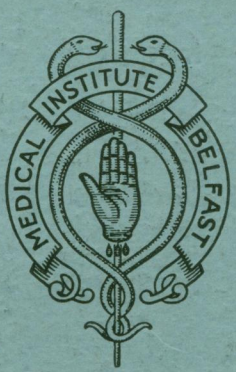
JULY, 1932

THE ULSTER MEDICAL JOURNAL



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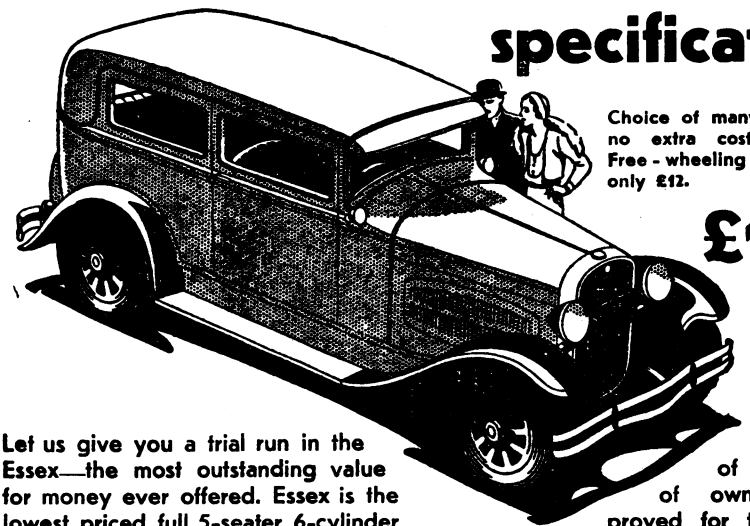

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CONTENTS

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NOTICE TO CONTRIBUTORS

1. Manuscript should be typewritten and fully corrected. Contributors will be responsible for the payment of any sum charged for correction of the printer's proof in excess of ten shillings per sheet (16 pages).
2. Illustrations must be in finished form ready for reproduction. They must be properly labelled in type or by hand, with reference pointers if necessary.
3. Line drawings must be sent whenever possible. Illustrations requiring half-tone blocks are costly, and unless printed on special art paper are often unsatisfactory. Authors will be charged for these half-tone blocks at cost price.
4. The legend describing an illustration must be inserted in the appropriate place in the text, and should not be placed on or appended to the drawing.
5. Orders for reprints must be given when the author returns the printer's proof. The cost of these may be obtained from the printers in advance.
6. Editorial communications should be sent direct to the Acting Editor, Dr. Hunter, Department of Anatomy, Queen's University, Belfast.

ADVERTISEMENTS

First advertising forms go to press thirty days in advance of the date of issue. In forwarding copy, time must be allowed for setting up and submitting proof. All communications for space must be sent direct to the advertising managers : Messrs. George A. Stewart & Co., Publicity House, 100 High Street, Belfast.

DATES OF PUBLICATION

1st January, 1st April, 1st July, 1st October.

tissue to deal with it. From about the age of ten years this excessive lymphatic tissue begins to atrophy rapidly, the child having obtained an additional amount of immunity by this time. A few "colds" can be regarded as a normal event in a child's life, but excessive colds or feverish colds point to an overdose of the toxin, and suggest that the tonsil has lost its useful function and is now harbouring infection. This latter type of case is usually benefited greatly by tonsillectomy. Adenoids are the result, and not the cause, of infection. They should be removed for nasal obstruction, or for ear complications (deafness, otitis mediæ, etc.).

Teaching children how to blow the nose, and also breathing exercises, might do a great deal to stop the formation of excessive adenoid tissue in the post-nasal space.

The president, Mr. S. T. Irwin, at the end of the discussion, summarised the points raised as follows :—

I. That if the tonsils are to be removed, it is agreed that complete enucleation is essential.

II. That the great difficulty is to decide what is meant by a "septic tonsil," as well as the exact conditions which are likely to benefit by the operation of tonsillectomy. Physicians and surgeons often disagree on these points, and tonsils frequently are removed when they have nothing whatever to do with the patient's illness.

III. That a research should be undertaken at once to trace a series of cases in whom tonsillectomy had been performed for other than local reasons, to learn the after-history, and to compare it with that of cases not submitted to operation. This should afford reliable data which would be of value in deciding which type of tonsil should be removed and which type left undisturbed. There is material available at the Royal Victoria and the Children's Hospital upon which such a research could be carried out. It awaits solution by an energetic young physician.

APPOINTMENTS

Mr. Maurice B. Lavery, M.Sc., M.B., F.R.C.S., and Mr. J. J. Moriarty, M.B., B.Ch., have been appointed honorary assistant surgeons on the staff of the Mater Infirmorum Hospital, Belfast.

Dr. W. R. Abernethy has been appointed Medical Superintendent Officer of Health for the City of Derry.

ULSTER MEDICAL SOCIETY LIBRARY

THE following books have recently been added to the Library :—

Bellingham-Smith and Feiling : *Modern Medical Treatment.*
Bishop : *Arterial Sclerosis.*
Clarke : *The Fundus of the Human Eye.*
Conybeare : *Textbook of Medicine.*
Fahney : *Ante-Natal Care.*
Fine : *Filterable Virus Diseases in Man.*
Jewesbury : *Mothercraft.*
Wheeler and Jack : *Handbook of Medicine.*

THE ULSTER MEDICAL SOCIETY

THE MEDICAL INSTITUTE,
COLLEGE SQUARE NORTH,
BELFAST.

Dear Sir (or Madam),

It has been felt for some time that the Transactions of the Ulster Medical Society, which have been published at irregular intervals, are not the best means of keeping the Fellows and Members interested in the proceedings of the Society, and that some other form of publication should be used. Very careful consideration was given to this by the Council, and it was decided to issue a quarterly periodical instead, to be known as THE ULSTER MEDICAL JOURNAL.

It has been decided to issue the journal to all Fellows and Members of the Ulster Medical Society free of charge, in place of the Transactions of the Society as issued hitherto.

If you are not a member of the Ulster Medical Society, we would appeal to you to give the question of joining your consideration. The Society has been in existence since 1862, and has always been active in keeping its members interested in the advances in medical science as well as in current professional affairs. The Medical Institute, situated in College Square North, belongs to the Society (through the generosity of Sir William Whitla), and is ideally adapted for meetings, committee meetings, and recreation. There is a library with current medical periodicals, and facilities for reference to medical literature are available in conjunction with the library at the Queen's University. There is also a billiard-room available to members, and lighter periodicals are also provided. An annual dinner is held each year in December, and a golf competition in June. Meetings are held at intervals of a fortnight during the winter months, and papers are contributed by members. Distinguished visitors are occasionally asked to contribute papers on subjects upon which they are specially qualified to speak.

The subscription to the Society is one guinea for Fellows and Members living in the country; two guineas for Fellows living in Belfast; and one guinea for Members living in Belfast who are not qualified more than seven years. The payment of a sum of twenty guineas entitles one to election to Life Membership.

May we, therefore, appeal to you to join the Ulster Medical Society, and so enable us to widen its influence and sphere of usefulness still further? For your convenience a proposal form is attached, which, if filled in and sent to the Honorary Secretary, will ensure your name being put forward for election to membership of the Society.

If you do not wish to become a member of the Society, will you consider entering your name as a subscriber to THE ULSTER MEDICAL JOURNAL? The subscription is five shillings per annum, payable in advance to the Honorary Treasurer, for which a banker's order form is attached for your convenience.

We remain,

Yours faithfully,

S. T. IRWIN, *President.*
J. A. SMYTH, *Hon. Secretary.*
F. M. B. ALLEN, *Hon. Treasurer.*

.....19.....

To DR. J. A. SMYTH,
23 UNIVERSITY SQUARE,
BELFAST.

Please have my name proposed for election to the Ulster Medical Society.

Name.....

Postal Address.....

.....

Year of Qualification.....

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(Ulster Medical Journal)

.....19.....

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Please pay to the account of the Ulster Medical Society (Northern Bank, Shaftesbury Square, Belfast), ULSTER MEDICAL JOURNAL *Account, the sum of five shillings, and continue to pay this amount on the 1st November each year until further notice.*

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This should be sent to the Honorary Treasurer, Dr. F. M. B. Allen,
73 University Road, Belfast, for registration.

THE
ULSTER MEDICAL JOURNAL

PUBLISHED QUARTERLY ON BEHALF OF THE ULSTER MEDICAL SOCIETY

VOL. I 1st JULY, 1932 No. 3

EDITORIAL

THE discussion on the relation of enlarged tonsils to disease, which took place in the Ulster Medical Society, sadly reflects the lack of agreement among medical men concerning the pathology and treatment of this condition. One would have expected by this time to find some form of agreement on these points, so that the public could be told the surest way of prevention and cure. It is, however, to the credit of all those who took part in the discussion that they were ready to come forward and give their personal experiences in the treatment of enlarged tonsils and to discuss the after-results. At the conclusion of the discussion, Mr. S. T. Irwin suggested that some of the younger and more energetic members of the Society should make a careful survey of the clinical records of cases in which tonsils had been removed for the relief of certain specific symptoms, and to follow up these cases and find out those types which benefited by their removal, those types which were unaffected by the operation, and those in which the symptoms were aggravated. It is only by such means, carried over a sufficiently large number of cases, that any definite information may be obtained, and it is hoped that some of our younger members will take this matter up and, at a future meeting of the Society, give us the benefit of any conclusions to which they may come.

It is hoped that further discussions may be arranged at the meetings of the Ulster Medical Society during the next session. Long individual papers may have their uses, but for the general practitioner they are often of so highly a specialised nature as to be outside the range of practical medicine without the full equipment of a large general hospital. Many subjects for such discussions come readily to the mind: Diseased Teeth in Relation to General Medicine; the Common Cold, its Treatment and its Relation to the Economic Problem of Life; Rheumatic Affections of Childhood in Relation to their Effects on Adult Life; or some of the newer phases of medicine, such as Individual Psychology in its Relation to the Practice of Medicine, for there seems little doubt that there is a definite relationship between certain forms of defective organs and specific psychological reactions. The subject is one that has not yet been given its rightful place in medical studies in Northern Ireland, and a discussion arranged by the supporters of the rival schools of Freud

and Adler would be of very great interest and value both to medical and surgical members of the Society.

The October number of the Journal, as announced last April, is to be devoted to the diagnosis and treatment of Tuberculosis. It is hoped that this special number will be a valuable compendium of our present knowledge of this disease, and each paper published will be the personal experience of the writer. Papers have been promised by Dr. John Gillespie, Tuberculosis Medical Officer for County Down; Dr. Andrew Trimble, Chief Tuberculosis Medical Officer of Belfast; Dr. Blyth Brooke, Tuberculosis Medical Officer for County Antrim; Dr. B. R. Clarke, Medical Officer in Charge, Forster Green Sanatorium; Dr. Richard McCullagh, Dr. S. I. Turkington, Mr. G. R. B. Purce, and Professor Andrew Fullerton.

Some Observations on the First Year's Working of Panel Practice in Northern Ireland

By JAMES BOYD, M.A., M.D., B.SC.,
Chief Medical Officer, Ministry of Labour for Northern Ireland

THE National Health Insurance Medical Benefit Regulations came into operation in Northern Ireland on 1st October, 1930. As I did not take up duties until 29th December, I am not in a position to give a personal account of the working of the scheme during the first three months of its existence, and I prefer to follow the course of events during the year 1931.

The scheme applies to almost one-third of the total population, and probably to about one-half of the adult population. It is as free from the element of charity as is life insurance. It is open to any doctor whose name is on the Medical Register, and in Northern Ireland there are now almost 500 insurance practitioners rendering service when required to about 360,000 insured persons.

From these figures it is seen that the great majority of general practitioners are insurance practitioners; and, in fact, it is a general practitioner service that the patient gets under the scheme.

There is a danger, however, especially in the case of certain doctors with large lists, that clinical examinations may at times be very incomplete or omitted altogether; for example, if a patient begins his story by stating that his main symptom is a cough, he may receive a prescription for Mist. Tussis and be dismissed without any attempt having been made to find the cause of the cough, and without any real medical advice. The same applies to the large group of patients who ask for a bottle of "tonic." An iron mixture may be prescribed when in reality there is not even a suspicion of anæmia. Even if the case is definitely one of anæmia, the same procedure may be adopted without trying to find out the cause of the anæmia.

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Many more examples of slipshod work could be given. Fortunately, however, the education of the public on health matters is going ahead, and no doubt the small number of doctors who have such a low sense of the duty entrusted to them will soon find their "panel" lists getting smaller.

It is, however, undoubted that the large majority of doctors are just as anxious to render the best type of professional service to their insured as to their private patients.

Scope of Service.

If a doctor renders treatment which is regarded by him as being outside the scope of medical benefit, and wishes to be paid by the patient for his services, he should notify the Ministry within forty-eight hours on a special form, stating (*a*) the nature of the service rendered, (*b*) that the insured person has agreed that it is a special service, (*c*) evidence of his special skill.

It has been decided that in the city of Belfast injection of varicose veins in uncomplicated cases is not a special service, but that the intravenous administration of arseno-benzol compounds is a special service.

Several claims have been made for services to be regarded as "outside the scope" on the grounds of

(*a*) The comparative newness of the treatment.

(*b*) The amount of trouble and responsibility entailed.

The only question to be considered, however, is whether the treatment rendered is within the competence and skill of general practitioners as a class.

Medical Certification.

Theoretically this is a very simple subject, but in practice there are many difficulties, e.g.,

(1) The difficulty at times in the detection of malingering.

(2) The difficulty in deciding just when a patient should return to work after an illness, and especially after a surgical operation.

(3) The problem of the young married woman who is determined to draw the maximum amount of cash benefits.

(4) The occasional tendency on the part of the doctor to yield to undue pressure from the patient.

At times observations such as the following appear on the forms which doctors are required to complete in the case of patients referred by their Approved Society : "It would be a real hardship if this man were put off the funds of the Society, as he has no other means of support." Such statements show a failure to appreciate that charity and sickness benefits are entirely different matters, and that the former is no concern of the Approved Society.

The exact wording of the different forms of certificate should be studied carefully, and every certificate issued should be correct in every detail. You may *know*, for example, that a patient is ill and incapable of work on a certain date, but that is no justification for issuing a certificate to the effect that you examined the patient on that date. The usual plea in such cases is that it is a mere "technical

irregularity." The view of the Department, however, and I believe that too of the General Medical Council, is that such certificates are false. It is an excellent rule, and one to which there should be no exceptions: Never allow your desire to oblige your patient to lead you into issuing such a certificate.

It is most important to observe the following rules:—

(1) "The forms provided by the Ministry shall not be used for any patient other than one whom the practitioner is attending, whether as principal, assistant, or deputy, as an insured person."

The chief object of this rule is to prevent an insured person, who feels dissatisfied that his panel doctor should have "signed him off," from substituting an intermediate certificate on the official form, obtained from another doctor. In such a case, if a certificate not on the official form is handed in, it should be noticed by the Society that the patient has changed his doctor, and steps may be taken to find out if the claim is a proper one.

(2) "If the practitioner, not earlier than one month after a certificate has been first issued by him in any case, is satisfied that the patient's incapacity is likely to continue for a prolonged period, and that, owing to the nature of the disease or disablement, *examination and treatment at intervals of more than one week will be sufficient,* he may issue a special intermediate certificate on the appropriate form, indicating that he proposes to issue certificates at specified intervals (not being longer than four weeks) during such period, and unless and until the Society gives notice to the practitioner that it objects to the proposed procedure, certificates may be issued at the intervals so specified."

If, for example, you have a case of *tabes dorsalis* which you consider necessary to examine and treat once a week, you are not at liberty to issue monthly, or even fortnightly, certificates.

(3) "Pregnancy where diagnosed while the patient is being certified as incapable from some other cause shall be stated on the certificate."

Investigation of Over-Prescribing.

Excessive Frequency.

If a doctor's frequency of prescribing is much greater than the average for the area, an investigation may show—

(*a*) That he has a relatively large number of 'chronic' patients.

(*b*) That in many cases a mixture which should have lasted perhaps for eight days has been repeated after four or five days.

(*c*) That medicine has been prescribed in many cases without any very definite therapeutic indication.

Excessive Average Cost per Form.

If the average cost per form is much in excess of that for the area, one or more of the following explanations will generally apply:—

(*a*) Multiple prescriptions, e.g., a mixture and powder on the same form.

(*b*) Routine use of such excipients as inf. senegæ, inf. gent. co.

In the case of one doctor an examination of 500 consecutive forms showed that prescriptions appeared on 233 forms containing ammon. carb., tinct. camph. co., and/or tinct. chlorof. et morph. B.P. '85, with inf. senegæ ad 10 fl. oz. The cost of this infusion was generally 9d., or 2097d. for the 500 forms, or an average of 4d. per form for this excipient.

(*c*) Unnecessary sweetening and flavouring agents.

One doctor was in the habit of issuing a prescription every seven or eight days to an epileptic patient for a 16 oz. mixture containing 12 fl. oz. of syrup of orange, the cost of this flavouring agent alone being four shillings.

(*d*) Undue predilection for costly preparations of certain drugs, e.g., elixir heroin, elixir terpo-heroin, linctus heroin, etc.

(*e*) Adherence to the maxim : "When in doubt, prescribe pot. iod."

(*f*) More or less routine use of special formulæ, e.g., a mixture of three syrups of iron, unnecessarily alcoholic mixtures, etc.

(*g*) Want of knowledge of the scale of dispensing fees.

Rules for Economical Prescribing.

1. Do not prescribe two bottles of medicine if only one is required.

2. Do not prescribe an expensive drug if as good a result is likely to be obtained with a less expensive drug. Remember that there is no relation between the cost and the efficacy of drugs.

3. If a patient asks for a "tonic," it does not follow that he is anæmic and requires iron. Further, if ferri et ammon. cit. is indicated, it is not necessary to add in routine fashion decoct. aloes co., inf. quassiæ, etc.

4. Avoid the routine use of B.P. aquæ, B.P. infusions, decoct. sarsæ co., etc.

5. Avoid tinct. aurantii for flavouring; it costs 1s. 8d. an ounce.

6. The use of concentrated preparations will often reduce the cost considerably, e.g.,

(*a*) Liq. ammon. acet. costs 1d. an ounce; liq. ammon. acet. conc. (eight times) costs 1½d. an ounce.

(*b*) Inf. gent. co. costs 1½d. an ounce; inf. gent. co. conc. (eight times) costs 2d. an ounce.

7. In prescriptions for liniments avoid spts. vini. rect., which costs 1s. 10d. an ounce, whereas spts. vini. meth. costs ½d an ounce.

8. In deciding between powders and tablets, for twelve doses or less it is more economical to order powders, but for a larger number of doses tablets are more economical. (Scotland and Northern Ireland.)

9. In the case of insulin, the chemist's profit is 6d. per hundred units, together with a dispensing fee of 5d., with a maximum of 2s. 11d. In other words, whether you order 500 units or 2,000 units, the chemist's profit is 2s. 11d.

10. Avoid, as far as possible, the use of proprietary drugs.

11. Unnecessary expense generally arises, not in the essential drug, but in the way in which it is compounded.

12. Avoid, as far as possible, the instructions : "Use as directed." Give accurate

instructions, and try to see that these are carried out, otherwise malt and oil may be given to other members of the family, or even to greyhounds.

Proprietary Drugs.

Whether acetyl-salicylic acid is called Aspirin, Empirin, Aspro, or Genasprin, it must produce the same effect on the patient. If, then, you order a proprietary article, for which an inflated price is generally charged, it may be difficult to support your contention that the preparation is "reasonably necessary."

On the other hand, it would be difficult to order Novalgin* under any other name. Before prescribing a drug of this type, however, you must satisfy yourself that it is "reasonably necessary," and be prepared to defend this view.

One case was reported to the Ministry in which it was alleged that the doctor had ordered a certain well-known proprietary drug, but stated that he could not prescribe it "on the panel." This is, of course, both an infringement of the terms of service and a reflection on the system. In this case it is probable that the preparation ordered was not "reasonably necessary," and that one of the N.F. prescriptions would have been quite as effective.

A few weeks ago, a doctor who had been in the habit of prescribing a proprietary form of phenyl-barbital, told me that the traveller for the proprietary article had explained to him that the non-proprietary form of the drug is very liable to produce unpleasant gastric symptoms. The statements of drug travellers should not be too readily accepted.

The manufacturers of many proprietary articles appear to realise that doctors are excellent agents for distributing their samples. Patients to whom you give samples naturally assume that you are not experimenting on them, and that you are actually recommending the product. They tell their friends how good it is—perhaps for constipation—that it was prescribed by their doctor, and that it can be purchased at the chemist's. Thus this method of advertising is likely to be both cheap and effective.

Statistical tables which have been prepared show the following :—

1. Out of a total of about 360,000 insured persons, 16,500 were still unallocated on 1st October, 1931.

2. About one-seventh of the total number of allocated insured persons are on doctors' dispensing lists.

3. For those on prescribing lists, the average number of prescription forms issued per insured person for 1931 was 2.40.

4. The corresponding frequency figures for Co. Armagh and Co. Antrim were 2.83 and 1.64. As there is no reason to believe that insured persons are less healthy in Co. Armagh, the figures suggest that the bottle of medicine habit is much more common in Co. Armagh than in Co. Antrim.

5. The average cost of drugs per insured person on doctors' lists for 1931 was 2s. 11¼d. (In arriving at this cost no account is taken of unallocated persons, and insulin is excluded.) The corresponding figures for Co. Armagh and Co. Antrim

* Novalgin is sodium-phenyl-dimethyl-pyrazolon-methyl-amino-methane-sulphonate.

respectively were 3s. 8½d. and 2s. 1d. The chief cause of this marked difference is the high "frequency" in Co. Armagh.

6. The average cost per prescription form fell from 15.89d. in December, 1930, to 13.02d. in December, 1931, i.e., a reduction of 2.87d. per form.

(NOTE.—A saving of 1d. per insured person means a total saving of £1,500 a year. Assuming the frequency to be 2.40, a saving of 1d. per form would result in a saving of 2.4 times £1,500, i.e., £3,600.)

In conclusion, this brief account shows that we have already gone a long way to surmount many of the difficulties inevitably associated with such a task as the introduction of medical benefits. Attention has been drawn to some points in medical certification which should be specially remembered. In the matter of economy in the cost of drugs, while it is satisfactory to note a continuous and marked improvement during the year, it is believed that there is still room for further economy without any resulting therapeutic loss to the patients.

AN IMPROVED MECHANICAL HAND

IN no branch of the ancillory branches of surgery has greater progress been made than in the fitting of artificial limbs to replace those lost through accident or war. This is particularly true in the making of mechanical arms. Yet even with the progress made during and since the great world war, further improvements have been introduced. The P.K. Arm, Limited, Belfast, are again in the front of this movement. They have introduced a new model hand which is constructed with a new silent operating mechanism for closing and opening. Like the original model, the hand is constructed of tapering spiral springs sewn to a backing of leather, with flat steel clock springs introduced between the spiral springs and the leather to give rigidity. Bowden steel wire cables are attached to fibre finger tips, and close the fingers when tightened against soft rubber palm pads, giving a secure grasp of any object or tool placed in the hand.

The new silent operating mechanism for closing and opening the hand consists of a nut and screw. The nut having the finger cables attached to it is so constructed that it is disengaged from, and slides up, the screw when it is pushed by the finger cables for quick adjustment when desired, but it is more fully tightened by rotating the screw. It will be noted that the latter has an inclined stem or spindle rotably mounted in a wrist block attached to the artificial arm, and can be revolved by a circular oscillatory movement of the hand or of the forearm, or both.

Intermediate between the hand and the wrist block a disc is attached to the screw, with which it revolves. Two ball locks are provided with engaging indentations on either face of the locking disc, so that either or both wrist and hand can be locked.

This arrangement allows the hand to be set in any position desired, or left free to swivel with the object held, an improvement which greatly increases the utility of the hand for many operations. The P.K. Arm, Limited, are to be congratulated on the results of their labour, for a more serviceable mechanical hand could not be desired.

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AN IMPROVED MECHANICAL HAND

IN no branch of the ancillory branches of surgery has greater progress been made than in the fitting of artificial limbs to replace those lost through accident or war. This is particularly true in the making of mechanical arms. Yet even with the progress made during and since the great world war, further improvements have been introduced. The P.K. Arm, Limited, Belfast, are again in the front of this movement. They have introduced a new model hand which is constructed with a new silent operating mechanism for closing and opening. Like the original model, the hand is constructed of tapering spiral springs sewn to a backing of leather, with flat steel clock springs introduced between the spiral springs and the leather to give rigidity. Bowden steel wire cables are attached to fibre finger tips, and close the fingers when tightened against soft rubber palm pads, giving a secure grasp of any object or tool placed in the hand.

The new silent operating mechanism for closing and opening the hand consists of a nut and screw. The nut having the finger cables attached to it is so constructed that it is disengaged from, and slides up, the screw when it is pushed by the finger cables for quick adjustment when desired, but it is more fully tightened by rotating the screw. It will be noted that the latter has an inclined stem or spindle rotably mounted in a wrist block attached to the artificial arm, and can be revolved by a circular oscillatory movement of the hand or of the forearm, or both.

Intermediate between the hand and the wrist block a disc is attached to the screw, with which it revolves. Two ball locks are provided with engaging indentations on either face of the locking disc, so that either or both wrist and hand can be locked.

This arrangement allows the hand to be set in any position desired, or left free to swivel with the object held, an improvement which greatly increases the utility of the hand for many operations. The P.K. Arm, Limited, are to be congratulated on the results of their labour, for a more serviceable mechanical hand could not be desired.

The Clinical Interpretations of Serological Reactions

By T. B. H. HASLETT, M.B.

from the Pathological Laboratories of the Royal Victoria Hospital, Belfast.

DURING the present century serological investigations have become of vital importance in the diagnosis of disease. The new branch of medicine so evolved has introduced a number of signs and abbreviations, the exact meaning of which may not be clear to those unaccustomed to laboratory technique. It is my aim, therefore, to explain serological notation, and to indicate in a general way the clinical value of the more common reactions.

TYPHOID AND PARA-TYPHOID FEVERS.

The Widal reactions will first be discussed. This test is carried out with the serum obtained from about 2 c.c. of non-hæmolysed clotted blood. The serum is diluted with saline and mixed with stock cultures of the B typhosus para-typhosus group, in such a way that in each tube there is a different dilution of serum. The dilutions are :—

$\frac{1}{25}$	$\frac{1}{50}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{500}$	$\frac{1}{1,000}$	$\frac{1}{2,500}$	$\frac{1}{5,000}$	*

It is usual to use suspensions of B typhosus, B para-typhosus A, and B para-typhosus B. The tubes are incubated for two hours at 56°C. The degree of flocculation in each tube is then noted. Complete flocculation is denoted by (C); almost complete (+ + +); moderately complete (+ +); slight (+); very slight (±); a mere trace (tr.).

Hence the report on a Widal positive for typhoid might be written down in this form :—

	$\frac{1}{25}$	$\frac{1}{50}$	$\frac{1}{125}$	$\frac{1}{250}$	$\frac{1}{500}$	$\frac{1}{1,000}$	$\frac{1}{2,500}$	$\frac{1}{5,000}$ C *
B Typhosus	C	C	C	C	+ + +	+ +	—	—
Para A	—	—	—	—	—	—	—	—
Para B	—	—	—	—	—	—	—	—

The above result might be stated in a simpler form, thus :—

The blood is positive to B typhosus in a titre of $\frac{1}{1,000}$ and negative in all dilutions to para A and para B.

The titre is of course the highest dilution of the patient's serum which gives a definite reaction with the appropriate bacteriological suspension.

Dreyer gives the result of a Widal reaction in figures which depend on the titre of the serum and the bacteriological suspension. Although his technique is the one generally used in Belfast, the report is seldom given in this form.

* A control is always set up, using saline instead of serum, in order to test the uniformity of the suspensions used.

The reaction depends on the fact that antibodies formed in the patient's serum in response to the entrance of living or dead bacteria of the typhoid-para-typhoid group, can react outside the body, with suspensions of the same bacteria, which called them forth. For example, if a patient develops typhoid, antibodies form in his serum which have the power of clumping suspensions of the typhoid bacillus. (In the same way infection with B para-typhosus A, B para-typhosus B, or B para-typhosus C, will call forth antibodies in the infected patient's serum.) The serum by causing clumping of the appropriate bacillary suspension will in consequence render diagnosis possible.

Antibodies do not appear in typhoid patients until the end of the first week following the onset of the disease. In rare cases they may even be delayed two or three weeks. Once antibodies commence to appear, they continue to form until about the end of the third week. In a typical case the serum about the eighth day will have a titre of $\frac{1}{250}$, in another week the titre may have reached $\frac{1}{2{,}500}$, while at the end of three weeks, serum in dilution of $\frac{1}{5{,}000}$ or higher may cause flocculation. After the third week the antibody content of the serum gradually falls. The extent of the fall is variable. I tested a case two years after an attack of para-typhoid fever, finding the titre of the serum to be $\frac{1}{500}$; in many other cases the titre falls from $\frac{1}{1{,}000}$ or more to $\frac{1}{25}$ in two months, and usually antibodies have disappeared almost completely after six months.

This rise and fall in the serum antibody content is very important, when we consider that antibodies may be present in the serum of a patient not suffering from typhoid or para-typhoid. Thus four per cent. of people giving no history of infection or inoculation with anti-typhoid vaccine (T.A.B.) react with B typhosus, B para-typhosus B and C, and B enteritiditis Gærtner, while about ten per cent. react with B Aertrycke (Mutton) (Rosher Fielden). The titre in the above is usually below $\frac{1}{100}$. In addition, antibodies are formed in response to inoculation with T.A.B. vaccine. These antibodies may give reactions in a titre as high as $\frac{1}{500}$ many years after inoculation. In both these cases, however, the antibodies present do not diminish or increase in amount rapidly, hence in early typhoid infection a titre rising from day to day will be obtained, and in late typhoid a falling titre will be observed, while no fluctuation will be found in the case of " natural antibodies" or inoculation antibodies.

Consider a case of suspected typhoid whose Widal, done on the sixth day, gives a result indicating agglutination of B typhosus in a titre of $\frac{1}{125}$. The antibodies so demonstrated may result from infection or from "natural" or agglutination antibodies.

On repeating the Widal in two days' time, one would find that the titre had risen to $\frac{1}{250}$ or $\frac{1}{500}$ in case of true infection, while in a non-infected case no change in the titre would be observed. Occasionally, however, one meets a case showing a rising titre from day to day where no typhoid infection is present. Such a case usually gives a history of having received anti-typhoid inoculations at some time and is suffering from a febrile disease. Two cases of this nature have to my knowledge occurred in Belfast. Both were cases of miliary tuberculosis.

WHEN SHOULD A WIDAL BE DONE? WHAT TITRE IS DIAGNOSTIC OF TYPHOID?

From a consideration of the antibody production it is obvious that a Widal done early in the first week will not in itself be diagnostic. But, should natural or inoculation antibodies be present, it will reveal them and will convert a Widal of higher titre done in the second week into one of vital diagnostic importance. Generally it is unsafe to accept a titre of less than $\frac{1}{250}$ as diagnostic unless a previous Widal of much lower titre has been obtained, or in cases with a history of T.A.B. inoculation. A Widal of a lower titre than $\frac{1}{500}$ should be repeated in two to four days' time, and only accepted as positive if a rise in the titre can be demonstrated.

ABORTUS FEVER.

A similar technique, using suspensions of B abortus, can be used for the diagnosis of abortus fever. In this case higher titres than those occurring in typhoid are often encountered, and a titre of $\frac{1}{500}$ at least should be obtained before diagnosis is made of abortus fever. A proportion of non-infected people agglutinate B abortus in low titre, especially if their work has brought them into contact with cattle.

TYPHUS FEVER.

A serological method for the diagnosis of typhus fever using suspensions of B proteus has been elaborated by Professor W. J. Wilson and Weil and Felix. The technique is very similar to that carried out in the Widal reaction. A titre of $\frac{1}{100}$ is said to be diagnostic of typhus fever.

SYPHILIS.

A most important branch of serology deals with the diagnosis of syphilis, hence a brief description of the tests used at the Royal Victoria Hospital will be given.

A Wassermann test was the first serological test to be carried out for syphilis. The test depends on the power of syphilitic serum, in the presence of a suitable antigen to fix the complement, the fixation being then demonstrated by the introduction of a hæmolytic system made up of sheep's cells and anti-sheep serum. There are to-day many modifications of this technique. The one used in the Royal Victoria

Hospital is known as the Harrison (2) test. The antigen used is a mixture of cholesterol and human heart extract diluted with saline. The complement is obtained from the serum of guinea-pigs. It is first titrated with the hæmolytic system to find the least amount which will just completely harmolyse all the red blood cells in the system. This amount being determined, it is referred to as one minimal hæmolytic dose (1 M.H.D.) of complement.

The test is made roughly quantitative by using 5 M.H.D. and 3 M.H.D. of guinea-pig complement in setting up each test. A blood-fixing of 5 M.H.D. of complement is said to be + +, and is more strongly positive than one fixing only 3 M.H.D. of complement.

The following are the readings and their meanings :—

+ +	At least 5 M.H.D. of complement fixed.
+ ±	Less than 5 M.H.D., but more than 3 M.H.D., fixed.
+	3 M.H.D. only fixed.
±	Less than 3 M.H.D., but more than 2 M.H.D., fixed.
—	No demonstrable fixation of complement—negative.

A second complement fixation test is carried out as a routine in the Royal Victoria Hospital on all suspected sera. This test—the Fleming test (3)—depends on the presence in human blood of bodies hæmolytic for sheep cells. Guinea-pig complement of known strength is not used in this method. The reaction depends for complement on the human serum. The only variable element in the test is the antigen which is used in half and full strength. Similar notation to that described in the Harrison test is used in reading the results. Some bloods (about ten per cent.), however, contain no hæmolysin for sheep cells, and in consequence do not hæmolyse the control in the tests. These bloods are read as "No Result" (N.R.). In such cases the test is of no value, and sole reliance must be placed on the Harrison result.

A typical positive blood would be reported on as follows :—

Harrison	-	-	-	+ +
Fleming	-	-	-	+ +
W/R	-	-	-	Positive

A positive blood with no natural hæmolysin for sheep cells would be reported—

Harrison	-	-	-	+ +
Fleming	-	-	-	N.R.
W/R	-	-	-	Positive

About ten years after the introduction of complement fixation tests, precipitin and flocculation reactions were evolved. Menicke, followed rapidly by Sachs and others, introduced fairly reliable tests. Sachs and Georgi produced in 1918 their Sachs-Georgi test, which was modified in 1921 by Dreyer and Ward (4). This modification, depending on a special technique in making up the antigen, is called the Sigma test. It has proved so reliable when compared with the Harrison test, that it is carried out in the Royal Victoria Hospital on all treated or doubtful cases of syphilis.

The test is carried out by making ultimate dilutions of the patient's serum from

$\frac{1}{2.5}$ up to $\frac{1}{500}$, and incubating, in the presence of a special antigen, for twenty-two hours at 37°C. The series of tubes are then examined for flocculation, the dilution of the serum and the degree of flocculation observed determining a figure for each serum. As these figures range from 0 to 1,000, it can be seen that the test is not only qualitative, but extremely quantitative.

Value of the Results Obtained in Serological Tests for Syphilis.

(1) *In an untreated case.*—As a routine both a Harrison and a Fleming should be carried out on all suspected bloods. If both these give a positive reading, the diagnosis of syphilis is almost certain. To confirm the diagnosis, and to facilitate treatment, a Sigma should be done. If the Sigma is above 1.5, syphilis can be diagnosed. If the Sigma is below 1.5, a definite diagnosis should be withheld until the patient has been given a provocative dose of N.A.B. (.3 grms.), and his Sigma repeated in one week following the injection. The second Sigma will almost certainly be higher than 1.5 if the patient be a syphilitic. In cases giving any combination of Harrison and Fleming results other than both negative, a Sigma should be done. Then a figure above 1.5 is positive, a figure below 1.0 is negative, while an intermediate figure calls for doubt until the result of a provocative dose of N.A.B. has been estimated.

(2) *In treated cases.*—The Sigma is undoubtedly the most helpful test in a treated case. It gives a definite reading in cases with a doubtful or negative Harrison reading. In those cases which show a positive Harrison test after a long course of treatment, the reaction reveals improvement by giving a much lower reading than before the treatment was instituted.

In judging the vexed question: When is syphilis cured? one can say that the patient should be serologically negative for two years. The final test should be carried out after a provocative dose of N.A.B., and at the same time the cerebro-spinal fluid should be tested and found negative. During the two years of negativity the patient should have his blood examined every three months, as serological relapse almost invariably precedes clinical relapse.

The conclusions which may be drawn from serological tests for syphilis may be summarised as follows:—

(1) Diagnosis of syphilis should be made on the results of both a complement deviation and a flocculation or precipitation test.

(2) False positives are then very rare, but cases of neuro-syphilis may give negative reactions. The C.S.F. should then be examined.

(3) Clinically positive, but serologically doubtful or negative cases, should be given a provocative dose of N.A.B. and a further test carried out.

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THE BELFAST HOSPITAL FOR SICK CHILDREN

THE staff of the Belfast Hospital for Sick Children for many years have been working under the most difficult and trying conditions. The hospital was built over half a century ago, and had become pitifully antiquated; the out-patient department was so congested that satisfactory work had become a physical impossibility, while the old equipment and long-since-obsolete type of operating-theatres and wards had become anything but a credit to the city of Belfast. This, however, is now changed. A new and modern children's hospital has taken the place of the old premises in Queen Street. It is built on the Falls Road, close to the Royal Victoria Hospital, on a plot of ground generously granted free of charge by the Corporation of the City of Belfast, and so complete and up to date is its plan and equipment that it is already one of the recognised show-places in Belfast medical circles. From the moment one enters the well-arranged James Rea waiting-hall of the out-patient departments, and passes through the superbly-fitted operating-theatres to the wards, to the kitchens and to the residential quarters for the staff, one is more and more astonished at the modernity of outlook which conceived the whole. The furniture of the operating-theatres is of stainless steel, the operating-tables are Down Brothers' latest pedestal type with oil-pump movements; the blankets for these tables are electrically heated, and the cupboards fitted with nickel-plated bascule locks. There are four of these theatres, two for the out-patient department and two for the wards. A blank cheque was given the hospital by the Atkinson family to purchase the furniture and equipment of the out-patient theatres, and another blank cheque was given by Mr. Fredrick Davis and Miss Davis to purchase the furniture and equipment of the ward theatres. The out-patient department, as is customary in children's hospitals, is much larger than the intern department, as the greater number of little patients are treated by both surgeons and physicians as extern patients. In the old congested hospital in Queen Street, 13,251 patients were treated last year in the out-patient department, with 44,934 attendances, while the relatively small number of 799 patients were treated in the wards.

A feature of this new hospital is the inclusion of a series of private wards for paying patients. This is in conformity with the modern tendency to centralise medical services, and to enable people of moderate means to obtain for their little ones the most modern and highly-specialised methods of treatment. There are baby wards set aside from the main children's wards, and a number of small mothers' wards, in each of which a mother may be installed to be with and help nurse her little one, in those cases where it is undesirable to separate mother from child. There is, too, an infectious ward situated close to the out-patient hall, and isolated from the other wards, so that any patient in whom there is the least doubt of infection may be detained, and thus prevent the introduction of infectious disease to the hospital patients. Complete massage and ultra-violet-ray treatment-rooms are also installed, and there is a play-room, fitted with vita-glass, for convalescent patients. In the basement there is a completely-fitted laboratory for bacteriological and biochemical investigations, an electro-cardiograph, and a room in which it is hoped soon to instal an X-ray apparatus.

The Musgrave bequest of £10,000 formed the nucleus of the rebuilding fund, which was augmented by contributions from many friends of the hospital, and particularly by the donation of £10,000 from Mrs. Harold Barbour, who laid the foundation stone in June, 1929, and a donation of £5,000 by Mr. James Rea.

The Board of Management is to be congratulated on the outcome of their courage in undertaking to build and equip such a much-needed institution during the period of financial depression through which our country is passing. The fact that the rebuilding fund has reached the magnificent sum of over £90,000 is indeed a tribute to their foresight, and should encourage them in their efforts to obtain the £23,000 still necessary before the hospital can say it is out of debt.

Discussion : Tonsil Infection in Relation to General Diseases

A DISCUSSION on "Tonsil Infection in Relation to General Diseases" took place at the ninth meeting of the Ulster Medical Society, held on Thursday, 10th March, 1932. The opening speaker was Professor W. W. D. Thomson.

He began by saying that the idea that the tonsils are of little or no value in the animal economy is a mistaken one. Not only are the tonsils an integral part of the great lymphatic system of the body, but they also form part of the reticulo-endothelial system, the importance of which is now being slowly elucidated.

He then continued : Subepithelial lymph-glands form a ring around the crossing of the two great routes by which micro-organisms may enter the body—the air-way and the food-way. Above lies the naso-pharyngeal tonsil, below, the lingual, and laterally the faucial tonsils. Between these are found smaller groups of lymphoid tissue, the most important being those which surround the Eustachian tubes and spread into the fossæ of Rosenmüller.

When the naso-pharyngeal tonsil and neighbouring lymphoid tissue become hypertrophied, adenoids are produced. The situation of this ring of fortifications, just under the epithelium and at a junction of such strategic importance, points to the activity of the tonsils in defending the more vital parts of the body. This point of view is corroborated by their rich blood and nerve supply, by their special activity during childhood before the immunity acquired by advancing years is acquired, by their possession of germinal centres for the production of lymphocytes and by the hypertrophy of other parts of the ring when the faucial tonsils are removed.

Standing thus in the first-line trenches, the tonsils may be unequal to the strain put upon them, and may themselves become diseased. What are the signs that the tonsils have ceased to be a protection and have become instead a source of potential mischief?

1. The history of repeated attacks of tonsillitis is evidence of repeated failures to counter the attack of micro-organisms. This is the most important evidence in favour of their removal.

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1. The history of repeated attacks of tonsillitis is evidence of repeated failures to counter the attack of micro-organisms. This is the most important evidence in favour of their removal.

2. The calling in of the second line of defence, as shown by the chronic enlargement of lymphatic glands at the angle of the jaw, indicates a failure of the protective mechanism of the tonsil.

3. An unhealthy tonsil is irregular in colour and in contour. The crypts may show inflamed and gaping mouths. On the faucial pillar covering the septic tonsil a reddish-purple inflamed area is often seen. It is important to remember that a large tonsil is not necessarily a diseased one, and that often, especially in adults, the septic tonsil is small and fibrous.

Within ten days of an attack of acute tonsillitis symptoms of acute rheumatism, acute hæmorrhagic nephritis, or erythema nodosum may appear. Although in none of these conditions is an exclusive throat ætiology warranted by clinical evidence, yet in many cases there can be little doubt that the tonsils are the portal of entry for the virus concerned. And as the percentage of unhealthy throats among rheumatic children is higher than in non-rheumatic children, removal of the tonsils would appear theoretically to be the best method of preventing acute rheumatism with its dread legacy of cardiac disablement.

Although there is some evidence to show that acute rheumatism occurs less frequently in tonsillectomised children than in those who retain their tonsils, yet cases of the disease arising subsequent to tonsillectomy are by no means rare. It is a peculiar fact that those children who develop acute rheumatism after removal of their tonsils are prone to develop chorea rather than endocarditis.

Tonsillectomy performed early in acute rheumatism may lessen the liability to recurrences, and if carditis has occurred the condition may be rendered less severe. On the other hand, physicians in charge of convalescent hospitals for cardiac children have pointed out that relapses are not prevented by the tonsil-adenoid operation.

That tonsillectomy carried out after definite organic lesions in the heart have occurred is without value, seems quite definite. The danger of the operation in these cases is that a fresh polyarthritis may be lighted up and a spread of the cardiac damage precipitated. The operation must be regarded as a major one, must be carried out under ideal conditions, and careful treatment, before and after operation, should be insisted on.

Acute tonsillitis may also be followed by acute nephritis, especially of the hæmorrhagic variety, or it may produce exacerbations in the chronic forms of nephritis. In acute hæmorrhagic nephritis or acute focal nephritis only a fraction of the total number of glomeruli are attacked. Frank hæmaturia at the onset is a marked feature, and the blood usually clears up in ten days with complete recovery in the vast majority of cases. If the hæmaturia continues, however, removal of the infected tonsils hastens recovery. In all cases of nephritis with a history of frequent sore throats or definitely infected tonsils, removal is indicated.

The close relationship between tonsillar sepsis and disease of the ductless glands, such as diabetes and exophthalmic goitre, can be demonstrated with almost mathematical precision. The diabetic suffering from an attack of tonsillitis requires an increase in his insulin to prevent sugar appearing in the urine. After removal

of a chronic septic tonsil, the insulin requirement may drop to a half or quarter of the previous amount, and in some cases may even be omitted.

There is a peculiar relationship between the lymphoid tissue of the body and the thyroid gland. In Graves' disease the lymphatic glands in the neighbourhood of the thyroid and also in the mediastinum and abdomen are often enlarged and more vascular than normal. There may be hyperplasia of tonsillar tissue. The removal of tonsils in this disease should, however, be approached with the greatest caution.

A girl in the Royal Victoria Hospital under treatment for Graves' disease developed an acute tonsillitis with marked aggravation of all her symptoms. Two weeks later the left tonsil, which remained septic, was enucleated. An immediate hæmorrhage resulted which was uncontrollable and fatal. A second case occurred shortly afterwards, while a third was only saved from imminent death by blood transfusion.

The incidence of measles, mumps, chicken-pox, and whooping-cough seems to be considerably increased by tonsillectomy. The attack rate for scarlatina is little affected, but most physicians consider that the severity of the symptoms is less in the tonsillectomised. But it is in regard to diphtheria that the most important observations have been made. Schick and Topper reported that tonsillectomy converted eighty-two children out of a total hundred from Schick positive reactors to Schick negative after six months. These results have been corroborated by Dudley in this country, but several other investigators have failed to find any increased immunity to diphtheria after tonsillectomy. Dudley points out that the positive result is due to the fact that in these cases the children had been exposed to infection; that the removal of the tonsil removed one of the natural immunity mechanisms used to destroy the toxigenicity of the diphtheria bacillus. The immunising action of the toxin was thus given free scope and its antigenic action intensified. In the case of the investigators who found the Schick reaction still positive after tonsillectomy, the children had not been exposed to infection, and hence, carrying no diphtheria bacilli in their pharynx, no specific antigen was available for immunising purposes.

There is weighty evidence that the tonsillar tissue has a special protective action in regard to the respiratory tract. If this be true, rash removal of the tonsils in respiratory diseases is to be deprecated. In asthmatic subjects the tonsils should be removed if definitely diseased. The beneficial results are not startling, but all other treatment will be useless until the septic tonsils are removed. In other diseases of the chest, bronchitis, bronchiectasis, recurrent pneumonias, etc., the tonsils should only be removed if there is a definite association of tonsillitis with the disease in question.

Figures given by the medical officers of two of the principal boarding-schools in Great Britain for boys and girls, show that from forty to seventy per cent. of the boys and girls entering school have had the tonsil-adenoid operation. Can any reasonable person believe that operation was really necessary in such a large proportion of children?

Welch, a pathologist, examined a thousand tonsils removed in Kansas City, and of these only seven per cent. gave histological evidence of actual inflammation.

Paton, the medical officer of the girls' school referred to, compared the forty-two per cent. of operation cases with the fifty-eight per cent. of non-operation cases. His results were not only no better than the rest, but were actually worse in practically every particular—teeth, postural defects of spine, vision, otorrhœa, rheumatic manifestations. The only advantage possessed by the operation group was a lessened incidence of enlarged cervical glands.

In America a vast amount of work has been done on this subject by Kaiser of Rochester. His first paper was based on an analysis of the complaints of 1,200 children three years after tonsillectomy, compared with 1,200 children with similar complaints, but in whom operation was refused, but who were also examined three years later. He claimed that the following conditions were indications for tonsillectomy and adenoidectomy—mouth breathing, frequent attacks of sore throat and tonsillitis, frequent head colds, persistent enlargement of cervical glands when no other cause is found, malnutrition, chronic and recurring discharging ears, unexplained fevers in the absence of other cause, the presence of rheumatic manifestations.

Kaiser published a paper four years later in which he compared two groups of a thousand children. This time the operation had been performed ten years previously, instead of three. His conclusions may be summarised as follows :—

1. The real value of the removal of tonsils and adenoids cannot be definitely established in a few years; apparent benefits during the first few post-operative years are not so evident over a ten-year period.

2. Outstanding benefits are apparent in influencing the incidence of sore throats and cervical adenitis over a ten-year period.

3. Some benefit in rendering children less susceptible to scarlet fever and diphtheria.

4. Acute head colds and otitis media are not benefited over a ten-year period.

5. The respiratory infections such as laryngitis, bronchitis, and pneumonia not only are not benefited, but actually occur more frequently.

6. First attacks of rheumatic manifestations occur from thirty to fifty per cent. less often in tonsillectomised children. The greatest reduction occurs in children tonsillectomised early. Recurrent attacks are not benefited at all.

7. Incomplete tonsillectomies do not offer the same advantages.

8. The hazards of tonsillectomy must be considering evaluating the end results.

With these latter results of Kaiser, said Professor Thomson, I find myself in close agreement.

Sir Thomas Houston then spoke. He said that in his opinion Professor Thomson had made out too strong a case against tonsillectomy. He quoted Sir Arbuthnot Lane's work in the relation between septic tonsils and chronic intestinal conditions, and pointed out that septic tonsils and adenoids constituted sites for auto-intoxication. He thought that the great difficulty in treating the condition was in deciding the best time for the operation of their removal. There was a considerable difference

of opinion as to the best time, and said that in his opinion patients should be given a rest and a holiday in order to bring them to the best physical condition before tonsillectomy. He then described some cases in support of this view. One patient, a young girl, had suffered from arthritis, and after a preliminary course of vaccine treatment had had her tonsils removed, with great benefit to her general health and relief from the arthritis. This case, Sir Thomas said, proved the value of tonsillectomy when performed under suitable conditions. Another case was a lady who had suffered from arthritis for five years. She had been given vaccine treatment, which so improved her condition that she went on a holiday to Scotland. But on her return her arthritis was worse than ever. Her tonsils were removed; this was followed by a severe reaction, but since then her condition had undergone a great improvement. Sir Thomas quoted other similar cases, and from them concluded that the removal of tonsils was sometimes beneficial to patients suffering from arthritis. He then discussed the relation between septic tonsils and nephritis, and described cases which had greatly benefited by tonsillectomy. In all the cases quoted, Sir Thomas laid stress on the importance of getting the patient into good physical condition before the operation if the best results were to be obtained. Another point discussed by Sir Thomas was the bacteriology of septic tonsils. He pointed out that practically every kind of micro-organism had been found, and said that in his opinion we should not be in a position to differentiate between the type of tonsils which should be removed, and the type which should be medically treated, until our knowledge of the infecting organs became more precise.

Dr. Anderson was the next speaker. He began by dividing his patients into three age periods : Those less than ten years of age, those between ten and twenty years, and those over twenty years. During the first period the signs and symptoms are well known, but there are a few which deserve special mention : lethargy, loss of appetite, mouthing of food, enuresis, night terrors, cough, and diseases of the ear, larynx, and lungs. It is worthy of note, he said, that chronically-enlarged tonsils or marked adenoids have lost their powers, as shown by the greater frequency with which 'adenoid' children contract diphtheria and scarlet fever. The benefit of operation in this type of case, Dr. Anderson stated, cannot be gainsaid, the child improves in every way, and parents are often surprised at the marked increase in appetite, and the increased well-being of the child. The tonsils may only be enlarged during a catarrhal attack, and the examination in quiet intervals is apt to give the impression that there is no necessity for operation, but constantly recurring colds are alone sufficient reason for this operation. Another group within the ten-year period he referred to as "adenoid asthenopia." In this condition the child finds difficulty with near work, and thus is associated with headache, whilst there is no refractive error or imbalance of muscle. Operation in these cases is often beneficial.

Between the ages of ten and twenty years the chief complaint is one of tonsillitis and sore throat. Towards the twentieth year quinsies being to make their appearance. Dr. Anderson stated that in his opinion repeated attacks of sore throat (tonsillitis) are a certain indication for the removal of the tonsils, and in the majority of these cases the operation is a certain cure. There can be no doubt, he continued, that in

the past the tonsils were not removed completely, with the result that the "stump" became infected and the condition was repeated, but the methods now employed render this much less likely to occur. No person who has suffered from quinsy need have a second attack, as removal of the tonsil, he said, by dissection, is a certain cure. The third age period opens the controversial end of the subject. The controversy ranges round the question : Can the causative agent of distant infections, i.e., rheumatism and its allied conditions, such as nephritis, enter the system through the tonsil? Dr. Anderson here gave an account of his method of examining the tonsil in these cases. "I use two tongue depressors; one is made to depress the tongue, and its tip is made to press firmly against the inferior pole of the tonsil and raise it slightly. The other is pressed firmly against the anterior pillar. Now if the patient 'gags' the tonsil will be almost dislodged from its bed. The crypts will be made to gape open, and one who does this for the first time will be surprised how dirty an apparently healthy tonsil will be made to appear. Examination by this method shows that there is first a cheesy-like and evil-smelling mass squeezed out of the crypts and from behind the anterior pillar, and especially so if adhesions (as the result of repeated attacks of inflammation) have formed between the tonsil and the anterior pillar. This cheesy mass consists of epithelial debris mixed with cholestrin, lymphocytes, and leucocytes. Secondly, there is a milky secretion that seems to pour from all over the surface of the tonsil, and my present belief is that this is the more prone of the two to cause rheumatism. In addition, a valuable aid to the diagnosis is a deep red colour of the anterior pillar and thickening and infection of the lateral band. It may be pointed out that there are many cases of cheesy-like secretion in the crypts without these developing rheumatism, neuritis, etc. Apart from distant infections, it was claimed that swallowing of this mess must be detrimental to health, and many gastric and duodenal conditions must be caused thereby, as well as anæmia and other conditions.

Dr. Anderson stated that in his experience cases of nephritis should receive the benefit of any doubt that might exist, and the septic tonsils should be removed. Cases of rheumatoid arthritis, on whom he had operated, showed beneficial results.

Dr. W. S. Gibson then spoke on the operative procedures. He stated that it is now generally agreed that complete enucleation of the tonsil in its capsule is the only satisfactory procedure. This enucleation may be done with the guillotine or by the dissection method, and in deciding which of these two methods to employ, two points should be considered : First—In the majority of cases where tonsillectomy is required in a child, the indications are local, viz., hypertrophy or local or adjacent infection, whereas in the adult in many cases distant infection is the reason. Second—In the child there is practically no lingual prolongation of the tonsil, whereas in the adult there is nearly always a well-marked lingual portion. Because of these facts, the enucleation by the guillotine is a sufficiently comprehensive operation in a child. In the adult, on the other hand, it is most important to remove very completely all the infected tonsil, including its lingual portion. To accomplish this adequately in every case necessitates the dissection operation.

Also in those cases where there have been repeated severe attacks of tonsillitis

or the occurrence of quinsy, the subsequent fibrous changes in the peritonsillar space render the removal of the tonsil more difficult, and here again the dissection operation is necessary. The guillotine method is a modification of the Shider method. The anæsthetic is either closed ethyl chloride or chloroform and ether on open mask. The head is *not* allowed to hang over the end of the table, as this renders the anterior pillar too taut and makes complete enucleation more difficult. The guillotine is blunt, and is used more as a volsellum to hold the tonsil. It is inserted into the mouth like a tongue depressor, and is then passed below and behind the tonsil, lifting it up. The tonsil is now pushed through the fenestrum with the thumb or index finger of opposite hand, the guillotine blade is closed, and separation is effected by twisting guillotine or by a sweep of index finger between guillotine and tonsil bed.

The dissection method varies widely with different surgeons, and the following description is the technique which is in use at the Benn Hospital:—The patient is anæsthetised, and a flexible intra-tracheal catheter is inserted into the trachea by direct vision through a Magill's laryngeal spatula. The catheter has an opening at the side of the outer end, and the patient breathes through the catheter. A Riverden-Moseley combined anæsthetic and suction apparatus is used—this drives the ether vapour into the catheter, and at the same time blood, etc., is sucked up from the mouth into a second bottle. A sandbag is then placed under the patient's shoulders, thus extending the head backwards.

A Boyle-Davis gag is inserted. This gag has a tongue spatula which keeps the tongue out of the way, and by opening the gag to the desired extent an excellent exposure of the mouth and tonsillar region is obtained. A headlight is worn by the operator. The tonsil is seized with a volsellum, and it is drawn toward the middle line. This exposes and puts on the stretch the plica semilunaris—that fold of mucous membrane which extends from the anterior pillar to the surface of the tonsil. An incision is made through the plica parallel to the edge of the anterior pillar. A retractor is inserted through the incision, and the capsule of the tonsil is exposed. By means of the blunt dissector and the insertion of gauze packing between the pillar and the capsule, the tonsil is gradually freed. The upper pole is first freed, and then the dissection by gauze is continued down to the base of the tongue, and the whole tonsil and its lingual portion are removed.

Dr. Sydney Allison also spoke. He stressed the close relation between acute tonsillitis and acute hæmorrhagic nephritis. In those cases which did not subside rapidly, he was in favour of early removal of the tonsils. He believed that this course was free of serious risk, and that it made a great difference to the subsequent history of the patient. In the other type of case, the chronic subject of rheumatoid arthritis, fibrositis, high blood-pressure, etc., he thought that removal of septic tonsils, though indicated, gave but doubtful results. For some years he had worked at an English clinic where many of these cases were admitted for treatment. On looking back at the cases of arthritis, he found that a big percentage, indeed the majority, had had their tonsils removed some time before admission, without apparent benefit; they were still patients.

Dr. Marshall, having congratulated the openers of the discussion, stated that in the brief time at his disposal he had been unable to consult his records fully, but had taken at random 132 cases of children attending the Ulster Hospital whom he had "sent to the guillotine." Of these thirty-four per cent. had rheumatism (twenty-two per cent. *with* heart disease, twelve per cent. *without* heart disease); fifteen per cent. had chorea (eleven per cent. *with* heart disease, four per cent. *without* heart disease). Fifteen per cent. showed evidence of tracheo-bronchial adenitis, nine per cent. recurrent tonsillitis, five per cent. chronic peritonitis, while the remainder had been tonsillectomised for varying condition such as deafness, otitis, severe stomatitis, and hæmorrhagic nephritis.

While he did not agree with the statement of Wilkinson of Birmingham that the onward march of rheumatism could be checked by tonsillectomy, he had never regretted having tonsils removed; he was satisfied that the tendency to chorea was indeed increased. He considered that the opportune time for tonsillectomy in hæmorrhagic nephritis was when the blood was already commencing to disappear from the urine, the blood urea content having returned to normal; but suggested that five minutes could be well spent in testing a patient's bleeding-time and coagulation-time where a tendency to too easy bleeding was suspected.

Mr. MacLaughlin said that in his experience many children with tonsils and adenoids large enough to cause obstruction to breathing, and the concomitant nasal and aural complications, needed operation. This was to prevent the laying of the foundations of subsequent disease, as even if the lymphatic enlargements should resolve without operation, the damage would already be done.

He also mentioned a group of cases, usually in adults, with vague myositic pains, usually in the shoulders, which were greatly benefited by the removal of infected tonsils. He advocated that the patient should be in as good general condition as possible, and that the tonsils should be rendered as quiescent as one could by treatment; under these conditions the patient stood the operation better and was less liable to complications. He summarised his views on the indications for removal as follows:—

(1) Local reasons—(*a*) Obstruction to breathing and swallowing, (*b*) Quinsy, (*c*) Frequent tonsillitis.

(2) Regional reasons—(*a*) Cervical adenitis (other causes being excluded, if possible), (*b*) For chronic ear conditions, (*c*) For some laryngeal conditions.

(3) Bacteriological reasons.

(4) As seats of focal sepsis, producing remote effects, in the opinion of the physician.

He supported the view that enucleation by guillotine or dissection, which removed the entire tonsil, was the only method of any use when operating.

Mr. J. R. Wheeler said that one of the commonest sources of infection was the ordinary head cold with or without tonsillitis.

A child enters the world with a limited amount of inherited resistance, and has to acquire immunity from prevailing infections. The common infection in the nose and throat being streptococci, this area was given a large amount of lymphatic

tissue to deal with it. From about the age of ten years this excessive lymphatic tissue begins to atrophy rapidly, the child having obtained an additional amount of immunity by this time. A few "colds" can be regarded as a normal event in a child's life, but excessive colds or feverish colds point to an overdose of the toxin, and suggest that the tonsil has lost its useful function and is now harbouring infection. This latter type of case is usually benefited greatly by tonsillectomy. Adenoids are the result, and not the cause, of infection. They should be removed for nasal obstruction, or for ear complications (deafness, otitis mediæ, etc.).

Teaching children how to blow the nose, and also breathing exercises, might do a great deal to stop the formation of excessive adenoid tissue in the post-nasal space.

The president, Mr. S. T. Irwin, at the end of the discussion, summarised the points raised as follows :—

I. That if the tonsils are to be removed, it is agreed that complete enucleation is essential.

II. That the great difficulty is to decide what is meant by a "septic tonsil," as well as the exact conditions which are likely to benefit by the operation of tonsillectomy. Physicians and surgeons often disagree on these points, and tonsils frequently are removed when they have nothing whatever to do with the patient's illness.

III. That a research should be undertaken at once to trace a series of cases in whom tonsillectomy had been performed for other than local reasons, to learn the after-history, and to compare it with that of cases not submitted to operation. This should afford reliable data which would be of value in deciding which type of tonsil should be removed and which type left undisturbed. There is material available at the Royal Victoria and the Children's Hospital upon which such a research could be carried out. It awaits solution by an energetic young physician.

APPOINTMENTS

Mr. Maurice B. Lavery, M.Sc., M.B., F.R.C.S., and Mr. J. J. Moriarty, M.B., B.Ch., have been appointed honorary assistant surgeons on the staff of the Mater Infirmorum Hospital, Belfast.

Dr. W. R. Abernethy has been appointed Medical Superintendent Officer of Health for the City of Derry.

ULSTER MEDICAL SOCIETY LIBRARY

THE following books have recently been added to the Library :—

Bellingham-Smith and Feiling : *Modern Medical Treatment.*
Bishop : *Arterial Sclerosis.*
Clarke : *The Fundus of the Human Eye.*
Conybeare : *Textbook of Medicine.*
Fahney : *Ante-Natal Care.*
Fine : *Filterable Virus Diseases in Man.*
Jewesbury : *Mothercraft.*
Wheeler and Jack : *Handbook of Medicine.*

Hints on the Clinical Diagnosis of Diseases of the Chest

By Foster Coates, M.D.,
from the Royal Victoria Hospital, Belfast

The method of examination is the first thing to consider, and it is most important to obtain at the outset a careful history of the patient's symptoms. In practically all pathogenic conditions the earliest manifestations are subjective, and for a considerable time symptoms may be complained of, before objective signs can be detected. In many cases it is only by carefully analysing the symptoms that an early diagnosis can be made. This applies especially to pulmonary tuberculosis, but in connection with this disease it should be noted that the history is frequently misleading, and the patient, though obviously ill, may deny or make light of his symptoms, and seem to be unwilling to assist in the forming of a diagnosis.

This is not due to euphoria, which is often present in the later stages, but apparently the patient has a dread that he may be suffering from phthisis, but is unwilling to admit the possibility, and will not acknowledge the presence of his symptoms.

Physical Examination.—To examine the chest properly the patient should be seated on a chair opposite the doctor and facing the light. He should also be stripped to the waist. It is then possible to detect asymmetry of the chest, and much easier to percuss the chest properly and to compare differences of resonance between the two sides.

The importance of carefully examining the back of the chest should be strongly emphasised, as here there is a much greater extent of lung available for examination than in front, and therefore more information to be obtained. The shoulders should be allowed to droop forward, relaxing the muscles and carrying the scapulæ to the sides. The inter-scapular regions should be carefully examined, as well as the apices and bases.

Inspection.—Any asymmetry should be noted, also the extent of the respiratory movements and the position of the apex beat. If the position of the latter is neither visible nor palpable, it should be defined by percussion and auscultation. The possibility of dextro-cardia should not be forgotten.

Palpation.—Vocal fremitus is important and should always be investigated. It may be absent in women, some of whom have soft non-vibrant voices. Rhonchal and friction fremitus can frequently be felt.

Percussion.—The resonance at the apices should be carefully compared, especially Krönig's area. The extent of resonance here varies, but if there is definite difference between the two sides it is significant. It is always advisable to determine and mark the extent of respiratory excursion at the bases.

Percussion over the upper part of the sternum should invariably be carried out. In the normal chest the sternum acts as a sounding board, and percussion over it gives a characteristic note. In cases of aneurysm and mediastinal tumours, of

whatever nature, impaired resonance or dullness over the sternum or to one side of it is usually detected, and may afford the clue to the correct diagnosis.

AUSCULTATION.—Some patients do not know how to breathe properly, and have to be shown how to fill and empty the chest. They either breathe noisily, simulating bronchial breathing, or they breathe so quietly that no respiratory sounds can be heard. Another point to bear in mind is that if there is much hair on the chest, it is necessary to smear the skin with vaseline, in order to eliminate all extraneous adventitious sounds due to this cause.

In many instances a diseased area of lung does not open up with ordinary breathing, as the bronchioles leading to the part are partially occluded, and thus no adventitious sounds are produced. Hence when the breath sounds are not clearly heard the patient should be instructed to cough; this clears the obstruction, and adventitious sounds are heard which were previously absent (post-tussive crepitations).

A further point to note is that "cog-wheel" breathing may be produced by slower expansion of diseased areas, but more commonly it is due to jerky painful inspirations or to spasmodic nervous breathing.

PLEURISY.—This term is much too loosely used, and should only be applied to cases with definite pleuritis as evidenced by friction or the presence of effusion. Pleurodynia is a much more suitable term to use for pain in the chest of doubtful ætiology. Apart from pleurisy and trauma, the most common conditions causing pain in the chest are inter-costal neuralgia and aponeurotic rheumatism.

Inter-costal neuralgia is common in young women, and the pain is frequently referred to the infra-mammary region on left side. It is generally associated with anæmia, and perhaps with leucorrhœa or some menstrual disturbance. There is often superficial tenderness. The treatment is tonic and hygienic.

Aponeurotic rheumatism is more common in middle-aged and elderly men, especially those subject to gout and allied rheumatic affections. The pain is best elicited by bringing the affected muscles into action. Deep tenderness on pressure may be present. *Treatment*—salicylates, iodides, heat, strapping, etc. This condition not infrequently affects the abdominal muscles.

Other causes of pleurodynia to be thought of are:—Herpes zoster (before the rash comes out—may be days or weeks), root pains due to pressure (new growth, spondylitis, aneurysm), or tabes. Also, of course, muscular strain or injury.

With the exception of pleurisy, these other causes of pleurodynia are usually afebrile, but occasionally one sees chronic dry pleurisy of considerable extent without temperature and sometimes without pain.

Diaphragmatic pleurisy must also be mentioned. This condition often gives rise to difficulty in diagnosis, and may simulate an acute abdomen. Severe pain is the chief complaint. It is situated in the lower part of the chest, usually along the tenth rib and extending to the sternum. It may radiate to the back and shoulder. The temperature is raised, and the patient looks ill and anxious. The respirations are hurried, but the diaphragm on the affected side is kept almost immobile. The pain is increased by coughing or by deep breathing. There may be superficial

tenderness below the costal margin, and rigidity of the upper abdominal muscles. Examination of the lung usually reveals some impairment of resonance and weaker breathing at the affected base. Occasionally a little friction may be detected at the base in front.

Pleurisy with effusion, serous or purulent, should offer no difficulty in diagnosis, as the leaden dullness and feeling of resistance found on percussion over the back of the chest is quite characteristic, and occurs in no other condition, except rarely with a large tumour. The displacement of the apex beat, the absence of vocal fremitus and of breath sounds, confirm the diagnosis.

It should be noted that bronchial or tubular breathing is at times heard over fluid, more commonly in children. In such cases the character of the dullness gives the clue to the condition, or exploratory puncture will settle the question.

Lobar Pneumonia.—The diagnosis of this disease is sometimes easy, but it may not be, as frequently the physical signs are not typical. In these latter cases the sudden onset, anxious expression, rapid respirations, fever, pain, and stained sputum, are the best guides.

Some cases, however, do not show the typical physical signs, and in these there is frequently effusion, serous or purulent, a centrally situated consolidation, a wandering or migratory pneumonia, an apical pneumonia, or a massive pneumonia.

A tuberculous pneumonia must also be considered. The onset and the course for the first week or ten days resemble ordinary lobar pneumonia, then the temperature instead of falling remains high and becomes remittent. After the tenth day softening and breaking down takes place, and tubercle bacilli are found in the sputum.

In lobar pneumonia, if the temperature does not settle down after the crisis, but rises again each evening, it generally means that a purulent effusion is present. If this be confirmed by physical examination, exploratory puncture should at once be performed to confirm the presence of empyema. If thin purulent effusion is found, aspiration may be tried, and some of the fluid removed, but operation should be delayed till the pus becomes thick, as by this time it is usually localised and shut off from the rest of the pleural cavity by adhesions, so that resection of a rib and drainage may safely be carried out.

Septic pneumonia occurs in debilitated conditions, and may follow influenza, measles, or whooping-cough; it may also follow surgical operations where there is a septic focus. It is characterised by marked toxæmia and cyanosis. The physically signs are those of capillary bronchitis, and there is no definite area of consolidation in the lung. This is a serious condition, and even if the patient makes a partial recovery, he is usually left with a pulmonary abscess.

Pulmonary Tuberculosis.—Here the early diagnosis is of extreme importance if the disease is to be cured or arrested. It has been said that the first and most important point in the diagnosis of pulmonary tubercle is to know when to expect it.

The most important symptoms are loss of strength and flesh, evening rise of temperature, cough, spit, sweating, and often dyspepsia. If phthisis is suspected, the patient should be examined at intervals till the diagnosis is definitely decided

one way or the other. The weight should be carefully kept, and the afternoon and evening temperatures noted. It is inadvisable to send the patient away to the country or seaside before the diagnosis is made, as he may return with the disease more advanced.

As regards the physical examination in early and doubtful cases, the most important point is impairment of resonance, with alteration of breath sounds and the presence of some, perhaps slight, adventitious sounds in a localised area after repeated examination. In early cases and in some fibrotic types the sputum may not be purulent and may show no tubercle bacilli.

There is one type of tubercle, hilum tuberculosis, which is fairly common, and which affords considerable difficulty in its diagnosis. In this condition the symptoms are even more indefinite. The only complaints may be dyspepsia and loss of energy. The temperature and pulse are frequently normal. The disease is very slowly progressive, and the earliest physical signs are found in the inter-scapular region :— Weak bronchial breathing, impairment of resonance, and a few fine, dry crepitations after coughing. The X-ray usually shows definite mottling.

Pulmonary abscess and bronchiectasis can be diagnosed by the history of previous illness and the presence of the very copious and often offensive sputum. Also by the effect of posture in promoting the flow of a large amount of purulent sputum from the lung. If the sputum is purulent and is over eight to ten ounces in the twenty-four hours, it suggests abscess or bronchiectasis.

PNEUMOTHORAX.—This condition is generally easy to diagnose, but occasionally it may present difficulty. If there is considerable intra-thoracic pressure, the percussion note, instead of being hyper-resonant, is a dull tympany. The position of the apex beat and absence of breath sounds suggest the diagnosis. Succussion splashing is absolutely pathognomic. The coin sound, metallic tinkling, and the hollow echo on coughing are always present in typical cases.

REVIEW

MOTHERCRAFT. By R. C. Jewesbury. 1932. London : J. & A. Churchill. pp. 170+vii; 21 illustrations, 13 in colour. 10s. 6d. net.

ON taking up this volume one is much impressed with its scope. It opens with a chapter on the relation of mothercraft to other aspects of maternity work, by Dr. Fairbairn, followed by one on the physiology of lactation by Professor J. Mellanby. These are excellent in their comprehensiveness and conciseness. Part III of the volume is devoted to the feeding and management of infants and deals with the normal as well as with the many difficulties encountered in breast-feeding. The importance of breast-feeding is suitably stressed in accordance with the views of all who have an extensive practice and experience of infant work such as Dr. Jewesbury's. It is a pity that the section dealing with artificial feeding is confined so much to an exposition of the teaching of Truby King. The success of a system of infant feeding is judged in large measure by the number of failures rather than by the successes, as well as by the simplicity of the method advised. In the experience of many, there are just as few failures with less complicated formulæ. To those, however, who wish to use the Truby King system, Dr. Jewesbury's book will be found exceedingly useful, as he writes with a wide knowledge and a great deal of practical experience. The concluding pages are devoted to some special conditions occurring in infancy and their management. The printing is excellent, and the volume is of a convenient size.

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Sub-Arachnoid Hæmorrhage

By S. B. Boyd Campbell, M.D., F.R.C.P.,
from the Royal Victoria Hospital, Belfast

The question of sub-arachnoid hæmorrhage is one which the majority of medical textbooks practically ignore, though recently several articles have been published in the medical journals.

It is not as rare a condition as is generally believed, as sporadic cases are continually occurring, and occasionally one finds what might almost be called a mild epidemic. At one time, in the summer of 1931, I had no less than three cases in the wards simultaneously, and several others some weeks later.

The arachnoid membrane consists of two layers—a parietal, lining the internal surface of the dura mater, and a visceral, which is closely applied to the pia mater. The space between the arachnoid and the pia mater is the sub-arachnoid space. This is normally occupied by cerebro-spinal fluid, and is in connection with the cerebral ventricles, the fourth ventricle, and the spinal cord.

The commoner sources of hæmorrhage into this space are :—

1. Traumatic, originating in the sub-dural space.
2. Hæmorrhage into the superficial parts of the nervous system may rupture the pia mater.
3. Deeply situated cerebral hæmorrhage rupturing into the ventricles.
4. Hæmorrhage derived from one of the vessels lying in the sub-arachnoid space.

Apart from trauma and the rupture of a cerebral artery, we have as causes of such a hæmorrhage—

1. Encephalitis.
2. Neoplasms.
3. Small congenital cerebral aneurysms.

During the epidemics of encephalitis several cases of this type were found.

Symptoms and signs of sub-arachnoid hæmorrhage.—These depend to a large extent on the size and rapidity of the hæmorrhage. As a general rule the larger the hæmorrhage the quicker the coma, and the less marked the typical signs of the condition.

One generally finds an initial mechanical effect due to pressure. If the hæmorrhage is on the motor cortex one gets Jacksonian epilepsy, and later hemiparesis, while if it is at the base of the brain signs of local pressure are often absent. The localising mechanical effect is often transient owing to the rapid diffusion of the blood. Later we find symptoms of a general increase in intra-cranial pressure, i.e., headache, vomiting, mental confusion, and possibly coma. Even if a small artery ruptures there is generally a brief initial loss of consciousness.

The more typical symptoms and signs are those due to the irritative effects of the extravasated blood. These are very similar to those of a basal meningitis. Thus we find occipital headache, pain, stiffness of neck, pains down the back and into

the limbs, Kernig's sign, and generally a mild febrile reaction due to extravasated blood being broken up and absorbed.

Ophthalmoscopic examination may show retinal hæmorrhages, or, if the intracranial pressure is marked, may show papillœdema.

Urinary changes are sometimes found, the presence of albumen or sugar being noted in some instances. A massive albuminuria has been described in the early stages of some cases. This disappears rapidly following lumbar puncture.

The definite diagnosis of the condition is based on the changes in the cerebro-spinal fluid. The presence of blood in varying amounts according to the size of the hæmorrhage is characteristic. This blood differs from that due to trauma during lumbar puncture, by being equally present in all samples withdrawn. Even though the hæmorrhage is recent, one finds on centrifuging the fluid that the supernatant layer has a yellowish tint. If the fluid is allowed to stand, the absence of coagulum is also noted. In old-standing cases most of the blood cells may have been broken down, and the fluid drawn off is found to be of a yellow colour.

In the majority of cases the fluid is under pressure. The examination of the cerebro-spinal fluid differentiates sub-arachnoid hæmorrhage from meningitis or from coma associated with glycosuria or albuminuria.

Treatment.—This consists in frequent lumbar puncture. At first only a small amount of fluid should be withdrawn for diagnosis, unless the danger of compression is marked. Lumbar puncture should be repeated either daily or after an interval of a few days, depending on the degree of meningeal irritation.

Of the following nine cases, eight were seen during 1931, and one (No. 6) was seen two years previously, and is mentioned on account of certain points of special interest. Other cases seen during previous years closely corresponded to those quoted.

Case No. 1.—W. McC., male, aged 51. Motor-driver. Family history nil, previous illnesses nil. Had been drinking gin heavily on Saturday night, 2/4/31, and on the Sunday morning complained of pains in the upper abdomen and later in the back, with shooting pains down the backs of both legs. Vomiting and general weakness. History of occipital headache for one month. Insomnia. On examination was found to have marked rigidity of neck and a definite Kernig. On lumbar puncture the fluid was under pressure and contained a large amount of blood. Was much better next few days, but as there was a recurrence of symptoms he was admitted to hospital 9/4/31. Pupils unequal—right slightly larger than left; react normally. Arm and leg reflexes absent, plantar reflex normal, abdominal sluggish. Sensation normal. Blood pressure 155/110.

Lumbar puncture on the 9th, 10th, and 12th. Cerebro-spinal fluid contained blood. On 22/4/31 blood had disappeared from cerebro-spinal fluid.

Headache and neck rigidity had disappeared on discharge on 25/4/31.

Urine contained sugar. Blood sugar .08. X-ray of cervical spine normal.

Case No. 2.—G. M., male, aged 54. Labourer, married. Admitted to hospital 23/5/31. Family history nil. Previous illnesses—kidney trouble, 1926. Present

affection—five weeks prior to admission sudden pain occipital region; vomited. Vomiting continued three or four times per day till shortly before admission. Vision worse since onset. Bowels constipated. Teeth pyorrhœa. Alcohol moderate. Tobacco—twenty cigarettes per day. Retraction of head, Kernig, tache cerebral, ptosis of both eyelids. Lateral nystagmus, papillœdema left disc. Reflexes arm and leg + +. Abdominal absent. Plantar reflexes flexor.

Temperature 102, pulse 60, on admission.

Lumbar puncture, 23rd, 25th, and 28th contained blood + +. Lumbar puncture, 29th, blood almost absent. Wassermann negative. Blood pressure 140/80.

Temperature gradually returned to normal after last lumbar puncture. Patient was allowed up on 17/6/31, and was discharged on 25/6/31, feeling quite fit.

Case No. 3.—W. W., male, aged 49. Labourer. Previous illnesses—headaches and high blood-pressure for some time. Had an attack of unconsciousness two years ago, which lasted one hour. Resumed work next day. Present attack—on 4/6/31 while at work felt weak. Sat down for a few minutes, and then became unconsciousness. On examination—unconscious, perspiring, stertorous breathing, corneal reflexes just present. Half an hour after admision to hospital began to show signs of recovering consciousness. Temperature normal, pulse 60, arteries hard and sclerosed. Blood-pressure 90/65. Pupils equal and reacted. Left side of mouth and right arm showed paresis. Arm and leg reflexes + +. Double Babinski; abdominal reflexes—right absent, left sluggish. Lumbar puncture on 4th and 5th, when fluid was found to contain a large amount of blood. On the 7th the fluid was practically clear. His symptoms and physical signs steadily improved, and he was discharged on 24/7/31 completely recovered.

Case No. 4.—B. H., female, aged 50, married. Found unconscious on 21/6/31. Neck rigidity and Kernig. Pupils unequal, left larger than right. Cerebro-spinal fluid blood + +. Wassermann negative. On admission to hospital, temperature 100 and pulse 88. Died 2/7/31 without regaining consciousness.

Case No. 5.—A. K., female, aged 26, unmarried. Admitted to hospital 21/7/31. When first seen six weeks prior to admission, she gave a history of sudden headache and vomiting on her return from a bus ride. The headache and vomiting continued, and when seen three days later she showed definite head retraction and a positive Kernig. She was quite conscious, but somewhat lethargic. Lumbar puncture showed the fluid under pressure and containing blood + +. There was considerable improvement the following day, but three days later there was still headache and rigidity. Lumbar puncture showed the fluid to be much clearer and not under pressure. She had intermissions of symptoms for a few days, and had occasional vomiting with pains in back and abdomen, and slight frequency of micturition. She was admitted to hospital on 21/7/31, and her condition while there was, briefly, as follows:—Neck rigidty. C.N.S.—discs showed marked papillœdema and retinitis. Reflexes brisk. Blood-pressure 120/65. Pulse 64-96. Slight temperature for first month.

Lumbar puncture, 22/7/31—pressure of 210 mm. water, and bloodstained.

Lumbar puncture, 23/7/31—More blood. Pressure 250 mm.

Lumbar puncture, 24/7/31—Pressure 300 mm. Retinitis thought to be renal in origin.

Lumbar puncture, 26/7/31—Fluid still under pressure, but less blood. Blood + + in urine.

Lumbar puncture, 27/7/31—Headaches less. Cerebro-spinal fluid pressure normal. Urine almost black with blood which had clotted.

Fragility, 30/7/31—

Dilutions :—	0.3%	0.35%	0.4%	0.45%	0.5%	0.55%	0.6%
Laking :—	+ + +	+ +	+	+	-	-	-

6/8/31.—Lumbar puncture. Fluid again under pressure. Blood + +.

13/8/31.—Lumbar puncture. Fluid again under pressure. Blood + +.

Fibrinogen given 13/8/31, and for four consecutive days, also on 26/8/31 and 29/8/31, with marked improvement in the hæmaturia and cerebro-spinal fluid. Patient was discharged from hospital very much improved, urine normal, and with no recurrence of symptoms.

Case No. 6.—C. M., male, aged 24, unmarried. First seen 24/5/29. Four weeks previously had fractured his clavicle while hunting. Three weeks later, while being driven in a car, was jolted off the seat and complained of pain at the root of his neck on same side as fracture. This pain persisted, and on the day prior to examination he began to vomit and complain of headache. Temperature 100, pulse 76, with rigidity of neck and slight Kernig. On lumbar puncture the cerebro-spinal fluid was under pressure, and was almost pure blood. Blood taken from vein for Wassermann had not clotted after thirty-six hours. Patient had hæmatemesis and hæmoptysis, and was passing blood per rectum. Blood film showed an almost total absence of platelets. Fibrinogen, 2 c.c., was given hypodermically, and three tubes orally; he was also given 20 c.c. of his father's blood intramuscularly. On the following day the bleeding from stomach and lungs had stopped; blood from a vein clotted quickly; platelets were present in blood film in normal numbers, and headache and rigidity had disappeared.

He made a rapid and uninterrupted recovery, and when seen three months later he stated he had no symptoms, and that he had just returned from a week's shooting in Scotland. On examination no abnormality could be detected. He has carried out his duties as an Army officer since his illness without any inconvenience.

He has always had an idiosyncrasy for sweet things. His blood sugar was normal .1.

Case No. 7.—W. M., male, aged 73. Farmer. Headaches for two weeks. One week ago was in city and on coming home headache became more severe. Pain in back of head and down spine. Vomiting on morning of 13/8/31. Marked insomnia. Bowels constipated. Urine nil, except frequency. Blood-pressure 140/90. Rigidity of neck and slight Kernig. On lumbar puncture cerebro-spinal fluid was under pressure. Blood + + and supernatant fluid yellow, which indicated that the hæmorrhage had been present for a few days. There was slight improvement in his symptoms, but as he refused to have any further lumbar puncture done his condition deteriorated and he died some days later.

Case No. 8.—Miss H., aged 58. Sudden onset of headache with vomiting and eye symptoms. On examination—rigidity of neck, nystagmus. Blood-pressure 190/40. Heart—triple rhythm. Lumbar puncture showed cerebro-spinal fluid under pressure and bloodstained. There was an immediate improvement in the patient's condition, and further lumbar puncture was not required.

Case No. 9.—Miss M., aged 30. History of giddiness for a few weeks. Headaches for years. Sudden vomiting with severe headache night of 22/12/31. Became unconscious, and when seen on the morning of the 23rd there was marked spasticity and rigidity of neck, twitching, double Babinski, pupils inactive. Conjunctival reflex normal. Incontinence of urine. On lumbar puncture cerebro-spinal fluid was not under pressure, but almost pure blood. There was a slight improvement in the patient's condition, but she did not regain consciousness. Lumbar punctured on 24/12/31, and cerebro-spinal fluid again almost pure blood. Died on the evening of the 24th.

The lesion was obviously from a large vessel.

Of the nine cases described, six made a complete recovery and three died. Of the latter, two had obviously a very sudden and large hæmorrhage, and were not benefited by lumbar puncture. The third case, No. 7, would probably have recovered if further lumbar punctures had been carried out.

Cases Nos. 5 and 6 were atypical, in that their original sub-arachnoid hæmorrhage was followed by a profuse bleeding from other organs. In both cases immediate benefit was obtained after the administration of fibrinogen.

In Case No. 6 the change in the coagulability of the blood was most striking. A blood which would not clot when first taken, clotted with increased rapidity the day following the administration of fibrinogen. It is difficult to account for this tendency to bleed following a sub-arachnoid, as in neither case was there any suspicion prior to the illness of a hæmorrhagic diathesis.

While rupture of a small cerebral aneurysm was the probable cause of the hæmorrhage in several of the cases, one wonders if some mild cerebral infection may not have been the deciding factor, and accounted for several cases occurring about the same time.

Diagnosis of the condition is confirmed by lumbar puncture, and if adequate treatment, which consists of repeated lumbar puncture, is carried out, a reasonable hope of complete recovery can be expected.

The Fractional Test-meal as a Guide to Delay in Emptying of the Stomach.

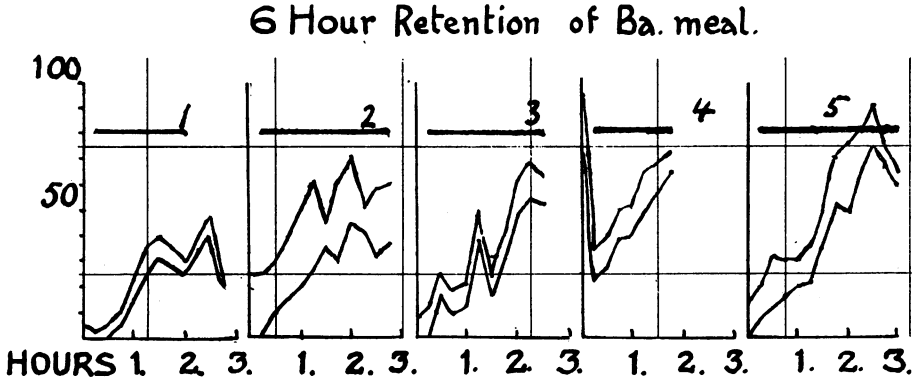
By R. S. Allison, M.D., M.R.C.P.,
from the Royal Victoria Hospital, Belfast

The patient who complains of abdominal pain related to food is often referred for an X-ray examination. Among other things, the barium meal will show the rate of emptying of the stomach. In some there will be no delay, but in others there will be retention of barium in the stomach six hours after the meal. A few cases of this nature have been collected, in which fractional test-meals were also done, and the radiological evidence of delay may be compared with the test-meal results. The patients, fifteen in number, attended the Royal Victoria Hospital, and most of them were seen in the extern department. They complained of pain or discomfort in the upper abdomen some time after food. Temporary relief was obtained by taking more food or alkali. In many the symptoms were of long duration, with alternate periods of good health and indigestion. For purposes of comparison, the test-meals have been divided into three groups. In the first group there was no radiological delay. In the second a small portion of the barium meal was still present in the stomach at six hours. In the third group, there was almost complete six-hour gastric retention. The findings are now given.

Group 1—No Radiological Delay.—The fasting acidity is low, but not always so, as illustrated by Case No. 4. The curve of acidity is "climbing" in type, and there is hyperchlorhydria. The amount of free HCl. is closely related to the total acidity. Starch is not present in the fasting juice, but is found, three times out of five, in all the subsequent fractions withdrawn from the stomach.

Group 2—Slight Six-Hour Residue.—The fasting acidity tends to be high. After an initial fall, the curve rises steadily, and is of the hyperacid type similar to Group 1. The curves of free and total acidity are again closely associated. Starch is absent from the fasting juice, but is present until the end of the test in four cases out of five. In the exception (Case No. 4) it disappeared in an hour and three-quarters.

Group No. 3—Large Six-Hour Residue.—The fasting acidity is high. There is a wide divergence between the curves of free HCl. and total acidity, and this is appreciably greater than in the former groups with slight or no retention. Starch is present in the fasting juice of two cases, and persists throughout the test in all but one. If no food has been taken for twelve hours, the finding of starch in gastric juice is strong evidence of retention. The case of No. 4 is noteworthy. There was no starch in the fasting juice, and it disappeared two hours after taking the meal. The curve of acidity is normal, and corresponds more or less to the standard type originally described by Bennett and Ryle (1). Yet this patient had a history suggestive of ulcer, and the X-ray showed a large six-hour gastric residue. A chronic ulcer about the size of a sixpence was found at operation close to the pylorus on the gastric side.


6 Hour Retention of Ba. meal.
100
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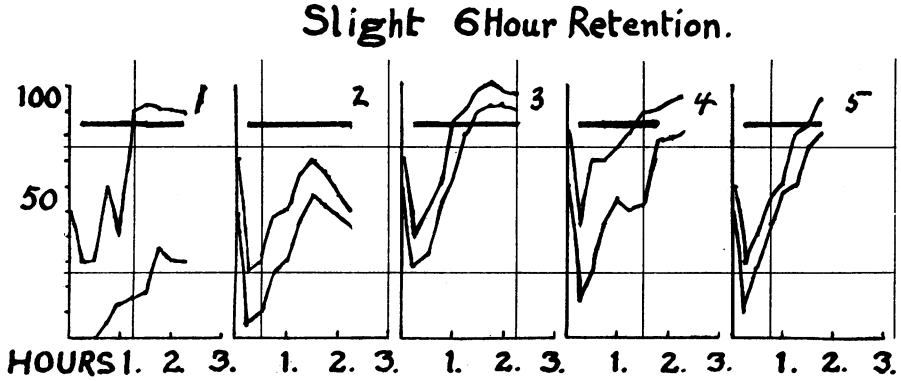
HOURS 1. 2. 3. 1. 2. 3. 1. 2. 3. 1. 2. 3. 1. 2. 3.


Slight 6 Hour Retention.
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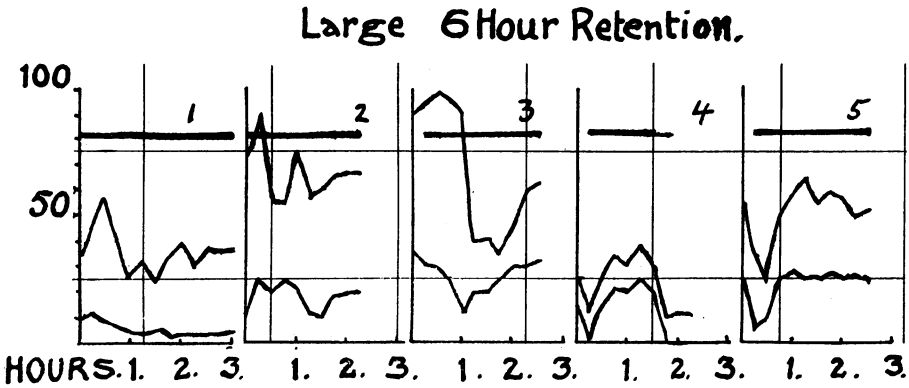
HOURS 1. 2. 3. 1. 2. 3. 1. 2. 3. 1. 2. 3. 1. 2. 3.


Large 6 Hour Retention.
100
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1
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HOURS. 1. 2. 3. 1. 2. 3. 1. 2. 3. 1. 2. 3. 1. 2. 3.

The method of fractional gastric analysis was first introduced by Rehfuss (2), and in its early days hopes were entertained that it might prove of great help in diagnosis. Some of these hopes have been realised, others have not. Its value in the recognition of achylia is beyond question. Again, in cancer of the stomach it often gives characteristic results. Bennett (3) found charcoal, given the night before, present in the fasting juice of thirty out of fifty-three cases, and other signs of stagnation in twenty out of the remaining number. He noted also the great difference between the curves of free and total acidity so often seen in cases of pyloric stenosis. The diagnostic importance of achlorhydria in cancer has been stressed by many writers, including Bennett and MacLean (4). Spriggs (5) found it in thirteen out of seventeen cases described recently. Hunter (6) published the results of test-meals in 174 verified cases of gastric and abdominal disease. In gastric cancer his results agreed with what has already been said, but there was little characteristic about the other curves, except those from cases of duodenal and pyloric ulcer. Here there was a strong tendency to hyperchlorhydria and a climbing type of curve. The work of Bolton and Goodhart (7) on total and mineral chlorides explained why an alteration in the curve of gastric acidity so often accompanies a lesion of the pylorus. In their opinion, duodenal regurgitation is a normal process in digestion. The patency of the pylorus in allowing this plays an important function in determining the type of curve of acidity. Interference with the neuromuscular mechanism of the pylorus tends to produce tonic spasm. Neutralisation of the gastric contents by duodenal regurgitation is thus hindered, and a climbing hyperacid type of curve results. This view has since been criticised by MacLean and his co-workers (8), Duthie (9), and Roberts (11). These observers believe that chloride as well as HCl. is excreted by the stomach, and that the curve of acidity depends more on the balance between these two secretions, than on duodenal regurgitation. Whether this is so or not, it seems to be agreed that pylorospasm and delay in emptying of the stomach favour hyperchlorhydria. It is probable too that apart from gastric cancer and the recognition of achylia, the value of the fractional method in gastro-enterology lies principally in the information it gives of the state of the pylorus. It is of chief use in the detection of pylorospasm and in the determination of the rate of emptying of the stomach.

The examples given in this series support this contention. A high fasting acidity and divergence between curves of free and total acid are fairly constant features of pylorospasm and stenosis. The X-ray and test-meal findings agree in the majority of cases. The number of cases is small, however, and the results by no means uniform. Had more examples been available, it is likely that the results would have been more varied. The barium meal and the test-meal are not infallible. Caution is necessary in interpreting the meaning of results. In a recent article on visceroptosis, Bedingfield (12) recalls the effect of emotion on the tone of the stomach, fright being liable in susceptible persons to cause dropping of the stomach and temporary stoppage of peristalsis. In an earlier work dealing with gastroptosis, Conran (13) found retention of barium in the stomach at six hours in thirty per cent. of his cases. These conditions, therefore, must be borne in mind in

deciding the possible significance of a six-hour gastric residue. Fallacies in the working of the test-meal have been proved in recent years. Duthie (10), using a double tube, showed that the position of the tube in the stomach mattered. Different curves were obtained from fractions withdrawn from the proximal and distal parts of the stomach. Attention has also been directed to the variability of the curves at different times in the same persons by Lion and others (14).

It is occasionally possible, therefore, for the test-meal to be at fault in failing to recognise gastric retention, but such failures are probably rare. In the case cited in Group 3, the test-meal result had little weight in the presence of a definite history of ulcer and X-ray evidence of massive retention. Operation was clearly indicated. The other type of case is, however, not uncommon with a definite history of ulcer, a high fasting acidity and climbing type of curve, but indefinite X-rays. This time the test-meal gives useful information of the presence of pylorospasm and the need for rest, dieting, and alkali. Lastly, there is the all-important question of deciding what to do for a patient in whom a duodenal ulcer has been diagnosed. Is treatment to be medical or surgical? This decision often turns on the demonstration of delay in emptying of the stomach. The necessary treatment will be undertaken with more assurance when this can be proved by both methods, the X-ray and the fractional test-meal.

Summary

Fifteen patients complained of pain in the upper abdomen related to food. Each had a barium meal and fractional test-meal. The results were classified according to the radiological findings of delay.

In the first group of patients with no delay, the test-meal curves had a low fasting acidity and were of the climbing superacid type. There was little difference between the percentage of free and total acidity.

In the second group with slight radiological delay, the fasting acidity was usually high. In other respects the curves resembled those of the first group.

In the third group there was a large six-hour residue of barium in the stomach at six hours. The test-meals showed a high fasting acidity as in the second group with slight retention. The characteristic feature, however, was the great divergence between the curves of free and total acidity. Starch was also present in the fasting juice in two cases, and persisted throughout the test in the majority.

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(8) MacLean and Griffiths, *Journ. of Phys.*, 1928, I, 65.
MacLean, Griffiths, and Wilkes, *Ibid.*
(9) Duthie, *Quart. Journ. Med.*, 1929-30, XXIII, 447.
(10) Duthie, *Ibid,* 1926-27, XX, 265.
(11) Roberts, *Ibid,* 1927-28, XXI, 7.
(12) Bedingfield, *Ibid,* 1929-30, XXIII, 1.
(13) Conran, *Ibid,* 1921-22, XV, 144.
(14) Lion, Bartle, and Ellison, *New York Med. Journal,* 1921, CXIV, 272.

REVIEWS

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Opportunity has been taken in this edition to revise the subject matter and to make additions to include recent work, e.g., the prevention and treatment of measles by convalescent sera, and modern views on the purpuras and Addisonian anæmia. We notice also an introductory chapter on the physiology of the blood, which should prove most useful. The illustrations are helpful in conjunction with the text, and have not the fault, so often present in textbooks, of overshadowing the text. We have failed to find any omission of importance, and can therefore recommend the book to medical students preparing for the final examination or senior degrees, and to general practitioners, as a sound guide to the principles of medicine.

The list of those who have contributed under Dr. Conybeare's editorship is in itself a warranty of the standard of the work, and a tribute to the editor.

Some Landmarks in the History of Medicine

An Address to Derry Medical Society by the Chairman
J. G. Cooke, O.B.E., B.A., M.B., Londonderry

This is a short discourse of an historical nature on the search for Truth, or, as we more conveniently term it, Research, a comprehensive word not to be used in a narrow sense, but as defined in the dictionary : "A diligent inquiry or examination in seeking facts or principles, continued search after Truth." I have said that my discourse will be of an historical nature : I do not propose to sketch out the History of Research, for that would be the history of our profession from the earliest ages till now, but merely to touch upon the historical aspect of the subject, as illustrated by the lives of some of the greatest champions of Truth who have ever adorned our profession.

I have chosen as my central figure Vesalius, whose biography has been written and rewritten, and of whose life the main facts are beyond dispute. He appeals to us, moreover, as an outstanding figure of the great Renaissance, a period in the history of Europe most attractive to the student; the sunrise after the long night of of the Dark Ages, the revival of letters and the beginning of emancipation for scientists, till then fast bound by the bonds of authority. Andreas Vesalius was born in Brussels in 1514. (His placenta and caul were preserved by his mother.)

His family history was remarkable for the fact that his great-great-grandfather, Peter Vesalius, was a medical author, his great-grandfather was physician to Mary of Burgundy, and a teacher of Medicine in the University of Louvain; his grandfather Eberhard was physician to the same great lady, and wrote commentaries upon the aphorisms of Hippocrates; his father was apothecary to the great Emperor Charles V, and accompanied him upon his expeditions—so that Vesalius had the rare distinction of having his four immediate progenitors medical men.

Of his youth little is known save that he was educated at the famous University of Louvain, where he acquired a very thorough knowledge of ancient classics; in his youth he tried to learn anatomy from the works of the schoolmen, but soon discovered that dissection, not books, was the only road to a knowledge of anatomy. In 1533, at the age of 19, he went to Paris to obtain a medical education—Paris being at that time the Mecca of the medical world. Here he came under the influence and teaching of one of the most remarkable men of his time, Jacobus Sylvius, a man of extraordinary avarice and eloquence. His lecture classes numbered as many as five hundred. He seemed to be made up of the most extraordinary characteristics, for, while he was the first professor in France to lecture on the human cadaver, and as a lecturer in botany always demonstrated by means of a collection of plants, yet he was obsessed with a blind reverence for the ancient authors. He is said to have regarded Galen's writings as gospel, and if the structures observed in the cadaver and Galen's descriptions did not agree, he went so far as to say that Galen's anatomy was infallible, and that further progress was impossible. This extraordinary genius, for genius he was, was a notorious miser,

a most bitter and vindictive controversialist; and in later days poured out the vials of his bitter invective on Vesalius, the most brilliant student of the school.

On Vesalius's arrival in Paris, he decided to devote his energies and talents to the studying and the teaching of anatomy; he found, however, that the professors were so imbued with the teachings of Galen, and devoted so little time to actual dissection, that there was little to be learned from them. He therefore set himself to dissect, "for never," said he, "would I have been able to accomplish my purpose in Paris if I had not taken to work with my own hands." He dissected numerous dogs, and made a thorough study of the bones. It is told of him that in his search for materials for a skeleton he haunted a cemetery where the bodies of executed criminals were thrown, and was there attacked by fierce dogs who infested the place. He and his companions nearly lost their lives on this occasion. He became so familiar with the bones that he was able to name any part of the skeleton placed in his hands when blindfolded. His talents were soon recognised, and he was requested to take charge of one of the earliest dissections which he attended in Paris, when, to the satisfaction of all, he made an elaborate dissection of the abdominal organs and the arm. After three years in Paris he returned to Louvain to search for bones; he found a skeleton held together simply by the ligaments, and still possessing the origins and insertions of the muscles. Morley, the historian, gives the following picturesque description of the scene: "The body was that of a notorious robber who, since he deserved more than ordinary hanging, had been chained to the top of a high stake and roasted alive; he had roasted by a slow fire made of straw kept burning at some distance below his feet; in that way there had been a dish cooked for the fowls of heaven which was regarded by them as a special dainty. The sweet flesh of the delicately roasted thief they had preferred to any other; his bones, therefore, had been elaborately picked, and there was suspended on the stake a skeleton dissected out and cleaned by many beaks with rare precision. The dangling skeleton complete and clean was lifted up on high before the eyes of the anatomist who had been striving to piece together such a thing out of the bones of many people gathered as occasion offered—such a prize could not be lost. He climbed the gallows with the assistance of a friend and secretly conveyed the skeleton to his home. One finger, a patella, and a foot were missing, and for these he had to make further excursions. However, he was soon able to give up these expeditions, for the civic authorities of Louvain gave him abundance of material for teaching purposes." About this time Vesalius published his translation and commentary on the 9th Book of Rhazes, a compendium of treatment illustrated by himself with drawings of plants mentioned in the text. This book was in itself no mean achievement, as it was a standard book in the schools for more than one hundred years afterwards.

In the year 1537, at the age of 23, Vesalius went to Venice, then particularly attractive from his point of view, owing to the fact that an Order of Monks, Theatins, devoted to the care of the sick, encouraged the study of anatomy. One of the heads of this Order was Ignatius Loyola, and, as Ball remarks, "It is a strange circumstance that two strong characters so dissimilar as were Vesalius

and Loyola should meet as co-workers in the same field; the one was filled with a desire for anatomical knowledge and was dreaming of the day when his Magnum Opus should revolutionise an important science, the other was enthused with visions of the worldwide acceptance of the doctrines of Catholicism." They met again in 1543, the year which marks two important events—the publication of Vesalius's great work, the *Fabrica,* and the full recognition of the Jesuits by the Pope.

In Venice he practised medicine and surgery, and made the acquaintance of Van Calcar, the artist who illustrated his great work. From Venice he went to Padua, where, after taking out his degree as Doctor of Medicine, he was appointed Professor of Surgery, with the right to teach anatomy in the university; this was the first anatomical chair ever instituted. I cannot do better than quote to you a description given by Vesalius's most recent biographer of a lecture in anatomy given by him: "The hall in which Vesalius conducted his course was built of wood, and held five hundred persons. In the centre of the room was a table under which was a receptacle for bones and joints; an articulated skeleton was placed in an upright position at one end of the table. The course was a strenuous one, occupying practically the entire day for a period of three weeks, and delivered before an audience of distinguished laymen and scholars. Vivisection of dogs and pigs was a regular part of the course. Drawings and anatomical charts, the work of Vesalius himself, were exhibited—Vesalius comes into the arena, walks to the table, which is closely surrounded by his auditors, and launches into the practical demonstration. After rapidly pointing out the divisions of the body and demonstrating the skin, joints, cartilages, ligaments, etc., he passes to the more complex parts, which are shewn upon the dissected body of a dog or lamb in order to conserve the human material. At times he has two human bodies, on one of which he demonstrated the muscles, ligaments, and viscera; while the other was used for the arteries, veins, nerves, etc. The abdominal cavity was opened and the relations of the viscera shewn, the skull was opened and the brain dissected and demonstrated, and so on." Kingsley, in a fine passage describes the scene: "There stands young Vesalius, upright, proud, almost defiant, as one who knows himself safe in the impregnable citadel of fact, and in his hand the little blade of steel, destined, because wielded in obedience to the laws of nature, which are the laws of God, to work more benefit for the human race than all the swords which were drawn in those days, or perhaps in any other, at the bidding of most Catholic emperors and most Christian kings."

The difference between these demonstrations of Vesalius's and those of his contemporaries was this: The usual way of conducting an anatomical demonstration was—the anatomist occupied a throne or elevated seat from which he read the works of Galen, or other anatomist; under his direction a barber cut up the body with a large knife, and so far as lay in him demonstrated the parts described, the lecturer taking care to fit in the appearances with Galen's descriptions, which, more often than not, was impossible, as Galen's dissections were mostly of the lower animals. However, this did not present any insuperable difficulty, as such

differences were explained by stating that the structure of the body had changed since Galen's time, and other equally ingenious theories. The essential point in Vesalius's demonstrations was that he did the dissection himself, and demonstrated what he actually found, leaving Galen out, or disagreeing with him when necessary. What this meant at that time when Galen was the Bible of Medicine, inspired and infallible, we can only conjecture, and admire the more the great seeker after Truth.

While in Padua Vesalius published his *Tabulæ Anatomicæ* for the use of students, consisting of six large plates, three of which were drawn by the author, the others by Van Calcar. After three years of hard work, in 1542 Vesalius completed the *Fabrica,* which has been thus described: "It was, and is, a great and glorious book, a rare and precious monument of genius, industry, and liberality." The work cost him enormous sums in fees to artists, who, he complains, "preferred drawing Venus and the Graces to drawing pictures of skinned and foul-smelling bodies!" The plates in the *Fabrica* are very wonderful, especially those of the muscles, and for many years were the basis not only of anatomical drawings, but also of anatomy in art. In the same year appeared the *Epitome,* a great work also, which was intended for the use of beginners in anatomy. The *Fabrica* was a truly monumental work consisting of 659 folio pages of text, and numerous illustrations and plates. It is really a comparative anatomy, and contains much physiology. That he did not discover the circulation of the blood almost surprises one when one considers the accuracy of his observations; we must, of course, remember that to him the arteries were carriers of vital spirits, the veins the true blood-vessels; but how close he got occasionally to the truth the following passage from his work shows: "Many things present themselves with regard to the arterial system which deserve careful consideration, especially the fact that there is scarcely a single vein going to the intestines, the stomach, or even the spleen, without its accompanying artery, and that nearly every member of the portal system has a companion artery associated with it in its course. Again, the arteries going to the kidneys are of such size that they can by no means be affirmed to serve merely for regulating the heat of these organs; and still less can we assert that so many arteries are distributed to the stomach, intestines, and spleen for such purpose alone—and there is, moreover, the fact which we must for many reasons admit, that there is through the arteries and veins a mutual flux and reflux of materials, and that within these vessels the weight and gravitation of their contents has no effect."

And now we come to the end of the scientific life of Vesalius. On his return from Basle to Padua after the publication of the *Fabrica,* he intended to write a work on medicine based on pathology. However, he found himself fiercely attacked by the advocates of Galen, and engaged at once in bitter and personal controversies; these controversies and the impossibility of making his contemporaries see the truth so disgusted Vesalius that he refused a professorship offered to him; destroyed several volumes of notes and manuscripts, and accepted the appointment of Court Physician to Charles V of Spain at Madrid. Here he practised with great success as a physician and surgeon for twenty years, when for some unexplained reason he went on a pilgrimage to the Holy Land. As he was returning

thence he was shipwrecked, and died from exposure on the island of Zacynthos, at the age of 50.

Vesalius was followed by Columbus, whose investigations on the blood were so accurate that it is to be wondered how he missed the discovery of the circulation; by Eustachius, mainly a comparative anatomist, who produced magnificent copper-plate engavings of anatomical subjects, which, however, owing to his not having the means to publish them, remained unpublished for many years after his death; by Fallopius and Fabricius, all of whom were connected with the school of Padua, and all very eminent anatomists.

I cannot leave the Renaissance period without referring to the great surgeon of of that time, Ambrose Paré, not a medical graduate of any school, but a barber surgeon who educated himself by long residence in hospital and subsequently by an unrivalled experience in many wars. Gifted with the faculty of accurate observation and enormous industry, he became principal surgeon to the French army and to the King of France. He is best known for his use of the ligature instead of the cautery in amputation wounds, and for his having been the first to dress bullet wounds with salves instead of with boiling oil; these achievements of his are comparatively unimportant compared with his methods and the influence he had on the surgery of his times—he wrote treatises on many branches of surgery, was a most accurate observer, and was in great request as a surgical opinion; he was, moreover, a very keen questioner of other surgeons as to their experience, and as to the treatment of patients, entered into the most minute particulars as to diet, fresh air, etc., thinking no detail too insignificant for notice.

As I have now touched on the search after Truth, as pursued by a great anatomist and a great surgeon, I now propose to skip the centuries and speak a few words about Laennec and his dramatic discovery of the stethoscope in 1816. His own account of this discovery is as follows: "I was consulted by a young woman labouring under grave symptoms of diseased heart, in whose case percussion and the application of the hand were of so little avail owing to the great degree of fatness. Non-mediate auscultation being rendered inadmissible by the age and sex of the patient, I happened to recollect a simple and well-known fact in acoustics, and fancied at the same time it might be turned to use on the present occasion. The fact I allude to is the augmented impression of sound when conveyed through certain solid bodies, as when we hear the scratch of a pin at one end of a beam of wood on applying the ear to the other. I rolled a quire of paper into a kind of cylinder, and applied one end to the region of the heart and the other to my ear, and was not a little surprised and pleased that I could thereby perceive the action of the heart in a manner much more clear and distinct than I had ever been able to do by the immediate application of the ear; from this moment I imagined that the circumstance might furnish means for enabling us to ascertain the character not only of the action of the heart, but of every species of sound produced by the motion of all the thoracic viscera, and consequently for the exploration of the respiration, the voice, the râle or rhonchus, and perhaps even the fluctuation of fluid extravasated in the pleura or pericardium."

Within two years after his discovery Laennec had written his great work on Auscultation : a work the result of his own elaborate researches, and is the basis of our knowledge of disease of the lungs and heart in the living; even supplying the nomenclature for the phenomena observed which is current to this day. As has been said of him : "He unlocked the secrets of the heart and lungs, and by his great researches made a thorough investigation of their physiology and pathology. Before his day the various sounds characteristic of valvular lesions of the heart were not known, and the diagnosis of these conditions was made on the post-mortem table."

My reason for introducing Laennec in this paper is that while apparently he discovered the stethoscope by a fortunate circumstance, yet in reality he did so in consequence of his opportune application of a physical truth, and that both before his discovery and after it he was a most diligent seeker after and recorder of facts; indeed, had it not been for this, it is quite possible he might have overlooked the importance of his discovery, epoch-making as it was.

In conclusion, let me quote the wise words of Sir James Paget : "Darwin had the rare power of taking the common things that other men waste, and out of them making the grandest material of scientific work; so that it is in vain to say in any branch of practice, 'I have no opportunity for scientific inquiry, I cannot investigate this, I can contribute nothing to that which I see the scientific members of my profession are doing.' "

It requires merely the opportunity of practice in the country, and the mind and resolution of Darwin, to bring great pathological conclusions out of the most ordinary facts of daily life in general practice.

"The commonplace is of all knowledge that which we can least afford to despise or disregard."

REVIEW

FILTERABLE VIRUS DISEASES IN MAN. By Joseph Fine, M.D., B.Sc. Edinburgh : E. & S. Livingstone. pp. 141. 6s. net.

THE amount of work on Filterable Virus Diseases in Man has now grown so large that a new volume such as this is welcome for the three reasons set forth in the preface : To present the facts in a compact form; to present the diseases in a manner which will best show such relationship as exists between them; and to review the position in cases in which no definite agreement has been reached. The first chapters are devoted to tropical diseases. The account of yellow fever contains a summary of the experimental work of Noguchi and others; and in the chapter on the typhus group particular attention is drawn to the presence of Rickettsia bodies and their significance. Diseases with which one is familiar are then considered, and include brief but illuminating facts on many diseases which have been the subjects of many discussions : the Herpes-chicken-pox-zoster group, and such everyday diseases as measles, mumps, and the common cold. The book is short, and published in a very readable fashion. It should be of great assistance to anyone interested in this engrossing subject.

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Facts and Theories about Muscular Activity

By J. H. GILLESPIE, M.B.,
from the Department of Physiology, Queen's University, Belfast

IN modern physiology it is an axiom that any living structure or part of a structure must, either in itself or in co-operation with a specialised conducting mechanism, be capable of excitation, of response, and of conduction, if it is to play its part in the team which composes the whole organism. We sometimes forget that what now seems axiomatic was, in many cases, unheard of a few hundred years ago; and that a clear perception of our most valuable biological working principles has almost never burst upon the scientific world through the sudden illumination of some limpid genius, but has rather come into being as the descriptive epitome of a multitude of experiences which often appeared quite unrelated. It is humbling for us to realise that, so far as the growth of scientific knowledge is concerned, our business is merely to be excited, to respond, and to transmit: it is encouraging to be reminded that much of what seems meaningless at the first blush may, in the process of transmission, be changed into a typical example of some great principle.

In his *Fabrica Humani Corporis,* published in 1543, Vesalius first stated clearly that what passes along a nerve to excite a muscle passes by the substance, and not by the sheath of the nerve. And yet, beyond crude ideas about the flow of a nervous fluid, this great author had no understanding of conduction or excitability.

We notice an improvement in the conceptions of Borelli. In his posthumous life-work, published in 1679, we read: ". . . since the inflation, hardening, and contraction do not take place in the channels, . . . but take place outside the nerves, namely, in the muscles, . . . the influence which the nerves transmit is not of itself sufficient to bring about inflation. Something else must be added—something which is to be found in the muscles themselves." Borelli was in a fair way to appreciate the trigger-like action of the nerve in releasing the muscle's energy. During the ensuing century, despite a good deal of discussion, no very helpful conclusion was attained. And then, sometime not long before 1786, it so happened that Luigi Galvani was living in a house which had an iron railing round its balcony. One day Galvani chose to hang out a row of frogs from his balcony by means of copper hooks. To his astonishment the frogs, like so many marionettes, gave him a lively display of step-dancing. And from that historic moment there has been radiated all our modern knowledge of electricity. But the physicists must not be allowed to have Galvani all to themselves: he was a properly qualified medical man and a physiologist. He held that the movement of the muscles was due to the connection, by means of the metal contacts, of the positive charge within the nerve with the negative charge upon the exterior of the animal. It was Volta who recognised that the current was generated, not in the animal, but by the contact of the dissimilar metals. Volta's work led experimenters to devote their thought mainly to physical investigation, which was soon to be blessed with the names of Ampère, Ostwald, Ohm, Faraday, and their descendants.

Faraday, whose centenary occupied the scientific world last year, concerned himself with physiology so far as to give himself the customary shocks, and to 'convulse' the limbs of frogs, by means of the various sources of electrical energy. But his purpose in this was merely to prove that the electricity, whatever its source, was always the same in essence. Once he had established this, he does not appear to have been much interested in biology. Others, however, possessed of the new toys which the study of electro-magnetism provided for them, stimulated frogs' legs by the thousand, and amassed a huge store of information of a descriptive kind.

But while many great physiologists have been great chemists, not many have been great physicists. Already, in Faraday's time the growth of physiology was being stunted by an estrangement from her sister physics, which persisted until this century. Indeed, while the physical study of electricity was making phenomenal strides, the physiologists as a whole were far behind in ingenuity and exactness, a fact well exemplified by the study of the nervous impulse.

It was known that when a skeletal muscle was stimulated electrically, the length of time during which the current flowed did not appear to influence its efficacy. Further, when the current applied to the muscle was gradually increased to its maximum, instead of being instantaneously switched on, the muscle failed to respond by contraction. Smooth muscle, on the other hand, appeared to be quite contrary in its reactions. Duration of stimulus was evidently as important as intensity, while a progressively increasing current was as effective as the stimulus which the French so neatly term "brusque."

In the midst of the confusion, made worse by its supposed explanation in certain general "laws," there appeared the historic work of Du Bois Reymond, *Untersuchungen uber thierische Elektricitæt,* published in 1848. The author, whose work remained unchallenged for fifty years, formulated the celebrated law which bears his name. "Excitation," he said, "is a function of the differential co-efficient of the current density with respect to time." That is, whether a stimulus will succeed in exciting a given muscle to contract will depend upon the rate at which its strength increases when it is switched on.

This law, so convenient and far-reaching, was made to meet every emergency until Hoorweg the physicist, in 1892, and Weiss, in 1901, perceived its fallacies. Actually, they thought, skeletal muscle behaves in the same way as the smooth: a definite length of time must elapse between the arrival of an adequate stimulus at a muscle, and the beginning of the contraction. It is this length of time which is the true indication of excitability, and not the rapidity with which the current reaches the level where contraction will occur. Earlier workers had failed to appreciate this, because, in dealing with skeletal muscle, they had made no attempt to analyse the extremely short interval of time which comes between the stimulus and the response. This has been done most successfully by the methods of Lapicque, who, since 1903, has been working at the difficult subject of "chronaxie." Suppose that we had a method of stimulating a muscle for so long that the time factor need not be considered. Using this instrument, we could increase the strength of our

shocks until the muscle began to show an answering contraction. This would give us a minimal value of stimulus which is called the "rheobase." Now, if we keep on stimulating the muscle at double the rheobase strength of shock, but gradually decreasing the length of time during which it acts, we shall find a minimum length of time below which the muscle will not respond. It is the minimum time which allows the muscle to respond to twice the rheobase stimulus which is called the "chronaxie." In actual practice, the very small lengths of time involved are measured by means of electrical condensers which have known times of discharge. These are used to give the shocks to the muscle.

Lapicque believed that he had proved that a muscle always had the same chronaxie as the nerve which supplied it—a principle known as "isochronism." Similar reasoning might be adopted to explain why an impulse travelling along the nervous system may successfully pass one synapse, and be stopped by another. Nerves having the same chronaxie could be regarded as "through routes" for a certain stimulus. Very recently, however, Rushton has complicated the picture by confirming what was suggested by Keith Lucas in 1906, namely, that a muscle may have more than one excitability, and therefore more than one chronaxie. There is no appearance of finality in this branch of study.

But the problems of the subject are being approached in numerous other ways. For example, in an instrument known as the Matthews oscillograph, the wireless valve amplifier has been harnessed to drive a special type of moving iron galvanometer. The photographic records obtained with this apparatus give a reasonably true graph of the minute currents which flow in a nerve during its natural activity. They do not, like the older records given by the capillary electrometer, need correction mathematically to make the amplitude of the recorded deflection a direct linear picture of the voltage which caused it. We can, for example, photograph the stream of discharges which is continually passing up the vagus nerve during life, or the volley of impulses which a single proprioceptive nerve-ending sends along its fibril when the muscle containing it is stretched. We have thus a powerful weapon at our disposal to attack the problem of how various factors influence conductivity and response. Thus it was used by Craib in 1930 to criticise the conventional explanation of the changes seen in electro-cardiographic records. In particular, he gives reason to abandon the view which regards active tissue as always electro-negative to inactive tissue. The actual potential, he holds, is purely a relative matter, and cannot depend merely upon the fact that a tissue is active. Incidentally, according to this theory, the much-debated "T" wave is of no more mysterious origin than the "Q-R-S" complex.

In a brief and superficial sketch of this kind, it would be foolish to catalogue the various theories which have been advanced in attempts to explain muscle activity. But we cannot conclude without a mention of the chemical approach to the problem, since it may yet prove to be the most productive of results. The whole matter is being constantly revised, but this much at least seems clear. Two metabolic processes are concerned in muscular activity—the one respiratory, requiring the presence of oxygen, and the other of the nature of ferment action, occurring

anærobically. When the nervous impulse arrives at the muscle, the first happenings are anærobic. Glycogen, the main source of the muscle's energy, is broken down to lactic acid, and it is the presence of the latter which appears to be the causative agent in bringing about contraction. The recovery of the muscle, which must take place during the "refractory period," when the muscle will not respond to further stimulation, requires the presence of oxygen. Of the lactic acid formed during activity, about four parts are built up again to glycogen, while one part is burnt up to carbon dioxide and water.

In addition to the carbohydrate changes in the muscle, there are other less evident, but equally important, changes during the action. Thus there are the comparatively slow operations of the complex nucleotide mechanism, without which the glycogen cannot be hydrolysed. There are also the essential and very rapid changes undergone by the labile compound between creatin and phosphoric acid, which can be ærobically built up in the normal muscle.

How the nervous impulse is related to these chemical happenings may become clear before many years; and the clinical importance of such a discovery would doubtless be great. There would, for instance, be a rational basis for the consideration of the myopathies, where the disturbance of function occurs outside the nervous system; while we could hope for light upon the cause of the rapid fatigue of muscle seen in myasthenia gravis, and even upon the very practical problem of occupational palsies.

Already one of the complex nuclear derivatives referred to has been placed on the market as a dilator of the coronary vessels. Whether the claims made for its value in coronary occlusion will be substantiated, remains to be seen. In any event, the study of muscular action must always be of moment to the clinician, for however little we may employ the muscles of our limbs, there is no living if the heart should cease its work.

BRITISH MEDICAL ASSOCIATION—BELFAST DIVISION

THE annual meeting of the Division was held in the Medical Institute on Thursday, 12th May, 1932. The chairman, Dr. Robert Marshall, presided. Dr. S. R. Hunter, Dunmurry, was elected chairman for the ensuing year, and Dr. G. G. Lyttle, Belfast, was elected vice-chairman. The Division congratulates Dr. J. C. Loughridge on his election as member of the Council of the British Medical Association, in place of the late Dr. R. W. Leslie, whose loss we deeply deplore as one who faithfully served the Association for many years. Dr. Loughridge was one of our representatives at the annual representative meetings, and his reports to the Division showed the interest and enjoyment he derived from his work. His promotion to the inner circle of the British Medical Association is a well-deserved honour. The Division welcomes our new representative, Dr. H. J. Ritchie, Belfast, who has long taken a prominent part in all that makes for the welfare of the profession. It was suggested that next session should open with a discussion on "The Future of Medical Practice." The extension of the Public Health Services

anærobically. When the nervous impulse arrives at the muscle, the first happenings are anærobic. Glycogen, the main source of the muscle's energy, is broken down to lactic acid, and it is the presence of the latter which appears to be the causative agent in bringing about contraction. The recovery of the muscle, which must take place during the "refractory period," when the muscle will not respond to further stimulation, requires the presence of oxygen. Of the lactic acid formed during activity, about four parts are built up again to glycogen, while one part is burnt up to carbon dioxide and water.

In addition to the carbohydrate changes in the muscle, there are other less evident, but equally important, changes during the action. Thus there are the comparatively slow operations of the complex nucleotide mechanism, without which the glycogen cannot be hydrolysed. There are also the essential and very rapid changes undergone by the labile compound between creatin and phosphoric acid, which can be ærobically built up in the normal muscle.

How the nervous impulse is related to these chemical happenings may become clear before many years; and the clinical importance of such a discovery would doubtless be great. There would, for instance, be a rational basis for the consideration of the myopathies, where the disturbance of function occurs outside the nervous system; while we could hope for light upon the cause of the rapid fatigue of muscle seen in myasthenia gravis, and even upon the very practical problem of occupational palsies.

Already one of the complex nuclear derivatives referred to has been placed on the market as a dilator of the coronary vessels. Whether the claims made for its value in coronary occlusion will be substantiated, remains to be seen. In any event, the study of muscular action must always be of moment to the clinician, for however little we may employ the muscles of our limbs, there is no living if the heart should cease its work.

BRITISH MEDICAL ASSOCIATION—BELFAST DIVISION

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has already encroached on the activities of general practitioners, and many doctors are of the opinion that they are losing, or about to lose, legitimate spheres of practice, so that this discussion should be of value in obtaining the views of the Division.

Ben Vista, Antrim Road, Belfast. S. SIMMS, *Hon. Secretary.*

BRITISH MEDICAL ASSOCIATION, TYRONE DIVISION

A MEETING of the Division was held in the County Hospital, Omagh, on 20th May. The following office-bearers were elected for the coming year:—Chairman, Dr. A. H. T. Warnock, Trillick; vice-chairman, Dr. R. D. McAllister, Omagh; hon. secretary and treasurer, Dr. G. W. Gillespie, Carrickmore. A discussion then took place on the rate of payment for the drug capitation to the panel practitioners. This rate for the period October, 1930, to December, 1931, was two shillings for the practitioners, and it was alleged that to chemists it was at the rate of four shillings. It was further alleged that the Ministry in a circular referred to the payment to chemists as an interim one. The meeting concluded that nothing could be done in the matter beyond waiting for the action, if any, of the Central Practitioners' Committee. The following resolution was passed unanimously, and copies sent to the Ministry and to the Omagh Board: "That in the opinion of the Tyrone Division of the British Medical Association, when a dispensary medical officer applies for leave, and nominates a locum in accordance with the dispensary regulations, Boards of Guardians should accept as locum tenens the doctor nominated by the medical officer, unless there are good and sufficient reasons against so doing; and in the case of there being such reasons, should give the medical officer an opportunity of making an alternative nomination, and should not appoint a locum who may be unacceptable to the medical officer."

It was decided to hold the next meeting in the Dungannon end of the County.

Carrickmore, Co. Tyrone. G. W. GILLESPIE, *Hon. Secretary.*

LONDONDERRY MEDICAL SOCIETY

A MEETING of the Londonderry Medical Society was held in the City and County Infirmary at 4.30 p.m. on Friday, 18th March, 1932. Dr. Cooke presided, and there was a large attendance. Dr. Cooke made a touching reference to the death of Dr. H. W. Cuningham, and a resolution of sympathy with his family in their bereavement was passed in silence. Professor A. Fullerton then gave an address on the important question of treatment of the enlarged prostate gland. The lecture was profusely illustrated with lantern slides and diagrams, and the lecturer painted in a vivid manner the difficulties liable to arise in individual cases culled from his long experience. An index of the interest aroused by Mr. Fullerton's remarks was shown by the discussion which followed the lecture.

19 Clarendon Street, Londonderry. J. A. JOHNSTON, *Hon. Secretary.*

BRITISH MEDICAL ASSOCIATION—NORTHERN IRELAND BRANCH

THE annual meeting was held on 19th May in the King Edward Hall and Wards of the Royal Victoria Hospital, Belfast. A large number of members attended from all parts of the six counties. The programme of clinical material was a large one, and representative of all branches of medicine and surgery. Afterwards about seventy members had lunch in the Grand Central Hotel at the invitation of the president, Dr. Killen of Larne.

Professor W. W. D. Thomson was elected president for the Session 1932-33, and Dr. J. Armstrong of Ballymena president-elect; Dr. S. E. A. Acheson of Belfast was elected vice-president, Dr. T. B. Pedlow of Lurgan honorary treasurer, and Mr. C. J. Woodside of Belfast honorary secretary; representatives of public services, Dr. J. McCoy and Dr. J. R. Gillespie, and of the Ulster Medical Society, Dr. J. A. Smyth.

8 Elmwood Avenue, Belfast. C. J. A. WOODSIDE, *Hon. Secretary.*

LISBURN AND DISTRICT MEDICAL GUILD

THE annual meeting of the Guild was held in April at Dr. W. M. Hunter's, of Crumlin. The secretary and treasurer read the report of the previous year's transactions, and submitted the financial statement, which was adopted. Dr. Frances Bell was elected president for the coming year, and Dr. J. W. Peatt honorary secretary and treasurer. Mr. James S. Loughridge, F.R.C.S., then read a paper on the treatment of fractures. He first discussed Colles fracture, and advised the injection of 5 c.c. of 2 per cent. solution of novocain between the fracture areas, so as to produce painless manipulation. He then described the treatment of forearm fractures, and those of the supra-condylar region of the humerus. He next discussed the complications of Volkmann's contracture and myosites ossificans. He then gave a demonstration, by means of skeleton bones, of the mechanics of Pott's fracture, and, lastly, he discussed the injuries and treatment of the os calcis. Mr. Loughridge's paper was much appreciated.

The May meeting was held at Dr. Boyd's, of Hillsborough. Dr. Frances Bell occupied the chair. Dr. R. S. Allison gave an address on the diagnosis and treatment of gastric and duodenal ulcer. The history of the case, he said, was most important, and pointed out the long history of gastric disturbance usually elicited. He discussed the points of value in making a differential diagnosis of ulcer from the conditions which are liable to simulate it: chronic gastritis, congestion of the gastric veins, pylorospasm from irritation of vagus, etc. He also discussed the value of test meals in three types of case: anæmia, pernicious anæmia, and achylia. He emphasised the value of frequent small meals in treating this condition.

14 Railway Street, Lisburn. J. W. PEATT, *Hon. Secretary.*