to 37° C., as to be converted into the harmless hay bacillus, and *vice versa;* but Klein[1] has effectually disposed of that idea, and of others similar about other bacteria, so that at present experiments go to prove that each species, though it may be altered somewhat by different modes of cultivation, as a rule breeds true.

The study of their cultivation is also of the greatest importance in "preventive medicine," especially if the theory of Pasteur be correct, that by special modes of feeding "attenuations of the different pathogenic species may be obtained," which will serve as vaccines for certain diseases.

And again, it is possible that some means of prevention or cure of the infective diseases may be found out in this way. Numerous substances have been proved to be capable of checking the growth of bacteria outside the body. Thus, according to Klein, pathogenic organisms cannot thrive in an acid medium, or if proteids and certain inorganic salts are absent; whilst certain putrefactive and zymotic organisms thrive well in acid media. Carbolic acid and its compounds, salicylic acid, and perchloride of mercury, especially the last, even if much diluted, prevent their growth. But a perfect antiseptic must be capable of killing the spores also. A 5 per cent. watery solution of carbolic acid will do so, but this is too strong for internal exhibition. Koch asserts that a solution of bichloride of mercury of 1 to 300,000 will prevent the growth of all micro-organisms, and that a solution of 1 part to

[1] *Op. cit.*, p. 131, &c.

20,000 will kill them; whilst Klein proves that after soaking in a solution of even 1 per cent. for twenty-four hours, the spores of anthrax bacilli are capable of germinating.

A solution of 1 part to 1000 in water, which was always kept ready in the laboratory, for washing the utensils used and the hands of the operators, seemed to be most effectual in preventing accidental contamination of the growths.

Heat is the best disinfectant for clothes, as experience with the contagious diseases as well as experiments on bacteria show. A dry heat of 240° F. used to be considered sufficient, and it will do for the living organism, but it seems that two or three hours' exposure to a temperature of 300° F. is necessary to destroy spores; this, however, is not practically useful, as it also seriously injures clothes. The most effectual disinfecting agent for woollen and such-like fabrics is found to be[1] "a current of steam at 212° F. constantly passing over the material for about three hours."

Antiseptics of a poisonous nature, however efficacious they may be outside the body, can never be used as destroyers of disease germs within it. If an antidote to any of the infectious diseases be ever discovered—presuming always that they are caused by micro-organisms—it will probably be by the vaccines of Pasteur, or by the exhibition of some chemical substance which in small quantities will influence their growth without being poisonous to the animal body.

Nor does this latter seem impossible, if we are to judge them by the standard of other fungi. Thus one of the Mucediniæ, the Pencillium Niger, which can be cultivated on bread moistened with vinegar, or on any acid fruits or liquids, has been proved by Mr. Raulin[2] to grow best on an artificial medium composed as under:—

	Grammes.		Grammes.
Water	1500	Carbonate of magnesia	0.4
Sugar-candy	70	Sulphate of ammonia	0.25
Tartaric acid	4	Sulphate of zinc	0.07
Nitrate of ammonia	4	Sulphate of iron	0.07
Phosphate of ammonia	0.6	Silicate of potash	0.07
Carbonate of potash	0.6		

The above mixture will grow 25 grammes weight of the plant, but the effect of leaving out some of its constituents is extraordinary. If the potash be omitted, the crop will fall to $\frac{1}{25}$th of what it was; to $\frac{1}{200}$th if the phosphate, and to $\frac{1}{150}$th if the ammonia be left out. This might have been expected, as it is known what good manures these chemicals are. But an extraordinary

[1] Laboratory Handbook, p. 35.
[2] Duclaux, Fermentation Handbook.

thing is that the withdrawal of the zinc, which exists only in the proportion of 1 part to 50,000, reduces the crop to $\frac{1}{10}$th. More marvellous still, the addition of one sixteen-hundred-thousandth ($\frac{1}{1600000}$) part of nitrate of silver to the liquid stops vegetation abruptly; and it is affected in a similar way by $\frac{1}{800000}$th part of corrosive sublimate, by $\frac{1}{8000}$th of bichloride of platinum, and by $\frac{1}{240}$th of sulphate of copper; whilst, on the other hand, the addition of 1 gramme of iron will increase the crop by 800 grammes.

Want of space will not permit me to pursue this interesting topic further; but it is possible that experiments on the same lines with the pathogenic organisms may yield good results.

It may be useful, perhaps, briefly to notice what is the evidence against the microbes. In their life-histories, it must be acknowledged, they agree remarkably with what is known of the zymotic diseases.

The latter may be carried by the air; and the atmosphere, as was proved by Tyndall, abounds in bacteria and their spores. They may also both be propagated by contagion, or, what is much the same thing, by inoculation.

The bacteria require a pabulum of decomposing or decomposable matter; the zymotic diseases are most deadly where the surroundings are filthy.

Micro-organisms, or at all events many of them, produce secretions, more or less acrid and irritating, many of which are inimical to the growth of the organism which formed them. The diseases in question are characterised by symptoms of blood-poisoning and irritative fever, and it seems as though some substance were formed in the blood which protects the sufferer from a second attack.

The spores of bacteria may remain dormant for any length of time, to be roused into growth under favourable circumstances. The germs of disease seem to act in a similar way. Scarlatina or small-pox, for instance, may be concealed in clothes for months, and be brought into activity when used by a person susceptible to the disease; and diphtheria will hang about a locality or a house for years, and break out now and again when favouring conditions present themselves.

Moreover, most of the very substances which are inimical to the growth of the microbes are those which, by common consent, are used as antiseptics in the zymotic diseases.

The foregoing may be said to be the circumstantial evidence, and now let us consider the direct.

Bacteria, by means of inoculations with pure cultivations, from which, by the process adopted, all other poisonous matter has been eliminated, can certainly cause some diseases in man and animals;

and in these diseases they are invariably found, by competent observers, in the blood and tissues; whilst, on the other hand, it is admitted that they are never found in the healthy body.

First and foremost, the bacillus anthracis undoubtedly causes the affection which is called anthrax, splenic fever, or malignant pustule in animals, and woolsorter's disease in man. These bacilli, obtained originally from an animal suffering from the disease, can be cultivated in test tubes for any number of generations; and when a minute portion of the cultivation is inoculated in a slight scratch under the skin of an animal, say a guinea-pig or a mouse, the animal most certainly dies, with definite symptoms of the disease, within a few hours. The blood and tissues are found to contain numbers of the bacilli; other test tubes may be inoculated with them, and other animals may be given the disease from the second series of cultivation in a similar way, and so on *ad infinitum*.

I am no vivisector, and I yield to no one in love for animals, and in repugnance to hear of, or to witness, their sufferings; but I have felt justified, in order to clear up my doubts on this subject, in being present when such experiments were being made. The result is that I feel as sure that the bacillus will produce anthrax as I do that brandy will make a man drunk or that strychnine will give him tetanic convulsions.

That the bacillus of mouse septicæmia will produce a disease *in a similar way, with definite symptoms*, has also been clearly demonstrated to me, and I must believe in it.

In tubercle, too, the chief manifestations of which are phthisis and acute tuberculosis, which is another disease that attacks men and animals, the action of the bacilli is well established. "In all cases of human tuberculosis," says Klein,[1] "particularly in the sputum, in caseating scrofulous glands, in bovine tuberculosis, in artificially induced tubercles, caseating glands of rodents, the tubercle bacillus has been shown to exist." Moreover, tuberculosis has been produced in animals by the inoculation of sputum from a case of phthisis and of portions of tubercle; and the continued inhalation of tubercle bacilli has given rise to acute tuberculosis in rodents.

A micrococcus found in the lymphatics of the skin in erysipelas may be cultivated, and will produce the disease in animals. In Germany it has been inoculated in man, with a view to ameliorate the condition of cancerous tumours, and it has produced erysipelas, with benefit at the same time to the tumour.

Klein has found a bacillus in the blood and tissues of persons suffering from choleraic diarrhœa from milk-poisoning; and has

[1] On Micro-Organisms in Disease, 1884.

proved that similar symptoms were produced in animals by feeding them with the diseased meat, and by inoculating them with the cultivated bacilli.

In certain forms of pneumonia, especially from the third to the ninth day, are found micrococci; and cultivations of these have produced the disease in animals.

A micrococcus is found in the pus in cases of acute osteomyelitis. These, according to Becher, when injected into the veins of healthy animals, had no effect, but when a bone had been broken or bruised, abscesses formed at the seat of fracture, and the pus contained micrococci.

A bacillus has been found in the pustules of glanders,[1] which may be cultivated, and produce the disease by inoculation.

It has been proved also by Koch that a bacillus derived in the first place from putrefying blood produces malignant œdema in animals.

Specific bacilli have also been found in certain other diseases, *e.g.*, typhoid, dysentery, leprosy, cholera, &c., but the absolute connection as to their cause has not been established, as it has been found impossible to produce the disease by inoculation of animals with the micro-organisms.

If the above facts are not sufficient to convince my sceptical friends that there may be something in the "bacterial theory," perhaps I may be allowed to remind them that it will never do to make light of what is believed in by such representative men as Pasteur, Davaine, Koch, Cohn, Virchow, Tyndall, Greenfield, Lister, Cheyne, Klein, Sanderson, and others of great eminence.

In conclusion, I must thank Mr. Watson Cheyne for kindly looking over the proof sheets of this article, and suggesting several valuable corrections and additions.

[1] See Exhibition Handbook on laboratory work.

TRANSPOSITION OF THE AORTIC ARCH.

BY

REGINALD H. COMBES

AND

CECIL CHRISTOPHERSON.

A very rare specimen, of which the following is an account, has recently been placed in the Museum. It is an abnormality of the aortic arch, and of the great trunks which arise from it. The subject was a still-born child, healthy and well-grown, possessing no outward appearance of internal malformation or abnormal blood vascular system.

When the front wall of the chest was removed, the lungs, pleuræ, and pericardium presented the usual appearance. On opening the pericardium, the heart lay in the usual position, its apex directed to the left side. The front surface of the heart was formed by the right ventricle, from which the pulmonary artery arose in the usual way, the origin of the vessel lying in front of the ascending aorta. As far as the first part of the aorta was concerned, there was nothing irregular as regards its origin or size, but, instead of curving towards the right, the greatest convexity of the artery was towards the left. Traced onwards, the great arterial trunk looped over the root of the left lung and descended slightly to the right of the middle line of the spinal column to enter the abdomen in the usual manner.

The first branches given off from it were the coronary arteries, which were normal in size and distribution. At the highest part of the arch the right and left common carotid arteries had separate and distinct origins. Immediately after their commencement these vessels ran upwards on either side of the trachea. It may be mentioned that this tube lay posterior to the ascending aorta,

behind which it divided into the two bronchi. Of these subdivisions, the left had the customary length and obliquity, and the right, instead of being nearly horizontal, resembled it. Returning again to the aorta, the branch given off after the right carotid was a vessel of large size, passing to the groove upon the first rib upon the right side, and giving off the branches usually supplied by the right subclavian. At some distance behind the right subclavian artery a vessel corresponding to the ductus arteriosus entered the descending aorta. In order to make clear the anatomy of the former vessel, it is necessary to return to the pulmonary artery. It has been already said that this vessel had a normal origin from the right ventricle; after ascending half an inch, it divided into two trunks of almost equal calibre; one of these passed to the right between the aorta and pulmonary artery, thence beneath the transposed arch of the former to enter the right lung. The other, immediately after its origin, divided into two; one of these at once entered the left lung; the other, which seemed to be the continuation of the artery, opened into the aorta at a point opposite the right subclavian artery. Obviously this corresponded to the ductus arteriosus, but, strangely enough, before it terminated in the aorta the left subclavian artery sprang from it. This latter vessel ascended at first behind the left side of the trachea, but before leaving the chest emerged from behind it, and nearly resembled, as regards its course, an ordinary left subclavian artery; its only peculiarity seemed to be that as it lay in front of the scalenus anticus muscle, it gave off a large vessel which passed beneath the clavicle, and afterwards had the course and distribution of the internal mammary artery. Beyond those described, the arteries of the chest had no other peculiarities.

The thoracic veins were normal; the vena azygos lay upon the right side of the aorta.

It is interesting to note the course of the recurrent laryngeal nerves. The great trunk, from which the left sprang, passed downwards over the thoracic portion of the left subclavian artery and onwards beneath the ductus arteriosus; at this point it gave off the left recurrent laryngeal nerve, which passed upwards beneath the arterial duct to reach the trachea and œsophagus, with which structures it had its usual relationship. On the right side the recurrent laryngeal, as would be expected, looped round the arch of the aorta, but the main trunk lay behind the arch between it and the abnormal left subclavian artery.

Having given a description of the positions, &c., of the main arterial and venous trunks of the thorax, it only remains to state the course of the lymphatic system. The thoracic duct was found to lie upon the right side of the spine, and instead of crossing to

the left, as usual, passed behind the root of the right lung, under the pneumogastric nerve of that side, and curving forwards, emptied itself into the right subclavian vein, close to the junction of the jugular. Upon the left side the lymphatic system was too minute to follow out, and indeed it must have been very unimportant, since it was sufficiently well demonstrated that those of the liver and right upper extremity joined the main trunk in its upward course.

A lengthy description of the abdomen is not necessary, but there were some points of great interest which may be noted. The aortic trunk entered the abdomen upon the last dorsal vertebra, and a half an inch below this gave off its cœliac axis; the renal arteries varied very considerably from the normal condition; on the left side the artery divided at once into three large trunks, passing separately to the hilum. The supply to the right kidney consisted of four very large trunks, passing from the aorta at varying distances from one another, the upper vessel supplying the upper lobules and the supra-renal capsule, and supplementing that given to it by the phrenic.

All other branches of the abdominal aorta were normal. Perhaps the median sacral was given off rather higher than usual.

One large renal vein returned the blood from the abundant supply of the right kidney, and a smaller vessel held the usual situation and course upon the left side.

In closing this short account of the specimen, it seems hardly necessary to proceed with a long description of it, from a developmental point of view; but we venture to lay down the following possible explanation of this rare abnormality.

In the first place, there can be no doubt that the aorta is formed by the persistence of a right arterial arch; seeing this, it will be necessary to explain the difficulties arising from the peculiar course of the ductus arteriosus (that is, its passage behind the trachea and œsophagus to join the descending aorta).

The following hypothesis may be ventured upon. In the early stage of development it is well known that the arterial arches on either side unite posteriorly to form a single trunk; since in this case the aorta is developed from a right instead of a left arch, it is necessary for the ductus arteriosus (which is the continuation of one of the arches on the left side subsequent to the formation of the pulmonary artery) to pass to the right to join the aorta.

As the œsophagus and trachea are developed within the loop formed by the blood-vessels, it is necessary for the ductus arteriosus to pass behind these structures.

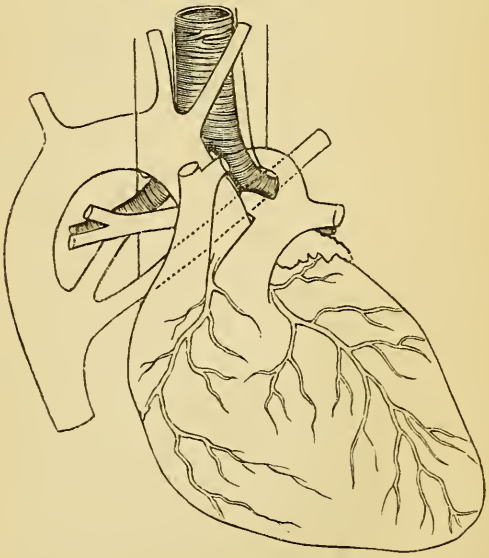
It is evident the recurrent laryngeal nerves on either side were really in their normal positions, though not in their usual rela-

tions. Since the ductus arteriosus is the continuation of the fifth arch, and since the nerve is developed round the fifth arch, therefore this position of the nerve is what one would expect, though owing to the twisting backward and to the right of the fifth left arch in this case, the nerve looped from behind forwards, not from before backwards. This also proves that it is the left fifth arch from which the duct is developed, and not the right fifth, which would seem more probable. Again, since the aorta is formed on the right side, it palpably takes the place of the subclavian (the latter being developed from the fourth arch on the right side), so here also we see the recurrent laryngeal is in its usual position.

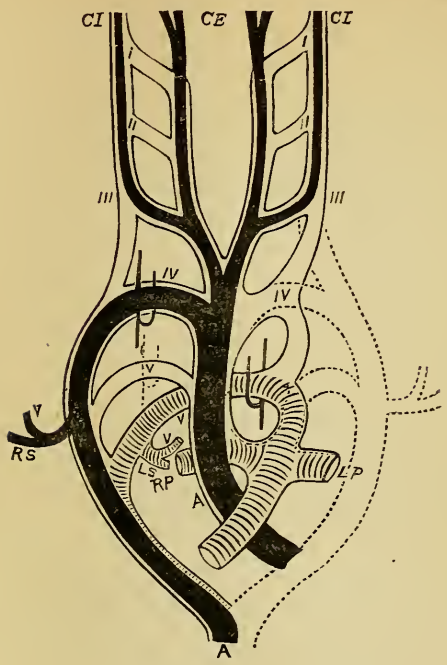
The accompanying woodcuts will make the real state and the developmental explanation more easy to follow.

In No. 2, the dotted lines signify the normal position of the primary arches; those in deep shading, the patent vessels of the systemic circulation in the dissected specimen. Those with transverse markings are the pulmonary arteries, ductus arteriosus, and left subclavian and vertebral arteries, and will be found to be the whole system, which is produced from the fifth left arch, but folded backward and to the right, behind the trachea and œsophagus, to join the aorta.

No. 1.



No. 2



In the Royal College of Surgeons there does not seem to be a case recorded tallying exactly with this one. All those shown have total transposition. For instance:—

Teratological Museum.

Specimen 19.—An injected and dried preparation of the heart and large vessels, with some of the abdominal viscera, in which all the parts are transposed.

Specimen 374.—A preparation of Sir Astley Cooper's, showing transposition of all the parts.

The vessels are given off in somewhat the same way as in the one described. The two carotids are given off from a common trunk in the situation of the innominate. The left subclavian arises separately, and the right springs from the posterior part of the arch, and passes behind the œsophagus to its destination.

Specimen 376.—A large human heart, in which all the parts are reversed.

Specimen 18.—A human fœtus, in which there is total transposition.

OUR HOSPITAL PHARMACOPŒIA AND APOTHECARY'S SHOP.

BY

W. S. CHURCH, M.D.

At what date the Hospital first drew up a set of formulæ of its own for use within its walls is uncertain, but it is highly probable that the Pharmacopœia would come into existence at the same time as the establishment of the Apothecary's shop within the precincts of the Hospital.

By permission of the Treasurer and House Committee, I have been allowed to examine the journals and ledgers of the House,[1] of which an unbroken[2] series is preserved since what may be called the re-establishment of the Hospital in 1547; and I must here express my thanks to Mr. Cross, Clerk of the Hospital, for the great assistance in many ways that he has given me whilst looking through the records of the House.

When the Hospital was re-established and placed upon its present footing in 1547, the surgeons appear to have been paid partly by salary and partly by extra-payments for special services, and it is clear that they found their own drugs. The first entries relating to their payments are as follow:—

"Money paid to the Surgyons due at Michaelmas 1547:—

"Imprimis payde to Martyn, Surgeon for cuttyng of a boye for the stone, x^{s}.

"Item gyven in reward to Richard Wetstall for his paynes taking among the poore xx^{s}.

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[1] Sir James Paget in his Records of Harvey (John Churchill, 1846) has extracted from the journals and ledgers the principal minutes and items which bear on the position of the medical officers of the House. As it is nearly forty years since the pamphlet was published, and it may not be accessible to many of my readers, I have repeated some of the extracts. I would refer all my readers who may be interested in the early history of our Hospital to Sir James's very interesting pamphlet.

[2] There are no entries in the journals from 1561 to 1567.

"Item paide to George Vaughan Surgeon for hys quarters wages due at Michellmas xxx^{s}.

"Item paide to Thomas Baylie for his paynes taken to dresse the poore for the space of six weeks xx^{s}."

The second entry relating to the remuneration of the medical officers of the House in 1548 is—

"Money paide for helinge of the poor to the Surgions as follows :—

"Imprimis to William Garter surgyon for his holle yere's wages due at Mykellmas v^{li}.

"Item paide to Thomas Bayli surgyon for his wages and drouggs for a hole yere xii^{li}.

"Item paide to George Vaughan surgeon for his wages and drouggs for a hole yere xii^{li}."

Then follows a list of special payments to William Gartar,[1] chiefly for healing patients of the "poxxe," but including other cures, such as that of "a burn from gunpowder," "the bite of a dogge, and a scald hedde." The usual fee was five shillings. Thus I find one entry in his list of extra-payments :—

"For helinge of Elizabeth Harvey of the poxe and Elizabeth Collyer of a scald hedde and lame in her loyns x^{s}."

The extra-payments to Gartar amounted in this year to £16, 8s. 4d. It is possible that these extra-payments were for services and attendance on patients in the outhouses and lock-houses attached to the hospital. Venereal patients were sent to special houses, as there are constant entries of payments for the "carriage of poore women to the Locke." Some years subsequently one finds regularly payments to the guide or guyder of these outhouses,[2] which at one time were numerous. Towards the close of the seventeenth century the outhouses had become reduced to two—one at Kingsland, the other the Locke in Southwark. These two remained for many years, and payments for them occur yearly, as well as to the female practitioner who had charge of the "scald heddes" and lepersies. Where she treated the said "heddes" and lepersies nowhere appears, but I think it probable they were treated at an "outhouse," and not in the hospital itself. From the journals I learn that the Kingsland outhouse and the Locke were at

[1] Gartar seems to have been also called Carter, and Dr. Moore calls him so in his paper on the Physicians and Surgeons of the Hospital before the time of Harvey. In the long list of special payments he is called Gartar, although occasionally his name is spelt Garetare and Garter The orthography in these old accounts is remarkable for its want of uniformity ; thus you find in entries made at the same time and in the same handwriting all kinds of variations in the spelling. I have endeavoured, in making the extracts from the journals and accounts, to adhere to the original spelling. In the above extracts one finds Baylie's name spelt in two ways ; surgyon twice, and surgeon once ; holle and hole both occurring ; but many much more curious instances might be given.

[2] For a fuller account of these outhouses see Sir James Paget's pamphlet, p. 37.

this time (*i.e.*, the end of the seventeenth century) both under the charge of qualified chirurgeons, who were called guides or guyders; they were responsible for the maintenance and cure of the patients committed to their charge, and the outhouses were visited by the beadles of the hospital every week, to receive complaints from the inmates, and report them to the Governors at the Courts. On several occasions complaints were made, and the guydes were ordered to attend the Courts and explain their conduct. In 1682 the guides were allowed fourpence a day for the maintenance of each patient. The hospital did all the repairs to the buildings and furniture of the "outhouses," and frequent entries in the journals allude to them. In 1682 one entry directs that eight close stools should be provided for use in the wards of the two outhouses. In Dr. Bernard's books, hereafter to be described, the word "out-house" occasionally appears written against a name in the same way that out-patient does, showing that patients were transferred from the hospital to the outhouses, as well as to the Locke. Whether only "incurable and scandilous or infeccous" cases were sent there, as recommended by Harvey fifty years previously, I know not; but one finds in the accounts records of numerous cases being paid for as *cured*. These may have been the venereal ones.

For many years the surgeons found their own drugs, as is apparent both from the entries given above and also from the following, dated

Oct. 18th 1549.—"Agreed at the same tyme at the request of the iij surgeons for by cawsse things p'teyning to theire facultey be very dere, that they shall have ev'ry one of them xviij^{li} a yere and that to be payde them q'trly from Mykelm's last past."

It is also interesting to find that even at that time the Governors of the charity did not confine their liberality to the patients whilst in the wards. Among the casual payments in the year 1548 I find, "gyven to the poore that were heled when they departed iv^{li} xvj^{s} viij^{d};" and about the same year, but rather later, much larger sums are entered under that head. One finds also payments for stumps and stylts, *i.e.*, crutches, for patients who had had their legs cut off; so that the germ of our Samaritan fund existed more than three hundred years ago. The spiritual wants of the patients were not forgotten, and the hospitaler seems to have been more liberally treated than the surgeons, who had to find their own drugs; for I find—

"Paid for a paraphrase to be redde to the poore x^{s}."

In the year 1549 the surgeons received an extra gratuity of a pound a piece, the entry being—

"Item paid Mr Gartar, Mr Bailey and Mr Vaughan Surgeons to every one of them for their hole yere's wage xvli. Summa xlvli.

"Item paid more to theym in Rewarde for the hole yeare iijli."

In the casual payments of this year are many interesting entries, which if followed out would throw much light on the management of the charity at that time; thus a sum of four shillings was paid to the surgeons for going to Mile-end,[1] to attend a poor man with a broken leg, and from other scattered entries it is clear that the surgeons of the hospital occasionally attended, I presume by the desire of the Treasurer or Governors, patients not in the hospital. One entry is rather amusing—

"Paid for helinge Henry Smythe's hedde which a sturdy beggar did breake xs."

I presume the sturdy beggar must have struck hard, as five shillings was the ordinary recompense for curing a patient.

In 1550 appears the first entry of anything pertaining to the pharmacy of the hospital, viz.—

"Paide for a great Kettle waying xxxiiij lbs.ss. at ixd the pound, for the surgeons to boyle with, xxvs xd.

"Paide for bringing a chest of salves to the house iiijd."

Perhaps the great kettle was used to remelt the salves in, or possibly to boil the pitch which was at that time applied to the stumps of amputations.

From several entries at this time it is evident that the sisters, and possibly the female patients, employed some of their time in spinning, as one comes across entries like the following—

"Paide and given to the sisters for their good spynning xiid.

"Paid for weving of vjxxix ells[2] that was spone in the hospitall, xxjs iiijd.

"Paid to the wever for weving of clxxv ells of cloth sponne in the house by the systers at ijd. Summa xxivs iid."

Regular physicians were appointed about 1567, and, at first, were probably provided with a house within the hospital; if this was the case, the arrangement did not last many years, for Harvey certainly did not reside in the hospital; the journals of 1614 and 1626 containing entries relating to the lease of a house in West Smithfield which the Governors were anxious to set apart for the physician. When the house became vacant, 1626, Harvey did not wish to take it, and it was let to John Meredith Skynner.[3]

[1] It is probable that this man was an inmate of the outhouse, which at that time existed at Mile-end. See also Sir James Paget's pamphlet, p. 28.

[2] vjxxix. ells stands for six score nine ells. See also "Orders and Ordinances."

[3] See Sir J. Paget's pamphlet, pp. 4, 5, 6.

Special departments of surgery were instituted very early. In the minutes of the Court held April 17, 1591, is the following:—

"This day John Isard Surgion made request to this court for recompense of his payne and charge healinge and curinge James Jones who hade his legge broken. Order is therefore taken that the said John Isard shall have xl^{s} ov^{r} and above the xv^{s} wh. he rec^{d} heretofore of Mr. Platt in lew of his pains and travell taken therein to be p^{d} him by Mr. Tr^{eas}."

Who Mr. Platt was, or why he paid John Izzard xv$^{s.}$ a year, I have been unable to find out; possibly Mr. Platt was an influential Governor who had great faith in John Izzard's skill, and had introduced him to the hospital that the patients might have the benefit of his bone-setting dexterity.

Again, in the minutes of the Court held September 25, 1589:—

"This day order is taken that Mr. Frederick shall have iiij^{li} paid him for cutting a wenn of a woman and too men of ruptures, paid him by the Treasurer, and he to be allowed for the same again in his accompte."

And November 8, 1589—

"This day order is taken that Mr. Frederick shall have the yerely stipend of iiij^{li} to be paide him quarterlie from Xmas next for the curing and cutting of all such ruptures wenns and such other like sores as any of the poore of this house shallbe infected diseased or troubled withall and he to have the said stipend so long as it please the Governors to have liking of him."

Christopher Frederick's name appears for many years in the accounts, and usually with the title "surgyon;" his name is placed after those of the regular staff. For further information about John Izzard and Frederick I would refer my readers to Sir James Paget's pamphlet, pp. 29–31.

With John Izzard as bone-setter, and Christopher Frederick as curer and cutter of the wenns, ruptures, and such-like sores as the poor of the house were afflicted with, there cannot have been very much left for the surgical staff to do; they probably reserved their skill and knowledge for the performance of amputations and other severe operations. The yearly stipend of the chirurgeons, which, as we have seen, was settled in 1549 at £18 a year, had risen by 1553 to £20.

As has already been mentioned, physicians were not attached to the staff of the hospital until 1567 or thereabouts; and I find no notice of any apothecary by name either in the accounts or in the journal until 1572, and it is probable that no one apothecary in particular was appointed until about that year. William Weston must have held office for some time before his name appears in the journal, for the earliest notice of him as apothecary in the journal is as follows:—

"Aug^{t} 9th 1572.—This order is taken by the court that William Weston poticary of this house shall be paid by Mr. Treasurer iiij^{li} x^{s} vi^{d} for his stuffe which he delivered by bill to one Thomas Jones, one of the poore lying in Davy Fowler's house.

"This day at the earnest request of Mr. Wm. Weston poticary of this house alledginge that he is not able to live upon his wage heretofore given, by reason of a greater number of poor daily increaseth in this house more and more, order is taken by the court that the said Wm. Weston shall have for his wages every yere as long as he serves this house wth all pottecary ware from Michaelmas next forthwith xvj^{li} xiij^{s} iiij^{d} to be paid to him quarterly."

From this date William Weston's, or rather William West's name, as he is also called, appears yearly in the accounts. The stipend of the apothecary had soon to be raised, and West's successor, Roger Gwynne, had in 1589 xxxvij$^{li.}$ xij$^{s.}$ for the whole year.[1]

Early in the seventeenth century the need of an apothecary's shop within the hospital seems to have become apparent. Doubtless the apothecaries of those days were often not as particular concerning the condition and purity of their herbs and drugs as they might have been. From a list of names at the end of one of the journals, it is probable that the Governors of the hospital went round and examined the condition of the drugs in the shops of the apothecaries or grocers (?) who supplied the hospital, and had the power of arresting those whose drugs were found in bad condition. It may possibly have been owing to the action of the illustrious Harvey that steps were taken to provide better and purer drugs and ointments for use in the hospital. Anyhow, we find in the minutes of the Court held January 22, 1614—

"This day it is ordered that Mr. Juxon, Treasurer, and Mr. Shawe, Mr. Gayus Newman, Mr. Hill, Mr. Chandler, Mr. Thwaytes have conference with the D^{rs} and Chirurgions of this house for and concerninge all oyntments and salves to be ministered to the poor of this house by the Apothecary and of the charges thereon, and to consider how the same may be made and provyded according to the foundation of this house."

And on July 28, 1614—

"This day report was made by some of the Governors according to an order of the 22d day of January last as concerning oyntments salves phisicke ministered to the poore of this hospital, that they, uppon consyderation had thincke it fytt and necessary for the more better curings of the poore, that all the oyntments, salves and phisicke applied to and for the helpe and cure of the said poore be made in some convenient place within this hospital whearby the poore may the rather and the better be provyded of these necessaries.

"It is therefore ordered that Humphry Croxton, Apothecary, be placed

[1] For further extracts concerning the apothecary see Sir James Paget's pamphlet, p. 33.

in such rooms for the supplying of the same offices as Mr. Treasurer and other of the Governors shall thincke meate. The said Humphry Croxton to have the yearly stypend of xvi^{li} and so long as it shall please the Governors of this house. To begin from Midsomer last."

In the accounts of the same year are numerous charges for the furnishing of the apothecary shop with necessaries, implements, and drugs. As they are of interest, I extract the principal ones, which appear to have been those first furnished to the hospital:—

"1614. Item paid for brasse morters and brasiers to be used in the apothecarie's shopp now erected in the hospital the first day of June xli^{li} iiij^{s}.

"Item paid for dyvers and other necessaries for the use of the Apothecary the xviiith of June iij^{li} iij^{s} iv^{d}.

"Item paid to Henrie Box grocer for dyvers parcells of apothecaries stuffe delivered to the Apothecarie for the use of the poore people harbored in the said hospitall the xx^{h} day of June, iv^{li} xvi^{s};" and a similar entry for iij^{li} viij^{s}.

"Item paid to Humphry Croxton the apothecarie for the hospitall by the consent of the Governors, for his paynes in probinge of the druggs and other things belonging to the poore in the hospitall till Midsomer 1614. By bill iiij^{li} xxxth day of Julie.

"Item paid to the joiner for stuffe and work done in the apothecarie's Roome for the settinge of pots and other necessaries. The 1st day of August, i^{li} ix^{s} x^{d}."

Then follow various entries for implements, drugs, herbs, and simples; and on October 10—

"Paid for a great Brasse Mortar and two iron pestells and a block for the same to stand on delivered into the Apothecarie's room iij^{li} xv^{s} iij^{d}."

Altogether the first furnishing of the apothecary's room or shop seems to have amounted to £55, 7s. 4d., a very considerable sum in those days. In the following year, 1615, the expenses connected with the apothecary, as far as can be made out from the accounts, amounted to £105, 12s. 2d., exclusive of £3, 10s. for

"Payntynge the table over the Apothecarie's room at the end of the great Cloyster."

Soon after this time the hospital appears to have possessed implements for the use of the surgeons, for on the resignation of Mr. Colston in 1625 appears—

"Paidd to John Colston for certaine ymplements remaining in the Matron's house xlij^{s}."

After the year 1615 the accounts are entered in a manner which prevents one ascertaining for what purposes the expenses were incurred; the entries taking the form of the date by bill, and the amount—not specifying in the ledger what the bill was for.

It is not until 1676 that the accounts for the apothecary's shop

are placed together in the ledger. They had by that time risen to the sum of £396, 12s., and £363, 2s. 6d. for the following year. Five years later, the year of Dr. Edward Browne's appointment, from whose manuscript notes we get our first knowledge of the Pharmacopœia, the expenses of the apothecary's shop amount to £332, 10s., besides £50, the salary of Charles Feltham, apothecary.

Scattered through the accounts of these early years are very many interesting entries,[1] which this is hardly the place to notice, and which give trustworthy information as to the prices of various commodities at these times. One more, however, I will extract:—

"Item paid to Mr. Hugh Middleton for a fyne for the new Ryver Water brought into the Matron's syde of the hospital the xxvith day of Nov^{r} 1614 xl^{s}."

My readers may remember that the New River was opened for the use of the public on the 29th of September 1613, and this item shows us how prompt the authorities of the hospital were even then to avail themselves of increased facilities of any sort which tended to the welfare of the patients. By the year 1682 the charge for New River water had risen to £6 per annum.

Having thus briefly traced the rise of our Apothecary's shop, it behoves us to consider its contents.

Our first actual knowledge of the formulæ in use in the hospital is obtained from the manuscript copy in Dr. Edward Browne's[2] Note-book, dated 1670, and I have to return my best thanks to my friend and colleague, Dr. Moore, for informing me of its existence among the Browne MSS. in the Sloane Collection at the British Museum.

The earliest printed mention of our Pharmacopœia that I have met with is dated 1718. In that year a small 12mo. book was published anonymously, entitled "Pharmacopœia Pauperum or Dispensatory of the Hospitals of London." It was printed for T. Warner at the Black Boy, Paternoster Row. In this work some of the formulæ in use in the London hospitals by Drs. Coatsworth, Mead, Cade, Wadsworth, and Hale,[3] &c., are given, but the formulæ

[1] Among the entries in some of the earliest ledgers are numerous ones for fish; from which we learn that 2½ cwt. of "Scottische fysche" cost v^{li} viij^{s} x^{d}, and three barrells of Herryng iij^{li} x^{s}. One entry is of value, being for Newland fish, which I take to mean Newfoundland fish. This is in 1555, showing how soon the Newfoundland trade in fish had begun in London—full twenty years before Frobisher's voyage of northern discovery.

[2] Dr. Edward Browne was the eldest son of Sir Thomas Browne, author of the "Religio Medici," and was born at Norwich in 1644. He took his degree as doctor at Oxford, was elected president of the College of Physicians, 1704, which office he held till his death in 1708.

[3] Dr. Salisbury Cade, whose name appears among those whose prescriptions

belonging to the different hospitals are not indicated in any way, and I cannot identify any of the formulæ therein with those in Browne's Pharmacopœia. By far the larger number of the formulæ have the letters D. *M.* or D. *W.* appended to them, showing that they were used by Dr. Mead and Dr. Wadsworth, and the bulk of the prescriptions included are either identical with or closely similar to the formulæ found in the Guy's Hospital Pharmacopœia in 1739. A few are the same as appear in our own Pharmacopœia of the same date. One formula, Pulvis Æthiopicus, has the letters D. C—de, *i.e.*, Dr. Cade, appended to it, with this note following :—

"This is an admirable Remedy, and of great Efficacy in all cutaneous foulnesses; such as Scabs, Itch, Leprosy, Herpes, and the like; and especially if the eruptions be anointed with the Unguentum Psoricum, and the patient be first bled, and purged with Calomel. This is Dr. C—de's Method of curing those Diseases in St. B——w's Hospital." "The 'Pulvis Æthiopicus' consisted of—

Æthiop. Min. sine igne præp. lbs. ss.
Antimonii Crudi, lb. i.

Misce f. Pulvis subtilissimus, Dosis ʒss. ter in die superbibendo Haustum Decocti Liberantis."

This little book appears to have been received with favour, and to have met with a good sale, as three years later its author, Henry Banyer,[1] brought out a second edition in his own name, and in the preface he says—

"Some of the Physicians, whose names were in the title, having taken it amiss,"

he suppresses the names in the new edition. I have compared the two editions; there are very few additions, and those of no moment, in the 1721 edition. In 1741, Theophilus Philanthropos published—

"A Physical Vade Mecum or Fifth Gift.[2] Wherein is Contained the

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were copied, was at that time our senior physician. He was M.D. of Oxford, and twice censor of the London College. Dr. Mead was then physician to St. Thomas's Hospital, and Dr. Wadsworth was Mead's colleague there. Dr. Hale was what would now be called an alienist; he was physician to Bethlem Hospital, and stood bail for Dr. Freind when he was released from the Tower.

[1] Henry Banyer was admitted an extra-licentiate of the College of Physicians on July 30, 1736. He practised at Wisbeach, and probably was the son of Lawrence Banyer of Wisbeach, who is on the College roll as an extra-licentiate, 1708.

[2] I have been unable to discover why he calls this work a fifth gift. One would imagine that he had written four other works, but the only other publication of Robert Poole that I can find is the "Benificent Bee; or traveller's companion, containing each day's observations in a voyage from London to Gibraltar, Barbadoes, &c." This work was not published until 1753, so must have been a sixth gift. No other anonymous publication than the Fifth Gift is attributed to Poole in the British Museum Catalogue.

Dispensatory of St. Thomas's Hospital, with a Catalogue of the Diseases and the Method of their Cure prescribed in the said Hospital. To which is added the Dispensatory of St. Bartholomew's Hospital and Guy's Hospital."

This book was printed for and sold by G. Duncomb in Duck Lane, Little Britain. It was published anonymously, but Theophilus Philanthropos was one Robert Poole, who had attended courses of anatomy under the "Incomparable Dr. Nichols,[1] Professor of Anatomy at Oxford," and of Chemistry by the "Ingenious Dr. Pemberton,[2] Professor of Physick at Gresham College." Poole entered himself as a physician's pupil at St. Thomas's Hospital, 2d March 1738, and attached himself at first to the practice of Dr. Wilmot (afterwards Sir Edward Wilmot, married to Mead's daughter).

Theophilus gives a very full and complete account of St. Thomas's Hospital, and of the rules and regulations for carrying on the work of the hospital. He then discourses at considerable length on the Pharmacopœia of that hospital and the method of treatment in vogue there.

Our Pharmacopœia follows, with the heading—

"The Pharmacopœia, or Dispensatory of St. Bartholomew's Hospital, containing the Medicines there Prescribed for the Cure of the Diseased thereof; Carefully Transcribed from a copy of the same, June 16th, 1739."

The next Pharmacopœia I have been able to find is one called "The Modern Practice of the London Hospitals," published anonymously in 1764, and printed for J. Carte and W. Nicoll in St. Paul's Churchyard. It contains a table of the diets and the Pharmacopœias of St. Bartholomew's, St. Thomas's, St. George's, and Guy's Hospitals, and has a supplement containing the Pharmacopœia of the London College.

I make no doubt that this is a translation of the Pharmacopœias of the Hospitals of SS. Bartholomew's, Thomas's, George's, and Guy's, which they probably compiled soon after the publication of the "London Pharmacopœia" of 1746; for I find in the library of the Royal Medical Chirurgical Society a "Praxis Medica et

[1] The "incomparable Dr. Nichols" was the well-known Dr. Frank Nicholls, who, when quite young, lectured with great success and distinction in Oxford, and subsequently in London. He married one of Dr. Mead's daughters. According to Dr. Munk, he was the inventor of corroded anatomical preparations.

[2] The "ingenious Dr. Pemberton" was Dr. Henry Pemberton, who, though not a member of the College, took so prominent a part in drawing up the fifth London Pharmacopœia, published in 1746, and in the same year published his translation of it, with a narrative of the proceedings of the committee appointed by the College to review the Pharmacopœia. He was a distinguished mathematician, and is said to have assisted Newton in the preparation of his "Principia," of which Dr. Pemberton published a translation. He died in the year 1771, aged 77.

Chirurgica Nosocomiorum Civitatis Londini, Cui additur index Morborum et Remediorum," published by C. Crowder, J. G. Griffin, and G. Nicoll, 1767. The Pharmacopœias in it are identically the same as in the "Modern Practice;" in the latter, however, the uses of the various formulæ are given and occasional remarks made on their value. This copy is of special interest to us, as it belonged to Richard Tyson,[1] the second of that name, who was physician to our hospital, 1762. The diets are given also.

There is a great difference between this Pharmacopœia and the older one of 1739. In fact, only four formulæ remain the same —the discursive or discutient cataplasm of oatmeal and stale beer-grounds, the emollient fomentation of mallow leaves, marsh-mallow leaves and elder-flowers, with linseed, fenugreek and cummin seeds; the paralytic infusion of mustard and horse-radish, and the ointment for leprosy, consisting of sharp-pointed dock roots, suet, tar, sweet-oil, and brimstone.

At the end of this book appears the "Pharmacopœia Chirurgica in usum Nosocomii Divi Bartholomæi," and also "Pharmacopœia Chirurgica in usum Nosocomii Divi Thomæ." From which it appears that at this time the physicians and surgeons made use of distinct sets of formulæ. These formulæ are interesting, as some of them have attached Percival Pott's name, and some Edward Nourse's, and one the initials J. F., *i.e.*, John Freke.

The next copy of our Pharmacopœia that I have seen is contained in a small book called "The Modern Practice of London Hospitals, the fourth Edition, with an useful Index of Diseases and their Remedies. Printed at Dublin for T. Walker, at Cicero's Head in Dame Street, 1772."

The Dublin copy is an exact reprint in English of the "Praxis Medica" of 1767, with the addition of the "Pharmacopœia of the Lock and Portuguese Hospitals."

I have not been fortunate enough to meet with any edition of the hospital Pharmacopœia between the years 1772 and 1799. In that year the hospital printed its Pharmacopœia in much the same form that it did up to the year 1869, when, in accordance with the first British Pharmacopœia, it was printed in English.

From the following extract it will be seen that twenty years elapsed after 1799 before another edition was printed, for I find in an old manuscript book, still existing in the apothecary's shop, consisting of minutes of the Shop Committee:—

"At a meeting of the Shop Committee of St. Bartholomew's Hospital,

[1] Richard Tyson was great-nephew to Edward Tyson, the author of the "Anatomie of a Pigmy," and nephew to Richard Tyson the elder, physician to our hospital, 1725.

held on Monday the 18th of April 1818. Present, the Treasurer, Mr. Harlock, Mr. Ridout, and Mr. King.

"The last Pharmacopœia for the use of this Hospital having been published so long ago as the year 1799, it appears to this Committee that it is very desirable to reissue it, and submit to the medical officers of this House whether some alterations and improvements may not with propriety be adopted, and request the medical gentlemen will be pleased to meet this Committee on Monday next, the 23d Nov., at 12 o'clock precisely, that this Committee may benefit by the desirable assistance of their suggestions."

The result of this meeting was the republication of our Pharmacopœia in 1819 or 1820; subsequent editions have since from time to time been brought out. I shall in this paper only consider the earlier Pharmacopœias, leaving the later ones to be dealt with on another occasion.

We must return now to the copy of our hospital Pharmacopœia in Browne's Note-book. It is catalogued as No. 1895 in the Sloane Collection, and is placed in the British Museum Catalogue among the MSS. of unknown authorship, but there can be no doubt that it is in the handwriting of Browne himself. The Pharmacopœia is headed "In Christ Church Hospital," but the pen has been drawn through "Christ Church" and "St. Bartholomew's" written above it in different ink. At the end is written, "These are also used at Christ Church Hospital out of the Pharmacopœia Londinensis," and then follows a list of drugs.

It is of course uncertain whether the date 1670 refers to the Pharmacopœia or to the year in which Browne copied it. He did not become physician to the hospital until the 7th of September 1682, the year of his father's death. Edward Browne returned in the year 1669 from his extended travels, and soon after settled in London. In 1672 he married the daughter of Christopher Terne, at that time physician to our hospital, and it is probable that, during his courtship of Miss Terne, he attended the practice of his future father-in-law at our hospital, and made this copy of our Pharmacopœia in the year 1670. As it is not very long, and gives a good idea of the state of pharmacy and medicine at the time, I have made a complete and accurate copy of it, which I think will interest my readers.

Before discussing the Pharmacopœia, let us try and realise as well as we can the position and state of the hospital at that time. For this purpose we will pass on for a few years to the year of Browne's appointment, 1682. The government and the lay officers of the hospital were similar in their titles and performed similar duties to their present successors. John Nicholl was treasurer for the year, and the "summa totalis" of all the charge and receipt for the poor amounted to £7750, 8s. 2d. From an examination of the expenditure we can find out

a good deal more than the mere sums set down. I have been unable to find any record of the number of beds then existing or the number of patients annually admitted, but there were fifteen sisters, representing at least fifteen wards. From Dr. Bernard's ward books, hereafter to be described, it seems evident that the various medical officers must have had their patients scattered through many wards, and not collected together; Bernard's patients, who were all men, were to be found in ten wards. In all probability medical and surgical patients were mixed together, for, unless that was the case, it is difficult to see how fifteen sisters could manage and look after the number of in-patients that the hospital then contained. There is no record of the exact numbers, but, as I shall hereafter show, Dr. Bernard had above 100 patients in his own charge, all men. His colleague, Dr. Browne, may have taken charge of the female patients, and, as junior, would probably have a much smaller number of beds, perhaps not more than fifty. The three surgeons would certainly have at the least 150 beds between them; a certain number would be required for the cutters for stone and the foul wards, so that we may safely conclude that the total number of patients was over 300. Dr. Browne, in a letter to his father the year of his election, says—

"St. Thomas Hospital is larger than ours, and holds forty or fifty persons more."

From Theophilus Philanthropos we learn that fifty years later St. Thomas's Hospital contained 446 beds, situated in eighteen wards. In the early ledgers the maintenance of the poor in the bills paid to the steward is entered as "at twopence daily;" at this date the entries in the ledger only show "Dyetts for the Poore," amounting in all to £1814, 2s. 2d. From an entry in the journal for this year, I find that the daily allowance for diets was fourpence a day; for 300 patients this would make a sum of £1825. And Strype, in his edition of Stow, says that St. Bartholomew's Hospital, a hundred years before he wrote, contained 300 patients. Again, we learn from Theophilus that the yearly cost of St. Thomas's Hospital for the 446 beds, fifty years after this date, when everything would probably be more expensive, "amounted to seven thousand five hundred pounds, and sometimes more." The total expenditure of our own hospital for this year was £6521, 18s. 1d., so that I think we are not far wrong in concluding that the number of in-patients was about 300, which would give an average of twenty beds to each ward. In Philanthropos's time the average number of beds in the wards of St. Thomas's Hospital was twenty-four. Our wards would probably be similar,

and contain on an average about the same number of beds. Although a ground-plan of the hospital as it existed before its rebuilding is extant, I am unable to identify the site of any of the wards. I should imagine that the Long and Cloister wards would abut on the Long or Cloister passage, a footway leading from King Street and Christ's Hospital to Smithfield, which is thus described by Strype in his edition of Stow:—

"From King's Street is a passage into Smithfield through a fair Cloister well paved with free stone. On both sides of which are rows of shops mostly taken up by semstresses and milleners, and over the shops on the walls are the names of the Benefactors to the hospital fairly painted; and this cloister gives entrance into the several wards belonging to the hospital and other rooms and appartments."

And the new wards were probably also situated near the long passage, for Strype has another entry:—

"This Hospital hath within these few years been enlarged by a new Ward built of brick and stone on part of the Church Yard, standing upon Peers or Pillars; under which are shops which front the common passage called the long Walk, betwixt this and Christ Church Hospital."

Confirmation of the position of the churchyard was afforded a few years ago when excavating for the foundations of the lavatories attached to the west end of the south block, numbers of human bones being found there. Although their exact sites are unknown, I am able, from Dr. Bernard's ward books, and from entries in the journal, to give the names of twelve of the fifteen wards, as well as the number of beds that Dr. Bernard's patients occupied in them. I give them in the order in which they stand in the collection of his ward books in the British Museum:—

1. Long Ward, in which Dr. Bernard had, on	Nov. 17, 1679,	13	patients.
2. Cloister Ward, ...	„ „	13	„
3. New Ward, ...	„ „	11	„
4. Charity Ward,[1]	Nov. 20, 1682,	?	?
5. Souldier's Ward, ...	Nov. 17, 1679,	14	„
6. New Ward,[2]	Feb. 23, 1680,	15	„
7. Garden Ward,[3]	Nov. 17, 1679,	8	„

[1] I am unable to give the number of beds occupied by Dr. Bernard's patients in this ward, as the book is kept in a different manner from the others, and the number of patients in it at the same time is not so easily arrived at as in the case of the others. Ninety-three patients in all were admitted between February 23, 1682, and October 8, 1683.

[2] This New Ward is certainly a distinct ward from No. 3.

[3] I find in the journal the following entry in the year 1682:—"Uppon the complaint of the Matron against the sister of Garden Dorler Ward for Imbeazling the patient's clothes that dyed, and suffering two pair of sheets to be burnt through her neglect. It is ordered that she pay 6s. 8d. in satisfaction of the

8. Diet Ward, in which Dr. Bernard had, on Nov. 17, 1679, 9 patients.
9. Naples Ward, ... „ „ 9 „
10. King's Ward, ... Feb. 23, $16\frac{79}{80}$, 9 „
11. Mary Ward.[1]
12. Katherine Ward.[1]

Linen for the use of the poor amounted in this year to £12, 8s., but this did not include the sum paid for weaving the flax spun in the hospital, which I presume was used in the service of the patients. To warm the wards both coal and wood seem to have been used. The bill for sea-coals amounted to £73, 11s., and I find from other entries that they cost about 20s. a chaldron. Besides sea-coals, "small coles," and "old coles," whatever they might be, occur, and also "billetts and faggotts;" and in most years, though not in this, "charre cole" as well. The lighting of the wards was by means of tallow candles, and I found in the journal the contract for this year:—

"Aug^{t} 1st 1682.—Agreed with Bryan Ayliffe and Daniel Midwinter tallow chandlers to serve the Hospitall the year ensuing with Candles for 4^{s} 4^{d} the dozen."

Mr. Cross informs me that candles are still bought by the dozen pounds, and the dozen here must mean dozen pounds, as it is impossible that tallow candles could be more than 4d. apiece. The total cost for candles amounted to £44, 15s. 6d.

At St. Thomas's Hospital, in Theophilus's time, the allowance of coals and candles to the wards there was—

"During the winter half year, viz.: from Michaelmas to Lady day, six sacks a week per ward and three candles at night; and during the summer from Lady day to Michaelmas two sacks and a half a week and two candles a night."

This seems a small allowance of light, but it is possible that

said sheets. And farther that It is ordered that if she doth not demeane herself well in her place to be dismissed therefrom at Mklmas next." Is Garden Dorler Ward the same as the Garden Ward? I believe it is, as in one place in Dr. Bernard's book something which I could not read followed Garden. What is the meaning of Garden Dorler? In other entries I meet with Garden Daughter and Garden Dorter. I expect that Dorler is a corruption of Dorter, itself a corruption of "Dortoir," French for Dormitory; that Dorler is not a mere *lapsus plumæ* for Dorter is shown by the word occurring in connection with other wards. I find Cloister Ward spoken of as Cloyster Dorler Ward.

[1] The names of these two wards I obtain from the journal. The sisters of both being summoned before the Court to be admonished, Sister Mary's offence was similar to that of Sister Garden Dorler, viz., embezzling the clothes of dead patients. Sister Katherine was admonished, but the cause is not stated.

Dr. Bernard was appointed assistant-physician in the place of Dr. Arthur Dacres, November 20, 1678. He had served the hospital for the previous seventeen years in the office of apothecary.

there may have been oil lamps as well in the wards, though I find no entry of oil for lamps.

I have abstracted from the accounts for this year some of the principal items that may interest my readers:—

Item paid to William Orme, Viccar	£90	0	0
Item paid to John Clarke, parish clarke	6	0	0
Item paid to John Hadden, Sexton	4	0	0
The Officirs Salleries—			
Item paid to Benjamin Edwards, Clarke	£32	0	0
Item paid to Thomas Pultney, Steward	64	0	0
Item paid to 'Xtopher Cawthorne, Renter	40	0	0
Item paid to Thomas Rawson, Porter	21	0	0
Item paid to Mary Libanus, Matron[1]	40	0	0
Item paid to Susan Cooke, Coque	20	0	0
Item paid to Sir John Micklethwaite, Phisition	33	6	8
Item paid to D[r] Bernard, Phisition	33	6	8
Item paid to Charles ffeltham, Apothecarie	50	0	0
Item paid to George Horsnell, Chirurgion[2]	40	0	0
Item paid to Robert Sanderson, Chirurgion	40	0	0
Item paid to Henry Boose, Chirurgion	40	0	0
Item paid to James Molins and Thomas Hobbs, Chirurgeons, for cutting the stone	15	0	0
Item paid salleries to the sisters at 50[s] apeice	37	10	0
Item paid to them for their liveries at 22[s] 6[d] apeice	16	17	6
Item paid to Margaret Pultney, Bultrywoman	2	10	0
Item paid her more for her liverie	1	2	6
Item paid John Hadden, Beadle[3]	8	0	0
Item paid him more for warning tenants	5	6	8
Item paid Augustine Garland, Beadle	8	0	0

[1] The matron does not seem to have had a livery annually provided for her, but there are occasional entries, such as "for the Matron's winter gown, xx[s].," just double what it cost in 1555; "Payde to the Matron for her winter lyvery, x[s]."

[2] An entry in the journal about this time directs that each amputation should be paid for at the rate of vj[s] viij[d]., not the way to encourage conservative surgery. Subsequently this fee was commuted to a fixed fee for operatious, which continued to be paid until quite recent years.

[3] The beadles were more important officers at that time than now. As may be seen in the "Orders and Ordinances for the better Government of the Hospitall of St. Bartholomew the lesse, 1553," they appear on the re-establishment of the hospital to have had in a measure the office of sanitary inspectors in the streets of the city, perambulating the city and taking into the hospital those who might otherwise "have dyed and stunck in the eyes and noses of the city." I do not know how long they exercised these powers, but in the plague year 1665 I find the following entries:—

"Item paide to John Kingston, Beadle, for walking the streets to take upp the vagarent poore people this last yeare ending at Mich. xviij[li] vj[s].

"Item paide to John Lenton, Beadle, for walking the streets to take up the vagarent people last yeare, xvj[li],"

which shows that the custom was either revived then, or that the Governors, in consideration of their increased labour and danger during the plague, made a substantial gift to their beadles. No such entry occurs in 1666. I have already mentioned that part of their duty was to visit the sick in the outhouses to receive complaints, if any, from the patients there, and see that the guides of the outhouses afforded proper maiutenance to the inmates.

Item paid more to him	£1	6	8
Item paid Edward Gylar, Beadle	8	0	0
For the outhouses—			
Item paid John Bignoll, Guide of Kingsland, for curing patients	94	10	0
Item paid John Dorrington, Guide at the Locke, for curing patients	82	10	0
Item paid Katherine Elsum for cure of scald heads and Lepersies for one year ending Mich: 1682 .	20	0	0

The medical officers received a special gratuity, which thus appears—

Paid Phisitions, Chirurgions, and Apothecarie's Gratuity, £100.

Lawsuits amounted to £20; Audits, Easter, and View dinners, £57, 8s. 11d.; Christopher Cawthorne's petty charges amounted to £136, 11s. 10d. The

"Summa totalis of the payments and allowances for the said year"

amounted to £6521, 18s. 1d.

With regard to food, I came across no entries from which I could gather information as to the daily diet of the patients. From an entry in the journal for 1679 it appears that a "mutton dyett" existed, and the matron is desired to go round and take care to provide "mutton dyett" for those who could not take the "common dyett" of the house.

In 1764 the diets are given in "The Modern Practice," &c. They consisted of full, low, milk, fish, dry, and raisin diet; but as that is nearly a hundred years after the time we are now treating of, I will leave any remarks on them for a subsequent occasion. The diets were not very liberal; but the patients were probably allowed to supplement them by provisions introduced from without. We learn from Dr. Browne's letter to his father that they generally approved of the diet drink.

To judge from Theophilus's account of St. Thomas's and from Dr. Bernard's books, the physicians still paid but one formal visit to the wards once a week.[1] The medical staff met together at a fixed hour, and then proceeded to walk together through all the wards, the doctor and surgeon who took in on the preceding admission-day leading the way. Each medical officer had his

[1] The charge to the physician, as drawn up in 1609, begins as follows:—"Phisicon, you are here elected and admitted to be the phisicon for the poore of this hospitall to p'forme the chardge followinge. That is to say, one day in the weeke at the leaste through the yeare, or oftner as neede shall requyer, you shall come to this Hospitall and cause the Hospitler, Matron, or Porter to call before you in the hall of this hospitall such and so many of the poore of this hospital as shall need the counsell and advise of the phisicon."

It must also be remembered that the hospital at this time partook more of the character of a workhouse than it does now.

ward book carried for him, in which were inscribed the names of his patients. The physicians did not, as a rule, go to their patients' bed-side; they sat in state in a chair, and had the patients brought up to them, examined their condition, and wrote against their names in the ward book the treatment. After the visit the ward book was taken to the apothecary's shop, and the patients attended there to get their own medicines; those who were too ill to go for their own medicines had their medicine brought them by the sister of the ward. The chirurgeons must have visited their patients in their beds, or at all events some of them, as a man with a fractured thigh could hardly have been hauled out of bed and carried up to the surgeon.

In the first hundred years or so of the accounts I find no charges for any other attendants in the wards but the sisters; possibly the sisters had to provide further help themselves, or the nursing, such as it was, may have been done by the convalescent patients.

Out-patients existed from a very early period, but not in large numbers. From a minute in the journal of 1682 they appear to have given rise to some differences of opinion between the medical staff and the Governors of the hospital, the former considering that they were insufficiently paid for the work done by them among the out-patients. The out-patients were seen by the medical staff after their visit to the wards. At St. Thomas's, in Theophilus's time, one physician saw the men, and another the women, who, he says—

"Are by far the most numerous, troublesome, and tedious in their examinations and making their complaints; therefore the Physician is, or ought to be, attended with a Beadle, to keep good order, and call aloud the names of the patients."

I don't know that the character of our female out-patients has altered much since those days. The total number of out-patients was small, not exceeding 300 a year.

After this brief and imperfect sketch of our hospital as it existed in 1682, we may proceed to examine the treatment of the patients and the preparations contained in the hospital Pharmacopœia.

Bernard's ward books,[1] to which allusion has so frequently been made, are the identical books carried round on his visits to the wards. From the prescriptions we can make a fair guess at the leading symptoms of some of his patients. Diseases of the pulmonary organs seem to have been as common in those days as now. I have transcribed the entry for the first week as it stands in the book for the

[1] The existence of the manuscript Pharmacopœia in Browne's note-book made me search through the Sloane Collection in hopes of coming across other MSS. connected with our hospital. I was rewarded by finding these Ward Books, No. 2290 in the Sloane Collection. No. 1805 is a small MSS. note-book of Dr. Bernard's. I found nothing of interest in it; it seems to contain formulæ similar to those in the hospital Pharmacopœia.

Long Ward. Those who like may, by the assistance of Browne's Pharmacopœia, make out the ingredients of some of the medicines ordered, but some of the preparations are neither contained in the hospital nor London Pharmacopœia; so that it seems probable that then, as now, there were numerous formulæ in use at the apothecary's shop not included in the Pharmacopœia.

I have marked with an * those belonging to Browne's Pharmacopœia, and with a ° those found in that of the London College.

Long Ward, November 17, 1679.

James Shallow. Decoct. Album.[1] c̄ Syr. Hed. opiat.[2]
John Bootland. P.S. Aqua Liberans.*
Richard Horne. P.S. Decoct. Pect.,* Pil. de styrac,° Cordial Lohoc.
Nich. Roote. Vesicat. pone aures. Dec. Ceph.* ? ? Pect. Lohoc.[3]
Robert Jones. Dect. Pect.* Lohoc,[3] P.S. Elect.
Wm. Stoake. Pil. de styr.,° Dect. Pect.,* Lohoc,[3] Empl. dorso.*
Henry Snayle. Bals. Lucat.,* Dect. Pect.,* Lohoc[3] theriac.
Nich. Harrison. P.S. Vin. Aperie., Dect. Amar. Cord.°[4]
Wm. Gardelay. Dect. Pect.,* lohoc[3] theriac. cordial.
Wm. Russell. Dect. Pect.,* & Caryophyll. cum Diasc. Lohoc.[5]
Humphry Jones. P.S. Dect. Ceph.,* Lohoc, Pil. nigr.* & styr.

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[1] Decoctum album, which is not in Browne's Pharmacopœia, appears in the one given by Theophilus, 1739. It consisted of burnt and unburnt hartshorn, 4 oz.; cinnamon, coriander seed, of each, 2 oz.; water, 4 pints. Bate had a similar preparation, of which he says it is of extraordinary use in quenching the thirst in fevers. Salmon calls it a specific in the plague, spotted fever, measles, and small-pox, &c.

[2] I do not find this syrup anywhere. Among the preparations of the London College was a Syrupus hederæ terrestris, a syrup made of the juice of ground ivy; the opium being added in the hospital preparation.

[3] I do not find these Lohochs anywhere. They were probably very similar to the Lohochs in the London College, but possibly had some special ingredients added, and were known by other names in our hospital. Lohochs were similar to linctuses, and the London Pharmacopœia at this time had nine formulæ, including among them Lohoch e pulmone vulpis. Various preparations made from the fox are mentioned by Pliny as having special virtues against headache, but he makes no mention of the lung. Among the receipts in Sextus Placitus, "Medecina de Quadrupedibus," preserved in "Saxon Leechdom, Wort-Cunning, and Star-Craft," occurs—"For oppressive breathing, a foxe's lung sodden and put into sweetened wine and administered, wonderfully healeth." From Saxon times it was handed down to comparatively recent times, appearing in the first three editions of the London Pharmacopœia, but disappearing in the 1721 edition. Shipton, in his work on the London Pharmacopœia dated 1689, seven years later than the time we are now treating of, directs that the foxes be caught in September. The London Pharmacopœia included at that time an Oleum vulpinum also. We find the term Lohoc in Mirfeld's Sinonoma Bartholomei, with this interpretation to it, "Confectio quæ lambi dicitur."

[4] The Decoctum amarum of the London College is not called cordiale, so I presume this must have had something added to it.

[5] I have little doubt that this was a very similar preparation to that called Julapium cord. cum diascordio in the 1739 Pharmacopœia.

John Valett.[1] P.S. Elect. Chalyb.,* Vin. & pil. aperie., Lohoc, Bol. purg.,* Pil. nigr.*

PHARMACOPŒIA COPIED FROM DR. E. BROWNE'S MSS.

St. Bartholomew's
In Christ Church Hospitall 1670.

Bolus purgans.[2]

℞. Jalapii ʒiiss, Crem. Tartari ʒiij ʒvj, Electuarii Lenitivi ʒvij, Syrupi Rosar. Solut. q. s. m. fiat Electuar. Dosis ʒss—ʒvj.

Pilulæ Nostræ Purgantes.[3]

℞. Aloes ʒvj., Mastiches ʒij., Colocynthidos, Diagredii ana ʒj, Caryophyll. ʒss, Mellis despumati q. s. fiat massa. Dosis ʒj.

℞. Pil. Nostræ ℈ij, ♀ dulcis ℈j. m.

Infusio Emetica.

℞. Vitri Antimonii ℈j, Vini Albi lib j. Dosis ʒx.

Infusio Hieræ.

℞. Spec. Hieræ picræ ʒj, Vini Albi lib. ij. Dosis ʒx.

℞. ♀ dulcis ℈j, Electuar. Lenitivi ʒj pro una dosi

Lixivium Hydropicum.[4]

℞. Ciner. Absynthii, Genistæ ana ʒx, Vini Albi lib. 4. Capiat colaturæ ʒx bis de die.

Aq: Liberans.[5]

℞. Guiaci lib. vj, Glycirrhizæ lib. iij., Aq: Calcis Cong. x capiat haustui bis de die

Fotus noster communis est Aqua Calcis.

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[1] John Vallett, who was supplied with no less than six different medicines, died before Bernard's next visit.

My readers will notice that no directions are given in any case as to the quantities to be taken or the frequency of the dose. I presume the various formulæ were always given in the same quantities and with the same frequency. No ages are appended to the patients' names. In turning over the leaves of the ward books I found a namesake of my own admitted to Garden Ward, December 22, 1679. Curiosity led me to try and follow his case, but I could make nothing out of his treatment, a hieroglyphic I cannot understand being placed against his name. He remained on the same treatment without change until April 5, 1680, when he died. I was also not a little surprised in looking through Bernard's ward books to see how seldom phlebotomy was ordered ; in the Long Ward only one patient was bled in six months. It is of course possible that the apothecary might bleed the patients as a preliminary to the physician's treatment, and we must remember too that the hospital in those days to a certain extent was used for the old and infirm as well as for those suffering from accidents and acute disease.

[2] Bolus purgans remains the same in 1739 with the exception of the omission of the syrup of roses. It was replaced in 1767 by a Bolus gambogiæ.

[3] These pills remain virtually the same in 1739 ; the mastich is omitted. In 1767 the Pilula purgans c̄ mercurio is quite different.

[4] In 1739 this preparation becomes much more complex. The absynth ashes are left out, but horse-radish, zedoary, garden-flower deluce, aron root, aromatic calamint, gentian, and mustard seed are introduced. The Lixivium diureticum of 1767 is quite a different preparation, being a simple cream of tartar and peppermint draught. After this date lixivia disappear.

[5] Probably owing to the expense of guaiacum at the time, we find that in 1739

Infus. Stercoris Caballini.[1]

℞. Stercoris caballini ℥vj, Decocti pectoralis vel Aq: liberantis lib. iij., Capiat haustum bis de die.

Decoctum Ictericum.

℞. Fol. Fragrariæ, Chelidonii, ana ℳ.ij. Ras. Eburis ʒiij. Passul. enucleat. ℥x, Curcumæ ʒij, coq. in aquæ fontanæ q. s. ad lib. 4. capiat haustum bis quotidie.

Decoctum Amarum in febribus intermit.[2]

℞. fol. Centaurii, Chamæmili ss.j, Sem. Cardui ʒij, Sennæ, Agarici, ana ℈j.

Gentian. ℈ss. Coque in Aq: fontanæ quantitate sufficiente ad ℥x capiat ante paroxysmum.

Aqu. Cordialis.[3]

℞. Fol. Cardui, Angelicæ, Calendulæ, Melissæ, Menthæ, Scordii ana m.12. Rad. Petasit. lib.4. Contrayervæ, Nuc. Mosch., Caryophyll. ana ʒij. Zingiberis, Gelangæ ana ℥j, Sem. Carui ℥ss, Cardamomi ʒij, Bacc. Juniperi. lib.j, Cerevisiæ non lupulatæ Cong. xij. fiat distillatio.

Syrupus cordialis quo utimur in Aqua Cordialis.

℞. Vini albi lib.ij., Vini rubri ℥x, Cinnamomi ℥j, Caryophyll. ℥ss, Zinziberis ℥j, Sant. rubri ℥ss, fiat infusio per horas aliquot; deinde adde duplum Sacchari. fiat Syrupus. cui addatur Syrupi Caryophyllorum libra una.

Aq. Cordialis ℥8. Syr. præscripti ℥j. dicitur Julep. cordiale.

Apozema Cordiale.

℞. Fol. Calend. m.iij, C.C. rass. ℥j, sem. cardui ℥ss, fol. Melissæ, Scabiosæ ana m.ij, Hyperici, Angelicæ ana m.j. Coque in Aq. Hordei q. s. ad lib.vj. Colat. adde Syrupi Limonum ℥vj.

Aqua liberans is made of guaiacum and sassafras of each a pound, ainseed half a pound, the liquorice and lime-water remaining the same. We know from Theophilus that this was used in all cases that required absorbers and sweeteners, especially in all venereal cases after salivation.

[1] Nasty as this seems, I think it not improbable that it was a useful draught. We must remember that scurvy was rampant among the civil population in those days, especially after the salted and monotonous diet of the winter months, and hence many patients had a scorbutic taint about them. In St. Thomas's Hospital Pharmacopœia a similar draught existed under the title of Infusio pleuritica, and Theophilus says of it, "This is a very good medicine for the purpose it is intended for, and will frequently produce ease when no other means will take place. If this dose (half a pint twice a day) be too noisome, it may be lessened and repeated the oftener. This is likewise ordered in distempers of the breast which are not a true pleurisy, wherein it will do great service, as in a peripneumony; and in an asthma, the common pectoral drinks are not to be compared to it." Dr. Bate, who boasts of having been medical adviser to two kings and one protector, and died in 1669, made great use of Aqua omnium florum, which was made of cow-dung gathered in May. Salmon in his edition of Bate's Dispensatory tells us that Bate adopted this water from a quack, a woman who set up to cure all disorders, and was most successful. Her receipt was cow-dung fresh gathered lbs. xij., spring or river water lbs. xxx.; mix and digest for twenty-four hours, then decant the clear liquor. Salmon himself bears witness to its value, saying, "'Tis true the medicine is but a mean thing, but not to be despised." He also informs us that the talented inventor made a fortune of £20,000 by it.

[2] Decoctum amarum is very much like that of Dr. Bate, but is simpler. Bate made use of agrimony, marigold, rhubarb, and citron as well.

[3] The Aqua cordialis of 1739 is almost identical with this, excepting that instead of using unhopped beer, spirits of wine was employed with water.

Decoctum Febrifugiū.[1]

℞. fol. Caryophyll. m.ij, Coque. in aq. font. q. s. ad lib.j.
Capiat haustum ante paroxysmum cum pulvere Gentianæ ℥j.

Emulsio Nostra.

℞. Hordei ℥j.
pass. alb. ℥ij, Rad. Althææ ℥ss. Coque in Aq. fontanæ q. s. ad lib.iij.

Julap. N.[2]

℞. Aq. Hordei et Syr. Limon.

Decoctum Stomachicum.

℞. Fol. Absynthii, Centaurei, Agrimoniæ ana m.j, Glycyrrhizæ ℥j. coque in Aquæ fontanæ q. s. ad. lib.iij.
Capiat haust. bis de die.

Decoctum Purgans.

℞. Sennæ lib.j, Rhabarb. ℥x, Polypodii ℥iij, Sem. fæniculi dulcis ℥j, Zingib. ℥j. fiat infusio per noctem. dosis ℥x.
Vel in electuar. Caryostino vel cum Jallapio.

Decoctum Cephalicum.[3]

℞. Fol. Rorismar., Salviæ, Betonicæ, Chamæp., ana m.j. Sarsæ, Sassafras, Guaici, Rad. pæoniæ, Glycyrrhizæ ana ℥j.
Coque in Aq. fontanæ lib.ix. ad vj. sub finem imponendo Stæchados, Galanzæ, nuc. Moschatæ ana ℥j. Capiat ℥x mane et hora somni.

Decoctum Pectorale.[4]

℞. Passularum enucleat., ficuum ana ℥x, Dactyl. ℥ij, Glycirrhizæ ℥j. Capill. Veneris, Hissopi, Scabiosæ ana m.j. Coque in Aq. Hordei q.s. ad lib.4.

Decoctum Psoricum.

℞. Fol. fumariæ, Scabiosæ, ana m.j. Glycyrrhizæ ℥j. Coque in Aquæ fontanæ q. s. ad lib.iij. Capiat haustum bis die.

Pulvis Alexipharmacus.

℞. Rad. Contrayervæ, Serpentariæ Virginianæ, Angelicæ ana ℥j, crocis ℥j, Chelis Cancrorum Calcin. ℥j, Cochineliæ ℥ss., Antimonii diaphoretici ℥ij, Camphoræ ℈j. fiat pulvis subtilissimus. dosis ad ℥j ex quovis vehiculo conveniente.

Electuarium Chalybeatum.[5]

℞. Rad. Raphani silvestris ℥iij, Cort. ligni Sassafras ℥iij, Rad. Jalapii,

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[1] This does not appear in 1739, an Electuarium febrifugium being introduced containing Peruvian bark, a pound ; oil of cloves, sixteen drops ; syrup of cloves, a sufficiency. This is the first introduction of bark into our Pharmacopœia.

[2] Julap. N. This disappears after this date, the juleps of 1739 being similar to the Julap cordiale mentioned under Aqua cordialis. The 1767 edition contains various kinds. The Julepum commune of that date was made of simple alexiterial water, spring water āā ℥iv., spirits of wine ℥iiss, and white syrup ℥ss. The term juleps does not occur in our Pharmacopias after 1767.

[3] Decoctum cephalicum remains in an almost identical shape in the 1739 Pharmacopœia, and then disappears.

[4] Decoctum pectorale. In 1739 this preparation had coltsfoot added.

[5] I find in a letter of Edward Browne to his father, shortly after he was appointed physician, that he was not very well pleased with this electuary. As the letter, though published in Sir Thomas Browne's Works, Life, and Correspondence by S. Wilkins, 1836, is not probably known to most of my readers, and as it deals almost exclusively with matters relating to our hospital, I think it is worth while giving it here *in extenso*:—

"*Oct.* 3*rd* 1682.

"Most honoured Father,

"The salary of the Hospital is so ordered that it comes to twenty shillings a weeke : for the patients within the house, the physitian receives quar-

Mechoacan. alb. ana ℥ss, trium santal. ā ℈ij, Rass. Eburis ℥ss, Crem. Tartar. ℥j, Chalybis crudi ℥ij, Conserv. Cochleariæ hortensis, Marrubii, Absynthii vulg. ana ℥iss, Theriacæ Diatessar. ℥j ℥ij, Oxymel. Scillitic. q. s. m. fiat electuarium dosis ℈iij mane cum excitio [1] et potu scorbutico.

Electuarium Nephriticum.[2]

℞. Terebinthinæ Venetæ ℥iss, Sp. Diatrag. frig. ℥iss, Baccar̄ Alkekengi, Radicum Althææ, Glycyrrhizæ ana ℥ij. Sacchari ℥12 soluti in Aquæ Lactis. fiat electuarium, capiat cum vel sine emulsione.

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terly nine pounds and a noble, and for the out-patients at Easter fifteen pounds, which comes to fifty-two pounds and a noble in a year; for which he cannot write less than six thousand prescriptions. We want a good Chalybeat electuary, that doth not purge, for ours does sometimes. I know not who invented it, and it is not well compounded, yet it doth much good; it is this

(Given above).

"I think to have this made ready, but if you please to add or alter it, it shall not be made up till I hear from you, Sir.

℞. Conserv. Absynt. Vulgaris ℥ij, Conserv. Ros. Rubr. ℥ij, Zinzib. Condit. ℥iiij, Cort. Winter. ℥j, Limaturæ Chalyb. ℥iij. Syr. de quinque Rad. q. s. m. f. Elec^{tr}.

And so it may be a standing medicine as well as the other. They make use of pills in old coughs and diseases on the lungs, which they call pilulæ nigræ, which are these

(Given above)

but I prescribe more of a strong diacodium they make. Pray sir, write me word how you make your syrupus de scordio for it is not knowne in London. Pray sir, think of some good, effectual, cheape medicines for the hospitall; it will be a piece of charity, which will be beneficiall to the poore, hundred of year after we are dead and gone. The purging electuary which is divided into boluses of half an ounce or six dragmes as it is ordered.

(Given above.)

"We make much use of Caryostinum & jalap powdered which are also often taken in four ounces of the purging decoction which is made of Senna, Rhubarb, polypody, sweet fennell seeds and ginger. Their scurvy grass drinke is good; they allow three barrells every weeke of it, four handfuls of common wormwood, fifteen handfuls of scurvy grasse, garden scurvy grasse, fifteen handfuls of broke lime and fifteen handfuls of water cresses to a barrell of good ale, which the poor people like very well.

"St. Thomas's Hospitall is larger than ours and holds forty or fifty persons more. We have divers of the king's soldiers in the hospitall. My wife sent downe last weeke, a past-borde box by the waggons with candlesticks for Mrs. Porly and chocolate for my lady Pettus. My duty to my most dear mother and love to my sister and Tomy.

"Your most obedient sonne,

"Edward Browne.

"When I am out of towne, there are divers other physitians who will willingly prescribe for me at the Hospitall."

[1] I read the word excitio, and do not understand its meaning. Is it contracted for exercitione? but exercise is not what one would generally prescribe for patients in hospital.

[2] In the 1739 Pharmacopœia this is made with Strasburg turpentine instead of Venice; in the 1767 edition the name remains, but the composition of the electuary is a good deal changed. It then consisted of Tereb. Argent. ℥ss, succ. Glycyrrhizæ ℥iss, pulv. rhei ℥ij, Elect. lenitivi ℥ij. capiat ℥j. omni mane.

Pil. Nigræ.[1]

Rad enulæ, Iridis Florent., Sem. Anisi, Sac. Candi ana lib.j, picis liquidæ q. s. fiat massa. capiat ℈j hora somni.

Pulvis Astringens.[2]

℞. Baccar? Myrtill., Cort. Granat. ana lib.j., Cassiæ ligneæ, Balaust. ana lib.ss. m. fiat pulvis capiendus cum lacte vaccino.

Pilulæ Astringentes.

℞. Santali Rubri ℥ij, Coralli rubri, succini ana ℈iiij, Gummi Arabici, Boli Armeni. ana ℥ij. Terebinth. Venetæ, Cretæ. ℥ss. fiat pil.

Pulvis ad Contusos.[3]

℞. Lapidis Hibernici, Myrrhæ, Boli Armeni., Mummiæ ana ℥j, Spermatis Ceti ℥ss, Rhabarbari ℥vj. M. dosis ℥j.

Fumus.

℞. Myrrhæ, Angelicæ ana lib.j., Thuris lib.iij, Nitri ℥8, Sulphuris ℥4, Picis lib.vj. fiat pulvis tempore pestis utendus.

Gargarisma Astringens.[4]

℞. Corticis Ulmi ℥ij, Aq. Hordei lib.ij, Mellis Rosacei, ℥jss. m.

Emplastrum de pice et ♁.

℞. Picis lib.ij, Sulphuris lib.ss. M. fiat emplastrum.

Emplastrum Ischiadicum.

℞. Euphorbii ℥iss, Majoranæ ℥j, Picis Burg. lib.j. fiat Emplastrum. Utimur etiam pro capite.

Emplastrum Dorsale.[5]

℞. Emplastri Diapalmæ part 4., Empl. ad Herniã ss.j. misce.

Pil. de Terebinthinæ et Chamæpit.

℞. Chamæpit. ℥j, Terebinth. q. s. fiat Massa.

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[1] From Dr. Browne's letter it appears that these pills were used for old-standing pulmonary disorders; what the strong diacodium which he preferred using was, I do not know. Diacodion was the old term for syrup of poppies.

[2] In 1739 this was compounded without the myrtle berries and cassia lignea, tormentil root and bistort being introduced instead.

[3] This must have been a valuable preparation! Mummy was officinal in the London Pharmacopœia until the great reform in it in 1746.

[4] In 1739 this title was used for a gargle of oak-bark ℔ss. boiled in a sufficient quantity of water to strain off a pint, honey of roses, ℥ij., sal prunella, ℥ij., spirit of vitriol, q. s. to make it of a grateful acid. In 1767 the preparation having the same title was composed as follows: Decocti cort. querci, ℔j., Spir. vini R. ℥ij., Tinct. myrrh. j. m.; and a note is added to say that this was successfully used to wash the mouth ten or twelve times a day after removing a fungus from the under-jaw. The Gargarisma astringens in 1767 is found in the Pharmacopœia Chirurgica, or Surgeon's Book.

[5] This was a most complex preparation, and if its virtues had only been equal to the number of its ingredients, it ought to have cured all diseases.

Emplastrum diapalmæ does not appear in the London Pharmacopœia of this date; but I find it in the Strasbourg Pharmacopœia for 1725, and it is in Bate's; but he recommended a more elegant preparation, which he called Empl. Diapalmæ Odoratæ. It consisted of decoction of the tender shoots of the palm, or, in Western Europe, of the oak, common oil, lard, and golden litharge, of each six pounds. It was used in various external affections, wounds and ulcers, burns, fractures, and dislocations of bones, and was said to egregiously dry cicatrices. The Empl. ad Herniam contained no less than thirty ingredients, which it would be tedious to enumerate. Its main ingredients, which gave it body and firmness, were Lapis calaminaris, Lithargyrum auri, Sanguinis draconis, Picis navalis, and turpentine.

Cataplasma Hydrop.[1]

℞. Stercoris Bovini lib.ij. Baccarū-Lauri, Juniperi ana ℥4, Rad. Brioniæ, Cyclaminis ana lib.ss. Sem. Cymini, Sulph. vivi ānā ℥iij, cum lixivio calcis. fiat Cataplasma lenta coctione.

Unguentum Sambucinū.[2]

℞. Foliorum Sambuci q. s. cum axungia porcina fiat unguentum.

Unguentum Psoricum.

℞. Rad. Enulæ pulverisatæ ℥iss., Flor. ♃ ℥j.
Axungiæ porcinæ, ℥ij., m. fiat unguentum.

Balsamum Lucutelli.[3]

℞. Ol. Olivarū lib.iiss., Terebinth. Venetæ lib.j., Ceræ flavæ ℥x., Santali rubri ℥iij., Vini Canarini ℥8. fiat Balsamū ut artis est.

Unguentum Ophthalmicum.[4]

℞. Tuttiæ præparat. ℥j., Caphuræ gr.x., Butyri Maialis ℥ij., fiat unguentum.

Aqua Ophthalmica.[5]

℞. Salis Communis ℥ss., Vitrioli albi ℥ij, Antimonii Crudi, ℥iss., Aquæ Euphra. lib.j., coqu. parum.

Unguent. Antiparasiticum.

℞. Unguenti Nervini q. s. Ol. Spicæ q. s.

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[1] This and the Infusio stercoris caballini are the only preparations, if we except the Pulvis ad contusos, which contain any of the disgusting substances, so many of which were at that time pharmacopœial. Those who have not had the curiosity to look back at the old Pharmacopœias of the learned colleges of the sixteenth and seventeenth centuries can hardly imagine the disgusting nature of the substances they contained. In the catalogue of the officinal simples of our own London College for the year 1689 occur: Homo vivens—Capilli, ungues, saliva, aurium sordes, sudor, urina, stercus, sanguis, calculi, semen, lac, menses, secundinæ. Homo mortuus—Cadaver, caro, cutis, pinguedo, ossa, cranium, usnea cranii, cerebrum cor, fel, manus. And this at a time when R. Morton, Edward Tyson, Hans Sloane, and Richard Blackmore were fellows of our College, and Sydenham a licentiate.

I ought, however, to add, that though these abominations occur in the list of officinal simples, scarcely any were made use of in the preparations under the ægis of the College. So strong, too, is the force of tradition, and so conservative are learned bodies, that in the next edition, the fourth, of the London Pharmacopœia in 1721, when Sir Hans Sloane was president, and our own physician, Salusbury Cade, senior censor, though all the simples obtained from homo vivens disappear, adeps and pinguedo hominis, cranium, and cadaver in the form of mummia, still remain, as also does usnea cranii humani, the green mould or moss that grew on dead men's bones when exposed to the atmosphere.

It is not until the fifth edition of the Pharmacopœia of our London College that we get rid of the old traditions handed down from the earliest periods of medicine. The 1746 Pharmacopœia may be said to mark a perfect revolution, or rather, I should say, reformation in the annals of English pharmacy.

[2] In 1739 Ung. Sambucinum is directed to be made with May butter, and Ung. Psoricum has olive-oil added to it. In 1739 an ung. ad lepram is found, consisting mainly of tar and sulphur. This is found unchanged in 1767.

[3] Balsamum Lucutelli, or Lucatelli, or Locatelli, for I find it spelt in these three ways, is almost identical with that in the London Pharmacopœia, the only difference being that in the latter the turpentine is to be washed in rose-water. From Theophilus we learn that this was used both inwardly, in all suspicions of internal ulcerations, and externally as a digestive. The dose was ℥j.

[4] Almost identical with the Ung. Ophthalmicum given by Salmon as used by Bate.

[5] No antimony occurs in this preparation; in 1739 Aq. Euphra, *i.e.*, Euphragiæ, eyebright, is used instead of Aq. fontana.

Gargarisma Antiparalyticus.[1]

℞. Decocti Cephalici lib.j, Sem. Sinapis ℥ss. M. pro Gargarism.

Emplastrum Paregoricum.[2]

℞. Empl. de Minio lib.4, Mercurii vivi ℥12, Terebinth. Venetæ ℥ij. fiat empl. s. a.

Unguentum Antiscorbuticum.

℞. Fol. Cochleariæ Hortensis, Nasturtii Aquat., Becabungæ, Sambuci ana M iiij. flor. Chamæmeli, Meliloti, Absynthii, Rorism. ana M iij., Rad. Raphani Sylv. ℥8, Baccar? Juniperi lib.ss., Sem. Cymini ℥x, Illicebræ M iij Axungiæ porcinæ lib.viij. fiat unguentum s. a.

At the end of the Pharmacopœia follows a list of the preparations from the Pharmacopœia Londinensis, which were also used. It seems hardly worth while to transcribe them here; they are seventy in all, and are for the most part the simpler and more active preparations. I found also the following entry:—

Pulvis pro dentibus S^ti^ Bartholomæi.

℞. Fol. Aquilegiæ, Cort. Rad. Capparis, Sem. Cochleariæ ana ℥ss. Rad. Ireos, Aluminis usti ana ℥iij, Mandib. Lucii, Corall. albi, Cornu Cerv. usti ana ℥ij.

What special property was supposed to reside in the pike's jawbone, I do not know, but it is included in the early official Pharmacopœias of most, if not all, the colleges.[3]

A comparison of St. Bartholomew's Pharmacopœia as given by Browne and Theophilus Philanthropos with that of the learned colleges of the same time shows, I think, that the practice of the hospital was then, as I trust it is now, not only abreast of, but in advance of, the general practice of the country. From Bernard's books it is clear that other preparations besides those mentioned in Browne's Pharmacopœia were in common use; and I find occurring from time to time Pulvis peruvianus, which I take to be bark. There is no mention of bark in Browne's MSS. Pharmacopœia, but we find an

Electuarium Febrifugium in Theophilus's copy, consisting of Peruvian bark in powder i. lb., chymical oil of cloves 16 drops, syrup of cloves a sufficient quantity to make into an electuary.

I have very little doubt that Browne himself used bark, for among his MSS. notes I found the following letter from his

[1] This reappears in exactly the same form in 1739; in 1767 the Gargarisma ad paralysia consisted of Rad. pyrethr. ℥j., Coque in aq. font, q. s. ad lib.j., Spir. sal. ammon. ℥ss. m.

[2] Empl. de minio was an official preparation of the London College.

[3] The earliest Pharmacopœia stamped with the authority of a corporate body is said to be that of Nuremberg, dated 1542. This was followed at the end of the sixteenth and commencement of the seventeenth centuries by Pharmacopœias published by the authority of the medical colleges in most European states. The earliest I have seen are those of Cologne, 1565, Augsburg, 1573, Venice, 1617, London, 1618, Amsterdam, 1636, Paris, 1639.

father, copied in Browne's own handwriting. Unfortunately no date is affixed, nor does it appear to whom the letter was addressed. Bernard's prescriptions of Pulvis peruvianus and this letter must both have preceded the publication of the "English Remedy," which was translated and published in England the year of Sir Thomas Browne's death. As the letter is interesting as showing the opinion of so capable an observer as Sir Thomas Browne on the new remedy, I insert it:—

"*Concerning ye Cortex Peruvianus, China Chini, or Quinana.*

"I am not fearfull of any bad effects from it, nor have I observed any that could clearly derive from that as a true cause, it doth not so much good as I could wish or others expect, but I lay no harme unto its charge, and I have known it taken 20 times in the course of a quartan. In such agues, especially illegitimate ones, many have died though they have taken it, but far more who have not made use of it, and therefore whatever bad conclusions such agues have I cannot satisfie myself that they owe their evell unto such medicines, but rather unto inward tumours, inflammations or atonie of parts, contracted from the distemper.

"I pray my humble service unto all our honoured friends.

"I rest your faithful friend and servant,

"Thomas Browne."

Sir R. Talbor has generally the credit given to him of being the first in England to use bark largely as a cure for agues. In 1672 he published his "Pyretologia, a Rational Account of the Cause and Cure of Agues;" but in it he carefully conceals all mention of the nature of his remedy. Talbor sold his secret to the King of France; and after Talbor's death his most Christian Majesty Louis XIV. ordered the secret remedy to be published for the benefit of his subjects. "The English Remedy," published 1682, is an anonymous translation from the French.

With the exception of the introduction of the Electuarium febrifugium, and the omission of Infusio stercoris caballini and Cataplasma hydropicum, I do not know that the pharmacy of the Pharmacopœia given by Theophilus is much in advance of that in Browne's manuscript. We do not seem to have adopted Dr. Mead's snail-water, although we did his paralytic infusion. I presume that we made use of the snail-water of the London College, for Aqua limacum or snail-water was used, as every one knows, as a diet drink in phthisis, and for much the same reasons as we now give cod-liver oil. R. Morton in his "Phthisiologia" gives several formulæ for snail-waters, and says they are to be drunk plentifully, and that even for ordinary drink, mixed with an equal quantity of milk, if the stomach will bear it. It must be remembered that all the snail-waters were made with wine or spirits of wine and aromatic herbs, and that Morton used it mixed

with a very strong infusion of capon or sucking-pig, so that, besides the snails and earthworms, it contained alcohol and meat juices.[1] Its value in phthisis was apparently undoubted, and it appears to have held at the commencement of the eighteenth century the position that cod-liver oil does now. Though we make no use of them now, we must remember that snails are still regarded as a most valuable adjunct to medical treatment in many countries, and they seem to have held their ground from the earliest days of medicine. Pliny gives a variety of methods of preparing them with and without their shells, and also discusses the virtue of those from different localities; the snails of Barbary about the quarter near Soli were the best. Pliny makes this

[1] Morton in his "Phthisiologia" * gives several different receipts for the preparation of a snail-water. The two following were what he appears to have preferred :—

Take 300 garden snails cleansed with salt, of common milk, or rather of the milk-water before described, three gallons; distil them in an ordinary still with a gentle fire, until an acid liquor begins to come off.

The milk-water was thus prepared :—

Take leaves of Maiden-hair, Colts-foot, Spotted Lungwort, Fluellin, of each three handfuls;
of Hyssop, Goat's Rue, Minth, Wormwood, of each two handfuls;
of English Saffron a dram; three nutmegs sliced; Dates, fat figs, of each a pound; of Raisins of the Sun, stoned, a pound;
let these be all cut and steeped in three gallons of new cow's milk and three quarts of Malaga wine, and distil them in an ordinary still so that half the liquor may come over; and let all that is distilled be mingled and reserved for use.

He says also—"I think the following magisterial water of snails likewise also which I use to make, is not to be despised, because it may be kept for use a long time :—

Take of new milk two gallons, distil it with Mint, Roman Wormwood, of each two handfuls to a gallon.

Then—

Take of Garden Snails, washed first in common water and then in small beer, half a peck;
of Earthworms, slit and washed, a pint;
of Angelica, a handful and a half; Agrimony, Betony, Rue, of each a handful.
Put the herbs in the bottom; upon these lay the snails and earthworms, and upon the top of all lay of Shavings of Hartshorn half a pound, of cloves an ounce, of Saffron three Drams. Infuse them in two quarts of Syder and a quart of best Malaga sack, and then distil this in an ordinary still.

These liquors must be drunk plentifully, and that even for ordinary drink, mixt with an equal quantity of milk if the Stomach will bear it, and it will quench the Patient's thirst. If you like the form of a Julep best, it may be given in the following manner :—

Take of the pig-water or the Capon-water before described a pint, of Loaf Sugar a sufficient quantity, and boyl them into the form of Syrup.

Take of the Milk-water or Snail-water a pint and a half, of the Magisterial Syrup just described, four ounces. Mingle them and make a Julep, of which let the Patient drink freely whenever he pleases.

* Translation, anonymous, 1694, p. 169.

observation about their use, which certainly is not in their favour:—

"Howbeit, as wholesome as they are supposed to be otherwise, this discommoditie is found by them, that they cause those to have a strong and stinking breath that use to eat them."—(Philemon Holland's translation.)

Neither Browne's Pharmacopœia nor the later one given by Theophilus contain any preparation of millepeds, which is somewhat singular, as we find an Expressio millepedum in the Surgeon's Book in 1767.

Millepeds[1] held their own as an officinal simple in the London Pharmacopœia until the seventh edition, 1809. Dr. Wadsworth is credited with the formula for their use given in the Pharmacopœia Pauperum, but they were held in great repute by Morton and others, especially in the treatment of asthma. If we can believe the testimony of the old physicians, there can be no doubt that millepeds were a valuable diuretic. Francis Fuller,[2] author of the "Medicina Gymnastica," a book containing much good sense, speaks of their value in dropsies, and others bear testimony to their value in various affections. On what their therapeutic virtues, if any, may depend, I do not know, as being crustacea, they are not likely to contain cantharidine or any of the other similar substances which are not infrequently present among the insecta.

Having thus very imperfectly traced the rise and development of our apothecary's shop, and brought before my readers some specimens of our earlier Pharmacopœias, it is time that I brought this paper to a close.

[1] The millepeds used at this time in pharmacy were not the same as those so termed by zoologists now. They were Onisci, familiarly known as wood-lice or sow-bugs; they are sometimes called in old books hog's-lice, under which term they are mentioned in "Saxon Leechdoms;" they belong to the class Crustacea, and are one of the few members of that class whose respiratory organs are fitted for aerial respiration.

[2] Francis Fuller, author of "Medicina Gymnastica," was not a doctor of medicine. He describes himself in his title-page as M.A., and was a member of St. John's College, Cambridge. In an appendix at the end he describes his own case; he suffered from three calamities at once—a flux, a vomiting, and the deliquiums. He considered that he was cured of them by riding. Opposite the title-page of his work is printed—"We whose names are here subscribed, having perus'd this discourse, entitled Medicina Gymnastica, &c., judge it well worthy to be communicated to the publick.

EDWARDUS BROWN, *Præses.*

Datum in Comitiis Censoriis,
Ex ædibus Nostri Collegii, Feb. 2, 170$\frac{4}{5}$.

WALT. CHARLTON,
W. VAUGHAN,
WALT. HARRIS,
JO. HAWYS,
} *Censores.*

Joh. Bateman, *Regist.*"

I hope on some future occasion to give further information on the progress of our dispensing department, and describe, as well as the imperfect materials I have as yet collected will allow, the growth and practice of our hospital during the last half of the eighteenth and the present century.

PROCEEDINGS

OF

THE ABERNETHIAN SOCIETY

DURING THE WINTER SESSION 1883-84.

October 11.

Opening meeting.

Mr. H. Trentham Butlin gave the introductory address on 'The Present and Future of the Medical Profession.'

The address is printed *in extenso* for circulation among members of the Society.

October 18.

Election of thirty-two members.

Mr. Harding showed a case of congenital ventral hernia.

Mr. Batten showed a specimen of sternum with rudimentary ribs.

Dr. Herringham read a paper on 'Aphasia.' He commenced by reading notes of several cases, comparing them with that of Lord Denman. He opened his remarks with Dr. Bristowe's picturesque description, who, in treating of this disease, says that aphasic people are in the habit of answering all questions by one or more repeated phrases, such as 'Yes,' 'No,' 'Can't afford it.' The speaker then asked pardon of the Society for a digression into the territory of metaphysics. He quoted the aphorism that 'words are wise men's counters, but the coin of fools,' and drew a slight sketch of the origin of language as expressed by symbols, and culminating in the art of printing. He explained how this system of symbolical expression had to be adapted to each sense in turn, first, probably, to hearing, then to sight, and, lastly, to touch, and how it is that the loss of the key to this great land of

unrealities accounts for the difficulties with which the study of aphasia is rife. He remarked that there are two ways of approach to this subject, namely, the mind and the body, and illustrated the steps of his argument from the cases quoted. Of the ninety cases there were forty-three recoveries, and in these only two cases said that ideas were present to their minds, but that they could not think of the words to fit them; thus proving that the mental disease consisted in the loss of word-ideation as well as of word-execution. After commenting at length upon the various symptoms and pathological phenomena shown by the subjects of this disease, the speaker concluded his paper by asking the question, 'Is the speech-centre really localised in what is known as Broca's convolution, or is it rather made up of a number of complex sensori-motor connections, intimately associated in health, and so apparently indivisible, but capable by disease of separation and morbid discontinuity?'

October 25.

Election of thirty members.

Dr. Tooth showed a specimen of congenital malformation of the heart, in which there was incomplete transposition of the pulmonary artery and the aorta, the pulmonary artery arising from the right ventricle in common with the aorta, though not from the infundibulum. There was a patent though nearly closed foramen ovale, the interventricular septum being deficient at the base. No vessel arose from the left ventricle.

Mr. Paget showed a case of a child nine weeks old, with shortening and imperfect formation of both upper limbs.

Mr. Walsh showed a specimen of congenital malformation of the vertex of the skull.

Mr. H. Campbell then read a paper on 'Habit.' The main part was devoted to proving the theory for which he contended, and which may be summed up in his definition of habit as 'the outward manifestation of a molecular change of the tissues which has become impressed upon them by the repeated operation of some agent capable of bringing about such a change.' If a change in the position of these molecules was repeatedly wrought in a tissue, this change tended to become permanently stamped upon it, and produced an alteration evident to the senses, and this he called habit.

The influence of this habituation on the grey cortical matter of the brain he believed to have reference to mind, and to belong to the department of the psychologist.

Mr. Campbell endeavoured to show how dependent reflex move-

ments were on molecular disturbances in the nerve centres. Nerve vibrations were at the bottom of every act, and such tended by frequent repetition to become partially or entirely independent of mind.

He next referred to reflex habits and to periodic habits, or those which tended to recur at rhythmical intervals. He instanced the movements of the heart and respiration, and contended that if a centre were educated to pass through the same changes at regular intervals, these changes would after a time recur of themselves. He applied the same law to cycles of development, and to periodicity in disease. Mr. Campbell enforced his theory by many illustrations taken from the natural laws.

November 1.

In consequence of the sudden death of Mr. Shuter (Assistant-Surgeon to the Hospital) the meeting of the Society was immediately adjourned.

November 8.

Election of six members.

Mr. Bowlby opened the surgical discussion on 'The Diagnosis and Treatment of Surgical Diseases of the Kidney.'

November 15.

Election of six members.

Mr. Black showed two specimens of small aneurysms of branches of the pulmonary artery.

Dr. Collins read notes of the history of five pregnancies in a case of contracted pelvis. Each had a different termination. At the first craniotomy was performed. The second was a vertex presentation with prolapse of the hand and chord. At the third, premature labour was induced at the eighth month; version and the child still-born. At the fourth, induction at the eighth month, and death of the child after birth. The fifth was a full-term pregnancy, with delivery of a living child by forceps.

Mr. Garrod read his paper on 'A Visit to the Leper Hospital at Bergen (Norway).'

The following is an abstract of the paper:—

The western coast of Norway is fringed by innumerable rocky islands, which support a scanty fishing population whose diet consists almost entirely of coarse bread and sun-dried fish.

The Gulf Stream washing the entire coast renders the climate

unusually mild for such high latitudes, and the rainfall is very great.

Bergen, the chief trade centre of this coast, is situated in the most thickly-peopled district. The town is situated upon a peninsula which juts out into the quiet waters of the fjord, and is built almost entirely of wood.

Happening to be in Bergen in July 1883 with a medical friend, the author took the opportunity of visiting its far-famed leper hospital.

Leprosy, which in the Middle Ages spread over the whole of Europe, has now died out from the entire Continent with the exception of certain outlying regions where it is still endemic. The western coast of Norway now vies with Crete for the unenviable reputation of being the chief remaining stronghold of the disease.

The total number of lepers in Norway at the present time is about 16,000, and the numbers are steadily decreasing, and it is calculated that it should become extinct in about fifty years. In the interior the disease only occurs sporadically, and in the eastern provinces is very rare, so that patients are brought from Bergen to the Christiania hospital for the instruction of the students.

The Bergen hospital contains some 200 beds and is built round a court-yard; the patients are housed in small wards, each containing four beds, which, on account of the absence of ventilation, are pervaded to a most unpleasant extent by the peculiarly disagreeable odour characteristic of the disease. The buildings consist of two wings set apart for male and female patients respectively, and each wing has two storeys.

The wards have a certain air of cosiness owing to the considerable amount of furniture which they contain. Each wing contains a large public sitting-room, where those of the patients who are able amuse themselves with light employments, the men being chiefly occupied in carpentering, the women in spinning with the old-fashioned spinning-wheel.

Owing to the absence of the medical attendant the author was not able to make as thorough an inspection as he could have wished, but was fortunate in gaining much information upon the subject at the Christiania hospital through the kindness of Drs. Gade and Vetleysen.

The author then proceeded to give a slight historic sketch of the disease from Biblical times to its prevalence in Europe in the Middle Ages, and discussed the universal belief in the highly infectious character of the disease, and the means adopted for the isolation of its victims. He gave, moreover, some account of its geographical distribution at the present day, dwelling especially

upon its remaining European strongholds, viz., Iceland, Norway, Portugal, the Riviera, and the Baltic provinces of Russia, as well as in Turkey and Greece.

The disease is characterised by the formation of nodes, especially in the cutaneous and nervous structures, which the microscope shows to consist of cells of various sizes enclosed in a network of corium. In the nerves they form fusiform swellings where the nerve is more than usually exposed. The pressure of the deposit causes atrophy of the nerve fibres; the cutaneous nodes are apt to break down, forming ulcers. A bacillus has been found in the morbid nodes, resembling somewhat the tubercle bacillus, but requiring for its demonstration a different method of staining.

After feelings of general malaise lasting for some time, patches of redness, in which the skin is tender and swollen, appear in various parts of the body, which disappear in a few days, leaving their sites pigmented and anæsthetic for a time; when the patches become more persistent, the disease is described as macular leprosy. Later the disease assumes the tubercular or anæsthetic form, according as the lesion affects chiefly the skin or nerves. In the anæsthetic form muscular wasting following the distribution of the affected nerve, often the ulnar, is succeeded by hyperæsthesia, and later by anæsthesia of the part. The fact that the cutaneous nerves are chiefly affected is the reason why the anæsthesia does not follow the distribution of particular nerves. Bullæ form, which break, leaving sluggish ulcers; the cornea is apt to become opaque, the hands claw-like. Spontaneous amputation of digits or of an entire foot or hand is common. Charcot attributes this to trophic lesions. In the tubercular form the face assumes a leonine expression from the thickening of the eyebrows and lips by tubercles and the falling off of the hair, *unde nomen* 'leontiasis;' the cutaneous tubercles are apt to break down, leaving leprous ulcers. The average duration of tubercular leprosy is eight or nine years, that of anæsthetic sixteen or seventeen years. Death ensues from intercurrent disorders or from asthenia. Treatment is most unsatisfactory; the most promising drugs are Chalmoogra oil and Jurgun balsam, the latter being apparently of real service in tubercular leprosy.

The ætiology of the disease was discussed at some length, with especial reference to the Fish theory, which, although it is not able to explain all the facts, is the most satisfactory of those hitherto advanced.

November 22.

Mr. Habershon showed a case of Molluscum fibrosum.

Mr. Moberly showed a specimen of a Graafian follicle of pregnancy.

Mr. Trinder, a specimen of cancerous stricture of the œsophagus, and Mr. Harding a specimen of recto-vesical fistula, arising from simple stricture.

Mr. Andrewes read a paper on Ferments. Short abstract of the paper :—

When a distinguished physiologist sums up his views in the words, 'Ferments are the universal chemical agents of the living organism,' it is time to consider what the exact meaning of the term 'ferment' may be. The history of the term shows that it was first used in a vague manner to express the agent of any little understood chemical change. The distinction into organised and unorganised ferments was not made till this century, and the gulf between them has now so deepened that it is questionable whether we should retain a common term for both. It is practically impossible to frame a definition which shall strictly include the two. As regards unorganised ferments, it is no explanation to call their action a process of catalysis. The best chemical illustration of their action is perhaps the process of continuous ætherification. As regards organised ferments, the vitalist theory supported by Pasteur is now generally accepted, which explains their action by a sort of parasitism which alters the media in which they live. Yeast, for example, unable to obtain its oxygen from the air, takes it from the sugar, the molecule of which falls to pieces in consequence.

Under one term, 'ferment,' originally applied when little was known as to their action, two essentially distinct classes of bodies have been confounded ; on the one hand, organised living beings acting in virtue of their nutritive irritability ; on the other, not-living substances, acting probably in a purely physico-chemical manner. If a yeast cell is to be called a ferment, why not nearly every living cell ? why not every living organism up to man himself ? The question is one of degree only, not of kind. Therefore either, with Claude Bernard, we must extend the term fermentation to the nutritive phenomena of every living cell ; or, as I would suggest, drop it altogether as a scientific term, and apply the term zymoses to the well-defined group of unorganised ferments.

In the second part of his paper Mr. Andrewes discussed the part played by unorganised ferments in the living organism. Digestive ferments fall into certain groups:—(1) *Diastases,* charged with the conversion of starch into sugar ; (2) *Invertin,* which changes cane-sugar into grape-sugar ; (3) *Emulsin,* which breaks up fats ; and (4) *Proteolytic* ferments. He commented on the importance of taking the factor of 'time' into consideration in artificial digestion ex-

periments. He mentioned also the rennet ferment, and other less known ferments in the animal and vegetable kingdoms.

Recent researches have made it possible to exhibit the evolution of the digestive process in passing up the animal scale, from the primitive food-vacuole of the amœba up to the complex division of physiological labour seen in the mammal. Lastly, reference was made to recent observations on the still unsettled action of the ferment concerned in the coagulation of the blood.

November 29.

Election of two members.

Letter read from Mr. Shuter's father, thanking the Society for their letter of condolence.

Mr. Batten showed a case of subastragaloid dislocation.

Mr. Paget showed a case of Molluscum contagiosum. Mr. Paget then read a paper on 'Burns and Scalds.'

The author thought it was not necessary to make any distinction between burns and scalds, as their course, complications, sequelæ, and treatment, were the same. He also made no classification of degree. As regards their pathology, he remarked that they differed from other injuries, in that the surface is suddenly and violently killed, but the deeper parts not even bruised. After this, attention was drawn to the slowness of healing, and also how a burn at first sight appears less severe than it really is. Next he described the contraction of tissues that takes place, but maintained they did not contract more than other wounds. Mention was made of the general consequences, including shock, pain, fright, failure of reaction, internal inflammation, suppression of discharge, ulceration of the duodenum (together with ulceration in the other parts of the small intestine), and convulsions and vomiting in children. The author concluded with various modes of treatment, laying great stress on brandy, opium, and careful nursing.

December 6.

Election of member.

Dr. Collins showed a specimen of a uterus from a case of hæmorrhage from retained decidua.

Mr. Cresswell read a paper on 'Hydatids.' He described the nature and life-history of the tænia echinococcus, including the formation known as the hydatid cyst. The embryo was believed usually to bore its way through the intestinal walls, and to enter the portal vein, and hence its commonest situation was the liver. It might, however, pierce any of the solid tissues, and is, in fact, found in every organ of the body. The nature of the fluid of these

cysts was neutral, colourless, of low specific gravity, with abundance of chloride of sodium, but no albumin. The daughter cysts were of two kinds, fertile or non-fertile.

A case was mentioned of hydatid of the lung to illustrate the large size to which the cysts may grow. The whole of the right lung in this case was completely destroyed.

As a rule, symptoms were only produced by the large size of the tumour, or by the interference of the functions of the organ by pressure. A tumour in the neighbourhood of a joint or of the liver unaccompanied by pain or tenderness should always be regarded as a possible hydatid. In some cases rupture of the cyst took place. In one a tumour above the pubes was at first thought to be a distended bladder, but not being emptied by the passage of a catheter, was tapped. The patient developed the symptoms of acute peritonitis, and died in two days. The post-mortem revealed a hydatid cyst in the pelvis, which had ruptured into the peritoneal cavity, but whether prior to the puncture or no was not clear. In a second case the cyst opened into the bladder, and hydatid cysts were discharged per urethram.

Mr. Cresswell then commented upon hydatids of the liver as a form of the disease most frequently met with. Treatment was generally called for in these cases either from the large size of the tumour, or from symptoms of pressure (jaundice or ascites). In some cases the cyst may rupture of its own accord or by violence; in others, suppuration is not uncommon. The cyst may under some circumstances become adherent to almost any organ in the abdominal cavity. It may even adhere to and perforate a bronchus and discharge by the mouth.

December 13.

House-Physicians' Evening.

Mr. Drage showed a specimen of Colles' fracture from a patient who died from other injuries received at the same time.

Mr. Lewis Jones showed the case of a child, illustrating the results of long-standing empyema. The chest had fallen in in consequence of the inability of the lung to expand and from the long-continued effects of atmospheric pressure.

Mr. Walsh showed a specimen of a cat with a congenitally incomplete diaphragm on the left side. The animal had been observed during life to breathe with great difficulty.

Dr. Collins showed an instrument designed by himself for washing out the bladder. The apparatus was simple in detail, and obviated the risk of the introduction of air. It consisted of

a two-wayed tap, to which was attached a syphon-enema of the capacity of an ounce and a half at one end, and at the other a flexible catheter. A waste tap inserted into a third tube completed the arrangement.

The subject chosen for discussion was pleural effusions.

Mr. Robert J. Collyns divided the thirty cases of pleural effusions that he had received into Dr. Andrew's wards into three classes:—1. Effusions of serous fluid. 2. Effusions of pus—empyema. 3. Effusions of air—pneumothorax.

With regard to serous effusions, the author first pointed out that the pleural cavities are two of the large lymph sacs of the body, and that fluid exuding into them is removed, in part at least, by a pumping action in the movements of respiration, and that if these movements are arrested (as they will be in the case of considerable effusion) the fluid in the cavity is no longer drawn up into the lymphatics during inspiration, and forced onwards by the movements of expiration: this may tend to cause effusion or to hinder its absorption. He then commented on the frequency of the difficulty of diagnosis between effusions of fluid and conditions of solid lung, and advised that in cases of doubt a fine trocar attached to a syringe should be used without hesitation. If the trocar enters the lung it does no harm.

He then passed on to the treatment, and summed up in the following sentences:—'So long as fluid (the result of inflammation of the pleura) is being poured out and its quantity is not excessive, operative interference for its removal only does harm. Moreover, it is wrong to interfere until all inflammatory action in the pleura has ceased, for by removing the fluid and bringing the irritable pleural surfaces together it is probable that inflammation will be regenerated and more fluid effused.

Unless there be indications for earlier interference, such as an excessive quantity of fluid which so embarrasses the circulation as to be dangerous to life, or any complication of the lungs, such as inflammation, œdema, or great collapse, I would make it a rule to wait a week after the fluid had ceased to be effused. If by that time the fluid was decreasing, I would leave it to be absorbed; but if it remained stationary or the process of absorption flagged, I would draw off the whole or part of it, being guided in this respect by the amount of pressure necessary for its removal; for it is well known that the removal of only a portion of the fluid may be followed by rapid absorption of the remainder.

With regard to purulent effusions, Mr. Collyns first dwelt on the difficulty of diagnosis between serous and purulent effusions, and again advised the use of an exploratory puncture. He contradicted the theory of Baccelli, that clear serum conducts whis-

pered bronchophony well, and pus little or not at all. He narrated cases which had been treated in different ways, and explained Dr. Hensley's method of washing out the pleural cavity. He ventured to make the following suggestions as regards treatment:—'A free opening should be made—1. Whenever an empyema is "pointing." 2. Whenever it is of so large amount or of so long duration as to render it probable that the lung, from extreme collapse or adhesions, cannot expand to take the place of the pus and fill the thorax. 3. Whenever the pus is ascertained to be fœtid. 4. In most cases of empyema in adults in whom the chest-walls are not capable of collapsing readily. 5. In cases where the health and condition of the patient are so bad as to render it probable that pus will continue to form for some time after the bulk is removed.

For the success of the treatment by aspiration or washing, it is essential that all the pus shall be removed, and that the two surfaces of the pleura shall come in close contact with one another. It follows, then, that those plans are most likely to suceeed in cases where the effusion has not existed long, where it is of small amount; in children and young persons, in whom the chest-walls can readily recede to meet the expanding lung, and in persons whose health and condition is such as will allow the process of adhesion between the two pleural surfaces to begin at once, and to proceed with expedition.

The objection to aspiration is the difficulty of removing all the pus; the residue, besides preventing adhesion of the pleural surfaces, acts as a lasting source of irritation, and provokes further effusion. This difficulty is avoided by Dr. Hensley's method of washing. By this means all parts of the cavity are irrigated with antiseptic solution, and all the pus is removed, so that the two clean surfaces are brought together. It has the disadvantage, however, that it is rather a tedious process, occupying from one to three hours, and it is sometimes necessary to keep the patient under chloroform for an hour or more, whereas aspiration is done in a few minutes. Both these plans have the great advantage that no further interference is needed unless the fluid re-collect, whereas with a free opening the drainings often prove a source of great distress to irritable and nervous children, though this objection may be lessened by the use of Listerian dressings, which may need changing only once in two or three days.'

As regards pneumothorax, Mr. Collyns said he had observed some excellent results by allowing the air to escape through a fine trocar and india-rubber tube, the end of which was placed under water. 'For the success of this treatment,' he said, 'it is necessary that the lung is capable of expansion, and that the aperture in the lung through which the air escaped into the pleura shall be

closed. For the first of these reasons the operation should be performed early, *i.e.*, during the first few days, and if the pleural cavity is refilled, the operation should be repeated a few days later, in the hope that by that time the hole in the lung will be closed.'

Mr. Cresswell asked the indulgence of the meeting, owing to the disadvantage under which he stood in having so recently replaced Mr. Morton, whose lamentable illness prevented his presence at the discussion.

He alluded specially to those forms of serous effusions in which there is very slow absorption and a high temperature throughout, usually in the case of small effusions and those confined to the base or lower half of the chest. In such the temperature was normal, or nearly so, by day, but tended to rise 2 or 3 degrees at night. The question arose whether the hectic temperature was due to the effusion becoming purulent or to phthisis. Some of the cases do terminate in phthisis, and some are probably due to tubercular pleurisy.

Notes of two illustrative cases were read. Exploration by means of a hypodermic syringe was recommended. Mr. Cresswell concluded by a reference to the treatment of these cases.

Mr. Lewis Jones dwelt first upon the symptoms of serous pleural effusions, notably with pain, also with the physical signs of friction and bronchial breathing. The diagnosis was sometimes difficult between pleural effusions and phthisis, since in the former there was frequently bronchial breathing, hectic fever, and emaciation, and since phthisis was frequently accompanied by effusion. Again, diagnosis was sometimes difficult from cancer of the lung, obstructed bronchus, hydatid of the lung, or even hepatic tumours. Puncture was most valuable as an aid, but was not absolutely reliable. It sometimes failed to obtain fluid.

The treatment of effusion was threefold; by aspiration, on general principles, and by saline purgatives.

With regard to purulent collections, the fluid might be purulent from the first or become so after tapping. It may be also of pyæmic nature, following measles. In the small and multiple effusions (loculated empyemata) the fluid was probably purulent from the beginning. A case of empyema following pneumonia, in which the pus was expectorated, was then referred to, and the treatment of empyema was fully discussed.

Mr. Berry gave a short summary of the cases which had come under his care during the short time he had been house-physician for Dr. Duckworth. He related in detail a case of large abscess of the liver which simulated empyema and had been mistaken for it during life. He also read short notes of three cases of traumatic pneumothorax, two of which had ended in recovery.

January 10.

Mr. Paget showed a specimen of a sarcomatous tumour 14 inches in circumference, removed from the humerus of a man. Also specimens of two granular kidneys with extreme contraction.

Dr. Robert Jones read a paper on 'What Constitutes Insanity?' In the first part of his subject the author analysed the meaning of the word *mind*, and, after criticising several definitions, adopted the positive one of the enumeration of its attributes, viz., Feeling, Will or Volition, and Thought or Intellect. As the most important of these, he considered more especially the emotions and their influence on character, for when not in equilibrium with the other constituents of mind they became either eccentricity or insanity. He pointed out the close analogy between genius and eccentricity.

Taking next the question of 'Insanity,' Dr. Jones proceeded to show how the word was used, having reference only to those who are under certificates, although, in the opinion of eminent authorities examined before a Royal Commission to inquire into the working of the lunacy laws, there were many persons at large who were insane. In their opinion, also, the great proportion of suicides committed were due to insanity, and could have been prevented had the persons been placed properly under restraint. A definition of insanity was therefore most important, but inasmuch as science is progressive, a definition of the present will not be a definition of the future. After discussing various views of insanity and reading short extracts from several authorities, Dr. Jones stated his definition to be 'any defect of mind on account of which an individual is unable to fulfil the requirements of society.'

Referring finally to classification, Dr. Jones suggested that of mania or exaltation, melancholia or depression, dementia or absence of the mental faculties, idiocy (with or without epilepsy), and general paralysis of the insane, the latter disease being sketched throughout.

January 17.

Dr. Hurry read notes of a case of puerperal fever.

Mr. Habershon showed a case of pseudo-hypertrophic paralysis.

Dr. Collins read notes of a case of Placenta prævia.

Mr. Womack contributed a paper on 'The Applications of Electricity to Medicine.'

The paper considered almost exclusively medical and nervous

diseases, taking separately the value of electricity in diagnosis and in treatment.

The behaviour of normal muscle and nerve to galvanic and faradic stimulation was first considered. Stress was laid on the desirability of ascertaining to what extent the reaction of an affected muscle corresponded with Pflüger's contraction law, which could be attained by placing (in the employment of the interrupted continuous current) the anode over some 'indifferent' part, *e.g.*, the sternum, and the kathode over the muscle or nerve whose reaction is to be investigated, and subsequently reversing the positions of anode and kathode. The behaviour of normal muscle was next discussed (α) with a 'weak current,' (β) with a current of 'medium strength,' (γ) with a 'strong current.' The three methods of faradism were then discussed, and since the currents are alternating, the necessity for distinguishing anode from kathode disappears, and the reaction in an affected tissue must be sought in the direction of quantitative or qualitative alteration. These alterations were taken seriatim and the different diseases tabulated in which they respectively occurred, which may be thus summarised :—

A. Alteration slight in amount to galvanism and faradism in	Paralyses of cerebral origin, *e.g.*, hemiplegia in cerebral tumours, after embolism or hæmorrhage ; also in chronic myelitis, in rheumatic facial paralysis, and in slight traumatic paralyses.
B. Simple quantitative changes	(α) Increase is rare, but met with in the early stages of some paralyses, *e.g.*, hemiplegia ; and usually contra-indicates electrical treatment. (β) Decrease met with in progressive muscular atrophy, at a late stage of bulbar paralysis, in some atrophic forms of spinal paralyses, &c.
C. Quantitative and qualitative changes	=The 'reaction of degeneration,' occurring in the spinal paralysis of children, in paralyses from pressure of tumours of nerve trunks, paralysis from neuritis, in all paralysis of traumatic origin, *e.g.*, crushing of nerves, and in lead-paralysis.

This reaction was fully discussed, and distinguished according as the current was sent into the muscle or into the nerve, and the explanation offered by Neumann brought forward. The more important nervous diseases were then separately dealt with in the paper, and their special electrical reaction tabulated thus :—In *anterior poliomyelitis*, complete well-marked reaction of degeneration, loss of excitability of motor nerves, elevation of muscular excitability to galvanism ; in *lead-paralysis*, similar reactions ; in

traumatic and peripheral paralyses, well-marked reaction of degeneration; in *progressive muscular atrophy*, the reaction is various; in *amyotrophic lateral sclerosis*, normal nerve excitability, increased reaction to galvanism in muscles; in *hemiplegia*, at first increase in galvanic and faradic contractility, later normal, finally both progressively decline; in *paraplegia*, if only a segment is diseased, contractility is at first normal, and after a time diminished when the muscles have been impaired by long disuse; but if the cord is extensively affected, the muscles related to this portion of the cord are from the first possessed of diminished contractility; in *hysterical paralyses*, normal contractility, but, according to Duchenne and Eulenberg, diminished muscular sensibility, this latter being disputed by Wood of Philadelphia.

The paper next touched upon the treatment of disease by electricity, taking first diseases of the spinal cord. That the cord itself may be reached by a galvanic current is shown by the quieting of strychnine and other toxic convulsions accompanying its use, and also by experiments of Fick, Dittmar, and Nobili. The importance of employing the uninterrupted galvanic current was next dealt with, also the necessity, as shown by Ohm's and Joule's laws, for having electrodes of considerable surface, of at least sixty-five square centimetres, or ten square inches area. The different methods of application of the electrodes, according as the spinal lesion is circumscribed or general, was discussed; and the treatment of the most important diseases described in detail. The following is a brief abstract:—In acute anterior poliomyelitis, to direct efforts to diminution of the inflammation in the first stage, but in the second, galvanic treatment of the cord, and galvanic or faradic treatment of the muscles. Angina pectoris has been most efficiently treated by faradisation of the nipple and præcordium, several cases being recorded by Duchenne. According to Eulenberg, faradisation is inadmissible in that form of angina due to vagus irritation. In exophthalmic goitre, galvanisation of the cervical sympathetic by a feeble current has been followed by good results in the hands of Eulenberg, Von Dusch, Choostek, and especially of Meyer. In chorea, the stated successes require cautious acceptation, but after elimination of all doubtful cases in which other remedies than electricity have been employed, some success has followed various methods of its employment. The action of the remedy in progressive muscular atrophy, hysteria, muscular pseudo-hypertrophy, in which there has been success, and in other diseases in which success has been doubtful or absent, was also spoken of. Reference was made to the desirability of ceasing to employ the terms 'weak,' 'strong,' &c., in connection with electric currents, and of the gain that would be derived if the

currents used in treatment were measured in ampères; as, for example, by a modification of Thomson's galvanometer for slowly interrupted galvanic currents, a dead-beat galvanometer for rapidly interrupted galvanic currents, and of some form of 'dynamometer' for faradic currents, such as that brought out by Dr. Stone, and described in 'Nature' of November 1882.

Finally, the applications of electricity to other purposes were alluded to, namely, galvano-puncture, the galvano-cautery, in feigned diseases, in alcoholic intoxication, and in the cure of nævus.

January 24.

Mr. Santi showed a specimen of a case of compound comminuted fracture of skull of a very extensive nature. He also showed a case of small tumours of both masseters.

Mr. Paget showed a case (for Mr. Habershon) of so-called Charcot's joint-disease, occurring in a woman of 48. Both shoulder-joints and both knee-joints were affected.

Mr. Berry showed a case of distorted knee-joint occurring in the right knee of a lad aged 19. The nodules of bone about the joint were very large. He also showed a case of spontaneous dislocations of several joints of the upper extremities, attributed to the results of a pyæmic affection, from which the man had suffered.

Mr. Hurry showed a specimen of goitre occurring in a fœtus.

Dr. Howe then read his paper on 'Locomotor Ataxia.'

As a definition of the disease he gave the following:—'That by locomotor ataxia is understood a peculiar affection characterised by the progressive loss of the faculty of co-ordinating movements, and apparent paralysis contrasting with the integrity of muscular power, generally commencing in the lower extremities with a tendency to involve the upper and other parts, and in the large majority of cases associated with sclerosis of the posterior columns of the cord or portions of the same.'

As regards the ætiology, he thought it was most common between 20 and 40 years of age, and more frequent in males than females. It would be found that nervous diseases of the same character generally run in the family. Its development was very slow. He divided the disease into three periods: first, 'lightning pains;' second, 'motor incoördination;' third, 'paralytic.' The speaker then described the symptoms, beginning with the eye, mentioning strabismus, amaurosis, and absolute blindness. He entered deeply into the loss of co-ordinative power, showing how the patient precipitates himself forward, and does not roll from side to side; how he can continue walking on when once started, but if he stops, finds it difficult to re-start.

Allusion was next made to the anæsthesia, which comes on later in the disease, and the loss of reflexes. Perforating ulcer he considered a rare symptom, but a very indicative one. A short account of the arthropathy of the disease was also given.

Finally, the subject of treatment was taken in hand. He strongly advised tonics, galvanism, highly nutritious diet, early hours to bed, mercury, iodide of potassium, arsenic, belladonna, and, lastly, nerve-stretching, especially the sciatic, which he said might be done in two ways. Either by cutting down on the nerve and stretching it, or by flexion manipulation round the head of the femur. In conclusion a few remarks were made on the pathology of the disease.

January 31.

Mr. Jones showed a series of microscopic specimens of uric acid crystals, and briefly demonstrated the various modifications of the simple and commonest type (the lozenge-shaped crystal), and described the manner in which he believed them to be formed.

Mr. Batten showed a case of a printer's boy who had recovered in the hospital after a multitude of injuries—fractures of both femora and of both humeri, his right forearm torn off and both bones of the left fractured, also dislocation of the sternal end of the clavicle.

Mr. Gardner showed a specimen of dentigerous cyst.

Mr. Paget showed drawings to illustrate the formation of such a cyst by a dropsy of the sac of the permanent tooth ; also a case of a peculiar secondary syphilitic eruption.

Mr. Lyndon read a paper on medical practice in the colonies. He began by referring to the present overcrowded state of the medical profession at home as amply justifying the choice of his subject, at the same time he deprecated wholesale emigration to the colonies on account of there being only room for a limited number of medical men. In explaining the heading of his paper he stated that by the 'Colonies,' he referred especially to New Zealand and Australia, but that he also proposed to touch on South Africa, Canada, British Columbia, and also to make a few remarks on China. Recommendation was made to two classes of men to emigrate. Firstly, men in a delicate state of health, particularly those suffering from chest complaints; secondly, well-qualified men with limited means. Quotations from an old 'Bart's' man's letter were made to prove how often appointments were to be got immediately upon arrival.

The speaker proposed the following questions as likely to occur to any one about to emigrate :—(1.) What sort of practice am I about to engage in? (2.) What is the scale of fees? (3.) Is

living cheap or dear? (4.) What must I take with me? (5.) How am I to get there? In answer to the first question, pure surgeons and pure physicians were almost unknown; the practice was chiefly medical. As regards fees, the salary of a house-surgeon varied from £150 to £300, including board and residence; and in general practice always large, and that a man in his first year may expect to make £500. He concluded by advising men to visit the colony before settling.

February 7.

Mr. R. J. Collyns showed microscopical specimens of the spinal cord of a case of amyotrophic lateral sclerosis. Described in full in the Hospital Reports, vol. xix. p. 349.

Dr. Howard Tooth opened the medical discussion on delirium tremens.

February 14.

Dr. Collins showed a case of syphilitic iritis.

Mr. Santi showed a man with congenital absence of ribs over the region of the heart. The third, fourth, fifth, and sixth ribs were absent, and part of the second.

Mr. Paget showed a cystic tumour removed from the flexor tendon of a boy's finger.

Mr. Berry then read a paper on 'Strangulated Hernia.'

The author began by referring to the high rate of mortality after operations for strangulated hernia, and showed that this was 43 per cent. out of 940 cases taken from the Reports of St. Bartholomew's, Guy's, and St. Thomas's Hospitals. He then briefly defined what he meant by a strangulated hernia, and explained the difference between it and an incarcerated hernia.

Speaking of taxis, he condemned any attempts to push the hernia back into the abdomen, but recommended that it should be lifted up and drawn gently away from the abdomen, in order that the neck might be straightened, and the hernia more easily be reduced.

He alluded to the postural method of reducing hernia by putting the patient on his back, with his buttocks high in the air, and also to a method of pulling a hernia back into the abdomen by one finger in the vagina, and a hand on the front of the abdomen.

He thought that grave mischief was far too commonly done by the injudicious use of taxis.

He thought a warm bath useless for femoral hernia; for other hernias he thought it often of much use. He recommended that no taxis should be employed in the bath, but rather that the

patient should be kept warm in bed for an hour before any further attempts were made.

Passing on to consideration of the operation for hernia, he was of opinion that harm is too often done by useless attempts at reduction before the sac was opened.

He deprecated the use of the so-called antiseptic method of operating; for the wound he preferred the simplest dressing of oiled lint, which disturbed the patient least.

He recommended that bad cases of hernia should, after operation, be fed exclusively by the rectum by means of artificially digested foods, since by that method more complete rest is given to the intestine than by the ordinary method of feeding by the mouth.

He condemned the early use of purgative enemata, and considered that the bowels ought not to be made to act for ten days or a fortnight unless local signs of distress were present.

He concluded by exhorting his hearers to a careful study of the details of all cases of strangulated hernia.

February 21.

Dr. Hurry showed a specimen of missed abortion.

Mr. Frames read a paper on 'The Progresses and Successes of Medical Treatment.'

He commenced by excluding hygienic and prophylactic treatment. Having alluded to the necessity of a thorough knowledge of our power in fighting with disease, he briefly considered the indications for treatment, and our ability to fulfil them, reserving till a later stage an estimate of our powers as regards the cure of disease.

He next asked the question, 'What degree of success may we hope for in the future greater than we have now achieved, and in what direction must we look for the attainment of this success?' In attempting to answer this question Mr. Frames gave a short sketch of the history of three of the great tendencies in medicine—supernaturalism, dogmatism, and empiricism. Dealing especially with empiricism, he showed, in spite of its dominant influence in medicine in the past, how small an amount of success it had achieved, and how many mistakes it had caused.

He then contrasted empirical successes with the successes of a fourth and, as he held, the greatest tendency in medicine, that of 'rational therapeutics,' and gave a list of twelve drugs which were of substantial use in the direct cure of disease. Of these successes he gave two to empiricism and five to rational therapeutics, and hence he considered that to rational therapeutics we must look for

all future progress. But at the same time he considered that all discoveries so made should be tested by means of rational empiricism, *i.e.*, by statistics and scientific observation of individual cases.

February 28.

Mr. W. T. Gardner showed a specimen of sacculated rectum, producing during life the symptoms of intestinal obstruction; also a specimen of polypi of the rectum.

Mr. Gay showed a case of scleroderma in an infant a month old.

Dr. William J. Collins read a paper on 'Specificity and Evolution in Disease,' which is published as a pamphlet by Messrs. Lewis & Son, Gower Street.

March 6.

House-Surgeons' Evening.

One member elected.

The subject chosen for discussion was diseases of the bladder.

Mr. Brinton opened the subject by stating that the subject had been divided into five parts—classification, pathology, diagnosis, prognosis, and treatment. He classified them as (1.) Cystitis, (2.) Tumours, (3.) Malformation, (4.) Tubercle. He subdivided cystitis into four classes—(*a.*) Irritating influences due to calculus, lithotrity, &c.; (*b.*) Extension of gonorrhœa; (*c.*) Result of spinal injuries; (*d.*) Mechanical obstruction. Tumours were divided into simple and cancerous.

Mr. Trinder described the pathology of the diseases, and showed a number of specimens to illustrate his remarks.

Mr. Batten, who spoke on diagnosis, mentioned the uses of palpation, percussion, and examination per vaginam and per rectum, and also by means of the finger in the bladder after median lithotomy, also of the uses of the sound, endoscope, catheter, &c.

Mr. Willett took prognosis; as regards cystitis, if due to stricture or enlarged prostate, bad, but if due to presence of foreign bodies, good; also if due to gonorrhœa, good, but bad if owing to injury. With regard to tumours the diagnosis was always bad; to tubercle not bad in itself, but on account of the disease of the neighbouring organs. In malformations it was good.

Mr. Tait in speaking of treatment divided it into those cases that are capable of cure, and those of only relief. He strongly advocated the use of washing out the bladder, passing a soft in-

strument, and making use of a long tube and funnel, but by no means using syringes.

After the discussion the Secretary read the names of candidates proposed by the Committee for the various offices of the Society during the ensuing year.

March 13.

Mr. Paget showed a case of cystic tumour of the neck.

Mr. Batten showed a similar tumour occurring in the abdomen of a child.

Mr. Berry showed a case of perforating ulcer of the foot associated with locomotor ataxia; and

Mr. Batten a similar case following spinal disease.

Two auditors for the year—Mr. Campbell and Mr. Frames—were then appointed.

The names of candidates for the offices of the ensuing year, proposed by other members than those of the committee, were read out.

Mr. Davy read his paper on 'The Relation of Bacteria to Disease.'

He began by stating that micro-organisms affecting diseased bodies of men and animals may be divided into two main classes, viz., phytomicrobes and zoomicrobes. The former group may be classified as schizomycetes and mycomycetes. After an allusion to Ferdinand Cohn's identification of the true nature of schizomycetes, the author referred to speculations concerning spontaneous generation as unconfirmed by further knowledge. The peculiarly resistent nature of bacteria was then pointed out, and the fact that their individual metabolism brings about certain chemical and physical changes in their environment. The case of Leptothrix buccalis which metabolises calcareous matter and cellulose, forming starch within its mycelial cells, was alluded to; and also another schizomycete which forms carbonate of lime calculi in the bladder. Pasteur's metabolic theory of fermentations was stated to be correct and valuable, and the distinction between putrid and chemical fermentation pointed out, the former produced by the metabolism of schizomycetes, the latter by the mycomycetes. The schizomycetes are of various chief forms, called rod-like bodies and micrococci. They are stages of development of the same organism. The specific microbes had been found in connection with leprosy, syphilis, and, most important of all, tubercle. Among the typhoid zymotics mention was made of the intermittent fever characterised by presence of Spirillium obermeieri.

In the last group, the diseases may be divided into (1) affec-

tions of the mucous membrane, (2) affections of the skin, (3) diseases of the deeper tissues. The author then explained how certain flagellate infusoria have been found to be connected with goitre when present in drinking-water. Allusion was also made to efficacy of substances containing a benzine radical in the treatment of many of these diseases. Zymotics were then classified as (1) leucocytoses, (2) diseases characterised as typhoid, (3) acute exanthemata, (4) general acute infectious diseases without localisation, (5) local infectious diseases of which only a few organs are the seat of infection. The pathology of septicæmia and diphtheria were shortly discussed. Under this heading ulcerative or malignant endocarditis was alluded to. Rheumatism was found to be connected with the presence of a lower organism which had been cultivated apart from the body. The following questions the author thought might be raised for discussion: (1.) Is the evidence sufficient to prove that microbia are the cause, whether exciting or primary, of these diseases? (2.) If so, how do you solve the problem of heredity? (3.) Remembering that inflammation is more often caused by exciting causes, and degeneration by spontaneous divergences from the normal standard of nutrition, are you inclined to connect the latter with the former? and if so, how?

March 20.

Annual general meeting.

The accounts of the Society were audited.

Messrs. Garrod and Spicer having been appointed scrutineers of votes, the election of members of committee for the following year then took place. The ballot resulted as follows:—*Treasurer,* Mr. Savory; *Presidents,* Dr. W. J. Collins, Mr. T. W. Shore; *Vice-Presidents,* Mr. R. J. Collyns, Mr. Harding; *Hon. Secretaries,* Mr. Crouch, Mr. Lyndon; *Additional Committee-men,* Mr. F. Andrewes, Mr. Huxley.

DESCRIPTIVE LIST

OF

SPECIMENS ADDED TO THE MUSEUM

DURING THE YEAR 1884.

SPECIMENS ADDED TO THE MUSEUM

During the Year ending October 1, 1884.

BY

D'ARCY POWER.

DURING the past year Mr. Bowlby has resigned the post of Curator of the Museum. He is therefore only responsible for the descriptions of those specimens which were added during the months October to February. The second volume of the Catalogue has been published; it completes the work, and the Museum is now catalogued throughout. Mr. Willett has kindly presented two cases of instruments which possess unusual interest for all members of the Hospital; the one is a dissecting case used by John Abernethy when a student; the other is a trephine which was employed by the same surgeon in his maturer years. Both cases had belonged to Mr. Thomas Wormald, after whose death they came into the possession of Mr. Willett. Two cases of surgical instruments have been placed on the floor of the Museum by Messrs. Arnold and Messrs. Ferguson, to enable students to become familiar with the appearance and names of the commoner implements of the surgeon's craft.

SERIES I.

DISEASES OF THE BONES.

119b. A Femur which has been affected with rarefying osteitis. The epiphysis has undergone less change than the diaphysis. New bone has been deposited on the outside of the shaft.

152a. The Lower Jaw of a Child which has undergone acute necrosis of the central portion. On each side the section has been made through healthy bone. As a result of the necrosis the teeth have dropped out.

For details of the case see *Lawrence Ward Book* for February 1884, under the name Amelia Simmonds.

288a. Lower end of the Radius, to show the enlargement characteristic of rickets.

347a. Radius and Ulna, with a deposit of newly-formed bone, resulting from syphilitic periostitis.

350a. Part of the Skull of a Child with natiform protuberances. (In Case F.)

For an account of the case by Dr. Norman Moore see the *Pathological Society's Transactions* for 1884, p. 282.
A photograph of the skull is preserved, Series lvii., No. 34a.

360a. An Exostosis growing from the right cribriform plate of the ethmoid, close to the base of the crista galli.

Presented by C. B. Lockwood, Esq.

429a. Section of a large Enchondroma, $4\frac{1}{2}$ inches long and 3 broad, removed from the anterior surface of the middle third of the femur of a lad. Externally the tumour is irregularly nodulated; the cut surface is of a bluish white colour, and scattered throughout the growth are small masses of calcareous material.

517a. Vertebræ infiltrated with a small round-celled sarcoma.

A section is preserved, Series lv., No. 11a.
For details of the case see *Mary Ward Book* for 1884, under the name M. A. Clark, and a paper by H. L. Jones, Esq., in the *St. Bartholomew's Hospital Reports* for 1884, vol. xx. p. 225.

539a. A Dentigerous Cyst. A part only of the cyst-wall has been preserved; but attached to its inner surface may be seen a permanent central incisor. A portion of the bone and of the cyst-wall attached to it is suspended in the upper part of the bottle.

From a boy aged 8 years.

SERIES II.

DISEASES OF THE JOINTS.

645a. The Hand of a Woman who during life exhibited a marked instance of "Heberden's nodes." The terminal phalanges are united by bony anchylosis. (In Case G.)

Casts of both hands are preserved, Series lvi., No. 23b., and a drawing in Series lvii., No. 468c.

669a. Humerus and Scapula, showing to an extreme extent the changes which take place as a result of rheumatoid arthritis. The glenoid cavity of the scapula is convex at its lower part, whilst the upper portion is deeply grooved and its margin is "lipped." There is a considerable deposit of fresh material around the coracoid and acromion processes. The surface of the bone is polished and devoid of cartilage. The head of the humerus is enormously increased in size by a deposit of new bone, but is hollowed out so as to articulate with the convex glenoid surface. Like the scapula, the articulating surface is

burnished and devoid of cartilage. In both bones the new deposit appears in the form of small gravel-like bodies. The capsule was much thickened and contained numerous stalactites, which were also present to a very considerable extent in the neighbouring muscles. (In Case G.)

The specimen was obtained from a body brought for dissection. The opposite shoulder was affected, but to a less extent.

Presented by W. S. A. Griffith, Esq.

669b. Scapula and Humerus from a less advanced case of the same disease. (In Case G.)

709b. Astragalus, with the external and internal malleoli of the fibula and tibia. The articular surfaces of the bones are coated with an unusually extensive deposit of urate of soda.

The specimen was obtained from a subject brought in for dissection. Many of the other joints were equally affected.

716b. Foreign body removed from the knee-joint of Mr. C. O'B. Harding. It was attached by a very slight pedicle to the synovial membrane. It is about the size of an almond, and consists of organised blood-clot enclosed in a synovial tuft.

Presented by C. O'B. Harding, Esq.

720a Four hundred and fifteen Loose Cartilages removed by operation from the knee-joint. They are all of irregular shape, with nodulated, uneven surfaces, and vary in size from a swan-shot to an almond, by far the larger number being midway between these two sizes; the largest and the smallest are suspended at the top of the bottle. They are none of them pedunculated, and were not attached to the synovial membrane. Three of them may be seen to be very nearly divided into two separate portions, which yet remain united by a thin band; none of the others presented a similar appearance. A cut section is smooth and homogeneous, and a microscopical examination showed that they consisted of hyaline cartilage.

From a man aged 31, who had had four attacks of rheumatic fever, while for six years past the knee-joint had been painful and swollen. At the time of the operation the synovial membrane was seen to be rough and vascular like granulation tissue, but there were no appearances of pedunculated growths. An amputation through the thigh was subsequently performed.

For details of the case see *Henry Ward Book*, vol. ix. p. 35.

740b, c, d. Right and Left Knee-joints and Right Ankle-joint from a case of hæmophilia. The ankle-joint (740d) is the least affected; the synovial membrane is slightly tinged, but there is no structural change in the articulation. When fresh, the joint contained some fresh dark blood and a small clot. In the left knee (740c) traces of effused blood are visible in the russet-brown staining of the lining membrane. The joint contained no blood-clot. The cartilages are pearly white. At the under surface of the external femoral condyle, where it meets the pressure of the tibia, the cartilage is worn thin and is granular over a space half an inch in diameter. The ligaments are unaltered. The

connective tissue of the right knee (740b) is deeply stained of a brown colour, and the changes in the cartilages are farther advanced than in the preceding joints. The cartilage is deficient at the points where the pressure is greatest, and a formation of bone thinly covered by cartilage has taken place at the periphery of the joint. About the centre of the under surface of each femoral condyle the cartilage is thin, worn, and rough. It is fissured in various directions and laminated, and has so far lost its attachment to the bone, that a knife can be passed beneath it here and there for a distance of 2–3 lines. The edges of the partially detached cartilage are seen when raised to be ragged and fibrous, and are split into layers, as in a case of chronic rheumatoid arthritis. Around each condyle was a prominent lip of bone, somewhat nodular, and covered by cartilage. Microscopic examination of the cartilage showed a fibroid degeneration of the hyaline matrix, with multiplication of the cells and breaking-up of their capsules. The minute, like the grosser changes, bore a marked resemblance to the alterations which take place in rheumatoid arthritis.

The specimens were obtained from a boy aged 13, who died from epistaxis. He had bled twice previously—once from a small wound on his tongue, and a second time after extraction of a tooth. He had frequently suffered from painful swellings of his joints, and he bruised easily. A brother died of epistaxis. A section is preserved in Series lv., No. 53g.

For further details see *Darker Ward Book*, vol. viii. pp. 416, 420, 486.

SERIES III.

INJURIES OF BONE.

761a. Calvaria of a man who shot himself with a revolver. The piece of bone attached to the lower part of the specimen was driven in before the bullet, and lay with it in the third ventricle of the left side. The skin of the scalp is preserved in Series xxxv., No. 2734a. (In Case H.)

817a. Portion of a Fibula which has been fractured at the junction of its lower and middle third long before death. The two portions of the bone overlap; they have been firmly united by bony substance deposited between their two surfaces. (In Case H.)

Presented by G. W. Cookson, Esq.

846b. A Humerus with an ununited fracture at the junction of the middle and lower thirds. The broken ends are rounded, the lower fragment being drawn up behind the upper, and separated from it by a small mass of tough degenerate muscle. The fragments are enclosed in a firm, fibrous capsule, which cannot be separated from the surrounding muscle.

From a man whose arm had been broken about ten years previously. Notwithstanding the ununited fracture, the limb was a useful one.

895a. Portions of the Frontal, Nasal, and contiguous Bones from a case

of "Broken nose." The bridge of the nose is broadened and flattened; the nasal bones are deflected to the left, and the nasal septum, as seen from behind, bulges so much to the right as almost to occlude the nostril on that side.

From a male subject in the dissecting-room.

928b. The lower end of the Radius, showing a comminuted fracture extending into the wrist-joint.

The injury occurred in a man who fell from a window a height of about eight feet. He died from the effects of a laceration of the liver thereby received. The specimen appears to illustrate one of the causes of stiff wrist after Colles' fracture.—See *Kenton Ward Book*, vol. ix. p. 209.

SERIES VI.

DISEASES OF THE MUSCLES AND TENDONS.

1176b. Muscles infested with Trichina spiralis.

The specimens were obtained from a man who had recently returned from America. All the muscles of the body contained an abundance of trichinæ, but none were noticed in the connective tissues. Sections of the muscles are preserved in Series lv., No. 189.

The details of the case are to be found in the *Coborn Ward Book*, Alexander Birch, vol. i. p. 889.

1178a. A Finger on whose deep flexor tendon are two small gelatinous cysts the size of split peas, apparently connected with the synovial sheath, but not separable from the tendon itself.

Presented by Stephen Paget, Esq.

SERIES VII.

DISEASES OF THE HEART.

1271a. Heart from a woman who died of pyæmia, with plugging of the iliac veins, four weeks after parturition. In the right ventricle are several large blood-clots adherent to the cardiac walls, and partially decolourised.

The uterus is preserved in Series xlvi., No. 3094a, and one of the iliac veins in Series ix., No. 1578a.

1365a. Heart of a child, showing a lacerated opening on the anterior wall of the right ventricle, immediately below the origin of the pulmonary artery.

Two ribs were broken on the right side close to the spine, but the thoracic walls on the left side were intact. The child had been run over by a cart; death was instantaneous.

1367a. A Heart showing a laceration of the septum ventriculorum, and extending to the pericardial surface of the left ventricle.

From a man who was dead when brought to the hospital, having been knocked down by a cart.

SERIES VIII.

DISEASES OF THE ARTERIES.

1377b. Part of an Aorta, showing a transverse rent one inch in length immediately below the origin of the innominate artery, just below the reflexion of the pericardium. The vessel is atheromatous and the surrounding tissues blood-stained. The pericardium and sheath have been stripped up by the blood along several inches of the vessel.

From an old man who was dead when brought to the hospital. He had been run over by a heavy cart.

1377c. Portion of an Aorta, the whole of whose coats have been cleanly divided by a transverse wound about one inch in length just below the origin of the left carotid artery. The artery is atheromatous, and the surrounding cellular tissue blood-stained.

1530a. Arteries removed from the base of the brain. Two small aneurisms are well seen, one situated upon the basilar artery, between the posterior cerebral and the superior cerebellar arteries; the second upon the right anterior cerebral immediately behind the anterior communicating branch. Nearly all the vessels have undergone calcareous degeneration. The hæmorrhage occurred from the left posterior communicating artery, which is seen to be much smaller than the right.

The specimen is taken from the brain of a woman who was admitted to the hospital in a semi-conscious state with left hemiplegia and conjugate deviation of the eyes to the right.

1551a. Iliac and Femoral Arteries, from a case in which the femoral artery had been ligatured in its continuity in Scarpa's triangle. The operation was performed five years before death, and effected the cure of a popliteal aneurism. The site of the ligature is apparent just above the second black bristle, and from this point to the first bristle is a clot which is decolourised. Immediately above the aneurism is another clot which has not yet become discolourised. The aneurism itself has become converted into dense fibrous tissue. The vessel is throughout calcareous. It is patent between the seat of ligature and the cured aneurism.

SERIES IX.

DISEASES OF THE VEINS.

1578a. A Right Iliac Vein filled with a Thrombus, which, though firm in some parts, is breaking down in others.

From a woman who had phlegmasia dolens, and died of pyæmia four weeks after delivery.

The uterus is preserved in Series xlvi., No. 3094a, and the heart in Series vii., No. 1271a.

SERIES X.

DISEASES OF THE LARYNX.

1632a. A Larynx showing the effects of Tuberculous Disease. The mucous membrane is generally roughened and papillated, much increased in thickness, and completely hides the vocal cords, which appear to be buried in its folds. The epiglottis and the arytænoepiglottidean folds share in the general thickening. There appears to be a very superficial ulceration in various parts, most marked at the upper end of the trachea.

The patient was a young man who died with general tuberculosis. He had suffered from aphasia for some time before his death.

1641b. Larynx from a patient who died of typhoid fever. A small ulcerated opening is seen immediately behind the posterior attachment of the left true vocal cord. A bristle has been passed through the opening into a cavity in which lie the necrosed arytænoid cartilages.

SERIES XI.

DISEASES OF THE LUNGS.

1758a. Portion of the Lower Lobe of a Lung, from a case of phthisis in which there was extensive excavation. An unruptured aneurism of the pulmonary artery, as big as a small bean, is seen to have been formed in the cavity. The aneurism contains firm clot. The patient died from exhaustion.

1758b. Portion of the Left Lung of a man aged 25, the subject of phthisis, who succumbed to an attack of tubercular meningitis. The lung was much excavated. An unruptured aneurism, the size of a small pea, is seen in the cavity. It contains dark firm clot. A bristle is passed into the artery.

1758c. Portion of the Left Upper Lobe from a male aged 39, who died from a sudden hæmoptysis in the course of phthisis, although he was gaining flesh and improving in his general health. There is a tuberculated excavation. In one recess of the cavity is a ruptured aneurism of the pulmonary artery as large as a small cherry. The point of rupture is a small linear slit.

1758d. Portion of the Left Lung from a case of phthisis, in which death resulted from hæmoptysis. There was much excavation of the pulmonary substance. An aneurism of the pulmonary artery as big as a pea is seen in the large cavity. A small irregular rent is visible in the aneurism. A bristle has been passed into the diseased branch of the vessel.

1758e. Portion of the Left Lung from a case of fatal hæmoptysis. In a small cavity close to the apex is an aneurism of the pulmonary artery as large as a filbert. It has ruptured ; its cavity was filled with a clot. Bristles are placed in the two ends of the affected branch.

The five preceding specimens were presented by Percy Kidd, Esq., M.D.

SERIES XII.

DISEASES OF THE NOSE AND MOUTH.

1769a. A Large Naso-Pharyngeal Polypus, removed by avulsion from a girl. It consists of myxomatous tissue, with a little fibrous tissue.

A section is preserved in Series lv., No. 73g.

1785a. Portions of a Tongue removed by operation. The surface is covered by a warty, papillated growth, consisting of small, white, rounded elevations, about the size of a hemp-seed, so closely set together that the normal surface of the organ cannot be seen. Before removal these small outgrowths presented a semi-translucent appearance.

Microscopic examination shows that the fungiform papillæ of the tongue are greatly enlarged, both their epithelial and connective tissue elements being increased.

1787a. Section of a Tongue with an Epitheliomatous Growth at the right lateral margin. A large ingrowth of epithelial tissue of a triangular form has invaded the muscular tissue almost as far as the septum.

1788b. Commencing Epithelioma of the Tongue.

SERIES XIII.

DISEASES OF THE TEETH.

1811e. A temporary Upper Central Incisor Tooth, from a child aged 3 years. A supernumerary tooth, resembling in form a canine, is fused with it. There are two distinct pulp cavities, which appear to communicate at one point. The other teeth were normal.

Presented by W. M. Gabriel, Esq.

1811f. Four Permanent Incisors whose fangs have undergone absorption.

Presented by Alfred Coleman, Esq.

1821a. Five Cases of Exostosis growing from the roots of permanent teeth.

Presented by A. Coleman, Esq.

SERIES XV.

DISEASES OF THE ŒSOPHAGUS.

1838a. The Œsophagus and Portion of the Stomach. The œsophagus is ulcerated at a point close to the stomach. The ulceration is not cancerous. At a short distance above the ulcerated portion the softened wall has been perforated by a catheter.

1844a. Œsophagus, Trachea, Aorta, and Glands. The œsophagus presents a large cancerous ulceration, which has extended through the anterior wall into the trachea. The opening from the œsophagus into the trachea is large and ragged; it is divided by a septum which runs transversely across its centre. The glands are enlarged.

For details of the case see a report by James Berry, Esq., in the *St. Bartholomew's Hospital Reports* for 1884, vol. xx. p. 53.

1846a. Œsophagus, Pharynx, and Trachea. The œsophagus is contracted by a narrow ring of epitheliomatous cancer.

The stricture was treated by the retention for ten weeks of a soft rubber tube similar to the one suspended by the side of the specimen.

For details of the case see a report by James Berry, Esq., in the *St. Bartholomew's Hospital Reports* for 1884, vol. xx. p. 49.

1846b. Œsophagus and Stomach, from a case of cancer of the œsophagus, in which gastrostomy had been performed eight months before death. The œsophagus is narrowed and ulcerated for a distance of $3\frac{1}{2}$ inches above its cardiac extremity; the ulceration has commenced at a point opposite the bifurcation of the trachea, and has extended downwards. It has not invaded the stomach. The ulceration at its upper part had perforated the walls of the œsophagus, and has exposed a bronchial gland, which appears as a black mark extending transversely across the tube. The cancer is of the scirrhous type. There were no secondary deposits, nor were the glands infiltrated. The stomach appears to be normal. The gastrostomy opening is situated at the lowest point in the greater curvature, midway between the cardiac and pyloric orifices. The skin with its orifice, and a portion of the costal cartilages adherent by the results of old inflammation to the greater curvature of the stomach, are left *in situ*.

For details of the case see paper by T. Whitehead Reid, Esq., in the *St. Bartholomew's Hospital Reports* for 1884, vol. xx. p. 117, and *Lancet*, November 3, 1883.

1847a. Œsophagus and Stomach. The œsophagus is ulcerated close to the point where it opens into the stomach by a cancerous ulceration. At a short distance above the stricture the softened wall has been perforated by a catheter.

SERIES XVIII.

DISEASES OF THE INTESTINES.

2022a. Portion of Small Intestine obstructed by a new growth. From the jejunum to the ileo-cæcal valve, the small intestine was thickened and dilated. Above the valve there was some pigmentation; the orifice of the valve was narrower than natural. On section of the walls of the intestine there was found to be some increase of connective tissue, but no new growth. From the ileo-cæcal valve to the descending colon the intestine was dilated, and at the commencement of the descending colon it was obstructed by a large ragged new growth which extended round the mucous membrane. Microscopic examination showed that the growth was an angiosarcoma.

Sections are preserved in Series lv., No. 86c.

2022b. Portion of the Jejunum constricted by a growth of cancer. The intestine above the constricted part is dilated into a sac, whilst the part below is very small and atrophied.

A section of the growth is preserved, Series lv., No. 86b.

From a man aged 47, who had vomited fæcal material for a month, and had suffered from complete constipation for twelve days before his death.

Presented by J. Dowson, Esq., M.B.

SERIES XX.

HERNIÆ.

2140a. The Sac of a Funicular Hernia. A portion of the anterior wall has been cut out, so as to show the septum which separates the cavity of the tunica vaginalis from that of the sac.

From a subject in the dissecting rooms.

SERIES XXI.

DISEASES OF THE LIVER.

2230a. Portion of a Liver in which is an old, shrivelled hydatid cyst, rolled in a spiral manner, and containing a very little cretaceous and cheesy material.

The patient died from tumours of the breast and head.

SERIES XXVI.

DISEASES OF THE THYROID GLAND.

2319a. A Large Tumour of the Thyroid Gland, with the adjacent parts. The tumour is extremely hard and of similar shape to the gland in which it grows, being composed of two lateral lobes of equal size joined by an isthmus. The cut surface is fibrous. Each lobe reaches the level of the hyoid bone above, and of the bifurcation of the trachea below. They are joined by a broad isthmus, reaching from the cricoid cartilage over the upper half of the trachea. Above, the lobes present a rounded outline, and are quite separable from each other, and their limits are clearly marked. Behind, below, and laterally, the limits of the growth are quite undefined, the surrounding parts being infiltrated by the tumour, and not simply pushed aside. Thus the common carotid artery, the external and internal carotids, the internal jugular vein, the pneumogastric, recurrent laryngeal and sympathetic nerves are on each side entirely included in the tumour. The depressor muscles of the hyoid bone are infiltrated and fixed; the œsophagus is infiltrated, and so compressed an inch and a half below the cricoid cartilage, that the tip of the little finger can barely be passed. The trachea has been compressed both laterally and in front, in the latter situation by the isthmus of the tumour (which has been divided), while its lower portion, which in life occupied the thorax and root of the neck, is infiltrated with new growths on each side, and so narrowed by lateral compression that the little finger cannot be passed. The aorta and all its branches, the innominate veins, with the superior vena cava and the pulmonary artery, are all incorporated in the tumour to a greater or less extent; but although the calibre of these vessels is more or less diminished by pressure, in none of them is there any ulceration or clotting of blood. The apex of the left lung is seen in the specimen closely adherent to and not separable from the lowest portion of the growth. The bifurcation of the trachea with both bronchi is adherent to the tumour, as are also the bronchial lymphatic glands. Neither in the neck nor in the thorax were the latter at all enlarged or otherwise altered.

The specimen is taken from a woman, mother of four children. Three years before her death the neck became fuller, and after laughing she would occasionally have "crowing inspiration." One year before her death the thyroid appeared to be incorporated with the trachea. It was very hard, quite painless, and fuller than natural. There was no dyspnœa. The swelling enlarged very slowly, and extended backwards upon each side of the trachea, which appeared to be grasped by it. A laryngoscopic examination showed that the left vocal cord was paralysed and that the trachea was narrowed to a chink. The patient gradually became worse, her breathing being stridulous and difficult after the slightest exertion, so that on several occasions suffocation appeared to be imminent. She was, however, generally relieved by chloroform inhalations. The tumour in front of the trachea was divided, and considerable temporary benefit was derived from the operation. The patient ultimately died.

A section of the tumour is preserved, Series lv., No. 90h. The specimen was shown at the Pathological Society in December 1884.

2319b. Fœtus with Large Tumour of the Thyroid Gland. The tumour

is of a goîtrous nature. Histologically it is a spindle-celled sarcoma, with hypertrophy of the glandular tissue.

A section is preserved in Series lv., No. 90h. The child was born at full time as a face presentation.

Presented by S. Cathcart, Esq.

SERIES XXVIII.

DISEASES OF THE KIDNEY.

2341a. A Tuberculous Kidney from a child who died of phthisis. The organ is much enlarged and its papillæ partly destroyed. In the cortex are many abscess-cavities, each lined with a thick, white, pyogenic membrane, and not communicating with the pelvis of the organ. The ureter is much thickened and dilated; its mucous membrane is almost entirely removed, and on its inner surface are many tubercular ulcers. The mucous membrane of the bladder is the seat of a similar ulceration, which in this situation seems to be of more recent date.

In the left kidney there was one large patch of tubercle; otherwise it was of normal size.

2346a. The Kidneys of a Child containing calculi. The case is of interest, as, notwithstanding the size of the calculi, and the large amount of injury which they have caused to the kidney substance, there was no suspicion during life that they existed. The child died of pneumonia.

2347b. A Dilated, Sacculated Kidney. The orifice of the ureter is entirely occluded by a stone about the size of a small bean. The calyces are destroyed, and only a very thin piece of the cortex remains.

SERIES XXIX.

DISEASES OF THE BLADDER.

2422a. Encephaloid Cancer of the Bladder.

From a patient aged 60, who had suffered for two years from hæmaturia.

Presented by W. S. Savory, Esq., F.R.S.

SERIES XXXI.

DISEASES OF THE SPINAL CORD.

2531a. A Spinal Cord exhibiting in the dorsal region that condition of the membranes known as "Pachymeningitis." The membranes are

fused to form a tough, white, leathery mass about a fifth of an inch in thickness. This thickening involves rather more than one-third of the circumference of the sheath, and is closely adherent to the cord along the posterior half of its circumference. The cord at this point is much flattened out, measuring rather more than a fifth of an inch antero-posteriorly. Here also the cord is twisted and distorted, being drawn round from right to left, so that the thickened mass, though it was adherent over the posterior segment, lay in its bony canal rather to the left side. The posterior roots are involved in the membranes on both sides. The anterior roots are natural.

Sections of the cord are preserved in Series lv., No. 107b.
The case is described by Dr. Tooth in *Brain* for July 1884, pp. 254–258.

INCISED WOUND OF CORD.

2548a. Sections of the Upper Part of a Spinal Column with the Spinal Cord. A glass rod is passed between the laminæ of the third and fourth cervical vertebræ on their left side, through the intervertebral cartilage, and into a hole in the membranes. Opposite this spot the cord has been externally injured. The anterior lateral columns on both sides, the whole of the grey matter, and the anterior part of the left posterior column have been cut through below the origin of the fourth nerve. A strand of fibres from the fifth nerve passes over the line of incision, and has escaped injury. On the right half of the spine the intervertebral cartilage has been partially divided.

F. æt. 21. Wound by knife. Paralysis of motion in trunk, legs, and arms. Can shrug her shoulders. Breathing with diaphragm. Can localise on legs, trunk, and arms, but sensation is impaired. Died with T. of 107°, June 24.
For details see *Stanley Ward Book*, vol. x. p. 324, June 24, 1882.

SERIES XXXII.

DISEASES AND INJURIES TO NERVES.

2566a. A Hand deformed, as the result of an injury to the median nerve. The fingers are doubled up and claw-like, the nails are curved longitudinally and transversely; they are fibrous, ridged, and furrowed. The phalangeal joints are stiffened in a position of flexion; their cartilages are thinned, and in the articulation between the second and third phalanges of the ring-finger there is true bony anchylosis. The muscles are not wasted, but during life the skin of the digits was smooth and glossy. About one inch above the wrist-joints the median nerve is enlarged, and embedded in its substance may be seen a small foreign body—a piece of metal.

The patient was a soldier, aged 32, who received a *gunshot* wound on the front of the wrist by a splintered ramrod, two years before he came under notice. The hand had slowly assumed its present condition, and sensation in the median distribution was everywhere impaired. The forearm was wasted and hyperæsthetic.

2566b. Hand showing a Cyst on the deep branch of Ulnar Nerve. The cyst contains synovial fluid; it is connected with one of the carpal joints by a narrow process which runs up over the carpus.

Presented by T. Swinford Edwards, Esq.

SERIES XXXIII.

DISEASES OF THE EYE.

2621b. Posterior half of the Right Eye, showing tubercle of the choroid in the form of small white patches.

The specimen comes from a child aged 7, who was admitted to Mary Ward, July 4, 1883, with tubercular meningitis. The diagnosis of tubercle of the choroid was made by means of the ophthalmoscope before death. There was optic neuritis. The other eye was free from deposits. A section of the eye is preserved in the Ophthalmic Histological Cabinet in the Eye Wards.

2636a. Melanotic Sarcoma springing from the ciliary processes.

2636b. An Eye showing a Melanotic Sarcoma springing from the choroid and involving the ciliary processes.

Microscopic examination shows that it consists of small spindle cells. Details of the case will be found in the *Male Register Book* of the Ophthalmic Wards, case No. 403, 1884.

SERIES XXXIV.

DISEASES OF THE EAR.

2670a. Epithelioma of External Ear.

2682a. A Soft Fibrous Polypus removed from the external auditory meatus.

SERIES XXXV.

DISEASES OF THE SKIN.

2707a. A Tumour which had grown for seven years from the scalp behind the ear of a girl.

Sections are preserved in Series lv., No. 116a.

For an account of the tumour see *Pathological Society's Transactions* for 1884, vol. xxxv. p. 340.

Presented by C. B. Lockwood, Esq.

2734a. Skin of Scalp showing bullet-wound; the smaller aperture of entrance and the larger one of exit are well seen, as well as the blackening from the unburnt powder. The bullet is slung below the specimen.

The skull is preserved in Series iii., No. 761a.

The preparation was obtained from a man who shot himself, holding the revolver within a few inches of his head.

2734b. Malignant Pustule removed from the neck of a man suffering from woolsorter's disease.

Sections are preserved in Series lv., No. 157a.
An account of the case with a coloured illustration will be found in the *British Medical Journal*, June 14, 1884, p. 1134.

SERIES XXXVI.

DISEASES OF THE TESTIS.

SUPPURATION AFTER INJECTION OF HYDROCELE WITH IODINE.

2753a. The Tunica Vaginalis and Testis of a man on whom the operation for radical cure of a hydrocele had been performed ten years previous to removal. The sac of the tunica vaginalis is converted into an abscess cavity with walls about a quarter of an inch in thickness, tough and firm, and lined by a smooth membrane. It forms a cavity capable of holding an ounce of fluid, and in the recent state contained some thin oily pus in which were innumerable cholesterin crystals, but no cells. Behind this is the testis in a perfectly normal state, but closely adherent to the contiguous structures. The epididymis and cord are normal. Immediately beneath the skin, in front of, but not in connection with, the sac of the tunica vaginalis, is some broken-down inflammatory material, marking the site of a superficial abscess.

From a man aged 27 years, who said that there had been a swelling of the testis ever since the operation for radical cure. It had never caused him any pain until quite recently, when it had begun to increase in size. At the time he came under treatment there was evident suppuration in the subcutaneous structures, and this was supposed to be in connection with a chronically enlarged and inflamed testis, the latter being simulated by the thickened tunica vaginalis. Castration was therefore performed.

2778b. A Tubercular Testis. The gland is about the size of a hen's egg, somewhat granular on section, of a yellowish colour, unduly firm to the touch, and more than usually adherent to the surrounding tunica albuginea. The latter is thickened, and the tunica vaginalis is adherent. The epididymis is enlarged, though not greatly; filled with caseating yellow material, and breaking down in parts into a soft pulpy mass. The cord is thickened generally, but the vas deferens more especially so. The latter has been separated from the surrounding structures, and may be seen to be about the size of a crow-quill.

From a healthy man aged 54 years, who said that the swelling of the organ first made its appearance four months before castration was performed, after a severe strain. He suffered no pain.

2778c. One half of a Tubercular Testis. Its cut surface closely resembles that of the preceding specimen, but is rather smaller and more firm and fibrous. The tunica albuginea is slightly thickened, and the tunica vaginalis partially adherent. The epididymis is very slightly, if at all, enlarged, and the vas deferens is scarcely thicker than natural.

The patient was a healthy man aged 33 years. He had noticed a swelling of the testis for eighteen months, gradually increasing in size and painless.

2778d. Testis affected with strumous disease. The testis ulcerated out, and was found in the patient's bed.

Presented by S. Paget, Esq.

SERIES XL.

DISEASES OF THE PENIS.

2874a. Part of a Bladder and a Penis, divided along its dorsum. The mucous surface of the membranous urethra is ragged and inflamed. Around the prostatic and spongy portions of the canal is an abscess cavity, communicating with the urethra and bladder by several openings, extending for some distance on the under surface of the penis, and surrounded by a mass of sloughy tissue. The bladder is thickened and the ureters dilated, glass rods being passed into their vesical orifices. On the right side of the bladder is a large sacculus, capable of holding nearly half a pint, and communicating with the bladder by an orifice about the size of a split pea. There was another and smaller sacculus in the anterior half of the viscus.

The patient was a man aged 49, who had suffered from stricture of the urethra about four years. Symptoms increased; three weeks' incontinence. He died with symptoms of pyæmia; abscess in kidneys.—See *Colston Ward Book*, vol. vii. p. 371.

SERIES XLIII.

DISEASES OF THE UTERUS.

RETROVERSION.

2945a. Vertical Section of Bladder, Uterus, and Rectum. The uterus is retroverted by an ovarian tumour, which occupies the utero-vesical pouch. As a result of adhesive perimetritis Douglas's pouch has become obliterated.

2951a. The Bladder and Uterus, with part of the vagina, rectum, and sigmoid flexure, from a case of perimetritis. In front is the bladder, bisected vertically and apparently healthy. The orifices of the urethra can be seen, one in each segment. Between the segments is the uterus, with its anterior wall divided vertically, exposing the cavity of the fundus, which is normal. The cavity of the cervix is two and a half times its natural length. The internal os is well marked, and in the middle of the posterior wall of the cervix is a large oval slough, almost perforating it, and forming one of the openings by which the perimetritic effusion which occupied Douglas's pouch would have escaped. In the anterior wall of the uterus are several small and nodular myomata. Below the cervix, and in the upper part of the vagina, just posterior and to the left of the external os, is another slough, not so large or so far advanced as the other, and leading into the apex of Douglas's pouch.

Immediately behind the vagina is the rectum, which has been laid open, and part of its posterior wall removed. At first it is in its normal relation to the vagina, but afterwards it is deflected towards the right cornu of the uterus, being separated from it and displaced to the right by the perimetritic effusion. Its calibre is small. About 3 inches from its lower part, and 6 to 7 inches from the anus, is a large irregular slough, also leading into the cavity of the effusion. The rectum having passed up to the right cornu of the uterus, suddenly becomes narrowed, and is bent at a right angle backwards, then directly downwards, and again to the left, forming three right angles in a course of as many inches. At each bend is a valvular fold of mucous membrane, which is best seen at the first angle, where the constriction is greatest. The bowel, which is probably the sigmoid flexure, passes upwards and to the left, forming the upper boundary of the cavity towards the left iliac fossa. From nearly the attached border of this fold of intestine to the upper border of the uterus and left broad ligament is a tough fold of membrane about 2 inches wide, which has been divided along its whole extent, so as to show the cavity of the effusion. This can only be organised lymph, which has entangled some of the masses of fat with which every part of the body was loaded. It forms part of the anterior wall of the cyst. It can be seen also that the left broad ligament forms part of the anterior wall, whilst the right is probably bent backwards, forming the right lateral margin, and, with the soft parts forming the wall of the pelvis, is adherent to the displaced rectum. Neither ovary can be distinguished, but the round ligament on both sides and the Fallopian tube on the left remain. In the lateral walls of the cavity may be seen on the left side the common iliac vessels, and on the right probably the external iliac artery and vein. The cavity is lined with lymph, ragged and shreddy in parts, and much resembles those containing pus.

For further details see a paper by W. S. A. Griffith, Esq., in the *St. Bartholomew's Hospital Reports*, 1882, vol. xviii. pp. 291–296.

2952a. A Uterus and Douglas's Pouch. The latter is occupied by the two ovaries, which are prolapsed and adherent to each other; to the uterus in front and the peritoneum behind. The right ovary appears the more extensively bound down by adhesions. It is therefore probable that the inflammation commenced in its neighbourhood; and the left ovary being prolapsed, became adherent at the point of contact.

From a woman aged 50, whose youngest child was aged 14 years. No further history could be obtained.

2992a. Portion of a Fibroid of the Uterus, showing cysts which have developed in its substance. They are lined by a distinct membrane composed of degenerated products. There is no epithelium lining the cyst wall.

A section of the cyst wall is preserved, Series lv., No. 130f.

3000a. Cystic Fibroid of the Uterus.

Presented by C. Godson, Esq., M.D.

3104b. Model in Plaster of a Pelvis, with wide separation of the symphysis pubis. The original was taken from a woman aged 44, who had ectopion vesicæ.

The cast is from No. 424 in the Teratological Series of the Royal College of Surgeons. An account of the pelvis occurs in the *Transactions of the Obstetrical Society* for 1884.

Presented by W. S. A. Griffith, Esq.

3117a. Malacostean Pelvis. The left innominate bone was less affected by the disease than the right; it is therefore less deformed.

The specimen was obtained from the body of a woman aged 67, who died without any symptoms of osteomalacia.

Presented by W. S. A. Griffith, Esq.

3129a. An Oblique Rachitic Pelvis, the sacrum being tilted to the left side. The following are the measurements:—

Exterior.		Brim.		Outlet.	
D. B. . .	6	C. V. . . .	2½	Tr. . . .	4½
Cr. . . .	10¼	R. Obl. . . .	4½		
Sp. . . .	10½	L. Obl. . . .	4¾		
		Trans. . . .	5¼		

The left iliac bone is smaller than the right, and measures a quarter of an inch less along its crest.

The patient was a woman aged 48. She had no lateral curvature, but the left leg was one inch shorter than the right, being the more curved and deformed. The obliquity of the pelvis is probably due to this condition.—See description of case by Mr. Griffith in the *Obstetrical Society's Transactions* for November 7, 1883.

SERIES XLVIII.

DISEASES OF THE MAMMARY GLAND.

3159a. Adenoma Mammæ. The structure of the tumour is of a somewhat unusual character.

Sections are preserved in Series lv., No. 142a.

Presented by A. Willett, Esq.

3181c. A Female Mamma. The nipple is retracted; the areola eczematous. In the substance of the breast, immediately beneath the areola, is a small oval mass of scirrhous cancer.

From a woman aged 51, who had suckled nine children without any breast trouble. The eczema was of three years' duration; the tumour of four months. At the time of the operation the glands were enlarged.

For further details see *President Ward Book*, vol. ix. p. 384.

3181d. A Female Mamma. The areola around the nipple is eczematous, the epidermis being removed, but there is no ulcerated surface. Beneath the nipple the breast tissue is indurated, though it is otherwise normal. At the margin of the gland is a firm scirrhous carcinoma rather larger than a walnut.

From a woman aged 45, mother of four children, the last of whom was born three years before the appearance of the cancer. After the birth of the third child the nipple was sore, and a thin fluid exuded from it. The last child would not take this breast. The tumour was noticed for four months; the eczema for seven years.

For further details see *President Ward Book*, vol. ix. p. 327.

3181e. A Female Mamma. The areola is ulcerated and continuous with a large mass of scirrhous cancer.

From a female aged 51, who had suffered for two years from eczema of the nipple, and for nine months from a tumour in the breast. The axillary glands were enlarged.
For farther details see *Lucas Ward Book*, vol. ix. p. 93.

3185a. Colloid Cancer of the Breast.

From a woman aged 55, the mother of one child. The tumour had been noticed for four months. The mother of the patient died of cancer of the breast; the father of stricture of the œsophagus. At the time of the operation the lymphatic glands were not definitely enlarged.
Sections are preserved in Series lv., No. 153b.

3185b. A Small Colloid Cancer of the Breast.

The colloid cells are well marked; the matrix is undergoing hyaloid degeneration.
Sections are preserved in Series lv., No. 153c.

SERIES L.

GENERAL PATHOLOGY.

3225a. Portion of the Abdominal Wall from a case of umbilical hernia, in which the sac was excised and its neck sewn up.

The patient died of peritonitis three days after the operation. The wound in the peritoneum is seen to be almost completely healed.

3228a. Portions of Ribs and Lung, showing the organisation of lymph to form adhesions. From a case of recent pleurisy.

3228b. A similar specimen, showing the effects of a pleurisy many years previously; the adhesions are denser than in the preceding specimen, the fibrous tissue having contracted so as to form a tough membrane.

3234a. The Lower Extremity of a Child, exhibiting burns of various degrees. In the upper part of the thigh the muscles are partially charred, while on some parts of the foot there is nothing more than a peeling off of the integument.

3235c. A Hand affected with dry Gangrene, as a result of idiopathic plugging of the arteries of the forearm and arm. The plug extended from the origin of the subclavian.

The arteries of the arm are preserved with the arch of the aorta in Series viii., No. 1555a.

3347a. A Thumb, on the dorsal surface of whose first phalanx is a large Nævoid growth. The surface is warty, the epithelium is increased to the thickness of about half an inch, and is covered by old blood-clot and disintegrating epithelium. On section the growth is seen to be composed of a fine reticulum of fibrous tissue, the spaces of which in the recent state contained fluid blood.

The patient was a girl aged 12 years. The swelling had been noticed at birth, and had increased during the two years before removal. It had frequently bled, and occasionally discharged.

Presented by J. Lucas Worship, Esq.

3364a. A small Sebaceous Cyst, removed from the dorsal surface of the index-finger of a woman aged 62 years. The skin covering the cyst had given way, and presented an ulcerated unhealthy surface.

The patient attributed the growth to frequently pricking the finger with a sewing needle; she had noticed it five months. A microscopic examination shows that the cyst wall is composed of numerous layers of epithelial cells, continuous with the rete.

DISEASES OF PARASITIC ORIGIN.

3382a. A Portion of the Foot of a native of India affected with mycetoma, the so-called Madura foot. The foot is enlarged and its normal outline is lost. Scattered over the dorsum, and less abundantly on the plantar surface, are rounded patches from which the cuticle has separated. Within these are the orifices of one or more fistulous tracks, some of which are filled up by the fungus which is said to cause the disease (the Chiomphe Carteri). On examining the section, the anterior portion of the foot is seen to be converted into a fleshy structure, having a fibro-cystic appearance. This appearance is produced by the presence of numerous small and large intercommunicating spaces in which the fungus is lodged. The metatarsal bones are unrecognisable. The os calcis, astragalus, and scaphoid are almost unaffected; the anterior portion of the cuneiform bone shows the absorptive process by which the bones are destroyed. Sparsely scattered over the section are black dots about the size of a pin's head, which are small masses of the fungus.

3382b. The Foot of a native of India, showing the disease called mycetoma, Madura or fungus foot. The foot is greatly enlarged. The swelling involves chiefly the sole, which is convex in outline. Scattered over the foot, most thickly on the sole, are loose elevated masses of cuticle. The orifices of fistulous tracks exist beneath, or are seen in the centre of some of these elevations.

3382c. Some of the Bones of Foot shown in the preceding specimen.

SERIES LII.

URINARY CALCULI.

202a. Uric Acid Gravel in a somewhat unusual form. It is granular, the grains being of the size and shape of small shot.

The gravel was passed by an out-patient, who had never suffered from gout and who had no stone. The symptoms had continued for twelve months.

SERIES LIII.

CALCULI.

244a. A Salivary Calculus, weighing 22 grains, removed from the parotid duct.

296a. Calculus weighing $17\frac{3}{4}$ ounces, obtained from the cæcum of a horse. The calculus consists chiefly of phosphates.

Presented by W. T. Strugnell, Esq.

SERIES LV.

MICROSCOPIC SECTIONS OF PATHOLOGICAL TISSUES.

9a. Enchondroma removed from the scapula.

11a. Small round-celled Sarcoma of the Vertebræ. There are a large number of indifferent cells present, the result of inflammation.

From Series i., No. 517a.

52a. Secondary Endothelioma of the Clavicle. The primary growth occurred in the pericardium.

See Transactions of the Pathological Society for 1884, Vol. xxxv., p. 372.

53g. Cartilage from a case of Hæmophilia.

The joints are preserved in Series ii., No. 740b, c, d.

57c. Sarcoma undergoing fibroid change.

From Series vi., No. 1174a.

67b. Papilloma of the Uvula.

73g. Sections of a Naso-Pharyngeal Polypus. It consists of myxomatous tissue, with which a few fibres are intermixed.

From Series xii., No. 1769a.

86b. Portion of Intestine invaded by a growth of encephaloid cancer.

86c. Portion of Intestine invaded by an angio-sarcoma.

89a. Amyloid Liver stained with methyl violet.

90a. Sections of a Liver affected with cirrhosis.

90f. Sections of a Liver which has undergone fatty degeneration.

90g. Sections of a Liver which has been congested for a long period (nutmeg liver).

The four preceding specimens were prepared and presented by J. P. Roughton, Esq.

90h. Sections of a Tumour occurring in the thyroid gland. The tumour is composed of fibrous tissue.

The tumour is preserved in Series xxvi., No. 2319a.

90i. Cystic Tumour of the Thyroid Gland. The tissue is hypertrophied gland substance, the glands being filled with colloidal tissue. Between the acini are a number of indifferent cells.

107b. Sections of the Spinal Cord, from a case of pachymeningitis. In the mid-dorsal region the dura mater is much thickened, the component bundles of connective tissue being separated by numbers of leucocytes. The blood-vessels are numerous. Between the dura mater and pia mater is a mass of fibrous material, in the meshes of which are many blood-vessels with thickened hyaline walls. The cord is flattened antero-posteriorly. The nerve fibre in the white matter is softened and destroyed. The thickened vessels pass into the cord. The right anterior horn of the grey matter is much attenuated; only one or two ganglion cells can be found, and they are degenerated. The left anterior horn, though greatly affected, has not undergone so much degeneration as the right. The left posterior horn is much more attenuated than the right. The left posterior roots have undergone much proliferation. The right posterior roots look natural. Both show great hyaline thickening of the vessels.

From Series xxxi., No. 2531a.

The specimens were prepared and presented by Dr. Howard Tooth.

111a. Melanotic Sarcoma of the Choroid.

113f. Sections from a case of Lupus.

116a. Tumour of the Scalp. The tumour consists of columns marked off from each other by sheaths of connective tissue. The greater portion of the tissue consists of connective tissue in the meshes of which are numerous cells. The cells appear in some cases to have undergone a form of colloid degeneration.

The tumour is preserved in Series xxxv., No. 2707a.

The sections were presented by C. B. Lockwood, Esq.

124a. Scirrhus of the Prostate.

126c. Fibroid Degeneration of the Ovary.

An account will be found in the *Pathological Society's Transactions* for 1884, vol. xxxv. p. 248.

The sections were prepared and presented by Norman Moore, Esq., M.D.

130g. Myosarcoma of the Uterus.

142a. Adenoma of the Breast. The tissue is very much looser, and is of a more areolar type than usual.

The tumour is preserved in Series xlviii., No. 3159a.

153b. Sections of a Colloid Cancer of the Breast.

The tumour is preserved in Series xlviii., No. 3185a.

153c. Sections of a Colloid Cancer of the Breast. The structure of the cancer is that of a true colloid, whose matrix has undergone hyaline degeneration.

The tumour is preserved in Series xlviii., No. 3185b.

157a. Sections of a Malignant Pustule.

See also Series xxxv., No. 2734b.

169a. Sarco-adenoma of the Groin.

182a. Crystals of Triple Phosphate obtained from the urine of man.

186a. Crystals of Urate of Ammonia.

Presented by H. L. Jones, Esq.

186b. Cystin Crystals from human urine.

Presented by H. L. Jones, Esq.

SERIES LVI.

CASTS AND MODELS.

13a. Cast of the Pelvis and Lower Extremities of a Child who suffered from an extreme degree of rickets. The femora are bent at an angle, whilst the tibiæ are curved laterally.

19a. Cast of the Legs of a Child suffering from rickets and genu valgum.

20b. Cast of an Elbow affected with chronic rheumatoid arthritis in a woman who had tabetic symptoms.

20c. Cast of a Knee from a case of chronic rheumatoid arthritis in a man suffering from tabes dorsalis.

The joint is preserved.

20d. Cast of a Hand affected with chronic rheumatism.

23b. Casts of the Hands, exhibiting Heberden's nodes.

One hand is preserved in Series ii., No. 645a, and a drawing of it in Series lvii., No. 468c.

29a. Cast of the Surface of a Knee. The femur has sustained a T-fracture into the joint. The depression in the skin was caused by the sinking backwards of the lower fragment.

32a. Cast of a Foot and Leg, showing an unreduced dislocation of the foot inwards.

36a. Torso of a Man who had many dislocations. The acromial end of either clavicle is dislocated.

Photograph of this patient is preserved, Series lvii., No. 13a.

36b. The Two Hands of the same patient, showing various dislocations.

For an account of the case, see the *Clinical Society's Transactions*, vol. lxvi. p. 264, and vol. xvii. p. 220.

85a. Cast of a Case of Talipes equino varus. A part of the tarsal arch was subseqently removed.

See *Teratological Catalogue*, Series ii., No. 3512a.

97a. Cast of the Left Foot of Henry Humphry, aged 8, suffering from pseudo-hypertrophic paralysis. The foot shows Talipes equinus, due to the contraction of the calf muscles in the advanced stage of the disease.

The child always had thick calves; it did not sit up till it was eight months old, and could not walk until it had attained the age of three. It never walked well. The characteristic stiffness of the calves was very marked in August 1882.—See *Luke Ward Book*, 1883.

104. The following Casts of Teeth were presented by Alfred Coleman, Esq. :—

1. Excess in Teeth, temporary series.
2. Deficiency in Teeth, do.
3. Early eruption of a low front Central Incisor, age 4 years 7 months.
4. Supernumerary Teeth.
5. Geminated or United Teeth (inherited syphilis).
6. Supernumerary Teeth in a patient with inherited syphilis.
7. Honeycombed Teeth.
8. Large Teeth.
9. Teeth erupted in unusual positions.
10. Case of supernumerary Teeth, for which left supernumerary was removed, and into its socket left central was inserted. This case of transplantation done by Mr. Coleman succeeded well.
11. Hypertrophy of Gums. These cases were either cured or much relieved by the removal of the teeth, which were loose and diseased at their roots.
12. Irregularity in the Teeth brought about by an obscure growth in the gums or inferior maxilla.
13. Exostosis of inferior maxilla.
14. Cast of inferior maxilla to show treatment of fractured Lower Jaw with Hammond's splint.
15. Casts from Elephant's (female, India) Tusk in Museum of the Royal College of Surgeons, Edinburgh, showing erosion (?) at neck, and larvæ of a dipterous insect.
16. Erosion on the Canine of a Sea-Lion, also from Royal College of Surgeons, Edinburgh.

149a. Cast of a Hand and Foot from a patient who suffered from anæsthetic leprosy.

SERIES LVII.

DRAWINGS AND PHOTOGRAPHS.

34a. Photograph of a Skull, showing the nodes of Parrot.

The skull itself is preserved in Series i., No. 350.

59a. Photograph of an Old Man who had many idiopathic dislocations.

Casts of this patient are preserved in Series lvi., Nos. 36a, 36b.

75b. Drawing of the Hands and Feet of a Child with "hammer fingers." (T. Godart.)

101a. Drawing of a Child with Measles, who was cyanosed as the result of some congenital malformation of the heart. The fingers were markedly clubbed. (T. G.)

112a. Drawing of the Face of a Man who had extreme veno-capillary congestion, in association with a remarkable eruption resembling lichen planus. See drawing 419e. (T. G.)

175a. Drawing of the Mouth from a case of stomatitis. (T. G.)

189c. Photograph of a Girl upon whom the Tagliacotian operation of rhinoplasty had been performed. (T. G.)

For details see *President Ward Book*, vol. ix. p. 170, 1882.

189d. Drawing of a Tongue and Fauces from a case of diphtheria, showing patches of false membrane. (T. G.)

189e. Drawing of a Tongue invaded by diphtheritic membrane. (T. G.)

193a. Drawing of a Case of Pharyngeal Stenosis. (T. G.)

208a. Drawing of a Polypus of the Mucous Membrane of the Stomach. (T. G.)

218a. Drawing of the Tongue, Œsophagus, and Stomach from a case of oxalic acid poisoning. The stomach is filled with blood. (T. G.)

218b. Drawing of the same parts after the blood in the stomach had been washed away. (T. G.)

226a. Drawing of a False Membrane in the Stomach from a child who had diphtheria. (T. G.)

228a. Photograph of a Piece of Intestine affected with catarrhal inflammation.

254a. Photograph of Typhoid Ulceration in the small intestine.

254b. Photograph of Perforation of the Small Intestine due to typhoid ulceration.

260a. Drawing of a Case of Interstitial Hernia which occurred in a child. The drawing shows the situation of the swelling. (T. G.)

280a. Drawing of a Medullary Cancer of the Liver. (T. G.)

298a. Drawing of a large Goître in a woman. (T. G.)

305a. Drawing of the Arm of a Man, showing the deep bronzing of the skin which occurs in Addison's disease. (T. G.)

305b. Drawing of the Knee of the same patient. (T. G.)

For details of this case see *John Ward Book* for October 27, 1883, under the name of John Ebden.

305c and **d.** Drawings of the Face and Arms of a girl who had Addison's disease. (T. G.)

For details see *Mary Ward Book* for 1884, under the name of Anne E. Webbe.

305e and **f.** Drawings of the Face and Arms of a woman who had Addison's disease. (T. G.)

For details see *Mary Ward Book*, June 26, 1884, under the name of Jane Bartrap.

328a. Drawing of a Kidney whose substance was in great part destroyed by a large blood-clot, which induced degeneration. The white spots represent cholesterin. (T. G.)

329a. Drawing of the microscopic appearances in a case of Cancer of the Kidney, associated with renal calculus. (T. G.)

388a. Drawing of a Hand showing the results of division of the median nerve. (T. G.)

388b. Photographs of a Hand some months after an injury to the radial nerve.

395a. Drawing of an Eye, showing dislocation of the lens, the result of the growth of a melanotic sarcoma. (T. G.)

For details of the case see *Alexandra Ward Book*, No. 403, February 19, 1884.

395b. Drawing of the Left Eye of a Woman, showing the growth of a melanotic sarcoma through the conjunctiva and sclerotic along the lower border of the cornea. (T. G.)

For details of case see *Alexandra Ward Book*, No. 377, February 15, 1884.

406b. Localised Scleroderma, which had existed for six and a half years in a woman. (T. G.)

For an account of the case see *Transactions of the Pathological Society*, vol. xxii. p. 61.

406c. A Patch of Scleroderma of the Scalp, following similar disease of the face, and undergoing spontaneous ulceration; from the same case as the preceding. (T. G.)

408a and **b.** The Face and Hands of a Man with melanotic sarcomata following excision of the eyeball. The sketch shows the peculiar livid pigmentation of his skin. (T. G.)

For further details see *Transactions of the Pathological Society*, vol. xxxv. 1884; *Luke Ward Book*, 1883, p. 1292.

409a. Drawing of the Face of a Woman who had been affected for seven years with myxœdema. (T. G.)

409b. Photograph of the same woman.

For further details see *Clinical Society's Transactions*, 1880, and *Elizabeth Ward Book*, March and April 1884, under the name of Mary Shepherd.

419c. Lichen Ruber occurring on the chest and abdomen. (T. G.)

419d. A Pruriginous Eruption of an uncertain nature, with an affection of the gums. It is perhaps an exaggerated form of lichen planus.

For further details see *Sitwell Ward Book* (Mr. Baker), No. 409, 1884.

419e. The Arm of a Man, showing an unusual form of lichen. The face of the same man is seen in drawing 112*a* (T. G.)

422a. Drawing of a Leg from a case of urticaria hæmorrhagica. (T. G.)

424a. Symmetrical Herpes occurring in a boy—front view. (T. G.)

424b. Same case, back view. (T. G.)

This case was shown at the Dermatological Society, July 1882.

424c. Face of a Man with a herpetiform syphilide and enlarged cervical glands. (T. G.)

424d. Herpetiform Syphilide, showing an eruption on the arm; from the same case as the preceding. (T. G.)

424e. Face of a man with herpetiform syphilide. (T. G.)

443a. A Warty Growth in the groin. (T. G.)

445a. Iodide of Potassium rash occurring on the face and hands of a man. (T. G.)

448a Head of a Child who had variola gangreformis. (T. G.)

458a. Head of a man suffering from purpura rheumatica. (T. G.)

464a. Lupus Vulgaris sive Hypertrophicus affecting the cheek. (T. G.)

465b. Ulceration of Nose or Upper Lip; lupus or hereditary syphilis. (T. G.)

468c. Hand of a Woman with subcutaneous rheumatic nodes—Heberden's. (T. G.)

The hand itself is preserved in Series ii., No. 645a.

470a. Face of a Man with well-marked epithelioma of the cheek. (T. G.)

477d. Epithelioma occurring in the back of a hand. (T. G.)

477e. A Rodent Ulcer in a case of locomotor ataxy; both great-toes affected. (T. G.)

477f. "Greasy Warts" occurring on the abdomen. (T. G.)

501a. An Ovarian Cyst, showing necrotic change in part of the cyst wall. (T. G.)

531a. Eczema of the Nipple in the right breast, occurring three years after removal of the left breast for scirrhus. (T. G.)

531b. The Right Breast of the same woman; the drawing was made fifteen months after the previous one. (T. G.)

533a. A Primary Syphilitic Sore on the Nipple. (T. G.)

534. Warty Growths occurring on the neck of a man. (T. G.)

538c. Gangrene of the Hand, resulting from idiopathic arteritis. (T. G.)

The arteries of the arm are preserved.

543b. A Case of Symmetrical Gangrene, view of legs. (T. G.)

543c. The same, view of back. (T. G.)

543d. Same, view of buttocks. (T. G.)

For further details of this case see *Faith Ward Book* for 1882, and *Pathological Society's Transactions*, 1883, vol. xxxiv. p. 286.

543e. Idiopathic Gangrene occurring on back of child after vaccination—(?) varicella gangreformis.

543f. Face of a Child with varicella gangreformis. (T. G.)

548a. Photograph of a curious case of tumour growing on the temple of a girl.

Presented with specimens of the tumour by C. B. Lockwood, Esq.

554l. Case of Cervical Lympho-lipoma in a man. (T. G.)

554m. Case of Lipoma of Neck. (T. G.)

554n. Case of Diffuse Lipomata occurring in a man. (T. G.)

595a. Gangrene of both Eyelids on the left side. (T. G.)

598a and b. Deformity of the Hands simulating rheumatoid arthritis occurring in an old ropemaker. (T. G.)

See *Mark Ward Book* for 1884.

598c. Photograph of a Man who had obscure symptoms of cancer, who subsequently died of carcinoma of the stomach.

602. A child suffering from Meningitis, showing the attitude assumed in such cases. (T. G.)

603. A boy who had Punctiform ecchymoses on his face after a severe crush of the thorax. (T. G.)

See *Harley Ward Book*, vol. ix. pp. 220 and 236, 1883.

SERIES XLIX.

ANATOMY OF STUMPS.

3205a. A small Ring of Necrosed Bone which separated from the femur of a child two months after amputation.

TERATOLOGY.

SERIES II.—CLASS V.

ARREST OF DEVELOPMENT.

3512a. A Wedge-shaped Piece of Bone removed from the tarsus in a case of confirmed talipes-equino-varus.

A cast of the foot before the operation is preserved No. 85a.

SERIES IV.

VARIATION OF BLOOD VESSELS.

RIGHT AORTIC ARCH.

3535a. Dissection of a Fœtus, showing right aorta given off from a heart naturally placed and of apparently normal formation. The several branches given off from the arch are as follows:—1st, The left carotid, which follows the usual course; 2d, right carotid, so closely applied to the former that they almost arise from a common trunk; 3d, the right subclavian; 4th, the left subclavian, which is given off from the third portion of the aortic arch, and passes behind the trachea and œsophagus to get to its natural position on the first rib behind the scalenus anticus muscle. The veins in relation to these parts are quite normal. On the left side, the recurrent laryngeal nerve is looped around the ductus arteriosus from behind forwards, and passes to its usual supply. On the right side the recurrent laryngeal passes around the arch of the aorta, and also passes up in its usual course with regard to the muscle supply of the larynx. All other structures in this part seem to be fairly normal. The aorta descends, gradually inclining to the middle line of the spine, and enters the abdomen upon the second lumbar vertebra. Of the branches of the abdominal aorta, the renal supply upon the right side is made up of four distinct large vessels. Upon the left there are three large branches given off from the cœliac axis. The aorta divides into the common iliacs upon the fourth lumbar vertebra.

Dissected and presented by Reginald H. Combes and Cecil Christopherson.
A more complete description and comments upon this case is to be found in the *Hospital Reports* for 1884, vol. xx. p. 269.

Congenital narrowing of the Left Ventricle immediately below the aortic valves. The heart and aorta of a man aged 18 years, who died with Bright's disease and pericardial effusion. The right side of the heart is normal. The aortic valves are free from disease and of the usual form, and did not permit regurgitation when fluid was poured

into the aorta. When depressed in this way by fluid, the aortic valves approached a fibrous ring, with the tissue of which their bases are continuous. Looked at from the ventricle, this abnormal structure appears as a circular ridge attached to the uppermost part of the ventricular septum and to the mitral valve. The part attached to the ventricular septum may be divided into two parts. The posterior and lesser crosses the bare spot two-thirds of the way up, and projects about half a line downwards into the ventricle. At the anterior boundary of the bare spot a very slight spur or puckering projects one line downwards on the surface of the septum ventriculorum. The anterior part of the ridge increases in downward projection as it extends forwards, till it reaches the depth of one line. This it does at a point one-fifth of an inch from the projection of the anterior wall of the ventricle from the septum ventriculorum. At this point there is another spur from the ring, extending one-third of an inch into the septum. The opposite part of the ring is continuous with the tissue of the mitral valve; the latter structure is quite natural. There is an aneurism of the ascending part of the arch of the aorta.

A microscopic examination shows that the ring is certainly not of inflammatory origin, but was probably formed late in fœtal life from some unknown cause.

See description of specimen by Dr. Norman Moore in the *Transactions of the Pathological Society*, vol. xxxiv. p. 29.

SERIES VI.

ABNORMAL CONDITIONS OF THE DIGESTIVE ORGANS.

3624a.

(*a*) Upper temporary Canine with two fangs.

(*b*) Upper temporary second Molar with four fangs.

(*c*) Lower temporary second Molar with three fangs.

3653a. Intestines with diverticula.

3647a. Imperforate Anus.

SERIES VII.

ABNORMAL CONDITIONS OF THE URINARY ORGANS.

3663b. A Kidney with five ureters. After a short course the ureters converge and unite to form a single tube of the normal size.

Presented by W. S. Richmond, Esq.

SERIES VIII.

ABNORMAL CONDITIONS OF THE GENERATIVE ORGANS.

3671a. Testis showing a fibrous body attached to the middle and under surface of the hydatid of Morgagni; it is white and glistening, hard to the touch, and firmly fixed. Some of its fibres can be traced to the root of the corpus Morgagni. The body appears to be the remains of that part of the Wolffian body which in the embryo lies between Müller's duct and the upper body of the testis. To the other testicle a similar body was attached.

For an account of this specimen see also the *Journal of Anatomy and Physiology*, vol. xvii. p. 538.

Presented by W. S. Richmond, Esq.

ANATOMY AND PHYSIOLOGY.

SERIES I.

3a. Two masses of impure Cholesterin obtained from the mammary gland of a bitch.

Presented by W. S. Church, Esq., M.D.

SERIES VIII.

THE OSSEOUS SYSTEM.

180a. Calvaria from a dolicho-cephalic skull.

296a. Hyoid bone with the muscles attached to it, viz. :—1. Geniohyoid, 2. Mylohyoid, 3. Omohyoid, 4. Sternohyoid, 5. Thyrohyoid, 6. Stylohyoid, 7. Hyoglossus, 8. Middle constrictor, 9. Geniohyoid, 10. Niticoglossus.

321a. Lower portion of the Femur, with the synovial membrane covering it, to show the insertion of the subcrureus muscle.

Prepared and dissected by J. W. Cockerill, Esq.

OSTEOLOGY OF ANIMALS.

339a. Disarticulated skeleton of a Frog (Rana esculenta), stained in carmine to differentiate the bones developed in membrane from those developed in cartilage.

Presented and prepared by D'Arcy Power, Esq.

482a. Skull of a Sheep with horns.

Presented by S. C. K. Moberley, Esq.

SERIES XIV.

THE INTESTINAL CANAL.

725a. Intestine of a Spotted Dog-fish (Scyllium), to show the spiral arrangement in its interior.

SERIES XIX.

THE HEART.

814. Heart of a Porpoise. Apertures have been cut into the different cavities to show the origins of the main vessels.

SERIES XXXII.

ORGANS OF GENERATION.

1207a. Decidua from the Uterus in the second month of pregnancy.

From a woman who had missed one menstrual period.

Presented by W. S. A. Griffith, Esq.

SERIES XXXV.

MISCELLANEA.

1388. Specimen of the Amphioxus Lanceolatus.

Presented by H. L. Jones, Esq.

1428a. Specimen of Sargasso Weed from the Atlantic, with its fauna.

Presented by D. Astley Gresswell, Esq.

INVERTEBRATA.

1470. Liver Flukes from a Sheep.

1515a. Lepas anatifera.

Presented by Dr. Andrew.

1524a. Crayfish—Astacus fluviatilis—dissected to show the vascular and sympathetic systems. The somewhat quadrilateral heart is seen lying in its pericardium, and a piece of blue paper is placed beneath

the right ophthalmic and antennary arteries. A second piece of blue paper is placed beneath the superior abdominal vessel. Upon the stomach is the azygos nerve, branching at the lower part to form the lateral azygos trunks.

1524b. A Crayfish dissected to show its alimentary and reproductive systems. The stomach with its muscular cardiac and thinner pyloric portion is seen, and lying upon it the median azygos nerve, beneath which a black bristle is placed. The straight intestine terminating at the anus. Beneath the intestine is a piece of black paper; upon it lies the superior abdominal vessel, and into the anus a glass rod has been thrust. Between the pylorus and the heart are seen the tufted hepatic cæca lying upon each side of the intestine so as to conceal it. The coiled tubes are the vasa deferentia, which open on the last pair of walking legs; into the reproductive orifices bristles have been placed; small portion of one testis is seen on the left-hand side immediately above the coiled tubes.

1524c. Mouth-parts of a Crayfish—Astacus fluviatilis.

CASTS AND MODELS.

CLASS II.

MALFORMATIONS.

72a. Cast of a Child's Hand with bifid thumb and congenital absence of index and middle fingers.

87a. Cast of both Hands and Arms from a woman who was born without fingers on the left hand; the thumb is represented by a papilla. The patient could knit and sew.

Ditto Hand.

97a. Cast of a Hand showing congenital constriction of right thumb, probably due to intra-uterine pressure.

SERIES XXXVIII.

DRAWINGS OF CONGENITAL MALFORMATIONS.

22. Drawing of the Thoracic Organs of a newly-born child who only breathed a few times. The partially expanded lungs are seen to be of a lighter colour than the unexpanded portion. The thymus is visible as a large body in the upper part of the drawing.

SERIES XXXVIII.

DRAWINGS OF NORMAL STRUCTURES.

289. Clot of Blood, surrounded by a thin layer of yellow granular matter, in the ovary of a woman who died during menstruation.

291. A Corpus Luteum, from a woman who died with chorea, in or about the sixth week of pregnancy.

356. Corpus Luteum at the commencement of the second month of pregnancy.

98. Veins of a Small Intestine filled with fluid like chyle; from a specimen in the Physiological Series, xiv., No. 719. (W. H. Clift, Esq.)

EXAMINATIONS, 1881-82.

Lawrence Scholarship and Gold Medal—
R. J. COLLYNS.

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Æq. { C. A. MORTON.
T. W. SHORE.

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Hichens Prize—
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Wix Prize—
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2. J. GAY.
3. G. L. WELLS.
4. H. H. FISHER.
5. { S. K. ALLCOCK.
O. WUNDERLICH.
7. G. P. NEWBOLT.

PRACTICAL ANATOMY.

SENIOR.

Foster Prize—J. C. HEATH.
2. S. H. HABERSHON.
3. F. E. MATTHEWS.
4. E. JESSOP.
5. H. C. CHAPMAN.
6. O. R. JULIAN.
7. S. J. PALMER.
8. F. P. MAYNARD.
9. J. P. ROUGHTON.

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Treasurer's Prize—E. HUMPHRY.
2. T. M. WRIGHT.
3. R. H. COOMBES.
4. T. W. DUFF.
5. R. F. JOWERS.
6. J. SOUTTER.
7. { L. P. SHADBOLT.
B. FURNIVALL.
9. H. W. GARDNER.
10. H. D. ROLLESTON.
11. R. BARBERY.

EXAMINATIONS, 1882-83.

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S. Paget.
T. N. Vogan.

Brackenbury Medical Scholarship—
F. Cresswell.

Brackenbury Surgical Scholarship—
J. Berry.

Senior Scholarship in Anatomy, Physiology, and Chemistry—
G. L. Wells.

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W. S. Whitcombe.

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Æq. { A. W. Laing.
C. H. Hands.

Jeaffreson Exhibition—
C. S. Pethick.

Kirkes Gold Medal—
F. Cresswell.
S. Paget.

Bentley Prize—
Æq. { S. H. Habershon.
W. T. H. Spicer.

Hichens Prize—
W. G. Spencer.

Wix Prize—
H. W. Gell.

Harvey Prize—

1. H. D. Rolleston.
2. F. M. Wright.
3. W. G. Spencer.
4. C. W. F. Young.
5. W. J. Gow.
6. J. Soutter.
7. F. S. Barber.
8. J. J. G. Pritchard.

PRACTICAL ANATOMY.

Junior.

Treasurer's Prize—F. W. Green.
2. F. W. Andrewes.
3. F. S. Arnold.
4. M. C. Moxham.
5. W. H. Hamer.
6. O. C. P. Evans.
7. W. H. R. Rivers.
8. J. Nixon.
9. H. C. L. Scofield.

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Foster Prize—F. M. Wright.
2. E. Humphry.
3. W. G. Spencer.
4. H. D. Rolleston.
5. J. W. Cockerill.
6. R. H. Combes.
7. R. F. Jowers.
8. { A. H. Davis.
J. J. G. Pritchard.
10. A. C. Dove.
11. { W. J. Gow.
J. A. Rigge.
13. L. M. Snow.

EXAMINATIONS, 1883-84.

Lawrence Scholarship and Gold Medal—
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Brackenbury Medical Scholarship—
Æq. { A. H. Garrod. / G. C. Murray.

Brackenbury Surgical Scholarship—
W. T. H. Spicer.

Senior Scholarship in Anatomy, Physiology, and Chemistry—
Æq. { W. G. Spencer. / F. W. Andrewes.

Open Scholarships in Science—
Æq. { F. M. Brown. / J. G. C. Colby.
Æq. { H. G. Adamson. / S. Blackmore.

Preliminary Scientific Exhibition—
Æq. { J. Wilkie. / H. Symonds.

Jeaffreson Exhibition—
S. Wilkie.

Kirkes Gold Medal—
S. H. Habershon.

Bentley Prize—
A. G. Francis.

Hichens Prize—
H. D. Rolleston.

Wix Prize—
F. W. Andrewes.

Harvey Prize—

1. T. W. Green.
2. W. H. Hamer.
3. C. H. Hands.
4. W. H. R. Rivers.
5. W. W. L. M'Lean.
6. R. Balgarnie.

PRACTICAL ANATOMY.

Senior.

Foster Prize—T. W. Green.
2. M. C. Moxham.
3. O. C. P. Evans.
4. M. Laing.
5. { W. H. Hamer. / J. R. Mackenzie.
7. H. Deacon.
8. F. Heasman.
9. F. Englebach.

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6. A. G. Hendley.
7. H. B. Cardew.
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10. F. S. J. Lulham.
11. R. Bird.

ST. BARTHOLOMEW'S HOSPITAL & COLLEGE.

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Consulting Surgeons—Sir J. Paget, Bart., D.C.L., LL.D., F.R.S., Mr. Luther Holden.

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Comparative Anatomy—Dr. Moore.

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Assistant-Medical-Tutor—Dr. Ormerod.
Tutor in Midwifery—Mr. W. S. A. Griffith.
Curator of the Museum—Mr. D'Arcy Power.

COLLEGIATE ESTABLISHMENT.

Warden—Dr. Norman Moore.

Students can reside within the Hospital walls, subject to the College regulations.

Ten Scholarships, varying in value from £20 to £130, are awarded annually.

Further information respecting Scholarships, Pupils' Appointments, and other details, may be obtained from Dr. Norman Moore, and at the Museum or Library.

INDEX.

ST. BARTHOLOMEW'S HOSPITAL REPORTS.

VOLUME XX.

INDEX.

PRINTED BY BALLANTYNE, HANSON AND CO.
EDINBURGH AND LONDON.

STATISTICAL TABLES

OF THE

Patients under Treatment

IN THE WARDS OF

ST. BARTHOLOMEW'S HOSPITAL

DURING 1883.

BY

THE MEDICAL REGISTRAR,

SAMUEL WEST, M.B. (Oxon.)—M.R.C.P.;

AND

THE SURGICAL REGISTRARS,

J. MACREADY, F.R.C.S.

AND

FREDERIC S. EVE, F.R.C.S.

LONDON:

HARRISON AND SONS, ST. MARTIN'S LANE,

Printers in Ordinary to Her Majesty.

1884.

PREFACE.

The Classification of Diseases in the Medical Tables is that adopted by the College of Physicians in their Nomenclature of Diseases.

CONTENTS.

SURGICAL REPORT—

ST. BARTHOLOMEW'S HOSPITAL.

1883.

Number of Beds in Medical Wards (including 14 for Diseases of Women)		236
" " " Surgical "	including 6 for Diseases of Women and 26 for Ophthalmic Cases	395
" " " Unassigned		41
		672

GENERAL STATEMENT OF THE PATIENTS UNDER TREATMENT DURING THE YEAR 1883.

Patients remaining in January 1st, 1883 :			
Medical	220		
Surgical	351	 571	
Admitted during the year 1883 :			 7,397
Medical	2,586		
Surgical	4,240	 6,826	
Discharged :			
Medical	2,179		
Surgical	4,011	 6,190	
Died :			
Medical	406		
Surgical	230	 636	 7,397
Remaining in January 1st, 1884 :			
Medical	221		
Surgical	350	 571	

Patients brought in Dead	41
Number of Post-mortem Examinations	478
or about 3 out of 4.	

OCCUPATIONS OF MALE PATIENTS.

Attendant	..	..	1	Collectors	..	..	4	Grocers	..	..	10
Accountant	..	..	1	Colourman	..	..	1	Groom	..	..	1
Actor	..	..	1	Commercial travellers			16				
Agents	..	..	5	Commission agent	..		1				
Artist	..	..	1	Commissionaire	..		1	Hairdressers	..	..	3
				Compositors	..	..	10	Hatter	..	..	1
				Confectioners	..	..	3	Hawkers	..	..	17
Bakers	..	..	11	Cooks	..	..	2	Horse keepers	..	..	8
Bargemen	..	..	6	Coopers	..	..	5	Horsehair dresser	..		1
Barmen	..	..	8	Custom-house officers			8	Housekeepers	..	..	4
Basket makers	..	..	4	Cutlers	..	..	4				
Beadle	..	..	1								
Bird fancier	..	..	1					Instrument makers	..		2
Bill poster	..	..	1	Decorators	..	..	4	Iron workers	..	..	10
Blacksmiths	..	..	10	Distillers	..	..	2	Ivory turner	..	..	1
Blind maker	..	..	1	Diver	..	..	1				
Boatman	..	..	1	Dock labourer	..		1				
Boiler makers	..	..	2	Drapers	..	..	10	Japanners	..	..	2
Bonnet-shape makers			3	Draymen	..	..	3	Jetworkers	..	..	3
Bookbinders	..	..	20	Drovers	..	..	4	Jewellers	..	..	5
Boot finishers	..	..	3					Joiners	..	..	2
Boot-last maker		..	1					Juggler	..	..	1
Boot makers	..	..	31	Electro-plater	..		1				
Box makers	..	..	18	Engine drivers	..		13				
Brass finishers		..	5	Engineers	..	..	18	Knife grinders	..		2
Brewers	..	..	52	Engine fitters	..	..	3				
Bricklayers	..	..	22	Errand boys	..	..	20				
Brick makers	..	..	2					Labourers	..	..	346
Brush makers	..	..	4					Lamplighters	..	..	2
Butchers	..	..	31	Farriers	..	..	4	Lamp maker	..	..	1
Builders	..	..	2	Fitters	..	..	3	Lath render	..	..	1
Butlers	..	..	3	Firemen	..	..	3	Leather cutter	..		1
				Fishermen	..	..	2	Leather dressers	..		2
				Fishmongers	..	..	4	Lightermen	..	..	6
Cabinet makers	..		24	Fish salesmen	..	..	5	Lithographers	..	..	2
Cabmen	..	..	74	Florist	..	..	1	Looking-glass makers			2
Card maker	..	..	1	Footmen	..	..	3	Locksmith	..	..	1
Carmen	..	..	70	Foremen	..	..	4				
Carpenters	..	..	32	French polishers		..	8				
Carpet workers		..	12	Furriers	..	..	2	Machinists	..	..	4
Carrier	..	..	1					Machine rulers		..	3
Carvers	..	..	4					Malster	..	..	1
Cattle dealer	..	..	1	Gamekeeper	..	..	1	Masons	..	..	7
Cellarmen	..	..	7	Gardeners	..	..	14	Mechanics	..	..	13
Chair maker	..	..	1	Gasfitters	..	..	11	Messengers	..	..	11
Chemists	..	..	3	General dealers		..	3	Milkmen	..	..	8
Cigar makers	..	..	5	Gilders	..	..	5	Minstrels	..	..	2
Clerks	..	..	49	Glass cutters	..	..	4	Miller	..	..	1
Clock makers	..	..	12	Glass fitter	..	..	1	Miners	..	..	2
Cloth workers	..	..	4	Glass silverer	..	..	1	Musicians	..	..	4
Coach makers	..	..	26	Glass workers	..	..	2				
Coachmen	..	..	15	Gold beater	..	..	1				
Coalheavers	..	..	8	Greengrocers	..	..	11	Newsvendors	..	..	3

OCCUPATIONS OF MALE PATIENTS (*continued*).

Night watchmen	5	Railway porters	12	Surveyors	3
		Rateatchers	2	Sweeps	17
		Rope makers	2		
Oilman	1				
Omnibus conductors	3			Tanners	3
Ostlers	5			Tailors	30
		Sadlers	2	Tent maker	1
		Sail maker	1	Telegraph clerks	4
Packers	12	Sailors	27	Timekeeper	1
Packing-case maker	1	Sawyers	9	Tin-plate workers	2
Painters	51	Scaffolder	1	Tobacconists	2
Paper hangers	2	Scavengers	2	Turners	20
Paper folder	1	Schoolboys	161	Typefounders	8
Paper stainers	6	Schoolmasters	3		
Pavior	1	Servants	22		
Pensioners	2	Sewermen	2	Umbrella maker	1
Photographers	2	Shirt maker	1	Upholsterer	1
Pianoforte makers	2	Shoeblacks	4		
Picture-frame makers	2	Shop boys	10		
Plasterers	4	Shopmen	19	Van boys	12
Platelayer	1	Signalmen	5		
Plumbers	15	Silversmiths	3		
Policemen	7	Skin dressers	2	Waiters	21
Polisher	1	Slater	1	Warehousemen	21
Porters	103	Smiths	7	Watch makers	6
Potmen	8	Soldiers	7	Weavers	5
Printers	45	Solicitors	2	Wheelwrights	3
Printer's boys	14	Sorter	1	Whip makers	6
Publicans	5	Stationers	2	Wine packer	1
Pupil teachers	2	Station-master	1		
Postmen	7	Stewards	3		
Pugilist	1	Stevedores	3	Zinc workers	2
		Stick makers	6		
		Stokers	5		
Ragmen	4	Students	13		
Railway inspector	1	Surgeons	2		

OCCUPATIONS OF FEMALE PATIENTS.

Artist	1	Flower sellers	3	Needlewomen	33
Artificial-flower makers	19	French polisher	1	Nurses (hospital)	30
		Fringe maker	1	,, (monthly)	5
		Furrier	1		
		Fur sewers	2		
Bag makers	2				
Ballet girl	1			Paper sorter	1
Barmaids	5			Purse maker	1
Bead workers	2	Governesses	7		
Bookbinder	1	Glove maker	1		
Bookfolders	9				
Bookkeepers	2			Rope maker	1
Boot makers	4			Rag sorters	3
Box makers	13				
Brush drawer	1	Harlots	110		
		Hat maker	1		
		Hawkers	7	School girls	26
		Housekeepers	4	Seampstresses	8
Cabinet maker	1	Housemaids	6	Servants	266
Charwomen	19	Housewives	700	Shirt maker	1
Cigar maker	1			Shopwomen	15
Collar makers	2				
Cooks	24				
Clerks	6	Ironers	8	Tailoresses	6
				Teachers	3
				Telegraphist	1
				Tie makers	3
Dressmakers	19	Lace maker	1	Toy makers	3
		Laundresses	25	Trimming makers	2
		Lady's maid	1		
Envelope folders	2			Umbrella makers	5
				Upholstresses	3
		Machinists	24		
		Manglers	2		
Factory girls	10	Mantle makers	3		
Fancy-shop keepers	3	Match maker	1	Waitresses	1
Feather makers	5	Milliners	9	Ward maids	3
Flower makers	2	Musician	1	White-lead workers	2

MEDICAL REPORT.

Disease.	Total	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
GENERAL DISEASES, A.																																									
Varicella (1)	4	1	3	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Scarlet Fever (2)	98	48	37	7	6	15	11	3	3	17	9	4	..	6	5	..	2	5	5	..	..	5	5	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Small Pox	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Measles (3)	66	35	25	6	..	20	16	6	..	5	7	..	..	2	..	..	..	3	..	..	..	4	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Typhus	3	1	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Typhoid (4)	126	63	39	15	9	1	1	1	..	4	2	1	..	16	9	4	1	16	6	4	1	20	16	4	5	5	4	1	1	1	1	..	1	..	..	..	..	..	..	..	..
Febricula	29	20	9	..	..	2	2	..	..	7	1	..	..	2	2	..	..	5	1	..	..	1	3	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..
Rötheln	5	1	4	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Diphtheria	23	7	8	2	6	4	..	2	4	3	3	..	1	..	..	..	1	..	3	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ague	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pyæmia (5)	13	3	..	4	6	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	3	3	..	..	..	2	2	..	..	1	..	..	..	..	..	..	..	..	..
	371	182	127	34	28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
GENERAL DISEASES, B.																																									
Rheumatic Fever (6) ..	176	101	73	1	1	..	..	..	..	..	1	..	..	8	8	..	..	24	13	..	1	32	30	1	..	24	15	..	..	9	5	..	..	4	1	..	..	..	..	..	..
Rheumatism (7)	103	56	47	..	..	..	1	..	..	1	1	..	..	2	5	..	..	17	11	..	..	11	23	..	..	17	3	..	..	11	3	..	..	1	..	..	..	..	..	..	..
Gonorrhœal Rheumatism ..	9	8	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lumbago	7	4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	2	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Muscular Rheumatism ..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gout—	19	15	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	5	1	..	..	7	2	..	..	2	..	..	..	..	..	..	..
Osteo-arthritis	5	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..	1	..	..	..	1	..	..

TABLE I (*continued*).

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
GENERAL DISEASES, B (*continued*).																																							
Rickets	11	9	1	1	..	8	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
General Tuberculosis ..	4	..	..	4	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Syphilis	3	2	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Addison's disease (9) ..	3	1	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..
Lymphadenoma	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Leucocythæmia (11)	3	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Enlarged Cervical Glands ..	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..
Chlorosis	7	..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Purpura (8)	8	4	2	2	..	1	..	..	..	1	..	..	..	2	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Anæmia	25	2	23	..	..	1	..	..	..	..	..	..	..	1	1	..	..	8	..	..	..	11	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..
Pernicious Anæmia (10) ..	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Otitis interna	4	2	2	..	..	1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	395	211	168	13	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
LOCAL DISEASES.																																									
DISEASES OF THE NERVOUS SYSTEM.																																									
Meningitis	6	3	3	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Tubercular ..	12	..	..	8	4	..	..	1	1	..	..	2	1	..	..	..	1	..	..	..	1	..	..	3	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
Pachymeningitis hæmorrhagica	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Apoplexy	12	1	..	9	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	5	1	..	..	1	..	..	..	2	1
Cerebral Tumour	7	2	5	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	3	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Abscess in Brain [12] ..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hemiplegia [14]	26	19	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	6	..	..	..	2	1	..	..	3	1	..	..	3	1	..	..	3	3	..	..
Paraplegia [13]	17	9	5	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	3	1	..	1	4	2	..	..	2	1	..	..	..	..	..	1
Lesion of cervical cord ..	3	1	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Tumour of Spinal Column..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Spinal Palsy (Infantile) ..	7	3	4	..	..	2	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ (Adult) ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..

TABLE I (*continued*).

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died		Discharged		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Chronic Myelitis ([16]) ..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Locomotor Ataxy	9	6	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	2	..	..	2	..	..	..	2	..	..	..	..	..	..	..
Progressive Muscular Atrophy	4	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lateral Sclerosis	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Disseminated Sclerosis ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Spastic Paraplegia ([20]) ..	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Tetanus ([22])	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cervical Opisthotonos ..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Paralysis Agitans	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..
Chorea ([15])	35	12	23	..	..	..	..	..	..	1	4	..	..	7	10	..	..	4	8	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Epilepsy ([21])	32	20	12	..	..	..	..	..	..	2	..	..	..	..	1	..	..	4	2	..	..	5	5	..	..	5	2	..	..	3	1	..	..	..	1	..	..	1	..	..	..
Convulsions (Infantile) ..	3	1	2	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Coma (? cause)	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Facial Palsy	10	7	3	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	1	..	..	..	2	..	..	..	1	..	..	..	1	..	..	..	2	..	..	..
Paralyses (various) ([17]) ..	6	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	2	..	..	1	..	..	..	..	..	..	..
Diphtheritic Paralysis ([19]) ..	4	3	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spasms of Muscles	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..
Aphasia ([18])	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Sciatica	8	5	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	2	..	..	..	1	.	..	..	1	2	..	..
Neuralgia—	5	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pleurodynia	3	2	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Headache	12	8	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	.	..	..	1	1	.	..	2	1	..	..	1	..	..	..
Anæsthesia	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Hysteria (23)	28	4	24	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	4	..	..	1	9	..	..	2	5	..	..	..	2	..	..	..	1	..	..	..	..	..	..
General Paralysis of Insane	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Imbecility	3	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	.	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Mania (24)	5	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..
	279	133	116	19	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE CIRCULATORY SYSTEM.																																							
Pericarditis (25)	7	1	2	3	1	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	1	..	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Morbus Cordis :—																																							
Aortic (26)	24	11	6	5	2	..	..	..	..	..	..	..	..	..	..	..	..	4	1	1	..	4	3	1	..	2	2	..	1	..	..	2	..	..	..	1	..	1	..	1	..
Mitral Sterosis (27) ..	12	1	8	2	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	1	..	..	4	..	1	..	2	1	..	..	..	..	..	..	..	..	..
„ Regurgitation ..	58	21	32	4	1	..	..	..	..	3	2	..	..	1	5	1	..	5	4	..	..	3	9	1	..	3	8	..	..	3	2	1	..	3	2	1	1	..	..	..	..
„ Double	19	4	13	1	1	..	..	..	..	..	1	..	1	..	2	..	..	..	1	1	..	3	4	..	..	1	3	..	..		2	..	..	..	..	..	..	..	..	..
Aortic and Mitral ..	23	9	4	3	7	..	..	..	..	..	..	1	..	1	1	..	2	2	1	..	..	2	1	1	2	2	1	1	1	1	..	..	1	1	..	..	1	..	..	..	..
Unspecified	15	5	3	4	3	..	..	..	..	..	..	..	..	1	..	1	..	1	..	1	1	3	2	1	1	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	..
Fatty Heart	3	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Aneurism (Aorta, Thoracic) [28]	9	4	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	4	..	1	..	1	..	..	..	..	..
„ Abdominal Aorta	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Innominate ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Abdominal Pulsation ..	3	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..
Exophthalmic Goitre— ..	6	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	1	..	..	1	..	..	..	..	..	..
Palpitation	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Thrombosis [29]	8	2	5	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	3	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..
Œdema of Neck	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	192	62	82	31	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE RESPIRATORY SYSTEM.																																									
Laryngitis—..	13	3	8	2	..	1	3	1	..	1	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	..	1	..
Croup (*cf.* Diphtheria) ..	4	4	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stridor	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Whooping Cough	8	2	4	..	2	2	3	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Laryngismus	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bronchitis	74	21	37	12	4	4	8	2	1	3	3	..	..	..	5	..	..	1	4	1	..	4	5	2	..	4	4	..	..	1	5	2	..	2	1	1	1	2	2	4	2
Emphysema	26	20	2	2	2	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	3	1	..	1	6	..	1	1	3	..	1	..	5	1	..	..
Asthma	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Pneumonia (lobar) (30) ..	99	61	19	14	5	10	2	2	3	8	6	..	..	6	3	..	..	8	4	1	1	17	2	3	..	7	1	2	1	3	1	5	..	1	..	..	..	1	..	1	..
,, (lobular) ..	7	4	1	1	1	3	..	..	1	.	1	..	.	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	.	..	..	..	..	..	..	..	1	..
Phthisis (31)	122	37	22	37	26	1	2	..	2	2	..	..	2	2	..	2	..	1	3	2	2	11	8	14	8	11	7	6	5	6	2	8	2	1	..	4	5	2	..	1	..
Gangrene of Lung	3	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..
General Tuberculosis of Lung	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hæmoptysis (32)	23	19	3	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	3	..	..	..	11	2	..	..	2	..	1	..	2	..	..	..	..	..	..	..
Pleurisy (33)	52	38	12	1	1	1	..	..	..	3	1	..	..	1	..	..	..	5	1	1	..	14	5	..	..	7	2	..	..	5	2	..	..	2	1	..	1	.	..	..	..
Empyema (34)	11	5	4	..	2	2	2	..	..	1	1	..	..	1	..	..	..	..	..	..	..	1	1		1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Pneumothorax (35)	3	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Mediastinal Tumour (36) ..	5	3	1	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..
	455	220	115	76	44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE DIGESTIVE SYSTEM.																																									
Stomatitis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tonsillitis (37)	52	16	36	..	..	3	2	..	..	3	4	..	..	3	..	..	..	4	8	..	..	5	15	..	..	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stricture of Œsophagus (38)	2	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
Hæmatemesis	16	9	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	3	..	..	2	2	..	..	3	..	..	..	1	1	..	..	1	..	..	..
Gastric Ulcer	12	2	6	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	1	1	..	..	1	..	1	..	..	..	1	1	..	..	1	..
Melena	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
Carcinoma of Stomach ..	13	4	3	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	2	1	1	..	1	1	1	1	..	1	..	1
Dyspepsia	19	5	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	5	..	..	2	4	..	..	2	..	..	..	..	1	..	..	..	2	..	..
Dysphagia	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Vomiting	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Diarrhœa	24	10	10	3	1	3	..	2	..	..	1	..	..	..	1	..	1	2	..	..	..	2	2	..	..	2	2	..	..	1	2	..	..	..	2	..	..	..	..	1	..
English Cholera	3	1	..	1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged		Died.		Discharged		Died.		Discharged		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE DIGESTIVE SYSTEM (*continued*).																																							
Enteritis (39)	4	2	..	..	2	..	..	..	2	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Intestinal Colic	8	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	3	..	..	..	..	2	..	..	..	1	..	..	..	1	..	..	..	..	..
Tympanitis	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..
Intestinal Obstruction (40) ..	8	2	4	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Constipation	7	4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..
Cancer of Large Intestine (41)	8	..	..	3	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	1	..	..	..	..	1	3	..	..	..
Typhlitis (42)	10	6	3	1	..	..	..	..	..	..	..	1	..	1	..	..	..	2	..	..	..	2	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1
Dysentery	3	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Cirrhosis of Liver (44) ..	32	7	9	12	4	..	..	..	..	..	..	1	..	..	1	..	..	..	1	..	..	2	2	1	..	2	1	4	..	2	2	1	2	..	..	3	..	1	2	2	2
Ascites (45)	14	4	7	1	2	1	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	1	..	1	..	4	..	1	..	..	1	..	..	1	..	..
Jaundice (46)	16	11	5	..	..	..	..	..	..	2	..	..	..	..	..	..	..	3	1	..	..	2	2	..	..	1	1	..	..	1	1	..	..	..	..	..	..	2	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE DIGESTIVE SYSTEM (*continued*).																																							
Hepatic Enlargement ..	7	4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	2	..	..	2	..	..	..	1	..	..	..
Carcinoma (47)	8	2	2	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1	..	2	..	..	..	..	..	..	..	1	2	..
Congestion of Liver ..	3	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..
Amyloid Liver	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Abscess (49)	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Acute Yellow Atrophy (50) ..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gall-stone Colic	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Hydatids (Liver) (54) ..	5	1	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..
,, Peritoneum ..	4	1	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Cancer of Pancreas (48) ..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
Peritonitis (Acute) (52) ..	5	2	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..
,, (Chronic) (53) ..	8	4	2	1	1	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	1	..	1	1	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..
,, (Tubercular) (51)	8	3	3	1	1	1	..	..	..	1	..	..	..	1	2	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
,, (Malignant) ..	3	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	1	..	..	..	..
Perforation (43)	4	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Abdominal Tumour.. ..	32	11	18	2	1	..	..	1	..	..	..	..	..	1	..	..	..	1	1	..	..	2	2	..	..	2	5	..	1	2	5	..	..	1	3	1	..	2	2	..	..
Enlargement of Spleen ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
	356	130	152	42	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE URINARY SYSTEM.																																							
Nephritis, Acute Parenchymatous (55) ..	32	17	6	6	3	1	..	1	2	..	2	2	..	2	..	..	..	3	2	..	..	5	1	2	1	4	1	1	..	1	..	..	..	1	..	..	..	..	..	..	..
,, after Scarlet Fever(56)	19	13	3	2	1	2	1	..	..	10	2	..	1	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
,, Chronic Parenchymatous (57) ..	27	13	11	3	..	..	..	..	..	..	..	..	..	2	..	..	..	1	2	..	..	1	2	2	..	4	2	..	..	3	2	..	..	2	3	..	..	..	..	1	..
Granular Kidney (58) ..	35	10	6	14	5	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	2	..	..	2	4	1	2	1	1	3	6	1	2	2	2	1	..	..	3	..
Calculus (Renal) (59) ..	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Renal Tumour	3	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Floating Kidney	6	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..
Hydronephrosis (60)	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pyonephrosis	4	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Cystitis (62)	5	..	4	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..
Vesical Tumour	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis of Urinary Tract	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Albuminuria	14	6	8	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	3	1	..	..	..	1	..	..	2	2	..	..	..	1	..	..	1	..	..	..
Hæmaturia (61)	3	2	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Diabetes Mellitus (63) ..	14	4	4	6	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	1	..	1	..	1	..	2	1	..	..	..	1	2	..	1	..	1	..
	167	70	54	33	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE FEMALE GENERATIVE SYSTEM.																																									
Amenorrhœa	1	..	1	..	..																	1																			
Dysmenorrhœa	5	..	5	..	..													1				2				2															
Menorrhagia	8	..	8	..	..													1								4				2				1							
Leucorrhœa	1	..	1	..	..																	1																			
Lupus Vulvæ	3	..	3	..	..																	2				1															
Epithelioma Vulvæ	1	..	1	..	..																																	1			
Cyst of Labium	2	..	2	..	..																	1				1															
Carbuncle of Urethra	4	..	4	..	..													1				1												2							
Vaginitis	8	..	8	..	..													4				3				1															
Erosion of Cervix	4	..	4	..	..																	2				1				1											
Granular Cervix	1	..	1	..	..																					1															
Cancer of Cervix	6	..	6	..	..																	1				1				2				2							
Polyp from Cervix	1	..	1	..	..																					1															
Cancer of Uterus	28	..	27	..	1																	1				6				12				7		1		1			
Prolapse of Uterus	11	..	1	..	..																									1											

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE FEMALE GENERATIVE SYSTEM (*continued*).																																							
Parametritis	10	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	3	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..
Perimetritis	18	..	16	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	..	2	..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Oophoritis	10	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Hæmatocele	4	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Pelvic Cellulitis	5	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Vesico Vaginal Fistula	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Imperforate Perineum (64)	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Undeveloped Uterus	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Uterine Fibroid	51	..	51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	..	..	..	16	..	..	..	17	..	..	..	5	..	..	..	4	..	..	..
Uterine Polyp	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..
Ovarian Tumour	11	..	8	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	2	..	1	..	2	..	1	..	..	..	..	1	1	..	..	..

Disease.	Total.	Discharged.		Died		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
AFFECTIONS CONNECTED WITH PREGNANCY.																																									
Pregnancy	7	..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Abortion (65)	15	..	12	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	5	..	2	..	3	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Retroversion of Gravid Uterus (66)	6	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Post-partum Pyrexia ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lacerated Perineum ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Subinvolution	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Retained Placenta ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Porro's Operation (old) (68)	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Extra-Uterine Fœtation (67)	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
	222	..	212	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE CUTANEOUS SYSTEM.																																							
Erythema	4	1	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Nodosum (73) ..	6	2	4	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..
Chronic Eczema	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Urticaria	4	2	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pemphigus	6	3	3	..	..	1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Herpes Facialis (74)	3	2	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Zoster	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pediculi Capitis	1	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	27	12	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
CONDITIONS NOT NECESSARILY ASSOCIATED WITH GENERAL OR LOCAL DISEASES.																																							
Debility	48	13	35	..	..	1	..	..	..	1	1	..	..	1	3	..	..	2	5	..	..	2	11	..	..	2	10	..	..	3	5	..	..	..	..	..	..	1	..	..	..
Marasmus	7	4	1	1	1	4	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Destitution	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Nil	7	3	4	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	2	..	..	..	..	..
Myxœdema	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	64	20	42	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
POISONS.																																									
Lead (70)	12	5	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	1	..	..	1	2	..	..	..	2	..	..	..	..	..	..
Mercury	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Phosphorus	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
White Precipitate	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bichromate of Potash (69) ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Caustic Potash	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Carbolic Acid (72)	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Coal Gas	2	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Alcohol—																																									
Intoxication	16	11	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	6	3	..	..	3	1	..	..	..	1	..	..	..	..	..	..
Delirium Tremens ..	12	10	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	..	..	3	1	..	..	1	..	..	..	..	..	..	..
Opium (71)	4	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Calabar Bean	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Uncertain Poison	2	1	1	..	..	1	..	..	..	..	..	..	..	.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	57	29	27	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

ABSTRACT OF TABLE.

DISEASES.	Total Number of Cases completed during the Year.	Number of Cases discharged.		Deaths.		Remaining in the Hospital at the end of the year 1883.
		M.	F.	M.	F.	
General Diseases, A	371	182	127	34	28	
Do. Do. B	395	211	168	13	3	
Local Diseases—						
Diseases of the Nervous System	279	133	116	19	11	
„ Circulatory System	192	62	82	31	17	
„ Respiratory System	455	220	115	76	44	
„ Digestive System..	356	130	152	42	32	
„ Urinary System	167	70	54	33	10	
„ Female Generative System	222	..	212	..	10	
„ Cutaneous System	27	12	15	..	..	
Conditions not necessarily associated with General or Local Diseases—						
Poisons	57	29	27	1	..	
Various	64	20	42	1	1	
	2585	1069	1110	250	156	221
		2179		406		
		2585				

Disease.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Typhus	..	..	..	..	..	..	..	..	..	..	1	2
Typhoid	12	15	9	4	2	3	4	5	5	32	24	11
Rötheln	1	..	1	..	2	..	..	..	..	1	..	..
Varicella	..	1	..	..	..	..	..	..	..	1	..	2
Measles	1	5	4	2	5	12	12	6	2	7	5	5
Scarlet Fever	10	9	7	1	5	10	11	10	9	9	10	7
Febricula	1	..	1	3	..	3	2	7	4	3	3	1
Diphtheria	4	..	1	1	1	1	1	4	..	4	4	2
Rheumatic Fever	10	11	13	8	8	7	14	17	24	29	15	20
Chorea	2	3	4	2	1	2	2	4	4	7	2	2
Pneumonia	7	9	10	18	5	8	4	8	8	4	10	6
Tonsillitis	5	3	3	3	3	7	4	4	5	3	7	5

APPENDIX TO TABLE I.

1. *Varicella.*—One case had parotid bubo.

2. *Scarlet Fever.*—One case was hæmorrhagic, and died; one died with ulceration of larynx, one with empyema, and one from hæmorrhage from veins after incision of a large abscess in neck.

One patient (25) was pregnant, miscarried, and recovered.

3. *Measles.*—Two of the fatal cases died of pneumonia.

4. *Typhoid Fever.*—Two cases died with acute peritonitis, but with no perforation; one died with congenital morbus cordis (aged 8), and one with parotid bubo. One died suddenly, with severe abdominal pain, followed by blood in urine and hæmatemesis, but no blood in bowel, and no perforation.

Two cases developed purulent otorrhœa, one suffered from severe boils, one had purpuric spots on abdomen and chest, but recovered. In one the temperature was very movable, rising regularly with any change of habit *e.g.*, getting up or diet.

5. *Pyæmia.*—One case had a fall on Oct. 11th, but no external injury; a rigor on 13th, swollen joints on 15th, rigor on 16th, pleurisy left side on 19th, pericarditis with slight albuminuria on 20th. Made rapid recovery.

One fatal case had abscess in right lobe of liver, many abscesses in brain, and spinal meningitis.

One fatal case developed after spondylotomy for transverse presentation.

In one case of metrorrhagia, a tent was inserted, and tincture of iodine injected. Peritonitis followed, with abscess and subsequent pyæmia.

	Total.	M	F	No Heart Disease.		Permanent Heart Disease.									
						Mitral.		Aortic.		Aortic and Mitral.		Pericard and Mitral.		Pericard.	
				M	F	M	F	M	F	M	F	M	F	M	F
1st Attack ..	69	45	24	22	10	10	12	1[1]	..	3	..	3	..	6	2
2nd Attack ..	47	27	20	8	5	10[2]	14[2]	..	..	3	..	2	..	4	1
3rd Attack ..	14	5	9	1	2	2[3]	7	..	..	..	..	..	..	2[4]	..
4th Attack ..	11	8	3	1	..	4	3[5]	..	..	1	..	2	..	..	..
5th Attack & more	23	13	10	6	1	4	8[6]	..	..	1	..	..	..	2	1

[1] Had also pericarditis.
53·6 per cent. had some permanent heart mischief.
Average age of males = 24·4.
„ „ females = 26·5.

[2] Two had presystolic murmur.
72·2 per cent. had permanent heart mischief.

[3] Two had simple mitral sterosis, and two had sterosis and incompetence.

[4] One had aortic disease as well as pericarditis.
78·5 per cent. had permanent heart mischief.

[5] In two the murmur was double.
76·5 per cent. had permanent heart mischief.

[6] In two the murmur was double, and in one only presystolic.

Of all cases taken together 108/164 per cent. = 65·6.

7. *Rheumatism.*—F 43, had nodules on buttock and arms.

8. *Purpura.*—(1) Patient had several attacks of epistaxis and bleeding from gums. The mother has Graves' disease, and is also subject to epistaxis. (2) Case on post-mortem had adherent pericardium, with aortic and mitral stenosis.

9. *Addison's Disease.*—(1) F 40: Ailing 4–5 years, discoloration 18 months, buccal mucous membrane pigmented. (2) M 26: Abscess over sternum 4 years ago, health failing 2 years, discoloration 1 year. (3) M 39: Both supra-renal capsules found caseous on post-mortem examination.

10. *Pernicious Anæmia.*—F 34: Post-mortem showed fatty heart, with hæmorrhage in pericardium, mucous membrane of stomach, arachnoid, and pia mater.

11. *Leucocythæmia.*—Patient had aortic disease, and albuminuria, hæmaturia, and large cutaneous hæmorrhage developed shortly before death.

12. *Cerebral Abscess.*—Child of 4: Had measles, followed by pneumonia and inflammation of middle ear. This led to meningitis and abscess of brain, and death.

13. *Paraplegia.*—Two were due to disease of spine and angular curvature; one case (F 57) was associated with descending lateral sclerosis and right-sided hemi-anæsthesia.

14. *Hemiplegia.*—One case (M 24) had right hemiplegia and aphasia, associated with aortic disease, and a high temperature on and off for months (100° to 103°).

15. *Chorea.*—15/35 had morbus cordis = 43 per cent. 5 M and 10 F. In all these the murmur was mitral-systolic, except one, in which it was double mitral and accompanied with pericarditis. In one of these (a fourth attack) the attack always came on during pregnancy.

16. *Myelitis.*—M 23: Was seized suddenly with numbness in both arms and legs, which soon became completely paralysed; a bedsore developed within a week of the commencement, and became very large. The paralysed muscles were slightly wasted, but they reacted to faradization. No mental defect. Patient left after 7 months, able to walk about and up and down stairs.

17. *Brachial Monoplegia.*—M 47: Due to syphilitic pachy-meningitis. There was double optic neuritis, and the urine contained half albumen. Four years before patient had "abscess of brain," and lost power in left arm, which has remained in *statu quo*.

18. *Aphasia.*—M 47: Became suddenly aphasic, without any paralysis. There was albuminuria.

19. *Diphtheritic Paralysis.*—(1) F 11: Had difficulty in swallowing 7 weeks after diphtheria, and subsequently accommodation-paralysis and diplopia. (2) M 27: Six weeks after diphtheria loss of power commenced in arms and legs. (3) M 17: Seven weeks after diphtheria, aphonia, with paralysis of soft palate and slightly of levator palpabrarum, and also of upper extremities.

20. *Spastic Rigidity.*—M 31: Of lower extremities, for which both sciatics were stretched, with slight temporary improvement.

21. *Epilepsy.*—M 37: With incomplete hemiplegia. Case was trephined, but without advantage.

22. *Tetanus.*—Idiopathic, M 8: Access gradual; thought to have caught cold. April 23, rheumatic pains. A small splint in inner side of right heel. Patient treated with chloral chiefly, and recovered; spasms ceasing gradually.

23. *Hysteria.*—One case simulated wrist-drop, but was cured. One (12) had a phantom tumour.

24. *Mania.*—F 38: Eight months pregnant, whose pelvis was deformed. Jumped out of window, and aborted. Was sent to St. Luke's.

25. *Pericarditis.*—Two fatal cases occurred in course of acute pneumonia of right base. One that recovered occurred in the course of pneumonia of left base; one with left pleurisy, and was associated with aortic regurgitation, and one occurred in course of rheumatic fever, and was associated with double murmurs at apex and base, and with left-sided pleurisy. A boy, aged 9, admitted for suppuration in shoulder-joint after fall. Developed left pleuritic effusion, and was tapped; the dyspnœa continued, and an incision was made. Pericardium found distended, and opened through wound in pleura; pus evacuated. Died a month later. Pericardium found almost universally adherent. Cause, pyæmia. (*Cf.* St. B. H. Report, 1884, and *Path. Soc. Tr.*, 1884.)

26. *Aortic Disease.*—One case of sudden death had aneurism of the valves, which had ruptured.

27. *Mitral Disease.*—In two cases of doubt mitral murmur, vegetations were found also upon the tricuspid.

28. *Aneurism.*—Nine were of the arch of the aorta; one ruptured into the pulmonary artery. One was of the innominate artery; left Hospital improved. Two of the abdominal aorta.

29. *Thrombosis of Femoral Vein.*—One case came on seven weeks after rheumatic fever, and one after suppurative periostitis of the right tibia.

30. *Pneumonia.*—

Apex.—Left—M 3, F 1. All recovered. *Right*—M 6, F 1. 2 M and 1 F died, the last of subsequent empyema, which was opened.

Base.—Left—M 25, F 10. 2 F and 2 M died. *Right*—M 28 F 8. 5 M and 1 F died. 3 M had empyema, two of which were opened, and patients left much relieved, and one was expectorated.

Double Base.—6 M and 2 F. 1 M and 1 F died. 1 F had part right and the left base pneumonic; the left base subsequently gangrened, but patient recovered.

Double Apex.—Only one case.

Crossed.—Right apex and left base in one lad of 16; the rest were not specified. In one of them pneumonia came on during treatment for varicose veins, and was possibly embolic.

31. *Phthisis.*—In three children, due to measles. In three cases (two died) amyloid change was found; in one case there were great daily oscillations of temperature, from 104° to 99°.

32. *Hæmoptysis.*—In one case due probably to morbus cordis; in one hæmoptysis occurred during purpura, without any physical signs in chest; one case only was quickly fatal.

33. *Pleurisy.*—Dry. 12 M, 6 F. 1 F died, with serous effusion. *Left side*—14 M, 5 F; 1 M died. *Right side*—9 M, 1 F. Paracentesis was performed in eight cases. Quantities removed were 1 pint, 32 ozs., 2½, 3½, and 5½ pints. One was tapped three times (53, 29, 68 ozs.), and died of pericarditis.

34. *Empyema.—Right*—1 M, 1 F died. In one case a hepatic abscess was tapped through pleura for an empyema; patient died. *Left*—3 M and 1 F. Double in case of a female child of 6. In one case the cause was probably injury, and had been accompanied at the time of the accident with hæmoptysis.

35. *Pneumothorax.*—One case was opened, but patient subsequently died.

36. *Mediastinal Tumour.*—One case was a sarcoma, extending from cervical glands. The tumour had involved the skin of the chest as well as the glands of mediastium.

37. *Tonsillitis.*—One case, F 21, had temporary glycosuria.

38. *Stricture of Œsophagus.*—M 43: Had dysphagia for 5 years, and had gastrotomy performed at Canterbury by Dr. Reid. The opening was made at the left anterior border of the left rectus at margin of ribs. Came into this Hospital about six months after the operation. The chief complaint was weakness; later was troubled with diarrhœa and hiccough, and died from exhaustion. During stay in Hospital was much troubled with expectoration of saliva.

39. *Enteritis.*—M 46: Found post-mortem to have several syphilitic ulcers of ilium, which had produced cicatrization, syphilitic ulcer of skull, with gummata of dura mater and liver, and granular kidney.

40. *Intestinal Obstruction.*—F 25: Due to scybala; relieved, but followed by rheumatic fever (first attack), leaving a systolic apex murmur. F 18: Died, and four constrictions, possibly tubercular, discovered in ilium.

41. *Cancer of Large Intestine.*—In two cases of sigmoid flexure; M 1, F 1. In one, at splenic flexion of colon, with extensive simple ulceration in loop of large intestine; in three, in rectum; in one, affecting ilio-cæcal valve.

42. *Perityphilitis.*—One case opened into bowel (M 39).

43. *Perforation.*—One from ulcer of vermiform appendix (M 19); one from gastric ulcer (F 26); one from intestinal ulcer with granular kidney (F 27).

44. *Cirrhosis.*—One girl (11) had drunk gin and spirits from birth; one (F 29) had gallstone, colic, and jaundice; one died with ascites and phthisis (M 32); two (M 43, F 65) had granular kidney as well; one died quite suddenly, cause not discovered; one had gummata beneath capsule, as well as being cirrhotic, had amyloid kidneys, and an aneurism of the aorta; one had been tapped seven times in Hospital eight years ago.

45. *Ascites.*—In one (F 54) due to cancer of peritoneum following scirrhus mammæ. In two cases probably due to cancer, and in two to enlarged glands, one of them probably tubercular.

46. *Jaundice.*—Two cases had hæmaturia during attack; one dated jaundice from typhoid fever 2½ years before.

47. *Cancer of Liver.*—In one case (F 67) due to cancer of intestine; in one (M 32) to cancer of abdominal walls, spreading to liver by direct contiguity. In one (M 60) tumour was melanotic; liver weighed 11lbs. (melanotic sarcoma); growth involved diaphragm, left kidney, and ventricle of heart; the eye had been removed for sarcoma in November, 1881.

48. *Cancer of Pancreas.*—One had ascites and jaundice, and was thought to have cirrhosis (M 60). Two (M 64) had jaundice, one for 3 months. One (M 51) was in Victoria Park with bloody urine, and was thought to have malignant disease of the bladder, and was admitted into this Hospital for retention. Was found post mortem to have cancer of pancreas, but no tumour of bladder.

49. *Hepatic Abscess.*—M 27: In 1880 was invalided home from India with hepatic abscess after dysentery; in 1882 (summer) was in Mark. Abscess aspirated, and free opening made. On this admission swelling considerable, but patient left without operation.

50. *Acute Yellow Atrophy.*—M 26, asphalte worker. Liver weighed 31 ounces; blood was found in stomach, and extravasation in lungs.

51. *Tubercular Peritonitis.*—M 17: Died suddenly, after prolonged vomiting.

52. *Acute Peritonitis.*—Two cases of suppuration; patient died after delivery. One of acute peritonitis, and collapse from rupture of a hydatid cyst into peritoneum after a fall; F 57.

53. *Syphilitic Peritonitis.*—With gummata in liver; M 29.

54. *Hydatids.*—Five in liver: Three tapped and recovered; one of them had been tapped two years before, and one twice twelve months before, as well as on this occasion, the tapping in all cases being dry, though in the last some shreds of membrane were obtained. One had cyst in left lobe of liver, which had opened into left hepatic ducts, the contents escaping by bowel. Four in peritoneum: One tapped once; one several times; one in right lumbar region (an old patient of last year) passed, then and now, several times cysts per urethra; one had also a cyst in liver, and another in right lung.

55. *Acute Nephritis.*—One (F 34) came on during lactation; recovery complete. Three died with pneumonia (M 3, 12, 24), one (M 4) of œdema of lung, one of uræmia, one with old morbus cordis, one with uræmia.

56. *Scarlatinal Nephritis.*—One died with pleuritic effusion and general dropsy; one of pneumonia and empyema. Two cases of acute ordinary nephritis gave history of previous scarlet fever—M 6, five years before; F 8, two years before.

57. *Chronic Parenchymatous Nephritis.*—Three had mitral regurgitation; one died of uræmia.

58. *Granular Kidney.*—Two died with pericarditis (M 20, F 25); two, M 42, F 39, with pleuritic effusion; two, M 30, F 28, of uræmia.

59. *Renal Calculus.*—Case of death after circumcision (M 20); calculi found in both ureters.

60. *Hydronephrosis.*—M 27: Old patient, tumour disappeared, apparently discharging through ureter. M 28: April, 1882, paracentesis, 1·5 per cent. urea in fluid with blood; Nov. 18, urine bloody; Dec. 8, paracentesis, six pints; contents: trace of albumen, 3·4 per cent. of urea, and ·409 Chl.; Jan. 5, paracentesis, five and a half pints, sp. gr. 1005, more albumen and chloride. Discharged relieved.

61. *Hæmaturia.*—M 8: probably purpura. This lad was in last year, and suffered spontaneous gangrene of fingers on both hands. (*Cf.* Appendix, 1883, Frank Hash.)

62. *Cystitis.*—From retroversion of uterus; bladder held nine pints of water.

63. *Diabetes Mellitus.*—M 50: was admitted for eczema, diabetes mellitus only found subsequently. M 57: had carbuncle, and died. M 34: had phthisis, and died of it. M 44: had œdema of feet. This patient had had diabetes for five years. M 47: got thin two years before; lost flesh and strength seven months; urine increased for three months; 40 days after admission necrosis of right little toe and of metatarsal bone;—this completely healed; admitted now for general anasarca, which disappeared completely after some months.

64. *Imperforate Perinæum.*—(14): sixteen ounces retained menses; patient admitted for retention of urine.

65. *Abortion.*—(35), induced: great hæmorrhage in uterus, 2 lbs., which decomposed. This was followed by phlegmasia dolens, first in left, then right, leg; the swelling reached shoulders, but patient recovered. (22): Induced by drugs three weeks before admission; perimetric abscess, which discharged through umbilicus; severe diarrhœa; death. (20), induced: albuminuria; sudden death from pulmonary thrombosis.

66. *Retroversion of Gravid Uterus.*—(30), paralysis of bladder from distension and pressure. Great benefit from galvanism.

67. *Extra-uterine Fœtation.*—(31) 5–6 months. Morphia injected into sac (gr. ii) by mistake; sac subsequently tapped, and 5 ozs. of fluid withdrawn. No effect upon fœtus or patient. Electric shock tried twice through two needles inserted without effect. Morphia $\frac{1}{6}$ also twice injected without effect. Patient died of septicæmia at end of a month.

68. *Porro's Operation.*—24, dwarf, performed by Dr. Godson, not in Hospital. Admitted into Hospital from him and sent to Convalescent Home. Mother and child well 7 weeks after operation.

Poisoning.—

69. *Bichromate of Potash.*—10 ozs. of saturated solution taken by mistake. Severe sickness, and collapse half an hour later. Recovery.

70. *Lead.*—Two cases of wrist-drop (M 28, F 40) ; one of both wrist and ankle-drop (M 38).

71. *Opium.*—(1) F 31 : Taken for persistent vomiting. (1) F 42 : Inflammation of arm from repeated subcutaneous injection.

72. *Carbolic Acid.*—M 41 : Admitted collapsed. Took 4–5 ozs. ; lived 5 days. Temperature rose to 103° on the day before death.

73. *Erythema Nodosum.*—F 36, F 41 : Both had severe rheumatism with it, and one tonsillitis.

74. *Herpes Facialis.*—M 16 . Following upper division of 5th nerve. M 22 : Following superior maxillary division, with herpetic stomatitis and hemiglossitis.

SURGICAL REPORT.

TABLE I.

Showing the Total Number of Cases under Treatment during the Year 1883, with the comparative Frequency and Mortality of each Disease at different Ages.

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
General Diseases.																																			
Erysipelas—(*a*) Simple	79	39	35	5	..	3	2	..	..	1	1	..	..	8	8	1	..	13	8	..	..	6	4	3	..	3	8	1	..	3	2	..	..	2	2	..	..
,, (*b*) Phlegmonous	44	27	10	5	2	..	..	..	..	..	..	..	..	5	..	..	..	6	1	1	..	8	5	..	1	5	2	2	1	1	1	1	..	2	1	1	..
Pyæmia	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Tetanus	4	..	..	3	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Hysteria	11	1	10	..	..	..	..	..	..	..	1	..	..	1	4	..	..	..	4	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Shock	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Venereal Diseases.																																			
Syphilis—																																			
Primary Sore	32	12	20	..	..	..	..	..	..	..	..	..	..	6	10	..	..	5	9	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Secondary Skin Eruptions	16	9	7	..	..	..	..	..	..	..	..	..	..	3	4	..	..	5	1	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ulcers of Throat	10	3	7	..	..	..	..	..	..	..	..	..	..	1	3	..	..	2	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Syphilitic Laryngitis	5	..	2	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..
Ulceration of Tongue	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Condylomata	12	2	10	..	..	..	..	..	..	..	..	..	..	1	3	..	..	1	3	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Ulcers and Gummata	17	11	6	..	..	..	..	..	..	..	..	..	..	2	1	..	..	3	5	..	..	3	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..
Phagedænic Sores	8	6	..	..	2	..	..	..	..	..	..	..	..	2	..	..	..	4	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Hereditary Syphilis	2	..	2	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died		Discharged		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Venereal Diseases (*continued*).																																			
Soft Sores	29	19	10	..	..	..	..	..	..	..	..	..	..	8	5	..	..	9	4	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Bubo	14	7	7	..	..	..	..	..	..	..	..	..	..	4	3	..	..	2	4	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gonorrhœa	67	41	26	..	..	..	..	..	..	..	..	..	..	19	18	..	..	18	8	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Paraphimosis	9	9	..	..	..	1	..	..	..	..	..	..	..	4	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gonorrhœal Rheumatism	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tumours.																																			
Enchondroma	5	4	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Osteoma and Exostosis	10	4	6	..	..	..	..	..	..	..	..	..	..	2	6	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lipoma	23	11	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	1	1	..	..	5	6	..	..	2	1	..	..	2	1	..	..
Fibroma	6	1	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..
Fibro-Neuroma	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Sarcoma—																																			
Bones—																																			
Skull	2	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Lower Jaw	3	2	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Sacrum	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Humerus	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Femur	2	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Tibia	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rectum	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Testis	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Breast, with Scro-cystic Disease	6	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	2	..	..	..	1	..	..
Subcutaneous Tissue	20	8	11	..	1	..	1	..	..	..	..	..	..	..	..	..	..	1	2	..	1	1	1	..	..	3	4	..	..	1	2	..	..	2	1	..	..
Recurrent	7	3	3	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	1	..	..	..	..	1	..	1	..	1	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Tumours (*continued*).																																			
Melanotic Tumours	2	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..
Epulis	8	2	6	..	..	..	..	..	..	..	1	..	..	1	1	..	..	1	3	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Parotid Tumours	5	1	4	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..
Angeioma—																																			
Nævus	14	5	9	..	..	3	8	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Angeioma of Tongue	2	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Lip	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Papilloma—																																			
Skin	4	1	3	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Tooth	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vocal Cords	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Prepuce	3	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vascular Tumour of Urethra ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Adenoma—																																			
Breast	11	..	11	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	6	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..
(*See* Parotid Tumour).																																			
Carcinoma—																																			
Face	5	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..
Lower Lip	5	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..
Nose and Upper Lip.. ..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Mouth..	10	8	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	3	1	1	..
Tongue	17	13	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	6	1	1	..	4	..	1	..
Lower Jaw	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Upper „	4	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	1	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Tumours (*continued*).																																			
Carcinoma (*continued*)—																																			
Larynx	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..
Œsophagus	3	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
Rectum	9	3	5	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	1	..	..	2	1	1	..	1	..	..
Breast	48	..	46	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..	16	..	..	..	17	.	2	..	3	..	..
Bladder	3	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..
Penis	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..
Scrotum	5	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	1	..	..	..	1	..	..	..
Testicle	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Labium	3	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	.	1	..	..
Thyroid Gland	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
Skin	3	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..
Recurrent	21	7	9	1	4	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	.	1	2	..	..	2	3	1	2	1	2	..	2	2	..	2
Rodent Ulcer	10	4	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	1	..	..	1	4	..	..
Teratoma	2	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Doubtful Tumours	6	3	2	..	1	.	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..
Keloid	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cysts—																																					
Sebaceous	31	22	9	..	..	..	..	..	..	..	..	..	..	5	3	..	..	9	4	..	..	2	1	..	..	4	1	..	..	2	..	..	..	..	..	..	..
Serous, of Breast	2	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dental	2	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dermoid	11	5	6	..	..	3	..	..	..	1	..	..	..	2	2	..	..	..	..	..	..	.	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Doubtful	3	2	1	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
TUMOURS (*continued*).																																			
Malformations and Deformities—																																			
Cleft Palate	23	12	11	..	..	5	5	..	..	2	1	..	..	5	4	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Harelip	19	9	10	..	..	9	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Microstoma	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Imperforate Anus	4	..	1	1	2	..	1	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spina Bifida	8	..	3	2	3	..	3	2	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ectopia Vesicæ	3	1	1	1	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hypospadias	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Phimosis	89	88	..	1	..	31	..	..	..	18	..	..	..	24	..	..	..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..
Of Pinna	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Of Leg	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Supernumerary Digits	2	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Other Deformities of Digits	3	3	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cervical Rib	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wry Neck	4	1	3	..	..	..	..	..	..	1	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Congenital Dislocation of Hip	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Genu Valgum	36	25	10	1	..	9	7	..	..	4	2	..	..	11	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Talipes Equinus	9	3	6	..	..	1	2	..	..	1	2	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Equino-Varus	22	15	7	..	..	9	5	..	..	3	1	..	..	2	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Varus	5	3	2	..	..	1	1	..	..	..	1	..	..	2	..	..	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Valgus	15	11	4	..	..	..	..	..	..	2	..	..	..	7	4	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Cavus	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rickets	6	4	1	1	..	..	..	1	..	3	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Curvature of Bones from other causes	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lateral Curvature of the Spine	11	3	8	..	..	..	..	..	..	..	..	..	..	3	6	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Malformations and Deformities (*contd.*)																																					
Genu Varum	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cicatrices, etc.	12	2	10	..	..	..	1	..	..	..	2	..	..	1	5	..	..	..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Contracted Tendons, etc.	13	7	6	..	..	..	1	..	..	..	2	..	..	..	1	..	..	..	..	..	..	3	1	..	..	4	1	..	..	..	..	..	..	..	..	..	..
Deformity after Excision	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Nervous System.																																					
Hydrocephalus and Meningitis ..	2	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Spastic Rigidity of Leg	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Paralysis of Extremities	3	1	2	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
,, of Particular Nerves ..	2	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Neuralgia	5	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	2	..	..	..	..	..	..	..
Diseases of the Eye.																																					
A. Conjunctiva—																																					
Catarrhal Ophthalmia	5	1	4	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Purulent ,, ...	6	2	4	..	..	2	1	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Phlyctenular ,, ...	5	2	3	..	..	1	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gonorrhœal ,, ...	2	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
B. Cornea—																																					
Keratitis	11	5	6	..	..	..	1	..	..	..	..	..	..	..	2	..	..	1	2	..	..	1	..	..	..	2	1	..	..	1	..	..	..	..	..	..	..
Interstitial Keratitis	6	3	3	..	..	..	..	..	..	..	2	..	..	2	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ulcers	30	7	23	..	..	1	10	..	..	1	3	..	..	3	3	..	..	1	5	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..
Opacities	15	2	13	..	..	..	2	..	..	..	2	..	..	..	3	..	..	2	1	..	..	..	4	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Pannus	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
DISEASES OF THE EYE (*continued*).																																			
B.—Cornea (*continued*)—																																			
Suppurative Keratitis	7	1	6	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	1	1	..	..	..	1	..	..
Staphyloma	10	6	4	..	..	..	1	..	..	..	..	..	..	2	1	..	..	2	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..
Hypopyon..	2	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hyphæma	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	.	..	..	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
C. Sclerotic—																																			
Gummatous Episcleritis.. ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
D. Iris—																																			
Iritis	14	7	7	..	..	..	..	..	..	..	..	..	..	1	3	..	..	1	1	..	..	1	..	..	..	1	1	..	..	2	1	..	..	1	1	..	..
Rheumatic Iritis	6	3	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	2	..	..	..
Syphilitic Iritis	3	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Occluded Pupil	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Synechiæ	7	4	3	..	..	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	.	..	1	..	..
Prolapse of Iris	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
E. Lens—																																			
Cataract—																																			
Hard	47	13	34	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	3	..	..	4	11	..	..	8	18	..	..
Soft	12	9	3	..	..	6	..	..	..	2	2	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Traumatic	4	1	3	..	..	..	1	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dislocation of Lens	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..
Opaque Capsule	3	1	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Eye (*continued*).																																			
F. Diseases of the Retina, Optic Nerve, and Vitreous Humour—																																			
Optic Neuritis	3	..	3	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Glioma	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hæmorrhage	4	1	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cysticercus	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Retained Nerve Sheath	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
G. Diseases of the Choroid, &c.—																																			
Choroiditis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Irido-cyclitis and Choroiditis	6	1	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	2	..	..	..	1	..	..	..	..	..	1	..	..	..	..
H. General Affections of the Eye—																																			
Glaucoma	11	2	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	1	..	..	..	1	..	..	..	5	..	..
Phthisis Oculi	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
I. Strabismus—																																			
Internal	43	6	37	..	..	..	6	..	..	5	21	..	..	1	7	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
External	2	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
J. Errors of Refraction—																																			
Astigmatism	3	..	3	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
K. Diseases of Lachrymal Apparatus—																																			
Lachrymal Obstruction	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dacryo-cystitis	7	1	6	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..

D

TABLE I (*continued*).

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Eye (*continued*).																																			
L. Diseases of the Eyelids—																																			
Granular Lids	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Entropion	6	1	5	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..
Blepharitis	2	..	2	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Œdema	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ptosis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ectropion	5	..	5	..	..	..	1	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nævus of Lids	2	..	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
M. Diseases of the Orbit—																																			
Abscess	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tumours	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Ear.																																			
Otitis Interna	3	2	..	..	1	..	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Polypus	3	2	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Exostosis	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Respiratory System.																																			
Nose—																																			
Epistaxis	7	4	3	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	2	..	..	..	1	..	..
Deflected Septum	11	6	5	..	..	..	..	..	..	1	1	..	..	2	2	..	..	2	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Ozæna	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Thickening of Mucous Membrane	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Respiratory System (*continued*).																																			
Polypus	12	5	7	..	..	..	..	..	..	..	..	..	..	1	2	..	..	1	3	..	..	1	2	..	..	..	..	..	..	2	..	..	..	..	..	..
Suppuration in Frontal Sinus	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Larynx—																																			
Laryngitis	4	1	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..
Diphtheria and Croup	27	2	4	7	14	2	4	6	14	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Old Tracheotomy	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Circulatory System.																																			
Cerebral Hæmorrhage after Injury	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Hæmophilia	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Aneurism—																																			
Thoracic Aorta	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Carotid	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Temporal (Traumatic)	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Anterior Communicating	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Subclavian	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Iliac	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Popliteal	5	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Cirsoid Aneurism	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Varicose Veins	7	4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	1	1	..	..	1	..	..	..	..	..	..	..	..	1	..	..

TABLE I (*continued*)

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Circulatory System (*continued*).																																			
Phlebitis	4	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	1	..	..	..	..	..	..	..
Thrombosis	7	3	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Phlegmasia Dolens	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Hæmorrhage from Varicose Ulcers	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Gangrene	8	2	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	2	..
Diseases of the Absorbent System.																																			
Lymphangitis	8	3	5	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	2	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..
Glands—																																			
Inflammation	6	5	1	..	..	1	..	..	..	..	..	..	..	2	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Abscess	5	4	1	..	..	1	1	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lymphoma	8	4	4	..	..	..	..	..	..	..	..	..	..	2	1	..	..	1	1	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
Lymphadenoma	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Thyroid Gland—																																			
Goitre	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Digestive System.																																			
Mouth—																																			
Stomatitis	3	1	2	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ranula	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Digestive System (*continued*).																																					
Mouth—																																					
Alveolar Abscess	7	2	5	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Hæmorrhage after extraction of a Tooth	2	2	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salivary Calculus	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Tongue—																																					
Glossitis	2	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fauces and Pharynx—																																					
Tonsillitis	4	..	4	..	..	..	..	..	..	..	..	..	..	.	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enlarged Tonsils	3	1	2	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Post-pharyngeal Abscess	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pharyngeal Fistula	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Œsophagus—																																					
Stricture	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
Diseases of the Intestines.																																					
Internal Obstruction	6	..	..	2	4	..	..	..	..	..	..	..	..	..	.	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	1	..	..	..	1	1
Intussusception	2	..	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sequelæ of Colotomy	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Hernia—																																					
Inguinal	19	17	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	3	..	..	..	5	..	..	..	4	1	..	..	1	..	..	..	3	1	..	..
Femoral	8	4	4	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	..	1	..	..	..	2	..	..	2	..	..	..
Umbilical	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged		Died.		Discharged.		Died.		Discharged.		Died.		Discharged		Died.		Discharged.		Died.		Discharged		Died.		Discharged		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Intestines (*continued*).																																					
Hernia (*continued*—																																					
Strangulated—																																					
Inguinal	19	14	2	3	..	3	..	..	..	..	..	..	..	..	1	..	..	1	..	1	..	4	..	..	..	3	..	..	..	..	1	..	..	3	..	2	..
Femoral	16	3	8	1	4	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	2	4	1	2	..	2	..	2	..	1	..	..
Umbilical	3	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..
Ventral	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Fæcal Fistula	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Rectum.																																					
Hæmorrhoids	39	18	21	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	6	..	..	5	4	..	..	6	6	..	..	2	3	..	..	3	1	..	..
Fistula	44	32	12	..	..	..	..	..	..	..	..	..	..	2	1	..	..	4	7	..	..	13	3	..	..	7	..	..	..	3	1	..	..	3	..	..	..
Fissure	12	5	7	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	2	..	..	2	3	..	..	1	1	..	..	1	..	..	..	..	..	..	..
Ulcer	2	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..
Stricture	21	..	21	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	8	..	..	..	9	..	..	..	2	..	..	..	..	..	..	..	1	..	..
Prolapsus	2	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Polypus	3	2	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ischio-Rectal Abscess	16	12	4	..	..	2	..	..	..	1	..	..	..	1	..	..	..	3	3	..	..	2	1	..	..	..	..	..	..	2	..	..	..	1	..	..	..
Eczema Ani	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Diseases of the Genito-Urinary Tract.																																					
Kidney—																																					
Hydro-Nephrosis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Suppurative Pyelitis	2	1	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Nephralgia	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Urinary Tract (*continued*).																																					
Bladder—																																					
Cystitis	4	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..
Tubercular Disease	3	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Calculus Vesicæ—																																					
Uric Acid	7	6	..	1	..	4	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..
Urates	2	2	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Oxalates	3	3	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Phosphates	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..
Foreign Body in Bladder	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hæmaturia	6	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..	..	..
Recto-Vesical Fistula	3	2	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Prostate—																																					
Enlarged	7	4	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	3	..	2	..
Inflamed	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Urethra—																																					
Stricture	79	75	..	4	..	1	..	..	..	..	..	..	..	4	..	..	..	8	..	..	..	33	..	..	..	21	..	2	..	2	..	1	..	6	..	1	..
Retention of Urine	5	5	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Extravasation „	3	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..
Calculus in Urethra	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Perineal and Urethral Abscess ..	13	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	4	..	..	..	4	..	..	..	1	..	..	..	..	..	..	..
Urethral Fistula	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Perineal „	9	8	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	3	..	..	..	2	1	..	..	..	..	..	1	..	..	..	..
Incontinence of Urine	4	1	3	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Urinary Tract (*continued*).																																			
Penis and Scrotum—																																			
Œdema	2	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..
Tunica Vaginalis—																																			
Hydrocele	16	16	..	..	..	2	..	..	..	1	..	..	..	4	..	..	..	2	..	..	..	2	..	..	..	1	..	..	..	3	..	..	..	1	..	..
Hæmatocele	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Suppuration of	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Cord—																																			
Varicocele	4	4	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Testis—																																			
Encysted Hydrocele of	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Orchitis and Epididymitis—																																			
Simple	9	9	..	..	..	1	..	..	..	1	..	..	..	3	..	..	..	1	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..
Tubercular	8	8	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	2	..	..	..	1	..	..	..	2	..	..	..	..	..	..
Syphilitic	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Retained Testis	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Generative System (Female).																																			
Cystic Diseases of Ovary	9	..	5	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..	1	..	1	..	2	..	..	..	1
Anteversion of Uterus	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fistulæ—																																			
Vesico-Vaginal Fistula	2	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Generative System (Female) (*continued*).																																					
Vulva—																																					
Inflammation	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Noma	2	..	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Breast—																																					
Inflammation	5	..	5	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chronic Induration	2	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Abscess	22	..	21	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	10	..	..	..	8	..	..	..	1	..	1	..	..	..	..	..	..	..	..
Diseases of the Organs of Locomotion.																																					
Bone and Periosteum																																					
Periostitis—																																					
1. Acute																																					
Femur	3	1	1	1	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tibia	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
2. Chronic—																																					
Femur	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tibia	14	8	6	..	..	1	1	..	..	1	1	..	..	..	1	..	..	4	3	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Clavicle	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Humerus	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lower Jaw	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Perichondritis of Costal Cartilages	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Organs of Locomotion (*continued*).																																			
Diseases of Bones—																																			
Ostitis	4	3	1	..	..	..	..	..	..	..	1	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Deformans	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..
Chronic Abscess	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Caries—																																			
Bones of Upper Extremities	7	4	3	..	..	..	2	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..
„ Lower „	29	13	15	1	..	4	3	..	..	3	4	..	..	3	7	..	..	3	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Trunk	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
„ Face	4	3	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Necrosis—																																			
Scapula	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Humerus	8	6	2	..	..	..	..	..	..	1	..	..	..	2	..	..	..	2	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..
Radius and Ulna	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hand	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..
Femur	12	11	1	..	..	1	..	..	..	1	..	..	..	5	1	..	..	2	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
Tibia	19	11	6	..	2	..	1	..	..	3	..	..	..	5	4	..	2	1	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Foot	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Skull	7	4	1	2	..	1	..	..	..	..	..	..	..	3	..	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..
Lower Jaw	8	4	4	..	..	..	..	..	..	2	1	..	..	1	1	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..
„ „ Phosphorus	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Malar Bone	2	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged		Died.		Discharged		Died.		Discharged		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of Bones (*continued*).																																			
Rickets (*see* page 46).																																			
Diseases of Stumps—																																			
Unhealed or Ulcerated	9	8	1	..	..	..	..	..	..	2	..	..	..	2	1	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Neuromata of..	3	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..
Old Excisions..	10	9	1	..	..	..	..	..	..	3	..	..	..	4	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of Joints.																																			
Synovitis..	52	32	20	..	..	..	2	..	..	2	..	..	..	7	4	..	..	12	7	..	..	3	4	..	..	5	1	..	..	2	1	..	..	1	1	..	..
Destructive Disease of Joints.																																			
Shoulder	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Elbow ..	18	13	5	..	..	1	2	..	..	1	..	..	..	5	2	..	..	4	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Wrist and Carpus	6	4	2	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..
Metacarpus and Fingers	5	3	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	1	..	..	..	..	..
Sacro-iliac synchondrosis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hip	87	54	27	4	2	13	9	1	..	11	10	1	1	21	5	..	1	6	2	1	..	1	..	..	..	1	1	1	..	1	..	..	..	..	..	..
Knee	79	41	36	1	1	5	10	..	..	6	3	..	..	10	8	..	..	12	9	..	1	5	3	..	..	2	1	1	..	1	1	..	..	1	..	..
Ankle and Tarsus	19	13	4	2	..	..	..	..	..	2	..	1	..	4	2	..	..	3	1	..	..	2	1	1	..	..	..	..	..	2	..	..	..	..	..	..
Metatarsus and Phalanges	3	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Ankylosis	17	14	3	..	..	..	..	..	..	1	..	..	..	2	1	..	..	3	1	..	..	1	..	..	..	6	1	..	..	1	..	..	..	..	..	..	..
Adhesions in Joints	7	4	3	..	..	..	..	..	..	1	..	..	..	1	2	..	..	..	1	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..
Loose Cartilages..	5	3	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	1	..	..	1	..	..	..	..	..	..	..
Acute Suppuration of Knee	5	1	2	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Charcot's Disease	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Spine.																																			
Caries	16	10	3	..	3	3	..	..	..	1	2	..	2	2	1	..	1	2	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
„ with Angular Curvature	21	11	9	1	..	..	1	..	..	2	4	..	..	4	3	1	..	3	1	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..
„ „ Psoas or Lumbar Abscess	14	6	5	2	1	..	1	..	..	..	2	1	..	2	2	..	1	2	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..
Diseases of Bursæ and of the Sheaths of Tendons.																																			
Enlargement and Inflammation—																																			
Bursa Patellæ	66	14	52	..	..	..	..	..	..	..	..	..	..	4	18	..	..	4	19	..	..	3	8	..	..	1	3	..	..	2	3	..	..	..	1	..	..
Olecranon	4	2	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Semimembranosus	2	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Other Bursæ	5	3	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Palmar Ganglion	7	4	3	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	1	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Other Ganglia	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..
Teno-synovitis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Cellular Tissue.																																			
Abscess	233	142	84	2	5	17	24	1	2	26	7	..	..	25	23	..	..	30	11	..	3	21	10	..	..	13	7	1	..	6	1	..	..	4	1	..	..
Inflammation	72	48	24	..	..	2	4	..	..	4	..	..	..	11	5	..	..	7	6	..	..	10	5	..	..	9	2	..	..	5	2	..	..	..	..	..	..

Disease.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Diseases of the Skin and its Appendages.																																					
Cutaneous Eruptions—																																					
Erythema	8	2	6	..	..	..	2	..	..	..	1	..	..	1	..	..	..	1	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Eczema	10	6	4	..	..	1	..	..	..	..	..	..	..	..	1	..	..	.	2	..	..	1	1	..	..	3	..	..	..	1	..	..	..	..	..	..	..
Lichen	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Purpura	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Leprosy Anæsthetica	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Copaiba rash	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Cutaneous System.																																					
Lupus	24	12	12	..	..	..	..	..	..	..	..	..	..	5	9	..	..	5	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	1	1	..	..
Ulcers	53	29	18	5	1	..	..	..	1	..	1	..	..	6	1	..	..	7	4	..	..	6	4	1	..	6	5	..	..	3	1	2	..	1	2	2	..
Carbuncle	8	6	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	3	1	..	..	1	..	..	..
Furunculus	2	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ingrowing Toe Nail	54	37	17	..	..	..	..	..	..	..	..	..	..	24	9	..	..	11	6	..	..	1	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..
Sinus	19	10	8	..	1	1	1	..	..	..	..	..	..	6	2	..	..	2	3	..	1	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Gangrene (*see* Diseases of Vessels).																																					
Perforating Ulcer	3	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Moles	2	..	2	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Œdema	5	2	3	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..

TABLE I (*continued*).

Injury.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Injuries.																																			
Burns	40	16	14	4	6	4	6	3	3	1	..	..	..	6	3	..	1	2	2	..	..	1	1	..	..	2	1	..	..	..	..	..	1	..	1	1	1
Scalds	31	16	14	1	..	14	10	1	..	..	1	..	..	2	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Dog Bites	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Frost Bite	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Contusions	23	19	3	1	..	..	..	..	..	1	1	..	..	3	1	..	..	7	1	..	..	2	..	..	..	3	..	..	..	1	..	1	..	2	..	..	..
Injuries of the Head—																																					
Contusions	2	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Wounds of Scalp	63	45	17	1	..	2	1	..	..	9	1	..	..	8	1	1	..	9	5	..	..	4	2	..	..	6	4	..	..	2	2	..	..	5	1	..	..
Fractures of the Skull—																																					
Vault, Simple	5	2	..	3	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..
„ Compound	2	..	..	2	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Base	10	2	..	7	1	..	..	..	..	2	..	..	..	..	..	..	..	..	3	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	1
Concussion	48	34	14	..	..	4	4	..	..	6	7	..	..	8	..	..	..	8	1	..	..	5	1	..	..	1	1	..	..	1	..	..	..	1	..	..	..
Injuries of the Face—																																					
Contusions	8	5	3	..	..	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	1	..	..
Wounds	39	30	9	..	..	7	1	..	..	7	1	..	..	4	2	..	..	6	2	..	..	1	1	..	..	3	1	..	..	2	1	..	..	..	..	..	..
Fractures—																																					
Lower Jaw	10	8	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	3	..	..	..	2	1	..	..	2	..	..	..	..	1	..	..	..	..	..	..
Upper „	2	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nasal Bones	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Gunshot Wound	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Injury.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Injuries of the Eye—																																			
Contusions	4	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..
Wounds	35	27	8	..	..	5	1	..	..	3	1	..	..	8	1	..	..	5	2	..	..	2	2	..	..	2	..	..	..	2	..	..	..	..	1	..	..
Injuries by Caustics	6	5	1	..	..	2	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..
„ by Explosives	3	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
Gunshot Wound	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ruptured Globe	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Foreign Body	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Injuries of Nerves—																																			
Wounds	5	4	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Paralysis following Injuries	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Injuries of the Neck—																																			
Contusions and Sprains	5	4	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..
Wounds	4	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
„ Suicidal	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lodgment of Foreign Bodies in Œsophagus	3	1	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Foreign Bodies Swallowed	3	2	1	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Injuries of the Back—																																			
Contusions	9	8	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	3	..	..	..	..	1	..	..	2	..	..	..	1	..	..
Sprains	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..
Fracture of the Spine	5	2	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	..	..	..	1	..	1	..	..	..	..	..	..
Concussion of the Spine	3	2	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Injury.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Injuries of Chest—																																					
Contusions	9	7	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	3	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..
,, with Rupture of Viscera	2	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Wounds	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fractured Ribs and Sternum	29	23	1	5	..	..	..	..	..	2	..	..	..	2	..	1	..	..	1	1	..	7	..	1	..	4	..	..	..	4	..	2	..	4	..	..	..
Injuries of Abdomen—																																					
Contusions	6	5	1	..	..	1	..	..	..	1	..	..	..	1	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wounds, non-penetrating	3	2	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Collapse after ,,	3	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Contusions with injury to Viscera	7	3	1	3	..	..	..	..	..	..	1	..	..	2	..	..	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Injuries of Pelvis and Genitals—																																					
Contusions	4	3	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Wounds of Scrotum	2	2	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ruptured Urethra	2	1	..	1	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Foreign Body in Urethra	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ruptured Perineum	8	..	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Injuries of the Upper Extremity—																																					
Wound and Contusions—																																					
Of Arm	12	8	4	..	..	..	..	..	..	1	..	..	..	1	1	..	..	2	1	..	..	1	..	..	..	2	..	..	..	1	1	..	..	..	1	..	..
Of Forearm	11	11	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	6	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Of Hand	52	50	2	..	..	1	..	..	..	2	1	..	..	20	..	..	..	13	..	..	..	6	..	..	..	5	..	..	..	3	1	..	..	..	..	..	..
Foreign Bodies in Upper Extremity	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..

Injury.	Total,	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Injuries of the Upper Extremity (continued).																																			
Fractures of—																																			
Scapula	8	8	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	3	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..	..	..
Clavicle	9	8	..	1	..	2	..	..	..	1	..	..	..	2	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..
Humerus—																																			
Simple	16	11	5	..	..	2	..	..	..	1	1	..	..	1	..	..	..	1	..	..	..	4	..	..	..	1	1	..	..	..	..	..	..	1	3	..	..
Compound	2	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Forearm—																																			
Simple	7	5	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	1	..	..	..	..	..	..	..	1	1	..	..
Compound	9	5	2	2	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	1	..	..	1	..	..	2	1	..	..	..	..	1	..	..	..	..	..
Hand	5	4	1	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Ununited Fractures	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..
Dislocations of Upper Extremity—																																			
Shoulder	4	..	4	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..
Elbow	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Digit	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Injuries of the Lower Extremity—																																			
Contusions	32	24	8	..	..	1	1	..	..	1	..	..	..	5	2	..	..	2	1	..	..	5	..	..	..	3	..	..	..	3	1	..	..	4	3	..	..
Sprains	11	8	3	..	..	..	..	..	..	..	..	..	..	2	1	..	..	2	..	..	..	3	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..

Injury	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Injuries of the Lower Extremity (continued).																																			
Wounds—																																			
Thigh	8	7	1	..	..	..	..	..	..	..	..	..	..	2	1	..	..	1	..	..	..	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..
Knee-joint	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Over Knee	11	9	2	..	..	..	..	..	..	1	..	..	..	3	2	..	..	1	..	..	..	1	..	..	..	2	..	..	..	1	..	..	..	..	..	..
Leg	10	9	..	1	..	1	..	..	..	1	..	..	..	1	..	..	..	2	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	1	..	..
Foot	14	9	5	..	..	1	1	..	..	1	..	..	..	3	1	..	..	4	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..
Gunshot Wounds	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Needle in Lower Extremities	6	4	2	..	..	1	..	..	..	2	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rupture of Tendons and Ligaments	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Fractures—																																			
Pelvis	7	5	..	1	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..
Femur—																																			
Simple	64	49	12	3	..	17	5	..	..	7	2	..	..	10	..	1	..	4	2	..	..	2	..	..	..	5	..	..	..	1	..	1	..	3	3	1	..
Compound	2	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Fracture of Neck of Femur—																																			
Intracapsular	10	2	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	8	..	..
Extracapsular	4	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..
Patella—																																			
Simple	24	13	11	..	..	..	1	..	..	..	..	..	..	1	..	..	..	3	2	..	..	6	6	..	..	2	..	..	..	1	2	..	..	..	..	..	..
Compound	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..

Injury.	Total.	Discharged.		Died.		Under 5.				— 10.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Injuries of Lower Extremity (contd).																																			
Fracture of both Bones of the Leg—																																			
Simple	122	96	25	1	..	2	..	..	..	5	1	..	..	10	1	..	..	14	4	..	..	28	10	1	..	18	4	..	..	9	4	..	..	10	1	..	..
Compound	17	8	..	6	3	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	2	1	2	..	1	..	1	..	1	1	2	..	2	1
Fracture of the Tibia—																																			
Simple	41	33	8	..	..	2	1	..	..	7	1	..	..	7	1	..	..	5	..	..	..	3	1	..	..	5	2	..	..	1	..	..	..	3	2	..	..
Compound	3	2	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Fracture of the Fibula—																																			
Simple	68	56	12	..	..	1	..	..	..	1	..	..	..	8	..	..	..	10	4	..	..	19	4	..	..	12	2	..	..	4	1	..	..	1	1	..	..
Fracture of the Bones of Foot	8	7	1	..	..	1	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..
„ Bone of a Stump	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Ununited Fractures	3	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..
Old Fractures	16	12	4	..	..	1	..	..	..	..	..	..	..	..	1	..	..	4	..	..	..	4	..	..	..	2	1	..	..	1	2	..	..	..	..	..	..
Dislocations—																																			
Knee	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Foot, Compound	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Sub-astragaloid	2	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases and Injuries unclassified, &c.																																			
Nihil and unclassified	29	18	10	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
For Instruments	33	17	16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wounds of Arteries	2	2	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

ABSTRACT OF TABLE I,

With Average Duration of Surgical Patients in the Hospital.

Discharged Cured or Relieved	M. = 2,471	
	F. = 1,540	
Died	M. = 134	
	F. = 96	
Remaining in at the end of the year 1883 *	M. = 214	
	F. = 137	
Average stay of Men	29·46 days.	
„ Women	28·36 „	

Average stay in the Hospital of all Surgical Patients = 28·91 days.

* These cases are not included in Table I.

APPENDIX TO TABLE I.

General Diseases.

Hysteria.—A young woman, aged 23, was admitted with Talipes Equinus and Spastic Contraction of the Flexors of the Toes. The spasm relaxed completely under chloroform, and the deformity was cured by the use of galvanism.

Syphilis.—Two patients were admitted with primary sores upon the Lips.

Tetanus.—A man, aged 49, cut off the tip of his right middle finger with a pair of shears. The wound was neglected and became inflamed. Seventeen days after the injury he noticed some difficulty in swallowing fluid. The following day Trismus came on. On admission, 19 days after the injury, the symptoms of Tetanus were well marked, with frequently recurring attacks of slight Clonic Spasm. The wound on the finger was covered with healthy granulations. He was treated with hypodermic injections of morphia every 3 hours, and the spasms were relieved to some extent, but he gradually sank and died of Asphyxia on the third day after admission.

A man, aged 27, had been treated in the hospital for disease of the ankle-joint, and was temporarily discharged on 18th February, with a plaster of Paris case. On 25th of March he noticed stiffness and uneasiness about the lower jaw, and soon after twitching of the muscles came on. When admitted, 27th March, symptoms of Tetanus were well marked. On removing the plaster case a sloughing ulcer was found on the inner side of the ankle. Amputation was at once performed through the middle-third of the leg. Ext. Physos. gr. $\frac{1}{8}$ was given every 4 hours, but the spasms were not relieved. The patient suddenly became livid and died on the evening of the day of admission. Tracheotomy was resorted to without benefit.

A labourer was admitted with Trismus and rigidity of the muscles of the back with occasional spasms. A few days before the Lock-Jaw came on he sustained a slight injury to the right Pinna, which, however, showed only slight excoriation, with no inflammation of the parts around. Chloroform was administered continuously for 12 hours, and the spasms were slight while he was under the anæsthetic; but he died in the first spasm after the discontinuance of the inhalation.

A girl, aged 11, was admitted with a foul burn on her cheek occasioned by falling on the fire a fortnight previously. At 5 a.m. next morning, without any premonitory symptoms, she was seized with Opisthotonos, and at 8 a.m. the symptoms of Tetanus were well-developed. She was treated with chloroform inhalation, but died on the following day.

A dustman, aged 35, was admitted with acute Tetanus, apparently produced by an ulcer of the leg, which had existed 15 years. He died on the third day after admission.

Shock.—A gamekeeper, aged 80, had a narrow Prepuce, which was slit-up under an anæsthetic. He never rallied from the operation, and died the next day.

TUMOURS.

A woman, aged 63, was admitted with a recurrence of Epithelioma in the Inguinal Glands, which were removed. A few days after the operation she was seized with Angina Pectoris, and had frequent returns of the attacks, in one of which she died. On post-mortem the heart was found to be dilated, and on the anterior surface of the Left Ventricle there were two openings in the Cardiac Wall, which was exceedingly soft and had undergone extensive fatty degeneration.

A healthy-looking man, aged 38, was admitted with a firm swelling on the anterior surface of the middle third of the Radius, and an ill-defined general enlargement of the radial and posterior surfaces of the Arm. The Ulna was distinctly thickened, and curved backwards in its middle third. Five months before admission the arm became swollen after a slight blow; the swelling subsided, but pain at the part remained, and the swelling again returned 4 months later. (When 24 years of age he had a sore on the Penis, followed by Buboes; he had no sore throat or rash, but ulcers covered by scabs appeared on the arms.) Amputation was performed through the lower third of the Humerus. On dissection there was a firm swelling overlying the middle third of the bones of the forearm and the interosseous membrane. On section it was fibrous externally, but internally was broken down and contained a caseous or curd-like material. Both the Radius and Ulna were much thickened. The tumour presented the microscopic characters of a Granuloma.

Carcinoma.

Breast.—Of 47 women subjected to operation for Scirrhus, 1 died; in 8 cases the whole Breast was removed with the Axillary Glands without a fatal result; the Tumour only was removed in 3 cases.

A stout unhealthy-looking woman, aged 52, was admitted with a large Scirrhus of the Left Breast, for which the whole gland was removed. The wound became sloughy, and she died of bronchitis on the eighth day.

Sarcoma.

Of Sarcomata of the Breast, 3 were examples of Cystic Sarcoma, one was a solid Round-Celled Sarcoma, and another was a Myxo- and Spindle-Celled sarcoma. In the other case, that of a woman, aged 36, the disease was Sero-Cystic. The Tumour appeared after parturition, and was associated with retraction and deformity of the Nipple.

Malformations.

Spina Bifida.—Two cases in children, aged 7 weeks and 8 months respectively, were treated by injection of Morton's fluid, and both died.

A Spina Bifida in a child aged 3 was tapped, and he died with Spinal and Basal Meningitis.

A child, aged 1, died with sloughing of the sac. A woman, aged 20, admitted with Spina Bifida and incontinence of urine, died with Cystitis and Suppurative Nephritis.

An infant aged 1 month, had a Congenital Pedunculated Cyst attached to the nape of the neck just below the Occipital Bone. The cyst was oval, translucent, 7 inches in circumference, and its pedicle was narrow; no evidence of communication with the cord or brain could be found. The cyst was tapped, and a considerable quantity of watery fluid, neither containing sugar nor albumen, was let out; but the cyst refilled next day. The patient's friends refused further operation.

An infant, aged 4 months, was admitted with a Pedunculated Cervical Spina Bifida. The pedicle was tied, and the cyst removed. The child died after leaving the Hospital, the wound having given way.

DISEASES OF THE NERVOUS SYSTEM.

A man, aged 32, was admitted with a tense contracted scar on the flexor surface of the right Wrist, which resulted from the explosion of a gun he was loading. The wrist and fingers were flexed and could not be extended; the

nails were thickened, curved forwards and marked by transverse ridges, and there was evidence of impairment of function of the Median Nerve. No improvement having taken place after the prolonged use of galvanism, amputation through the forearm was performed. Just above the annular ligament the median nerve was swollen, reddish, and adherent to the cicatrix; and imbedded within it was a splinter of wood, with several small spiculæ of steel.

Neuralgia and Nerve-stretching.—A man, aged 56, had suffered for 2 years with Paroxysmal Neuralgia over the regions supplied by the Infra-orbital and inferior Dental Nerves. He had a constant tingling pain in the parts and from 10 to 40 paroxysms a day. The Infra-orbital and inferior Dental Nerves were stretched. When discharged he still complained of aching pain, but had had a complete immunity from the paroxysms since the operation.

A gardener, aged 60, who had suffered with severe right Facial Neuralgia for 8 years, commencing with severe toothache, was treated by stretching the inferior Dental Nerve. A month after the operation he had had no return of the pain. (*See British Medical Journal*, 1883, vol. ii, page 1235.)

A porter, aged 32, suffered with Spastic Rigidity of the right leg and contraction of the knee; the Sciatic Nerve was stretched without benefit.

In another case no improvement followed stretching of the Sciatic Nerve for Neuralgia of the stump of a leg with intense hyperæsthesia of the skin below the knee. The patient was a man, aged 22, whose leg had been amputated 6 months previously.

Diseases of the Respiratory System.

Diphtheria and Croup.—All the cases included in the Surgical Report were subjected to Tracheotomy. Of the males 2 recovered and 7 died; 1 of the latter survived for 26 days, the remainder died within 6 days after the operation. Of the females 4 recovered and 14 died before the 6th day.

Diseases of the Circulatory System.

Aneurism.

Orbital.—A lad, aged 18, eleven weeks before admission, received a pistol shot wound in the inner Canthus of the eye. There was much hæmorrhage. Three weeks after the accident he had severe hæmorrhage from the nostril. On admission there was a pulsating tumour at the inner angle of the eye; a bruit was heard all over the Cranium, and, with the pulsation, was arrested by pressure on the Carotid Artery. He was treated by direct pressure on the Aneurism, and subsequently by digital pressure on the Carotid; but a sudden and severe hæmorrhage from the nostril necessitated ligature of the common Carotid. Pulsation ceased, and the tumour rapidly diminished in size.

Temporal.—Two patients were admitted with Traumatic Aneurisms of the Temporal Artery; one was treated by ligature, the other by excision.

Subclavian.—A painter, aged 30, was admitted with a rounded, firm, pulsating swelling, having a low bruit, in the right Subclavian Triangle. The right radial pulse was feeble, and the arterial pressure, as shown by the sphymograph, was much diminished. The symptoms commenced three months before with pain extending from the shoulder down the arm, and a month later he began to lose power in the arm. Eight years before admission he had primary Syphilis, followed by a Syphilide, and later by pains in the head, limbs, and scalp. It was at first doubtful whether the Subclavian Artery was raised by a new-growth, perhaps syphilitic, or if the patient were suffering from Aneurism. Iodide of potassium was exhibited, and with "rest" the swelling subsided, and the pulsation became less distinct. He left the Hospital, but returned in nine weeks' time with an increase of the swelling downwards beneath the clavicle, and much aggravation of the pain. Rest and cardiac sedatives were again prescribed, but no marked improvement having taken place at the end of a month, the arm was removed at the shoulder-joint, an attempt having first been made to ligature the Subclavian Artery, which was dilated. The immediate result of the application of the ligature to the distal end of the artery

was the almost complete cessation of pulsation in the Aneurism. The patient progressed favourably, and the Aneurism became firmer, although still pulsating. On November 3rd, a month after the operation, the wounds were healed, with the exception of one sinus, and the Aneurism still pulsated, but was firmer; he still suffered with attacks of pain in the arm.

Iliac.

A messenger, aged 36, who, in July, 1877, had undergone ligature of the external Iliac for an Aneurism of that artery near the junction of the Femoral, was re-admitted on account of increase of the Aneurism of four weeks' duration, the pulsation having returned two years before; there was no bruit. The size of the Aneurism and force of the pulsation diminished with "rest."

*A man aged 35, had a tubular Aneurism occupying the fold of the groin, its long diameter being $2\frac{3}{4}$ inches. He was treated by "rest" and other measures for more than a year, but the pulsation having become more forcible, with a more rapid increase of the Aneurism, the external Iliac Artery was ligatured on February 9th, 1882. On exposing the vessel it was found to be diseased for some distance above the Aneurism, and a kangaroo tendon ligature was applied just below the bifurcation. The wound healed rapidly, the Aneurism solidified, and there was no return of pulsation.

Popliteal.

A labourer, aged 39, six weeks before admission suffered with pain and stiffness of the left knee, and a few days after he noticed a swelling in the ham, which rapidly increased in size. On admission there was a large Popliteal Aneurism extending upwards to the junction of the middle and lower thirds of the thigh. He had hypertrophy of the heart, with a double murmur at the base. On June 21st two kangaroo tendon ligatures were applied to the superficial Femoral, and the artery was divided between them. When discharged on June 27th the tumour was solid and half its previous size.

A hawker, aged 37, began to suffer pain in the knee three months before admission, and about that time noticed a swelling in the ham. A month later he was obliged to desist from work. On admission there was an Aneurism of the left Popliteal Artery, $2\frac{1}{2}$ inches in diameter. It was soft, and its size was much reduced by pressure on the Femoral Artery. On January 13th a thick silk ligature was applied to the superficial Femoral. The tumour slowly diminished in size, the wound healed rapidly, and the ligature separated on the thirty-first day.

A felon, aged 27, had felt stiffness of the left knee for about nine months; three weeks before admission he noticed a swelling in the left ham. Two years previously an Aneurism of the right ham, as large as a fist, had been cured by digital pressure, continued for 48 hours. A year before that he had syphilis, and pigmented scars still existed on the legs and arms. On admission there was a saccular Aneurism in the left ham of about the size of a hen's egg; some thickening could be felt in the right ham, but there was no pulsation. On May 17th digital compression was applied for $7\frac{3}{4}$ hours. May 20th, compression was resumed and continued for 12 hours. May 24th, pulsation was still well marked. An Esmarck's bandage was applied for 1 hour and 40 minutes under chloroform, and a tourniquet for half an hour after that; next day the pulsation still persisted. May 30th, two kangaroo tendon ligatures were applied to the superficial Femoral, the artery being divided between them; antiseptic precautions and dressings were used. June 13th, Aneurism much diminished in size; slight pulsation felt, probably from a dilated superficial vessel. July 4th, Aneurism solid, small, and without pulsation.

A hawker, aged 35, was admitted with a rapidly increasing Aneurism of the right Popliteal Artery. Ten days previously his attention was attracted to a swelling in the ham by considerable pain in the part; he was at the time suffering from a hard chancre. On September 12th, digital compression was employed for 6 hours. He complained of acute pain in the evening. On

* By an oversight this case was omitted from the Statistical Tables of last year.

the following day it was observed that the Aneurism had much increased, and there was discoloration of the superjacent integuments. Rupture of the sac was diagnosed, and the artery was tied with two kangaroo tendons, and divided between them. Pulsation did not return in the Aneurism. On October 2nd the incision was almost healed, and some hardness and fulness at the site of the Aneurism only remained.

A man, aged 44, was admitted with an Aneurism of each Popliteal Artery. He had noticed a slight swelling in the right ham seven or eight days before admission, and the part had been painful for four weeks. No history of syphilis, but he had been a hard drinker. He was the subject of morbus cordis. There was an Aneurism of orange size in the right popliteal space, and a slightly smaller Aneurism in the left space. Digital pressure having first been tried, the right superficial Femoral was ligatured on August 24th. Two kangaroo tendons were applied, and the artery was divided between them. No return of pulsation in Aneurism. September 22nd, ligature of the left superficial Femoral was performed in the same manner. Extensive sloughing of the skin occurred on the posterior and inner surfaces of the thigh. October 16th, return of pulsation in Aneurism. December 7th, Aneurism firm, of size of horse chesnut, but still pulsating indistinctly. Aneurism on right side cured.

Cirsoid Aneurism.—A woman, aged 30, was admitted with Cirsoid Aneurism of the forehead. When 3 years of age she was kicked upon the left side of the forehead, and a small spot like an enlarged vein remained to mark the place. After she had attained the age of 21, and during her first pregnancy, the spot grew much larger; subsequently she bore four children, and during each pregnancy it again enlarged, diminishing in the intervals between them. There was a Cirsoid Aneurism occupying the left side of the forehead and adjacent parts of the scalp, and also extending to the eyelids, nose, and to some extent across the middle line. The skin appeared nævoid, and its surface was uneven and nodulated by prominent tortuous vessels; there was distinct heaving pulsation, and a loud systolic bruit; the left superficial Temporal Artery was much dilated, and appeared to be chiefly affected. She did not complain of pain, but of a buzzing and hammering noise in the head, especially when lying on her left side. Operation—On June 26th the enlarged vessels surrounding the tumour were controlled by passing acupressure needles beneath them, and direct pressure was applied by means of a shield of sheet lead. After the lapse of a few days pulsation had ceased, and the tumour had become less prominent. Subsequently some ulceration occurred over the most projecting portion of the tumour. This ultimately healed, and the tumour became quite flat, although the vessels around it continued to pulsate.

Gangrene.

On June 19th a clerk, age 33, fell off a railway platform and sustained a Colles' fracture of the left wrist. The displacement, which was unusually well marked, was reduced, and the arm placed between two splints. He had much pain in the arm during the night, and on readjusting the bandages next morning it was observed that the hand was swollen. On June 22nd the splints were readjusted at another Hospital. On the morning of the 23rd he returned to the Hospital with moist gangrene of the hand and arm, the lower two-thirds of the upper arm being hot and of a brownish-yellow colour. The limb was amputated 2 inches below the shoulder joint, the incision being carried 1 inch below the upper limit of the discoloration of the skin. On dissection the radial artery was found to be reduced to an impervious cord, probably as the result of a stab on the front of the forearm ten years before. The patient recovered without any complication, and on July 19th the stump, with the exception of the inner angle, was healed.

A lad, aged 17, a bookbinder, was admitted with a severe laceration of the upper third of the flexor surface of the forearm, the Ulna Artery being torn across. On the third day the patient had severe hæmorrhage from the wound, the dorsum of the hand was dusky, cold, and covered with bullæ, and the skin of the palm had sloughed. Amputation was successfully performed through the lower third of the arm.

A storeman, aged 76, sustained a severe compound fracture of the leg from

the beam of a crane. On the fourth day there was a boggy gangrenous patch of skin on the outside of the lower third of the leg, and the whole limb was swollen. The gangrene extended slightly. He became restless and died exhausted on the sixth day.

A woman, aged 78, was admitted with a severe compound fracture of the Tibia and Fibula, for which primary amputation through the lower third of the thigh was performed. On the third day the flaps were sloughing. The gangrene extended up the limb, and she sank on the fourth day.

A man, aged 63, applied nitric acid to a corn on the third toe; the toe became inflamed, and he was admitted with Dry Gangrene of the second and third toes, which subsequently extended to the fourth toe and to the dorsum of the foot. He became feverish, gradually sank, and died on the ninth day after admission.

A man, aged 83, was admitted with Dry Gangrene of the Toes and anterior part of the foot, which had existed 14 days. There was general atheroma. The line of demarcation formed, but he died exhausted.

Suppurative Phlebitis.

A woman, aged 27, was confined on February 27th. She was admitted with a large Abscess extending along the whole length and around a greater part of the circumference of the thigh. The Abscess was opened and drained. She died with symptoms of pyæmia on March 11th. On post-mortem no pyæmic emboli were found, but there was Suppurative Phlebitis with Thrombosis, extending from the Uterine to the Iliac and down to the Femoral Vein, which, at the lower end, contained pus and freely opened into the Abscess.

Hæmophilia.—In a boy, aged 13, who was admitted with Epistaxis. There was no family history except that a brother died of Epistaxis, at the age of 3½. When 3 years of age, he bled for a long time from a small wound of the tongue, and at 6 years of age he had hæmorrhage for 8 weeks after the extraction of a tooth. He bruised easily and frequently had painful swelling of the joints. The Epistaxis commenced on January 21st, and soon after he vomited a bowlfull of blood. On admission he was much collapsed. The nares were plugged, and the bleeding ceased, but he became delirious and died on the fourth day after the hæmorrhage. The knee and right ankle joints showed changes which have been described as occurring in Hæmophilia.

Hæmorrhage.—A man, aged 42, died two days after admission for severe Hæmorrhage from a Varicose Ulcer.

Diseases of the Digestive System.

Glossitis.—A boy, aged 11, was admitted with Inflammatory Œdema of the Tongue, which protruded from the mouth; he had had previously a similar attack. No cause was apparent. There was considerable fullness of each submaxillary region. Two incisions were made into the tongue, and the swelling rapidly subsided.

Intestinal Obstruction.—Of 8 cases 2 were males and 6 females. All died except an infant admitted for Intussusception, who recovered after injection.

Retro-peritoneal Hernia into the Fossa Inter-Sigmoidea. A woman, aged 63, was admitted with complete obstruction, which occurred suddenly. Fæcal vomiting commenced on December 31st. Colotomy was performed in the right loin, and a portion of intestine was opened. The vomiting continued, and she died collapsed on January 4th. On post-mortem it was found that a portion of the Ileum had passed through an opening, of the size of a shilling, in the Meso-Sigmoidea, and was enveloped by a thin layer of peritoneum. The opening occupied the usual seat of the Fossa Inter-Sigmoidea. The large intestine took an abnormal course, apparently in consequence of congenital adhesion between the sigmoid flexure and the commencement of the ascending colon. A portion of the jejunum which lay in the right loin had been opened in the operation.

A carpet-planner, aged 52, had enjoyed good health until the morning of June 10th, when an Inguinal Rupture came down; this he reduced without trouble. In the evening persistent vomiting came on, and there was absolute

constipation; no pain at the seat of the hernia. He was admitted on the 15th. The left inguinal canal was explored by operation, and found empty. The obstruction was unrelieved, and he died on June 18th. Post-mortem: A foot and a-half of the lower part of the ileum was bound down by adhesions to the mesentery in such a way as to describe two sharp curves, but the channel of the intestine was patent.

A woman, aged 48, who for 10 weeks had suffered from constipation, and for the last 5 with occasional vomiting, was admitted with complete obstruction of two days' duration. There was tenderness and fulness of the abdomen, and, per vaginum, a tender induration was felt at the brim of the pelvis. Vomiting was incessant, and she gradually sank. On post-mortem, a circumscribed Abscess was found at the lower part and left side of the abdominal cavity. The descending colon formed part of its walls, and appeared to have been compressed and infiltrated.

A laundress, aged 30, in the seventh month of pregnancy, fell down stairs on March 30th. Immediately afterwards she was seized with pain in the right iliac fossa; vomiting came on the same evening and persisted. She was treated with purgatives, but had no action of the bowels. Abdominal section was performed on April 8th, immediately after her admission, when a portion of the lower part of the ileum was found to be constricted by twisting of its mesentery. The intestine was untwisted and the wound closed. The patient died on the following day. The autopsy revealed general peritonitis with congestion of the lower part of the ileum and of the cœcum; the meso-cœcum was unusually long.

A man, aged 63, was suddenly seized, while in bed, with pain at the umbilicus, and shortly afterwards vomiting set-in. On admission, there had been absolute constipation for 5 days, with persistent vomiting, and he was much collapsed. The abdomen was distended, but there was no pain or tenderness at any part. Gastrotomy was performed, but no cause for the obstruction was discovered. After death, which took place with peritonitis, it was observed that the upper part of the Jejunum was much distended and congested, and there were old adhesions between different parts of the intestine, but no light was thrown on the cause of the obstruction.

An infant, aged 3 days, was admitted with symptoms of Intussusception; it was *in extremis*, and no operation was performed. No post mortem.

A female infant, aged 17 months, was admitted with obstruction of two days' duration. Blood and slime had passed *per anum*, but there was no vomiting. A swelling as of intussuscepted bowel was felt near the anus. An olive-oil injection was given, and the swelling disappeared. The child completely recovered.

A woman, aged 48, was admitted on August 6th with distension of the Abdomen and Tympanitis. The bowels had not acted since July 29th, but there had been no vomiting. Rectum free. She had neither suffered from constipation previously nor had passed blood nor slime *per anum*. Left lumbar colotomy was performed, and much fæces evacuated. After death, which took place on August 12th, a tight annular cancerous stricture was found at the upper part of the Sigmoid Flexure.

Hernia.

Strangulated Inguinal.—Of 19 cases, 2 were females. In all, 3 males died, and only in one of these cases was an operation performed. Nine cases yielded to taxis; of these a man, aged 75, died on the day after the reduction of an old Scrotal Hernia, which had only been down a few hours. Post-mortem: There was no peritonitis, but a portion of the lower end of the Ileum was congested and contracted, with infiltration of the mucous membrane.

A man, aged 26, was admitted with a Strangulated Inguinal Hernia of three days' duration. The scrotal swelling was tapped, and about 6 ozs. of blood-stained serum were drawn off. A small hernia was then apparently reduced. The vomiting persisted, and the patient sank on the day after admission. On dissection a knuckle of intestine was found tightly strangulated by the neck of the sac which was formed by the funicular portion of the Tunica Vaginalis.

Herniotomy.—The operation was performed ten times, with one fatal result; in three cases the sac was not opened, and there was no fatality; two of the

cases in which the sac was opened were females, and both recovered. The fatal case was that of a man, aged 61, who died with Peritonitis.

Strangulated Femoral.—Of 16 cases, 4 were males and 12 females. Herniotomy was performed in 13 cases, with 5 deaths. The sac was not opened in 2 cases, both of which recovered. Of the fatal cases there were 4 females and 1 male.

A woman, aged 57, admitted with Strangulation of a week's duration, died on the day after the operation, with Perforation of the Intestine.

In another case, that of a man, aged 59, the bowel burst on being returned. The wound was enlarged to allow the clearing out of the Pelvic Cavity. The patient did not rally from the operation.

Strangulated Umbilical.—Three cases of Strangulated Umbilical Hernia were admitted. All of them were operated on, and 2 died with Peritonitis; in one case Peritonitis already existed in the sac, and the bowel was not returned.

A domestic, aged 44, was admitted on October 3rd, 1882, with a Strangulated and Gangrenous Ventral Hernia, midway between the umbilicus and pubes. A free incision was made into the gangrenous parts, and much fæces evacuated. The slough separated, and the patient recovered with a fæcal fistula. On February 23rd the two ends of the bowel opening at the fistula were approximated, and the enterotome was applied. The patient passed a motion *per anum*, but soon relapsed into her former condition. On April 24th, the peritoneal cavity was opened at the fistula, and a portion of bowel which presented, thought to be the transverse colon, was stitched to the wound. On May 31st the wound was re-opened, and the upper portion of the bowel terminating at the fistula was united to an opening made in the transverse colon. The patient passed watery motions *per anum*, for a day or two, but the fæces soon passed again from the wound. On September 26th a similar operation to the last was again performed, and the wound in the integuments was closed by a plastic operation. The greater part of the wound healed, and on December 13th she left the Hospital, passing motions by the natural channel, and with a small sinus still communicating with the bowel; this eventually closed.

Diseases of the Rectum.

Cancer.—Excision of the Rectum for Cancer was performed in the case of a man, aged 53, who had suffered with symptoms of the disease for 8 months. Occupying the anterior and right walls of the bowel was a large Cancerous Ulcer, beyond which the finger could easily be passed. The patient suffered continuously with retching after the operation, and died exhausted on the third day. Post-mortem: The wound was sloughy, but there was no peritonitis.

Proctotomy was performed in 9 females for the cure of Stricture of the Rectum, without a bad result. (*See British Medical Journal*, vol. ii, 1883, pages 1120 and 1186.) In one case the stricture turned out to be sarcomatous.

Diseases of the Urinary System.

Nephrectomy was performed on a lad, aged 17, who had Pyo-nephrosis with a sinus in the loin. The patient was much reduced by hectic and suppuration. On December 29th the kidney was exposed by a lumbar incision, and removed piecemeal, the bleeding vessels being secured by ligatures. He improved rapidly after the operation, and passed over two pints of urine daily. On May 11th he left the Hospital much improved in health, and with only a small sinus in the lumbar region.

Calculus Vesicæ.—Of 8 cases, in which lithotomy was performed, 2 died. A man, aged 61, had suffered with symptoms of Stone for a year and a half. On May 9th a moniliform stone, chiefly phosphatic, and nearly 1½ inches in diameter, was removed by lithotomy. On the 11th he vomited, and on the next day there was pain and distention of the abdomen. He had continuous pyrexia, became gradually weaker, and died on the 22nd inst.

A man, aged 33, died with exhaustion from Cystitis following Lithotomy for the removal of a Phosphatic Calculus.

Foreign Body in Urethra.—A man, aged 33, was admitted with the broken end of a gum elastic catheter impacted in a urethral stricture. It was removed with forceps.

Diseases of the Generative System.

Diseases of the Ovary.—Of the cases included in the Surgical Table all were subjected to abdominal section; 6 recovered and 4 died. Two patients, aged 53 and 62 respectively, died from exhaustion after the operation. A woman, aged 54, died with peritonitis; she had granular kidneys. A woman, aged 45, died with exhaustion following an exploratory operation for the removal of an ovarian tumour.

Diseases of the Organs of Locomotion.

Bones.—A girl, aged 5, was admitted with acute Periostitis of the tibia following a slight blow on her leg. The periosteum was laid open by an incision. A month later, symptoms of pericardial and pleural effusion appeared, with which she died. Post-mortem: the pericardium was distended with sero-purulent fluid, and there was much serous fluid in both pleural cavities. On the anterior surface of the left tibia was a superficial sequestrum, and a small abscess cavity occupied the cancellous tissue at the upper extremity of the diaphysis.

Rickets.—A rickety child, aged 8 months, was admitted with a swelling over the right parietal region, which was first noticed two months after a fall down an area. The swelling was rounded, prominent and fluctuating. It was situated above the right ear, and bounded above by a prominent ridge of bone. He was drowsy on admission, and lapsed into a state of coma. Death occurred with convulsions on the second day after admission. Dissection revealed an elongated opening an inch and a-half in length, occupying the line of the squamosal suture. Within the opening was a cyst-like cavity containing serous fluid; it was bounded externally by the pericranium, and internally by the dura mater, which, with the subjacent brain, was pressed inwards. There were tabio-cranes of the occipital region, and other evidences of rickets.

Osteitis Deformans.—A woman, aged 54, had suffered with Rheumatic pains in the limbs for 45 years. Her right lower extremity became bent 9 years before admission, and soon afterwards the left limb became affected. *Condition on admission:* Her head was enlarged and forehead prominent; spine kyphotic; humeri thickened; and the radii bent and thickened. The lower extremities presented the characteristic appearances of the disease.

Another case was that of a man, aged 49. (*See Clin. Soc. Trans.*, 1884.)

Diseases of Joints.

Of 87 cases of hip joint disease 6 proved fatal, 2 from lardaceous disease and exhaustion, and 4 after excision. Amputation at the hip joint was performed in two cases successfully.

Knee Joint.—A man, aged 31, had had four attacks of acute Rheumatism, the last occurring 10 years before admission; 4 years later the right knee became painful, and gradually increased in size. On admission the joint was generally enlarged; the synovial membrane was much distended, and contained numerous small rounded, movable bodies. On December 7th the knee joint was freely opened on both sides, and 400 free cartilaginous bodies of nearly uniform size were turned out. Drainage with antiseptic precautions was adopted. Suppuration of the joint ensued, with abscesses tracking along the thigh and leg. He recovered, with an ankylosed joint, and left the Hospital for Highgate on June 24th. On August 11th he was re-admitted, one of the sinuses having re-opened. Diarrhœa and vomiting came on, with a friction sound on the

right side, and he died on the 15th. Post-mortem: General tubercular peritonitis and right pleurisy were found.

A stonemason, subject to rheumatism, was admitted with great enlargement of the knee joint from passive effusion. Five months before his knee had become swollen, but had subsided with rest. The joint was freely opened and drained under antiseptic precautions; no suppuration ensued, and the patient left the Hospital in six months, with a sound and useful limb. (*See St. Bart. Hosp. Rep.*, vol. xix, p. 207.)

The knee joint was incised and drained for acute Arthritis in 7 cases, 5 being males and 2 females. In 2 males, aged 32 and 51 respectively, the patients recovered with Ankylosis; in 4 cases amputation of the thigh was subsequently performed, with one death, which took place with suppurative Phlebitis. In another case, that of a child, aged 10 months, amputation was advised, but was refused by the parents. In a boy, aged 7, suffering with disease of the ankle joint, drainage of the joint was employed, and he recovered with a useful limb.

Charcot's Disease.—A woman, aged 54, was admitted with well-marked symptoms of Locomotor Ataxia and Charcot's disease of the right elbow and both hip joints. The spinal disease commenced seventeen years before admission, and for eight years she was completely paraplegic, but had subsequently partially recovered movement in her lower extremities. The right elbow was much enlarged by effusion; there was extreme mobility of the bones, and several loose bodies could be felt in the joint.

Diseases of the Spine.

Caries.—In one case there was Paraplegia. A girl, aged 8, died with Empyema.

Diseases of the Cutaneous System.

Leprosy Anæsthetica.—A man, aged 37, born in the Madras Presidency, came to England in 1875; soon after he noticed wasting and numbness of the left leg. From that time the disease gradually progressed, but less rapidly during a short residence in India in 1879. On admission there was complete anæsthesia of both forearms, of the legs, greater part of the thighs, and of the back. The skin on the front of the chest and on some parts of the thighs was abnormally sensitive. The hands were wasted and claw-like, and he had lost several toes and the extremities of three fingers. There were no leprous nodules.

Injuries.

Burns. (See Tetanus, p. 69)

Head.—Fractures of the Skull.—Compound.—An infant, aged 1½, fell and struck its head upon a piece of wood, from which three nails projected. He was brought to the Hospital with the wood still fixed to the back of his head, and some force was required to remove it. No constitutional disturbance was noticed until the eleventh day after the accident, when the temperature suddenly rose, and he was sick; drowsiness came on, and death took place with coma. A post-mortem was not allowed.

A man, aged 26, was admitted on December 22nd in a state of coma. It was stated that while in a public house a man had thrust a stick into his left eye. Beneath the eye was a small punctured wound. The next day there was complete left hemiplegia; he could be roused from the coma, but soon relapsed. He died on the 27th. On post-mortem it was found that the stick had passed from the left orbit through the ethmoid bone, fracturing the right lesser wing of the sphenoid. At the base of the brain a laceration extended from the anterior perforated spot into the right lateral ventricle.

A boy, aged 14, was admitted with a comminuted Depressed Fracture in the right frontal region. The bone was elevated, and several comminuted fragments removed; there was considerable laceration of the brain substance. No

paralysis. Protrusion of the brain occurred, but he progressed favourably until the twelfth day, when he became noisy and restless; this condition was succeeded by drowsiness, and finally coma, in which he died. On post-mortem it was found that the base of the skull was fractured; there was considerable destruction of brain substance, and a layer of pus extended over the base of the brain.

Injuries of the Mouth.—A lad, aged 13, was admitted with a pistol-shot Wound of the mouth. The bullet had passed through the upper lip, knocking out the incisor teeth, and had penetrated the tongue from the tip to the base. After careful examination under chloroform no signs of the bullet were found. He recovered without any complication, and on the sixth day after the injury the bullet was discovered in his motions.

Injuries of the Neck.—A woman, aged 21, was admitted on June 21st with a Stab in the neck by a penknife. There was a small punctured wound behind the left sterno-mastoid muscle and 2 inches below the ear, which passed down to the spine. The patient was collapsed and almost unconscious. The next day, on recovering from the shock, it was found that she had complete motor paralysis of the legs, trunk, and arms, with impaired sensation over the same parts; the respiration was diaphragmatic. On June 23rd her temperature in the morning was 103°; in the evening 106°; she was delirious, and her breathing laboured. June 24th, morning temperature 104·6°; breathing very laboured. Drowsiness came on, which was followed by death. Post-mortem: The knife had entered the spinal canal between the laminæ of the third and fourth vertebræ; the spinal cord was partially divided, the posterior and right lateral columns being unsevered; the grey matter was completely divided, with the exception of the right anterior cornua. There was no extravasation of blood.

A man, aged 58, was admitted with loss of power in the hands and numbness of the fingers, which followed an injury 3 months previously, when he fell down stairs on the back of his neck.

A wine merchant, aged 45, on the morning of November 24th, awoke in a violent attack of Dyspnœa, and found that he had swallowed his false teeth. He had occasional attacks of Dyspnœa, and at 2 p.m. he was placed under the influence of chloroform. An obstruction was felt just above the cricoid cartilage. All attempts to remove the foreign body by the mouth were unsuccessful. Œsophagotomy was performed, and the foreign body, an upper gold plate, was extracted. The patient died on November 28th, with symptoms of Septicæmia.

A clergyman was admitted on May 15th, having swallowed a plate carrying two artificial teeth. There was Dysphagia and pain at the Episternal notch, with fulness of the sides of the neck from surgical emphysema. The plate, which had lodged opposite the cricoid cartilage, was drawn up by a probang. Death took place next day. Post-mortem: On the posterior wall of the Pharynx was a perforation, from which a track was traced along the left side of the Œsophagus into the Thorax; no wound of the pleura was found. There was Emphysema of the neck and of the Mediastinum.

In the case of a girl, aged 17, a pin, which it was stated had been swallowed, was removed from the Abdominal Wall near the Umbilicus.

Injuries of the Thorax.—A middle aged man, who died shortly after admission to the Hospital with injuries sustained by a fall from some scaffolding, was found to have an Internal Rupture of the Heart. There was no laceration externally, but the Anterior Muscular Papilla of the Mitral Valve was torn across at its base.

A man, who died ten minutes after admission, having fallen from some scaffolding, was found to have sustained a Rupture of the Aorta. On the posterior surface of the Aorta, where it lay between the pillars of the Diaphragm, was a transverse rupture, 1½ inch long, which was joined above by a longitudinal rupture half an inch long.

A man, aged 32, was admitted with a Compound Fracture of the Leg, caused by the fall of a box from a crane. The following day, October 17th, his respiration was hurried. The Heart was displaced to the right, and there was hyper-resonance over the left side of Thorax. The Abdomen did not move on

respiration. The dyspnœa became very urgent, with increasing lividity, and he died on October 19th. Post-mortem: The right border of the Heart was on a level with the right costo-chondral junction. There was a rent as large as a shilling in the right side of the Diaphragm; and on the left side was a rent extending from the Œsophageal opening in front, backwards and outwards to the false ribs. The left pleural cavity contained the stomach, transverse colon, omentum, spleen, and a few coils of intestine; the left lung was collapsed. The right pleural cavity contained nearly a pint of blood, and the lung was somewhat collapsed.

Injuries of the Abdomen.

Rupture of Viscera.—On January 17th a man, age 22, was brought to the Hospital in an extreme state of collapse, having fallen off the tail-board of a van while in motion. He complained of great pain in the Epigastrium, and soon after the injury began to vomit incessantly. 18th, constant sickness, with intense desire to defæcate, but absolute constipation. He passed no urine. Abdomen very hard and tender. Temperature 99°6. On the 19th, as the patient was getting decidedly worse, it was resolved to open the peritoneal cavity. An incision having been made below the umbilicus, the peritoneum was found to be filled with dark, fluid blood, but nothing further was discovered, and the wound was closed. The patient lingered until the night of the 20th. Post-mortem: There was an extensive transverse rent near the right border of the liver.

A lamplighter, aged 29, on January 31st fell from a first-floor window, his abdomen coming into violent contact with the pavement. He suffered with vomiting and pain in the abdomen, which soon became distended. Death occurred next day. Post-mortem: A Rupture, large enough to admit the little finger, was found in the third part of the Duodenum.

Injuries of Lower Extremity.

Compound Fractures of the Femur and Patella.—A woman who had jumped from the third story window of a house, was found to have sustained a Compound Comminuted Fracture of the Patella, together with other injuries, from the effects of which she died. Of two cases of Compound Fracture of the Femur, in one, that of a woman, aged 33, who had sustained other injuries, death took place on the second day; the other case, a boy, aged 10, recovered.

Compound Fractures of the Leg.—A man, aged 70, admitted with a Compound Fracture of the Leg, died with moist gangrene. (See p. 73.)

A cabman, aged 40, was admitted with a Compound Fracture of the Leg. He progressed favourably until the twelfth day, when, on sitting up in bed to be washed, he suddenly became faint and died. No indication of the immediate cause of death was found on post-mortem examination.

Sub-Astragaloid Dislocation.—There were two cases of Sub-Astragaloid dislocation of the foot inwards uncomplicated with fracture, and in both reduction was easily effected.

SURGICAL OPERATIONS PERFORMED.

OPERATIONS.	AGE AND SEX.																					
	Total.		Discharged.		Died.		Under 5 Years.		— 10		— 20		— 30		— 40		— 50		— 60		— 70		Over 70.	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
OPERATIONS ON THE EYE.																								
Strabismus	16	19	16	19	..	..	1	4	12	9	3	3	..	1	..	1	..	1	..	..	..	..	..	..
Iridectomy	17	11	17	11	..	..	2	1	2	..	1	1	4	..	3	3	2	..	2	3	1	3	..	..
Cataract—																								
Linear Extraction ..	24	19	24	19	..	..	..	..	1	..	1	1	..	..	..	1	1	2	8	7	10	6	3	2
Flap Extraction.. ..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Needle Operation ..	6	4	6	4	..	..	3	..	1	3	..	1	..	..	..	..	1	..	1	..	..	..	..	..
Abscission	11	5	11	5	..	..	2	1	..	1	5	..	1	2	1	..	..	..	1	1	..	..	1	..
Extirpation of Globe ..	17	12	17	11	..	1	2	2	1	..	2	3	3	1	2	1	3	3	2	..	2	2	..	..
Entropion and Ectropion ..	2	7	2	7	..	..	1	..	..	..	..	3	..	2	1	..	..	..	..	1	..	1	..	..
Anterior chamber tapped ..	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trephining Cornea ..	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Slitting the Canaliculus ..	3	4	3	4	..	..	..	1	..	..	1	..	1	1	1	1	..	..	..	1	..	..	..	..
Removal of Capsule ..	2	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..
Sclerotomy	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Peritomy	..	2	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
Keratonyxis	5	..	5	..	..	..	2	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..
EXCISION OF JOINTS AND BONES.																								
Shoulder	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Elbow	6	1	6	1	..	..	..	..	1	..	1	1	3	..	..	..	1	..	..	..	..	..	..	..

OPERATIONS.	AGE AND SEX.																					
	Total.		Discharged.		Died.		Under 5 Years.		— 10		— 20		— 30		— 40		— 50		— 60		— 70		Over 70	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Excision of Joints and Bones (*continued*).																								
Wrist	2	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..
Hip	4	1	1	..	3	1	..	..	3	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Knee	3	4	3	4	..	..	..	1	..	..	3	2	..	1	..	..	..	..	..	..	..	..	..	..
Ankle	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Of Astragalus ..	2	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Of Os Calcis	2	..	2	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Other Parts of Foot ..	1	1	1	1	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..
Resection of Tibia	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Removal of Sequestra:																								
From Head and Face ..	5	3	5	3	..	..	1	..	1	..	..	..	2	1	..	1	1	1	..	..	..	..	..	..
„ Upper Extremity	6	2	6	2	..	..	..	..	..	..	3	..	2	1	1	1	..	..	..	..	..	..	..	..
„ Lower „	13	4	13	4	..	..	..	1	2	1	6	1	1	..	2	1	1	..	1	..	..	..	..	..
Amputations.																								
Primary—																								
At Shoulder Joint ..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Arm	2	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..
Forearm	2	1	2	1	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..
Parts of Hand	..	..	..	..	..	..	Many		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Thigh	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Leg	2	2	2	..	..	2	..	..	..	..	..	..	1	..	..	1	..	..	1	1	..	..	..	..
Parts of Foot	..	..	..	..	..	..	Many		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

OPERATIONS.	AGE AND SEX.																					
	Total.		Discharged.		Died.		Under 5 Years.		— 10		— 20		— 30		— 40		— 50		— 60		— 70		Over 70.	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
AMPUTATIONS (*continued*).																								
Secondary—																								
Arm	2	..	2	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..
Forearm	2	..	2	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..
Hand	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Thigh	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Leg	3	..	3	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	1	..	..	..
For Disease:																								
At Shoulder Joint ..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Arm	1	1	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..
Forearm	1	1	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..
Parts of Hand	8	3	8	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
At Hip Joint	2	..	2	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Thigh	14	9	14	7	..	2	1	1	3	1	4	1	3	3	2	2	1	1	..	..	..	..	..	..
Knee Joint	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Leg	6	1	4	1	2	..	..	..	..	..	..	..	1	1	2	..	1	..	2	..	..	..	..	..
Ankle Joint	5	3	5	3	..	..	1	..	1	..	2	1	..	2	1	..	..	..	..	..	..	..	..	..
Parts of Foot	3	2	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
REMOVAL OF TUMOURS.																								
Connective Tissue Tumours:																								
Enchondroma	3	1	3	1	..	..	..	..	..	..	1	..	1	1	1	..	..	..	..	..	..	..	..	..
Exostosis..	4	3	4	3	..	..	..	..	..	..	2	3	2	..	..	..	..	..	..	..	..	..	..	..
Lipoma	10	12	10	12	..	..	..	..	..	..	..	..	1	3	1	1	4	6	2	1	2	1	..	..
Fibroma	2	4	2	4	..	..	..	..	..	..	..	..	1	2	..	2	..	..	1	..	..	..	..	..
Fibro-neuroma	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Sarcoma	10	19	10	17	..	2	..	..	..	..	1	1	2	3	1	2	4	6	1	3	1	2	..	2

OPERATIONS.	AGE AND SEX.																							
	Total.		Discharged.		Died.		Under 5 Years.		—10		—20		—30		—40		—50		—60		—70		Over 70	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Removal of Tumours (*continued*).																								
Epulis	2	6	2	6	..	..	..	..	..	1	1	1	1	3	..	..	..	..	..	1	..	..	..	..
Parotid Tumour	1	3	1	3	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	1	..	..	..	..
Operations for—																								
Angeioma and Nævus	6	11	6	11	..	..	3	9	..	1	2	1	1	..	..	..	..	..	..	..	..	..	..	..
Epithelial Tumours:																								
Papilloma	..	3	..	3	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..
Adenoma	..	11	..	..	..	..	..	..	..	..	..	3	..	5	..	3	..	..	..	..	..	..	..	..
Carcinoma:																								
Face	1	2	1	2	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..
Lip	7	..	7	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	3	..	2	..	1	..
Mouth and Cheek	5	1	4	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	3	1	..	..
Tongue	10	..	8	..	2	..	..	..	..	..	..	..	..	..	..	..	2	..	4	..	4	..	..	..
Lower Jaw	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Breast	..	35	..	34	..	1	..	..	..	..	..	..	..	..	..	8	..	11	..	14	..	2	..	..
Serotum	4	..	4	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	1	..	..	..
Vulva	..	2	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..
Skin	2	1	2	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..
Thyroid	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Recurrent	7	10	6	7	1	3	..	..	..	..	..	..	1	..	..	2	3	3	1	2	2	3	..	..
Rodent Ulcer	2	4	2	4	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	1	..	2	..	..
Teratoma	1	1	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Keloid	..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..

OPERATIONS.	AGE AND SEX.																							
	Total.		Discharged.		Died.		Under 5 Years.		—10		—20		—30		—40		—50		—60		—70		Over 70.	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Polypi	6	5	6	5	..	..	..	..	..	..	3	1	2	2	..	1	..	..	1	1	..	..	..	..
Cervical Rib	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
Mole	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lupus	10	8	10	8	..	..	..	..	..	..	4	7	4	..	..	1	..	..	1	..	1	..	..	..
Cysts—																								
Sebaceous	21	7	21	7	..	..	..	..	..	..	5	3	8	2	2	1	4	1	2	..	..	..	..	..
Simple	1	2	1	2	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..
Dermoid	5	6	5	6	..	..	1	..	1	1	3	2	..	..	..	2	..	..	..	..	..	1	..	..
Removal of—																								
Upper Jaw	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Lower Jaw	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Penis	4	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	..	..
Castration	7	..	7	..	..	..	..	..	..	..	..	..	3	..	1	..	1	..	2	..	..	..	..	..
Removal of Enlarged Glands	2	2	2	2	..	..	..	..	..	..	1	..	1	..	..	1	..	1	..	..	..	..	..	..
Operations on the Urinary Organs—																								
Lithotomy, lateral	10	..	8	..	2	..	4	..	2	..	1	..	..	..	..	..	..	..	1	..	2	..	..	..
,, median	2	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Litholapaxy	2	..	2	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..
Removal of Foreign Bodies from Bladder	1	1	1	1	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..
Nephrectomy	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..

OPERATIONS.	AGE AND SEX.																							
	Total.		Discharged.		Died.		Under 5 Years.		—10		—20		—30		—40		—50		—60		—70		Over 70.	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Operations on the Urinary Organs (*continued*)—																								
Perineal Section and External Urethrotomy	8	..	6	..	2	..	..	..	..	..	..	..	..	..	3	..	3	..	1	..	1	..	..	..
Internal Urethrotomy ..	8	..	8	..	..	..	..	..	..	..	..	..	3	..	4	..	1	..	..	..	..	..	..	..
Calculus removed from Urethra	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Supra-Pubic Puncture of Bladder	2	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Incisions.																								
Ovariotomy	..	10	..	6	..	4	..	..	..	..	..	..	..	2	..	2	..	2	..	3	..	1	..	..
Œsophagotomy	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Gastrostomy	2	1	..	..	2	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	1	..	..	..
Colotomy	1	2	..	..	1	2	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..
For Hernia—																								
Inguinal—																								
Opening of Sac ..	5	2	4	2	1	..	1	..	..	..	..	..	1	1	1	..	..	..	1	1	1	..	..	..
Without opening of Sac	3	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	1	..
Femoral—																								
Opening of Sac ..	2	9	1	5	1	4	..	..	..	..	..	..	..	..	..	2	2	4	..	2	..	1	..	..
Without opening of Sac	1	1	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..
Umbilical	..	3	..	1	..	2	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	..	..
Trachæotomy	9	22	2	5	7	17	7	18	..	..	1	..	..	2	..	..	..	2	1	..	..	..	..	..

OPERATIONS.	AGE AND SEX.																							
	Total.		Discharged.		Died.		Under 5 Years.		—10		—20		—30		—40		—50		—60		—70		Over 70	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Incisions (*continued*).																								
Laryngotomy	1	1	..	..	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Osteotomy	6	2	5	2	1	..	1	..	..	1	3	..	..	1	1	..	1	..	..	..	..	..	..	..
Rectal Operations.																								
Hæmorrhoids	12	14	12	14	..	..	..	..	..	..	..	..	1	3	4	3	4	4	1	4	2	..	..	..
Fistula in Ano	26	10	26	10	..	..	..	..	..	..	2	1	3	5	11	3	7	..	3	1	..	..	..	..
Proctotomy..	..	9	..	9	..	..	..	..	..	..	..	1	..	6	..	1	..	1	..	..	..	..	..	..
Excision of Rectum .	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Ulcer of Rectum	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Ligature of Vessels.																								
Brachial	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Common Carotid	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Temporal Artery	1	1	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..
Ulnar Artery	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
External Iliac	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Femoral Artery	5	..	5	..	..	..	..	..	..	..	..	..	1	..	3	..	1	..	..	..	..	..	..	..
Popliteal	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Operation for Varicose Veins	2	..	2	1	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..	..	..	..	..	..
Varicocele	4	..	4	..	..	..	..	..	..	..	3	..	1	..	..	..	..	..	..	..	..	..	..	..
Miscellaneous Operations.																								
Deviation of Septum Nasi	6	2	6	2	..	..	..	..	1	..	2	1	3	1	..	..	..	..	..	..	..	..	..	..
Gouging of Bone	8	7	7	7	1	..	1	4	..	1	3	2	4	..	..	..	..	..	..	..	..	..	..	..
Exploratory Operations ..	6	3	6	1	..	2	..	..	..	..	3	1	1	1	..	..	1	..	1	1	..	..	..	..
Trephining	4	1	3	1	1	..	..	..	1	..	1	1	2	..	..	..	..	..	..	..	..	..	..	..

OPERATIONS.	AGE AND SEX.																					
	Total.		Discharged.		Died		Under 5 Years.		— 10		— 20		— 30		— 40		— 50		— 60		— 70		Over 70	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Miscellaneous Operations (*continued*).																								
Ingrowing Toe-nail ..	27	12	27	12	..	..	..	..	..	..	19	5	7	6	..	..	..	..	1	1	..	..	..	..
Compound Ganglion ..	4	2	4	2	..	..	..	..	..	..	1	..	..	1	2	..	..	1	1	..	..	..	..	..
Radical Cure of Spina Bifida	2	2	..	1	2	1	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
,, Hydrocele	6	..	6	..	..	..	..	..	..	..	1	..	..	..	2	..	1	..	2	..	..	..	..	..
Nerve Stretching	3	1	3	1	..	..	..	..	..	..	..	..	..	1	1	..	..	..	2	..	..	..	..	..
Division of Gustatory Nerve	1	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..
Removal of Bulbous Nerves of Stumps ..	2	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..
,, Enlarged Bursæ ..	..	8	..	8	..	..	..	..	..	..	..	..	..	4	..	3	..	..	..	1	..	..	..	..
,, Enlarged Tonsils	1	2	1	2	..	..	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
,, Loose Cartilages	4	1	3	1	1	..	..	..	..	..	..	..	..	..	2	..	1	1	1	..	..	..	..	..
,, Needles, &c. ..	2	1	2	1	..	..	..	..	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..
Incisions into Joints and Drainage..	5	..	5	..	..	..	1	..	1	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..
Removal of Salivary Calculus	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Forcible Fracture for Deformity of Bones ..	1	1	1	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..
Reparative and Plastic Operations.																								
Harelip	10	14	10	13	..	1	10	13	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Cleft Palate..	8	7	8	7	..	..	2	2	2	1	4	3	..	..	..	1	..	..	..	..	..	..	..	..
Ruptured Perinæum ..	..	7	..	7	..	..	..	..	..	..	..	..	..	3	..	4	..	..	..	..	..	..	..	..

OPERATIONS.	AGE AND SEX.																							
	Total.		Discharged.		Died.		Under 5 Years.		—10		—20		—30		—40		—50		—60		—70		Over 70	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Reparative Operations (*continued*).																								
Recto-vesical Fistula ..	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Vesico-vaginal Fistula ..	..	2	..	2	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..
Pharyngeal „ ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Urinary „ ..	3	..	3	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..
Closure of Artificial Anus	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Imperforate Anus	..	3	..	2	..	1	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Extroversion of Bladder ..	2	..	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
For other Malformations ..	3	..	3	..	..	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Resection of Divided Nerves	2	1	2	1	..	..	..	..	..	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..
„ Tendo Achillis	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Deformity from Cicatrices..	1	9	1	9	..	..	..	1	..	1	..	6	1	1	..	..	..	..	..	..	..	..	..	..
Contraction of Flexors of Hand after a Wound ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..

STATISTICS OF ANÆSTHETICS.

During the year 1883 Anæsthetics were administered 2,715 times.

Chloroform was administered	1,421	times.
Nitrous Oxide Gas (alone)	287	„
Ether (alone)	566	„
Ether, preceded by Nitrous Oxide Gas ..	1,156	„
Ethyl Bromide	11	„
	3,441	

A surgeon, aged 56, was admitted to the Hospital with Epithelioma of the tongue. He was much broken down in health from alcoholism and neglect. Considerable hæmorrhage occurred from the tongue on the night after his admission. The following day inhalation of chloroform was commenced, with the intention of performing removal of the tongue. During the earlier part of the administration slight hæmorrhage began and increased during the struggling of the excitement stage, which was extremely violent. Before the operation was commenced, he turned pale, then became suddenly livid, and ceased to breathe. No respiratory movements were afterwards made, though inversion and other methods of restoration were used. On post-mortem the right lung was found to be generally attached to the chest walls by old adhesions; the substance of the heart was natural, and the valves were competent.

A wheelwright, aged 53, was admitted on March 22nd on account of a Wound of the forearm, with division of the Ulna by a circular saw. Under chloroform, the ends of the bone were united with wire. On March 29th the administration of chloroform became again necessary for the purpose of making an incision into the arm, which had become inflamed. Soon after commencing the inhalation, the pulse was weak and irregular, and the administration was continued cautiously; but before insensibility was complete, the patient became suddenly faint, and died. Post-mortem: there was general hypertrophy of the heart, with dilatation, especially on the right side; slight thickening of the edges of the cusps of the mitral valve. Miliary tubercles were thickly scattered throughout both lungs and in the spleen; a few tubercles were also found beneath the endocardium. There was commencing cirrhosis of the liver and kidneys.

APPENDIX

TO

TABLE OF OPERATIONS.

Excision of the Shoulder Joint was performed on a clerk, aged 45, who, for some time, had suffered from pain in and immobility of the Shoulder Joint, as the result of an injury.

Excision of the Hip Joint was performed five times for *Morbus Coxæ*. Only one patient, a boy, aged 21, survived. A boy, aged 7, died with Meningitis; the remainder, two males and a female, died with exhaustion from prolonged suppuration and amyloid disease.

An extreme degree of Talipes-equino-varus in a man, aged 22, was successfully treated by the removal of a wedge-shaped portion of the tarsus.

Resection at the Knee was performed in a lad, aged 16, for distortion after an excision of the knee for disease nine years before. Osseous union had taken place, but there was nearly 10 inches shortening of the extremity from bending of the bones forwards and outwards. The patient was much benefited by the second operation, the limb being straight, and only shortened 6 inches.

In the case of a lad, aged 17, who underwent excision of the Knee for disease, amputation of the Thigh was rendered necessary by suppuration and hectic, which ensued.

AMPUTATIONS:

Primary—

Shoulder Joint.—Amputation at the Shoulder Joint was performed on a man aged 25, for a railway injury of the arm and forearm. Death took place within 24 hours of the operation with shock.

Thigh.—A woman, aged 78, died with Gangrene after amputation through the lower third of the thigh for a Compound Fracture of the Leg. (See p. 74.)

Leg.—A woman, aged 38, died with exhaustion and Traumatic Delirium, on the seventh day after amputation for Compound Fracture of the Leg.

A woman, aged 55, whose Leg was amputated for a Compound Fracture, died from the effects of injury to the Thorax.

Secondary—

Arm.—Amputation immediately below the Shoulder Joint was successfully performed for Gangrene supervening on a Colles' Fracture. (See p. 73.)

In a lad, aged 17, the Arm was amputated above the elbow for Gangrene of the Hand, following a lacerated wound of the Arm. (See p. 73.)

Amputations for Disease—

Shoulder Joint.—In a man, aged 30, for Subclavian Aneurism. (See p. 71.)

Arm.—For Disease of the Elbow Joint; and in a woman, aged 62, for Phlegmonous Inflammation of the Forearm.

Forearm.—For a Tumour of the Forearm. (See p. 70); and for Phlegmonous Inflammation.

Hip Joint.—In both cases successfully, for Morbus Coxæ.

Thigh.—In eight males for Disease of the Knee Joint; in two for Sarcoma of the Thigh and Tibia respectively; in one for Congenital Deformity of the Leg; in one for Acute Necrosis of the Femur; and in two for Necrosis of the Tibia. All the patients recovered. In six females for diseases of the Knee Joint, of which two died, one with Suppurative Phlebitis, and the other with exhaustion and Phthisis. In one case for Ulcer of the Leg; in one for Infantile Paralysis; and in one for Sarcoma of the Femur.

Knee Joint.—In one case for Ulcer of the Leg.

Leg.—In three males, for Disease of the Ankle; in one for Chronic Ulcer; in one for Infantile Paralysis; and in one for Tetanus. (See p. 69.) Two patients died with Tetanus and Erysipelas respectively.

In one female, for Infantile Paralysis.

Foot.—Males.—In three cases for Disease of the Tarsus; in one for Disease of the Ankle Joint, and in one for Ulceration of the Stump after Chopart's operation. Syme's amputation was done in all cases except in the last mentioned, in which Pirogoff's amputation was performed. *Females*—In two cases for Caries of the Tarsus and Metatarsus, and in one for disease of the Ankle Joint. Of these, Pirogoff's amputation was performed in one, and Syme's in two cases.

Removal of Tumours.

Tongue.—Two patients died after removal of the Tongue for Epithelioma, one of Grey Hepatisation of the Lungs, with softening and abscess formation; the other of Pulmonary Congestion.

Forearm.—After the removal of four nodules of Sarcoma from the Forearm, secondary hæmorrhage occurred five times, and was finally arrested by ligature of the Brachial Artery.

Cancerous Glands.—Some Cancerous Glands were removed from the Axilla of a woman, age 50. On the ninth day after the operation, hæmorrhage occurred to the extent of half a pint; it was arrested by pressure. The hæmorrhage recurred three days later, and on opening the wound the Subscapular Artery was found to be the bleeding vessel.

Removal of Upper Jaw.—The operation was performed on a lad, aged 14, for Fibro-Sarcoma springing from the base of the Skull. After the extirpation of the growth, the dura mater could be seen through an opening in the basi-sphenoid. The patient recovered from the operation.

Nephrectomy.—In a lad for Pyo-Nephrosis. (See p. 76.)

External Urethrotomy.—Death took place in the case of a man, aged 41, from Septicæmia after the performance of Wheelhouse's Operation.

Incisions:

Abdominal Section.—In a male and a female, for Intestinal Obstruction (see p. 74); and in a male who had a Rupture of the Liver, with symptoms simulating intestinal obstruction. (See p. 80.)

Ovariotomy.—(See p. 77.)

Œsophagotomy.—For the removal of a Plate carrying Artificial Teeth. Death took place with Septicæmia. (See p. 79.)

Colotomy.—In a male infant, for Imperforate Anus; and in two females, for Intestinal Obstruction. (See p. 74.)

Herniotomy.—(See p. 75.)

For Artificial Anus.—(See p. 76.)

Tracheotomy.—In 27 cases for Diphtheria and Croup (see p. 71); in two cases for Œdema Glottidis; in one for Syphilitic Disease of the Larynx; and in one in the operation for the removal of a Scirrhus of the Thyroid Gland.

In a case of Œdema Glottidis, associated with Tubercular Disease of the Larynx, profuse hæmorrhage occurred from the wound on the third day after the operation, and the patient died soon after its commencement. Post-mortem: the lower lobes of the Lungs were filled with blood clot.

Laryngotomy.—For Laryngitis with Œdema Glottidis in a woman, aged 40.

Excision of Rectum.—In a man, aged 53, with a fatal result. (See p. 76.)

Osteotomy was performed once for Ankylosis of the Hip, and once each for Ankylosis of the Ankle and Deformity after Pott's fracture.

A lad, aged 19, submitted to McEwen's operation for Genu Valgum on April 14th. Bleeding occurred at intervals until the 30th, when the wound was enlarged, and an opening was found in the Popliteal Artery opposite a sharp spicule projecting from the lower end of the cut surface of the femur. The artery was ligatured. May 2nd, gangrene of foot and leg. Amputation through lower third of thigh. Death took place the same evening.

Resection of Tarsus.—For Talipes-Equino-Varus in a man, aged 22.

Nerve Stretching.—Of the Inferior Dental, in two cases for Neuralgia; and of the Sciatic, in two cases for Spastic Rigidity of the Leg and Neuralgia of a Stump respectively. (See p. 71.)

Trephining of Temporal Bone.—In two cases, for Caries of the Temporal Bone.

Ligature of Arteries in Continuity.

Common Carotid.—In one case, for Orbital Aneurism.

Temporal.—In one case, for Traumatic Aneurism.

Brachial.—For Secondary Hæmorrhage, after the Removal of Sarcomata from the Forearm.

Ulnar.—For Secondary Hæmorrhage, after a Wound of the Forearm.

External Iliac.—For Ilio-femoral Aneurism.

Femoral.—In all cases for Aneurism.

Popliteal.—For Secondary Hæmorrhage after Osteotomy for Genu Valgum. (See above.)

Reparative Operations.

After the performance of a Plastic Operation for Extroversion of the Bladder in a child, aged 5 months, death occurred, with sloughing of the wound.

SUB-TABLE, SHOWING THE NUMBER OF CASES OF ERYSIPELAS, PYÆMIA, &c.

DISEASES.	Under 5.		5—10.		10—20.		20—30.		30—40.		40—50.		50—60.		60—70.		70—80.		Total.		Deaths.	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Erysipelas—																						
Admissions	3	2	1	1	9	9	13	8	10	4	4	8	3	2	2	2	..	..	45	36	5	..
Occurring in Hospital	1	1	1	..	1	..	4	1	4	..	1	2	1	..	1	..	..	..	14	4	1	..
„ after Operations ..	..	..	2	..	3	2	3	4	2	3	2	..	3	4	2	3	1	..	18	16	3	2
Phlegmonous Inflammation—																						
Admissions	..	..	..	..	5	..	7	1	9	6	7	3	2	1	3	1	..	..	33	12	5	2
Occurring in Hospital	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	3	..	2	..
Pyæmia and Septicæmia—																						
Admissions	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	2	..	2
Occurring in Hospital	..	..	..	..	..	1	..	..	..	..	1	1	..	..	1	..	..	..	2	2	2	2
„ after Operations ..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	2	1	2	1
Tetanus—																						
Admissions	..	..	..	..	..	1	2	..	..	..	1	..	..	..	..	..	..	..	3	1	3	1
Occurring in Hospital	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..
Delirium Tremens—																						
Occurring in Hospital	..	..	..	..	..	..	2	..	3	3	2	..	..	..	..	1	1	..	8	4	3	1

APPENDIX TO SUB-TABLE OF CASES OF ERYSIPELAS, &c.

ERYSIPELAS:

Admissions—

The apparent discrepancy between the number of cases in this and in the first Table, is due to the fact that a few cases were admitted with Erysipelas complicating some other disease or some injury, and that such cases have been entered in the first Table under the heading of the Primary Disorder.

ERYSIPELAS OCCURRING IN HOSPITAL:

Male.—In 6 cases it occurred as a complication of Wounds; in other instances complicating a Compound Fracture of the Coracoid Process of the Scapula, a Compound Fracture of the Ulna, and Crushed Hand in two cases. It complicated abscesses and old suppuration in 4 cases, and supervened on chronic diseases of joints in 2 cases, and on an ulcer of the leg and Lupus in others. The fatal cases were those of disease of the knee joint and ulcer of the leg.

Female.—It complicated abscesses in 2, and a scald in 1 case; and in the remaining instance it followed the opening of an abscess connected with a suppurating knee-joint.

ERYSIPELAS AFTER OPERATION:

Male.—It occurred in 4 cases after operations on bones for Caries or Necrosis. In 4 after amputations, namely, in 1 case after amputation of the Thigh, and in 3 of the Leg. One of the latter cases—that of a man aged 58—proved fatal.

In 2 cases it followed respectively Excision of the Hip and Resection of the Tarsus. In 2 the removal of Epitheliomata, and in 2 of Epitheliomatous Submaxillary Glands. In other cases the removal of a Congenital Cyst, an operation for Fistula, Lithotomy, and Tenotomy. The patient on whom Lithotomy was performed died subsequently with Cystitis and exhaustion.

Female.—In one case it followed amputation of the arm for Phlegmonous Inflammation, in 6 cases Amputation of the Breast, and in 2 the removal of Epitheliomata. In one of the latter—a case of Epithelioma of the Vulva in a woman aged 57—it proved fatal; as did a case of recurrent cancer of the Cervical Lymphatic Glands, into which an incision was made.

Erysipelas also complicated respectively the operation for Vesico-Vaginal Fistula, that for Compound Palmar Ganglion, and the scraping of patches of Lupus in two cases.

In two instances it followed the opening of abscesses.

PYÆMIA AND SEPTICÆMIA OCCURRING IN HOSPITAL:

Male.—Two patients, admitted for Phlegmonous Inflammation, died with Pyæmia.

Female.—A girl, aged 15, died with Pyæmia complicating Acute Necrosis of the Tibia (see page 77); and in a woman, aged 41, it was associated with a Mammary Abscess.

PYÆMIA AND SEPTICÆMIA AFTER OPERATIONS:

Male.—Septicæmia proved fatal after the performance of Wheelhouse's Operation on a man aged 41; and after Œsophagotomy performed on a man, aged 45, for the removal of a plate carrying false-teeth.

A woman, aged 26, died with Pyæmia, which ensued after an exploratory operation for a chronic Pelvic Abscess.

TETANUS OCCURRING IN HOSPITAL. *See* the Appendix to Table I, page 69.

TABLE OF AMPUTATIONS WITH THE PERCENTAGE OF DEATHS DURING THE TEN YEARS *from* 1874 *to* 1883 *inclusive.*

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.										Total Number of		Average Percentage of Deaths.
	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	Cases.	Deaths.	
PRIMARY.																							
Thigh	..	1	1	2	4	1	3	1	3	1	..	100·	..	..	50·	100·	66·66	100·	100·	100·	17	11	64·7
Knee Joint	..	..	..	1	..	2	..	1	..	..	..	..	..	..	..	50·	..	100·	..	50·	4	2	50·
Leg	..	..	3	2	2	1	..	3	4	4	..	..	66·66	100·	50·	..	..	33·33	·50	50·	19	10	52·63
Ankle Joint	1	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..	..	5	..	..
Shoulder Joint ..	1	..	1	..	..	..	..	..	..	1	100·	..	..	..	..	..	..	..	..	100·	3	2	66·6
Arm	3	3	2	2	3	3	3	..	1	2	..	33·33	..	..	..	33·33	..	..	..	..	22	2	9·09
Forearm	..	2	2	2	1	5	3	..	3	3	..	..	50·	..	..	..	..	..	..	..	21	1	4·76
SECONDARY.																							
Thigh	1	..	2	..	1	1	..	1	3	1	..	..	50·	..	100·	100·	..	..	66·66	100·	9	6	66·66
Leg	1	2	..	1	2	..	3	2	1	3	..	..	..	100·	..	..	..	50·	100·	..	15	3	20·
Arm	..	1	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	4	..	..
Forearm	1	..	..	1	1	..	1	1	..	2	..	..	..	..	..	..	..	..	..	..	7	..	..
Shoulder Joint ..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	100·	..	..	..	1	1	100·

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.										Total Number of		Average Percentage of Deaths.
	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	Cases.	Deaths.	
FOR DISEASE.																							
Hip Joint	2	..	1	2	..	3	..	3	2	2	100·	..	100·	100·	..	66·66	..	33·33	50·	..	15	9	60·
Thigh	19	18	9	14	19	27	23	25	15	23	10·52	27·77	11·11	7·14	10·52	14·81	17·39	24·	13·33	8·69	192	29	15·10
Knee Joint	..	..	..	..	..	..	..	2	1	1	..	..	..	..	..	..	..	..	..	..	4	..	..
Leg	7	9	2	7	9	9	8	10	5	7	..	..	50·	28·57	..	..	..	10·	..	28·57	73	6	8·
Ankle Joint	9	7	6	5	15	14	9	14	8	8	11·11	..	16·66	..	20·	7·14	..	7·14	12·5	..	95	8	8·42
Shoulder Joint ..	..	..	1	..	..	..	2	2	..	1	..	..	100·	..	..	..	50·	50·	..	..	6	3	50·
Arm	..	2	4	4	3	2	4	3	1	2	..	..	25·	..	33·33	..	25·	..	..	..	25	3	12·
Forearm	4	3	2	4	2	4	4	2	2	3	..	..	..	..	..	..	..	..	..	..	30	..	..