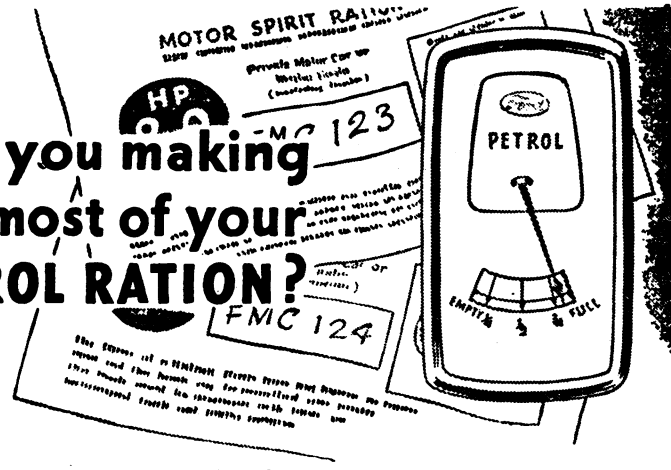
APRIL, 1942

THE ULSTER MEDICAL JOURNAL

PUBLISHED BY
THE ULSTER MEDICAL SOCIETY



Are you making the most of your PETROL RATION?

Take advantage of our

Special War-Time Service for Motorists

War conditions demand petrol economy and, as a car owner, your aim is to secure the maximum number of miles from the petrol ration at your disposal.

If you own a Ford you have taken an important step towards economy. In your own and the National interest make sure that your car is giving the high petrol mileage it is designed to give.

We will submit your car to skilled inspection and make any necessary adjustments to ensure economical running.

ASK US FOR DETAILS

PHONE 25208

R·E·HAMILTON & Co

MAIN DEALERS

32 LINENHALL ST · BELFAST ·

"MORE MILES PER GALLON IS GOOD—FEWER PENCE PER MILE IS BETTER"

Trade Mark **'METYCAINE'** Brand

Gamma-(2-Methyl Piperidino)-Propyl Benzoate Hydrochloride.

A local anæsthetic effective by topical and infiltrative application.

'Metycaine' has in general the same compatibilities and incompatibilities as cocaine and procaine.

The toxicity is less than that of cocaine and is comparable to that of procaine.

It does not alone blanch tissues, but may be combined with adrenaline and ephedrine for this effect.

It produces prompt, diffusible and profound anæsthesia. Its effects are obtained either by infiltration or by topical application to mucous membrane and similar surfaces.

ELI LILLY AND COMPANY LTD.

BASINGSTOKE and LONDON

Just to remind you -

TRADE **'HELMITOL'** MARK

BRAND OF **FORMAMOL**

A urinary antiseptic causing an acid reaction, in which the liberated formaldehyde can achieve its fullest action.

Powder in 1 oz. containers
Tablets of 5 gr. in containers of 25, 100, and 250
7½ gr. in containers of 20

TRADE **'CARBOSERIN'** MARK

BRAND OF **ACTIVATED CHARCOAL**

This medicinal charcoal possesses an adsorbent power which is forty times greater than that of ordinary charcoal.

Tablets of 6 gr. in containers of 50, and 500

TRADE **'PROMINAL'** MARK

BRAND OF **PHEMITONE**

The antispasmodic and anticonvulsant action of phenobarbitone is here exhibited with diminished hypnotic effect. It is indicated in routine treatment of migraine and epilepsy.

Tablets of ½ gr. in containers of 30, and 100
Tablets of 3 gr. in containers of 10, and 100

TRADE **'SELAROM'** MARK

BRAND OF **SALT-FREE CONDIMENT**

A substitute for table salt which is indicated in the diets of renal disease and circulatory metabolic disturbances. *Contains no Sodium Chloride.*

Containers of 2 oz., 8 oz. and 2 lb.

TRADE **'CHOLEFLAVIN'** MARK

BRAND OF **CHOBILAN**

This cholagogue has also the property of an antiseptic for the biliary passages. It possesses, in addition, an antispasmodic action.

Pellets in containers of 60

TRADE **'PELLIDOL'** MARK **OINTMENT**

BRAND OF **STAINLESS SCARLET RED**

A non-irritant and non-staining form of scarlet red. It promotes healthy granulation and is useful in the treatment of burns, abrasions and eczema.

Containers of 1 oz. and 8 oz. Also
Powder in 1 oz. containers

and to introduce

TRADE **'CYCLOFORM'** MARK **SUPPOSITORIES**

'CYCLOFORM' BRAND OF **BENZAMELID**

This analgesic, antiseptic and astringent combination is now presented in suppository form. In this way its efficiency is increased in the treatment of hæmorrhoids.

Boxes of 12, each 2½ gr.

ALL MADE IN ENGLAND

BAYER

BAYER PRODUCTS LTD • AFRICA HOUSE • KINGSWAY • LONDON • WC2

THE TREATMENT OF

Rheumatoid Arthritis

IN GENERAL PRACTICE

"In view of the appalling results of uncontrolled arthritis the slight risk accompanying gold treatment, when compared with the remarkable improvement and even complete cure which has resulted from the method in so many instances, makes it imperative to give it a trial in suitable cases and under proper conditions."

C. W. Buckley—"Arthritis, Fibrositis & Gout."

★ **MYOCRISIN** is a gold compound of low toxicity capable of stabilisation in aqueous solution It is painless on intramuscular injection and rapidly and completely absorbed. The prognosis in early cases of Rheumatoid Arthritis has been transformed by the introduction of gold therapy which is incomparably the most valuable method of attack in this hitherto intractable and crippling condition. In cases of longer standing when the process is still active, the use of **MYOCRISIN** brings about increased range of movement, reduction of pain and prevention of further disability. The published results are in agreement that clinical cure or marked improvement may be obtained in some 70 per cent. of the cases treated, with varying degrees of improvement in a further proportion. Cost is by no means excessive despite a general belief to the contrary and a course of treatment can be carried out for 35/-.

Supplies:

Ampoules of 0.01 Gm. at 1s. 9d.
Ampoules of 0.02 Gm. at 2s. 0d.
Ampoules of 0.05 Gm. at 2s. 6d.
Ampoules of 0.10 Gm. at 3s. 3d.
In aqueous solution or oil suspension.
Subject to our usual discount, plus purchase tax.

★ *Trade Mark*

Dosage . . .

Injections of 0.01, 0.02 and 0.05 gramme are given, and if there is no sign of intolerance, the treatment is continued with 0.10 gramme weekly until approximately 1 gramme has been administered in 10-12 weekly injections. Whatever degree of improvement results, relapse will occur unless further treatment is given, but 12 weeks' rest period must be allowed between courses.

4004 PHARMACEUTICAL SPECIALITIES M&B (MAY & BAKER) LIMITED DAGENHAM

Regulation Military Waterproofs

for SERVICE and CIVILIAN WEAR

WE have a large selection of WATERPROOFS and advise an early choice while the stock is available

DOUBLE TEXTURE WATERPROOFS, hand made and guaranteed waterproof; single breasted with belt, saddle flap, leg straps and wind cuffs,

75/- 95/- and 105/-

D.B. TRENCH COAT with detachable fleece lining and interlined oil fabric throughout - - - - **110/-**
Ditto without Fleece Lining - **84/-**

GENT'S DEPARTMENT GROUND FLOOR

OPEN ALL DAY WEDNESDAYS
CLOSED SATURDAYS ONE O'CLOCK

THORNTON'S

43 ARTHUR STREET FORMERLY OF DONEGALL PLACE

Phone : Belfast 22466 (2 lines)

for

MORNING COFFEES, LUNCHEONS
AFTERNOON TEAS, AND DINNERS

visit Belfast's most popular rendezvous

THE CARLTON

DONEGALL PLACE

OPEN 8 A.M. TILL 8 P.M.

PRIVATE ROOMS FOR BANQUETS, DINNERS, AND DANCING, FOR PARTIES OF TEN TO THREE HUNDRED

For Wedding Parties and other events requiring efficient and up-to-date catering apply to the Manager, who will be glad to submit quotations and make all necessary arrangements

Telephone 26861

Active little bodies

MUST have nutritious food in plenty, food so nutritious that, along with bodily growth, there should be a corresponding development of brain power

R.S.O. FOOD

"A PURE WHITE PRODUCT"

provides the necessary nutriment; it is a natural food in easily digested form

"There's a wealth of Health in every tin"

Product of

WHITE, TOMKINS & COURAGE LTD. - BELFAST

Manufacturers of Pure Foods since 1841

PRINTED FOR THE ULSTER MEDICAL SOCIETY BY GRAHAM AND HESLIP, LIMITED, BELFAST.
ADVERTISEMENT AGENTS : GEO. A. STEWART & CO., 25 WATERLOO GARDENS, BELFAST.

CONTENTS

PAGE

THE PAINFUL SHOULDER. R. J. W. Withers, M.D., M.CH., F.R.C.S.ED. - 1

THE TREATMENT OF ORO-MAXILLARY FISTULÆ CAUSED BY THE EXTRACTION OF TEETH. David H. Craig, F.R.C.S.ED. - - - - 10

BOOK REVIEWS - - - - - - - - 9, 17

THE HISTORY OF THE BELFAST SCHOOL OF OBSTETRICS. C. H. G. Macafee, M.B., F.R.C.S.ENG., F.R.C.O.G. - - - - - - 20

GAS ATTACKS: WHAT TO DO AND WHEN TO DO IT. Sir Joseph Barcroft, C.B.E., F.R.S., (HON.)M.A., M.D., D.SC. - - - - - 51

FUNCTIONAL PHENOMENA IN ORGANIC DISEASE. Robert Marshall, M.D., F.R.C.P.I. 62

THE ULSTER MEDICAL SOCIETY - - - - - - 68

Fellows and Members of the Ulster Medical Society receive the Journal free.
Subscription to non-members, five shillings annually.

CONTENTS

PAGE

THE PAINFUL SHOULDER. R. J. W. Withers, M.D., M.CH., F.R.C.S.ED. - 1

THE TREATMENT OF ORO-MAXILLARY FISTULÆ CAUSED BY THE EXTRACTION OF TEETH. David H. Craig, F.R.C.S.ED. - - - - 10

BOOK REVIEWS - - - - - - - - 9, 17

THE HISTORY OF THE BELFAST SCHOOL OF OBSTETRICS. C. H. G. Macafee, M.B., F.R.C.S.ENG., F.R.C.O.G. - - - - - - 20

GAS ATTACKS: WHAT TO DO AND WHEN TO DO IT. Sir Joseph Barcroft, C.B.E., F.R.S., (HON.)M.A., M.D., D.SC. - - - - - 51

FUNCTIONAL PHENOMENA IN ORGANIC DISEASE. Robert Marshall, M.D., F.R.C.P.I. 62

THE ULSTER MEDICAL SOCIETY - - - - - - 68

Fellows and Members of the Ulster Medical Society receive the Journal free.
Subscription to non-members, five shillings annually.

THE ULSTER MEDICAL JOURNAL

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, 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 advertisement controllers: Messrs. Geo. A. Stewart & Co., 25 Waterloo Gardens, Belfast. 'Phone: Belfast 47275.

DATES OF PUBLICATION

For the duration of the present war it is hoped to issue two numbers each year: on 1st April and on 1st October.

THE ULSTER MEDICAL SOCIETY

THE MEDICAL INSTITUTE,

COLLEGE SQUARE NORTH,

BELFAST.

Dear Sir (or Madam),

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 billiards-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 ULSTER MEDICAL JOURNAL, the official organ of the Society, is issued to all Fellows and Members free of charge.

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? Please make application to the Honorary Secretary, which 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.

We remain,

Yours faithfully,

G. G. LYTTLE, M.B.LOND., M.R.C.S.ENG., *President.*

H. HILTON STEWART, M.D., M.R.C.P.LOND., *Hon. Secretary.*

J. S. LOUGHRIDGE, M.D., B.SC., F.R.C.S.ENG., *Hon. Treasurer.*

.....19.....

To MR. J. S. LOUGHRIDGE,
26 UNIVERSITY SQUARE,
BELFAST.

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

Name .....

Postal Address .....

.....

Year of Qualification .....

BANKER'S ORDER

(Ulster Medical Journal)

.....19.....

Name of Bank .....

Address of Bank or Branch .....

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.*

Signature.....

2d.
STAMP

Address .....

This should be sent to the Honorary Treasurer, Mr. J. S. LOUGHRIDGE,
26 University Square, Belfast, for registration.

THE
ULSTER MEDICAL JOURNAL

PUBLISHED ON BEHALF OF THE ULSTER MEDICAL SOCIETY

Vol. XI 1st APRIL, 1942 No. 1

The Painful Shoulder

By R. J. W. WITHERS, M.D., M.CH., F.R.C.S.
from the Royal Victoria Hospital

THE views expressed in this paper are partly from current teaching on the problem of the painful shoulder and partly from a close personal study of almost two hundred cases.

The exclusion of tuberculosis, infective arthritis, fractures, dislocations, and bone tumours still leaves us with a well-defined clinical group of conditions of the shoulder which is characterised by pain, limitation of movement, and muscular wasting.

So-called minor injuries and affections of the shoulder, which are often referred to as "neuritis or rheumatism" of the shoulder, form an important part of orthopædic practice, since, although at the onset apparently trivial, they frequently lead to functional disability which may persist for months, years, or occasionally be permanent.

A detailed account of the anatomy of the shoulder would be quite out of place in a communication such as this, but attention should be directed to several important points which tend to modify ordinary joint-diseases in this region of the body :—

1. The wide range of movement which is permissible at the shoulder.
2. The peculiar triple muscular action required to raise the arm above the head. This is the combined action of the supra-spinatus initiating the first fifteen degrees, the deltoid continuing abduction to a right angle, and then, with the shoulder-joint fixed, the serratus magnus tilting the scapula forwards on the chest-wall in the last phase of full elevation of the arm.
3. The relatively small area of bony contact between the head of the humerus and the cavity of the glenoid.
4. The fact that the attachment of the arm to the body is effected mainly by muscles, and the important significance of the mobility of the shoulder-girdle.

5. The capsule of the shoulder-joint is very lax, and consists in great part of the fused and expanded tendons of the supra-spinatus, infra-spinatus, teres minor, and subscapularis muscles.
6. The presence between the expansion of the spinati and the deltoid of the large sub-deltoid bursa.
7. And lastly, from a comparative anatomy study, the recently acquired functions of the shoulder-joint. Watkins[1] has pointed out that despite the development of orthograde man, there has been no development of new shoulder-muscles. The muscles which were adapted to plantigrade action have merely had orthograde functions superimposed on them.

For example, the supra-spinatus was originally used to swing the forelimb forwards, but now its action is one of abduction and external rotation.

It follows that when the limb is disabled, this most recently acquired function will be the first to be affected and the last to recover.

Indeed, in a large percentage of cases of painful shoulder, the loss of movement is in a direction of abduction and external rotation, and the wasting is found in the supra-spinous fossa of the scapula.

These anatomical considerations make it obvious that disease will be more prone to attack the musculo-tendinous elements and their closely related bursæ, than the bony elements of the joint.

It must be the experience of all that chronic arthritis, such as one sees in the hip- or knee-joints, is a very rare condition indeed in the shoulder.

Dissatisfaction in the nomenclature of the disease processes must be firmly expressed. That clinicians have long recognised that the affections are chiefly in the soft parts has done nothing to clarify the position. For example, some, believing the bursæ to be at fault, have applied the term bursitis with appropriate adjectives added to describe further the type of bursitis present. Others, believing the tendinous cuffs of the rotators to be affected, have introduced the term tendinitis.

In this way the following terms have and are still being applied, be it noted, each to exactly similar conditions :—Bursitis, tendinitis, periarthritis, arthritis, synovitis, capsulitis, etc., and to those who would stress the painful nature of the conditions, neuritis, pseudo-neuritis, and rheumatism. Of all the terms used, the last three appear to have least to substantiate their continuance. Codman[2] believes that all parts of the joint are affected in the worst cases, but he is certain that adhesions in the sub-deltoid bursa are the most significant from a point of view of treatment.

The majority of clinicians appear to lean to the view nowadays that most cases of stiff and painful shoulders are primarily due to lesions in the tendinous expansions of the rotator muscles, and especially of the supra-spinatus, and that the bursæ or synovial membrane are only secondarily affected.

If this be true, it would be reasonable to make more universal use of the term tendinitis, remembering that other structures will be affected in proportion to the

severity of the case, and to attempt to point to the type of tendinitis by the addition of suitable adjectives.

PATHOLOGY.

Whilst the pathology has not yet been fully investigated, a large amount of evidence in support of the above beliefs is gradually forthcoming by a study of the results of novocaine injection into painful joints, of manipulation, of post-mortem examinations, and of operative findings.

For example, novocaine injection in the irritable stage will return to almost normal the ability of elevation of the shoulder. Again, manipulation at this stage will increase the irritation and cause a worsening of the symptoms; whilst if carried out when adhesions have formed, may often effect a complete cure.

Akerson's[3] study of two hundred painful shoulders by post-mortem examination throws some light on the underlying pathological processes.

Thirty-two per cent. of the cases he examined showed ruptures of the supra-spinatus tendon, and in a fair proportion of these the tears were sufficiently large to reveal the articular cartilage of the humeral head when the sub-deltoid bursa was opened. Normally, on opening the bursal roof, the shining bursal floor covering the tendon is visible, the head of the humerus being completely hidden from view.

In some cases portions of the infra-spinatus and subscapularis tendons were also ruptured. Not all the ruptures were by any means complete ones, and many showed minor tears involving neither the whole width nor the entire thickness of the tendon, and with the bursal floor intact over them.

In actual practice, complete tendinous ruptures must form a small percentage of all cases. For example, in my series of cases, seven came to operation with the diagnosis of complete rupture, and only in two was the diagnosis verified.

It is likely that incomplete ruptures form a large number of cases, even where direct trauma cannot unquestionably be proved.

Other changes seen in the tendinous cuffs were calcified deposits which varied in size from a pin-head to much larger areas sufficient to throw a shadow on the X-ray plate. Codman believes that pin-head deposits are very common, though his belief cannot be verified, as X-rays are constantly negative.

The larger areas used to be thought to be in the sub-deltoid bursa, but this is now known to be inaccurate, since constantly the floor of the bursa has to be incised before the calcareous material can be exposed.

Areas in the cuffs of inflammatory reaction were also found, and were seen on section to consist of fibrin and necrotic fibrous tissue.

The pathological changes in the sub-deltoid bursa are of the utmost importance. The bursa can be compared to the peritoneum, in that it shares the pathology of the organs which it protects. In appendicitis there is peritonitis in the right iliac fossa with guarding or rigidity of the overlying abdominal muscles; so, in tendinitis there is bursitis with rigidity of the shoulder-muscles related to it. In this way scapulo-humeral movement is greatly limited from the early stages, and in the worst cases may be completely absent.

The presence of the tendinitis causes an outpouring of an inflammatory exudate into the bursa, which becomes absorbed wholly or in part as the tendinitis settles down.

Still considering the comparison with the peritoneum, adhesions may form in the bursa and remain as a permanent feature, so that the range of scapulo-humeral movement will be reduced by structural changes. During the acute or irritable stage, where the tendons are inflamed, over-enthusiastic or manipulative treatment will cause a further outpouring of fluid rich in fibrin, and will further increase the risk to the patient of adhesion-formation. It must be everyone's experience that in some of their cases early manipulation has been a complete failure, and in fact has actually caused further stiffness of the shoulder to develop.

Few changes are found in the bones or in the true joint-cavity, and it is the usual experience that X-ray examinations are constantly negative. This is not to suggest that X-rays need not be taken in these cases; quite the reverse, in fact, since a negative X-ray (where the triad of pain, stiffness, and muscle-wasting is present) undoubtedly points to the diagnosis of some form of tendinitis.

THE CLINICAL GROUPS AND THEIR TREATMENT.

From a practical point of view, three groups of painful shoulder can be distinguished :—

(a) TRAUMATIC TENDINITIS—sub-divisions :complete rupture and incomplete rupture.

(b) IRRITATIVE TENDINITIS—where the limitation of movement is due to inflammation in the tendons and is therefore protective.

(c) ADHESIVE TENDINITIS—where limitation of movement is due to adhesion formation in the bursæ or more rarely in the synovial cavity.

(a) TRAUMATIC TENDINITIS.

1. *Complete tendinous rupture.*—This condition is found in heavy workers over 40 years of age, and is more common in men than in women. The usual history is of an acute strain to the shoulder, such as lifting a heavy weight. Sometimes the patient will volunteer the information that he felt something "give in the shoulder." Pain comes on immediately and rapidly gets worse, so that sleep is soon interfered with. The pain is generally felt in relation to the insertion of the deltoid, though occasionally it is felt over the joint itself. On examination, three signs are constantly present :—

(a) Inability to abduct the arm from the side, though the deltoid can be felt strongly contracting.

(b) Inability to maintain the arm in the abducted position when so placed by the examiner. As soon as the examiner's hand is taken away, the arm falls immediately uselessly to the side.

(c) The presence of a full range of passive movement. This sign distinguishes at once cases of ruptures from other forms of tendinitis where passive movement is always restricted.

Sometimes tenderness on pressure over the greater tubercle of the humerus can be elicited, and some examiners have claimed that they can actually feel a hollow

through the deltoid muscle, representing the tear in the tendon. Occasionally cases of incomplete rupture present almost identical signs, and an unnecessary operation may be embarked upon. However, there is very clear indication for early operation, since the results of non-operative treatment or of late operation are on an average extremely poor.

As an example, some time ago I operated on a man who had been diagnosed nineteen weeks previously as a case of deltoid paralysis and had been kept for all that time in an abduction splint. At operation a large triangular shaped rent was found in the tendon of the supra-spinatus muscle with scarring round its edges. With much difficulty the tendon was repaired, but unfortunately no improvement in the man's condition resulted, and he now has permanent loss of abduction.

Most of the ruptures described are of the supra-spinatus, and most are about 1 or $1\frac{1}{2}$ cm. from the bony insertion.

The operative approach is an easy one. An incision two inches long is made from the acromio-clavicular joint downwards, and deepened to separate the fibres of the deltoid. The roof of the sub-deltoid bursa is incised and the floor of the bursa inspected. If a complete rupture is present, the cartilage of the humeral head immediately comes into view, whilst if no rupture has occurred, the humerus remains completely hidden. The tear is then sewn back to the greater tubercle with silk, and the shoulder immobilised in an abduction splint for many weeks before any active exercises are permitted.

Cuthbert Wallace, in discussing traumatic lesions of the abdominal viscera, stated that it is better to look and see than to wait and see. So with the shoulder: if complete rupture of the supra-spinatus is suspected, immediate operation is the best method of treatment. The operation is a simple one, and does no harm if unnecessarily performed, whilst a permanently useless arm may easily result from the non-operative treatment of a complete rupture.

2. *Incomplete tendinous rupture.*—Whilst complete ruptures usually occur from a single strain of the joint, incomplete ones are more often the result of occupational strain, where excessive abduction of the shoulder has been carried out over a long period of years. They may also follow a fall or a blow on the shoulder or may result from degenerative processes in elderly subjects.

The pain in this type is never severe to begin with, but often is more of the nature of a "catch" during certain movements. After several weeks the pain becomes more marked, and is referred to the insertion of the deltoid muscle, presumably as a reflex through the circumflex nerve. Characteristically, the pain is felt only during mid-elevation of the arm. That is, 0 to 60 degrees abduction, no pain; 60 to 120, severe pain, and usually a slowing down of the speed of elevation; 120 to full elevation, again quite painless.

During mid-elevation of the arm the supra-spinatus tendon is passing under the acromion and is closely impinging on the bone. It is likely then that the pain is due to acromial pressure on the damaged part of the tendon.

Soon the patient learns to externally rotate the humerus before abduction is commenced, so that acromial pressure is thereby avoided. Inversion of the normal

scapulo-humeral rhythm often occurs in these cases. Instead of the first 90 degrees elevation being scapulo-humeral, it becomes scapulo-thoracic. This can often only be appreciated by examining the patient from behind, from which position the relations of scapulo-humeral to scapulo-thoracic movement can at once be seen. This inversion is unconsciously carried out in order to avoid the voluntary contraction of the supra-spinatus and the avoidance of pain from its contraction.

If recovery does not occur at this stage, an irritable condition is set up in the sub-deltoid bursa, fluid is poured out into it, and soon the shoulder-muscles go into spasm, so that wholly or in part scapulo-humeral movement becomes restricted. The arm can then only be abducted through scapular action, and the condition passes into one of irritative tendinitis.

Treatment of incomplete ruptures.—Conservative measures are generally successful. The shoulder is immobilised in an abduction splint in a position of 90 degrees abduction and 45 degrees external rotation. This position should be maintained for several weeks. In severer cases two to three months may be required before healing has taken place. At the end of three months, if it is thought that healing is incomplete, the tendon should be exposed by operation, and if a rupture is found it should be repaired.

The abduction splint requires firm bandaging to the chest-wall by many carefully applied turns of bandage material, otherwise it slips and allows stretching of the healing lesion to occur. This is dangerous and may lengthen by weeks the period of immobilisation necessary. The immobilisation should be of the same nature as for a fracture, i.e., absolute and uninterrupted.

In mild cases repeated injections of novocaine into the tendon will affect a cure within a short time.

(b) Irritative Tendinitis.

In this group, following trauma degeneration or infection, the tendinitis sets up an inflammatory reaction in the bursa. A sero-fibrinous exudate is poured out, and reflex spasm of the scapulo-humeral muscles results. Often this muscle guarding is so complete that only by scapulo-thoracic action can any movement of the arm be effected. Pain is of a more constant nature than in traumatic tendinitis cases, and is present through all movements. Forcible attempts at movement produce nothing except an increase of the pain.

Usually the patient cannot lie on the affected shoulder, and sleep may be interfered with.

Swelling of the deltoid region may be present on examination, due to fluid in the bursa, and wasting of the spinati is invariably in evidence. X-ray examination is negative in the great majority of cases, but, in a few, calcified areas in the supra-spinatus tendon can be seen.

The etiology of this group is often obscure or the evidence in favour of any suspected cause sometimes inconclusive. It is possible that they are all of traumatic origin, the trauma coming either from outside or from changes within the joint itself.

I have been impressed, on looking over my cases, by the relatively large number

which followed influenza, pneumonia, and throat infections. Some others appear to come on spontaneously, whilst others follow degeneration, including calcium deposition. The average age of patients is 45 to 50.

Treatment.—The worst treatment is manipulation under anæsthesia or passive stretching and massage by a masseur or masseuse. Such forcible measures tear inflamed tissues, increase the bursal exudate, and often reduce the range of shoulder-movement.

Rest is the first essential, and this is best carried out by the application of a shoulder-abduction splint. Combined with the local administration of heat, pain readily disappears. A short gas-oxygen anæsthetic may be required in severe cases to relax momentarily the muscles for the proper application of the splint. In a position of abduction and external rotation, maximum rest to the inflamed tendons is granted, and even should adhesions later form, they will quickly be stretched by the arm and little disability will result. The splint should be worn until bursal or joint irritability is at an end. This can be appreciated by removing the splint from time to time and gradually lowering the arm. If irritability is still present, the shoulder-muscles will be felt suddenly to go into spasm, movement downwards to stop, and pain to be complained of.

When irritability only comes on at the lowest 20 degrees of abduction, the splint can be discarded and active exercises commenced.

The exercises required.—Our aim at the start, remembering the comparative anatomy of the supra-spinatus, should be to imitate the plantigrade actions of the shoulder. Hence all exercises are carried out first in the crouching or stooping position. With the body well bent forwards, the patient swings his arm forwards and backwards and then attempts to sweep it across his chest.

Next, lying on his back flat on a couch, the patient slides his hands up behind his neck, and clasping them there, attempts to force the arms backwards so that the elbows touch the couch.

No exercises in the upright position are allowed at this stage, i.e., no true abduction drill, until the patient is proficient in the first exercises. He should practise at home these movements for five minutes several times a day.

When proficiency has been attained, he should attend a class for shoulder drill, where other shoulder exercises are practised, and each class should end off with five minutes on the pulley-block wall combination.

No mention is made of massage, ionization, diathermy, or passive stretching, and none will be. As previously mentioned, the sooner we forget massage and other passive measures the better it will be for our patients.

The keynote to the problem is activity, but an activity entirely of the patient's own.

At the commencement of mobilisation some pain may be experienced, so that the patient may become discouraged and give up his exercises. This must be avoided at all costs, for, without activity, adhesions will form and the patient's state will then be worse than before.

A few c.c. novocaine injected into the bursa will be found to allow, in apprehensive subjects, the movements to be carried out smoothly and painlessly.

If calcium deposits are present in the tendinous cuffs, washing out the bursa with normal saline will be found helpful. Their presence should be suspected if joint irritability is still present after eight weeks rest in an abduction splint.

It has been stated by some that cases of calcified tendinitis tend to cure themselves, but this has not been my experience. In fact, some of the worst cases with which I have had to deal have been just of this type.

(c) Adhesive Tendinitis.

This condition has been called "frozen shoulder" by some, by others chronic obliterative bursitis, periarticular adhesions, ankylosis of the shoulder, etc.

As a result of trauma degeneration or inflammation in the tendinous cuffs, adhesions form in them or round them mainly on their bursal aspects. The clinical result is a rigid painful shoulder in which all or nearly all scapulo-humeral movement is lost.

Some patients, in time, learn to compensate for this by the development of an increased range of scapulo-thoracic movement. It is important to be able to distinguish between irritative tendinitis and adhesive cases. This can be done in three ways :—

1. Absence of joint irritability in adhesive cases.
2. By the results of novocaine injection into the bursa. In irritative tendinitis a considerable return of humeral movement follows the injection, whilst with adhesions no appreciable alteration in the range of movement is produced.
3. There is much more wasting of the spinati in adhesive cases than in irritative.

It is also obvious that the longer the history of the patient's complaint the more likely that adhesions are present.

Treatment.—The indications resolve themselves into two :—

(a) Stretching the adhesions either gradually or suddenly, and

(b) The building up of the atrophied muscles by exercises.

Gradual stretching of adhesions can be carried out by putting the patient to bed without pillows and tying the wrist of the affected arm to the top of the bed. The head end of the bed is then gradually blocked up so that the patient tends to slide downwards in the bed, leaving the arm behind, which then takes up a position of abduction and external rotation. This is a most excellent method, but unfortunately produces a considerable amount of pain, so that the patient requires to be kept under the influence of morphia during the treatment. Usually two or three days are needed before the arm takes up the required position. Thereafter, exercises as previously detailed are practised religiously and persevered with until movements are maximal.

Sudden stretching of adhesions is effected by manipulation of the joint under general anæsthesia. Several points must be stressed :—

(a) Great gentleness is necessary.

(b) The shoulder should be put through only one range of movement at a time, so that in severe cases several manipulations will be necessary. External

rotation will be found to be the most useful movement, and often one finds that full external rotation is the only manipulation required, the other movements returning afterwards by exercise. We often hear the expression, "I put the joint through its full range of movement." This sounds impressive, but is bad orthopædics, since rough tearing of adhesions results in bleeding, organisation of the blood-clot, and further adhesion formation.

During most successful manipulations, adhesions can be felt or even occasionally heard giving way.

(c) The day following manipulation the patient must exercise the shoulder and attempt to get the arm up to the position which the surgeon accomplished under the anæsthetic. For this reason, it is advisable that the masseur be in attendance during the manipulation to see what range of any one movement is possible in the individual case.

Exercises are persevered with until movement is as nearly complete as possible or until it is thought necessary to do a further manipulation. If the spinati are much wasted, faradic stimulation of them will be found a useful adjunct.

TO SUMMARISE THE POSITION.

1. It is suggested that the majority of cases of stiff and painful shoulder are due to an underlying tendinitis.
2. Other varieties of stiff shoulder do of course occur, but they are uncommon.
3. From a practical point of view, it is important to distinguish between traumatic, irritative, and adhesive varieties of tendinitis. It is not sufficient to X-ray the shoulder and then send the case to a physio-therapist.
4. Manipulation should only be employed where adhesions are without doubt present.
5. The value of activity on the patient's own part is stressed. It is doubtful whether massage, diathermy, etc., are of very much value.

REFERENCES.

1. WATKINS: *Journal of Bone and Joint Surgery*, vol. 7, 1925, p. 788.
2. CODMAN: *The Shoulder*, Boston, 1934.
3. AKERSON: *Annals of Surgery*, 1931, xciii, 348.
4. MERCER: *Orthopædic Surgery*, 1932.
5. BURNS AND ELLIS: *Recent Advances in Orthopædic Surgery*, 1937, pp. 151-176.

REVIEW

DISORDERS OF BLOOD PRESSURE. By various authors. Edited by Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D., F.R.C.P., and Alan Moncrieff, M.D., F.R.C.P. Pp. 83. 6s. net. Published by *The Practitioner*.

ARTICLES published in "The Practitioner" in recent years on Disorders of Blood Pressure, after revision and the addition of illustrations, have now been published in this small volume. In addition, a valuable chapter on Nephrosclerosis and Malignant Hypertension has been specially contributed by Professor W. W. D. Thomson. There are six chapters, each by a well-known physician, which present the subject clearly. The booklet should be a most useful supplement to the ordinary textbook; and it can be thoroughly recommended to all general practitioners, particularly to those specially interested in medical examinations for life insurance.

rotation will be found to be the most useful movement, and often one finds that full external rotation is the only manipulation required, the other movements returning afterwards by exercise. We often hear the expression, "I put the joint through its full range of movement." This sounds impressive, but is bad orthopædics, since rough tearing of adhesions results in bleeding, organisation of the blood-clot, and further adhesion formation.

During most successful manipulations, adhesions can be felt or even occasionally heard giving way.

(c) The day following manipulation the patient must exercise the shoulder and attempt to get the arm up to the position which the surgeon accomplished under the anæsthetic. For this reason, it is advisable that the masseur be in attendance during the manipulation to see what range of any one movement is possible in the individual case.

Exercises are persevered with until movement is as nearly complete as possible or until it is thought necessary to do a further manipulation. If the spinati are much wasted, faradic stimulation of them will be found a useful adjunct.

TO SUMMARISE THE POSITION.

1. It is suggested that the majority of cases of stiff and painful shoulder are due to an underlying tendinitis.
2. Other varieties of stiff shoulder do of course occur, but they are uncommon.
3. From a practical point of view, it is important to distinguish between traumatic, irritative, and adhesive varieties of tendinitis. It is not sufficient to X-ray the shoulder and then send the case to a physio-therapist.
4. Manipulation should only be employed where adhesions are without doubt present.
5. The value of activity on the patient's own part is stressed. It is doubtful whether massage, diathermy, etc., are of very much value.

REFERENCES.

1. WATKINS: *Journal of Bone and Joint Surgery*, vol. 7, 1925, p. 788.
2. CODMAN: *The Shoulder*, Boston, 1934.
3. AKERSON: *Annals of Surgery*, 1931, xciii, 348.
4. MERCER: *Orthopædic Surgery*, 1932.
5. BURNS AND ELLIS: *Recent Advances in Orthopædic Surgery*, 1937, pp. 151-176.

REVIEW

DISORDERS OF BLOOD PRESSURE. By various authors. Edited by Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D., F.R.C.P., and Alan Moncrieff, M.D., F.R.C.P. Pp. 83. 6s. net. Published by *The Practitioner*.

ARTICLES published in "The Practitioner" in recent years on Disorders of Blood Pressure, after revision and the addition of illustrations, have now been published in this small volume. In addition, a valuable chapter on Nephrosclerosis and Malignant Hypertension has been specially contributed by Professor W. W. D. Thomson. There are six chapters, each by a well-known physician, which present the subject clearly. The booklet should be a most useful supplement to the ordinary textbook; and it can be thoroughly recommended to all general practitioners, particularly to those specially interested in medical examinations for life insurance.

The Treatment of Oro-Maxillary Fistulæ caused by the Extraction of Teeth.

By DAVID H. CRAIG, F.R.C.S.ED.,

Major, R.A.M.C; Otologist to a Military Hospital; Surgeon, The Belfast Hospital for Sick Children; Assistant Surgeon, The Benn (Ulster) Ear and Throat Hospital.

Two hundred and ninety years ago Nathaniel Highmore described the earliest recorded case of oro-maxillary fistula in the following terms :—

"A gentlewoman who had the dens caninus drawn on account of an inveterate defluction of sharp humor, on thrusting a silver bodkin into the alveolus was exceedingly frightened to find it pass as it did almost to her eyes. Upon further trial with a small feather stripped of its plume, she was so terrified as to consult a doctor and others imagining nothing less than that it had gone to her brain. But they, considering the circumstances, found that the feather had doubled only into the cavity."

Keith describes the development of the maxillary antrum as follows :—

"At birth the sinus is only a shallow recess on the outer wall of the middle meatus above the germ of the first milk molar tooth. It continues to grow until the twenty-fifth year, and is the only one of the air sinuses developed from the nasal cavity which is more than a rudiment at the time of birth. In the years of adolescence the sinus expands until it inflates the maxillary part of the molar. As it expands backwards, the posterior border of the maxilla which contains the buds of the permanent molar teeth undergoes a rotation downwards, so that what was situated on the posterior border comes to be situated on the alveolar border.

"If the process of growth and rotation are arrested, the last molar tooth is left on the posterior border of the maxilla, where it may give rise to pain and suppuration."

The thickness of the antral floor and the number of teeth which are in relationship to it are consequently somewhat variable. The roots of the first or second molar or the second bicuspid most commonly may penetrate the floor, but where the antrum is large its floor may extend from the canine tooth to the third molar.

The antrum may be opened during a dental extraction, where for development reasons the floor is so thin that the roots of the tooth project through it, or where there is such a degree of infection round a root that the sinus floor necroses and readily comes away when the tooth is extracted. Though it is not uncommon for the antrum to be thus opened, an oro-maxillary fistula is not often seen. It would seem that it is a failure in technique, which permits the opening to persist until the buccal and antral mucosa unite, and the fistula becomes permanent.

The purpose of this paper is to consider how the development of such a permanent fistula may be avoided, and if already established, how it may conveniently be cured.

Symptoms.

Many patients with a oro-maxillary fistula find that the sensation of air passing through the fistula from the nose into the mouth is a disagreeable one; some complain that since the fistula developed, their voice seems to them to have acquired a nasal quality; almost all suffer from a continuously bad taste in the mouth, a nasal discharge, and in some degree, headache and nasal obstruction. Every patient finds his fistula a considerable inconvenience, and all are eager to have it repaired.

Types of Fistula.

Oro-maxillary fistulæ caused by the extraction of teeth may be classified as follows :

(a) *Temporary*.—Before the mucous membrane of the antrum and of the gum have united—

(i) Where the antrum is not infected.

(ii) Where the antrum is infected.

(b) *Permanent*.—Here the fistula has persisted until there is a union of the buccal and antral mucosa. Such fistulæ vary considerably in size—from quite a large opening, perhaps 7 mm. in diameter, through which the mucosa of the antrum pouts, to an almost imperceptible orifice from which oozes beads of pus. The fistula may be situated in the middle of the alveolar ridge or on its lateral side. I have not seen one on the medial aspect of the alveolus. Its size and situation in the gum bear no constant relationship to the deficiency in the bony floor of the antrum. At operation, a fistulous track may be found to lead through the soft tissues, from quite a minute orifice in the centre of the gum to a large opening into the antrum, on the lateral aspect of the alveolar ridge.

The scar-tissue, which is a constant feature round the opening, by its contraction tends to narrow the fistulous track, but while the antrum infection persists, rarely succeeds in entirely occluding it. (Case 7.)

Treatment.

(a) *Temporary Fistulæ*.—Voorhees has described the irrigation of the antrum via a tooth-socket for the treatment of an infected sinus as "the worst operation in surgery, which converts a simple condition into a chronic suppuration." These warning words should be remembered when the antrum is first opened. If no antral infection is present, it is sufficient to suture the gum edges of the tooth-socket together immediately, thus supplying a framework on which the clot can organise and healing take place. Should the antrum be infected at the time of the extraction of the tooth, or if suppuration should supervene in the course of a few days, it should be repeatedly washed out via the inferior meatus of the nose. I cannot too strongly urge that probing or irrigation of the antrum via the tooth-socket, especially if repeated, entails a very considerable risk of converting a temporary into a permanent fistula.

All local interferences should be reduced to a minimum, and every effort made to avoid injury to the mucous membrance of the floor of the antrum.

(b) *Permanent Fistulæ*.—Before any repairative operation for the fistulæ is undertaken, treatment must be directed to the infected antrum. In all cases an intranasal antrostomy should first be performed, and the antrum irrigated through the

orifice so provided until the infection subsides. Apart from the rather restricted field of operation, and the concomitant antral infection, technical difficulties arise in the repair of these fistulæ owing to the scar-tissue which surrounds them. A variety of plastic procedures have been suggested to obtain adequate flaps. Welty and Ashley have described methods of obtaining such flaps from the hard palate; and Axhausen and Berger from the substance of the cheek.

From the tissue of the cheek a thick, well vascularised flap can easily be obtained, which takes well, and which can readily be adapted to all positions and sizes of fistulæ. This source was used in the cases here reported.

The method adopted was as follows:—Under general anæsthesia, with an intra-tracheal tube, passed via the nose, in situ; the patient was placed on his back, his head slightly extended over a pillow, the mouth kept open by a dental prop, and the pharynx packed off.

The area of the gum and cheek to be operated on was injected with adrenaline 1 : 1000 in normal saline. It has been found that 1 c.c. of adrenaline hydrochloride solution to 10 c.c. normal saline can safely be used if no chloroform has been given to the patient. This injection produces satisfactory hæmostasis.

The flap was cut to include the orifice of the fistula. The incisions were made right down to the bone of the alveolus, and diverged slightly as they passed into the soft tissues of the cheek. The free end of the flap, which included the orifice of the fistula, was cut off with sharp scissors. A bed was prepared on the medial aspect of the gum for the reception of this flap, by removing an area of mucous membrane only, and undermining the edges slightly, so that the sutures could more readily be inserted.

This lateral flap was arranged to lie easily, without any tension, in the bed prepared for it. The fistulæ in the floor of the antrum, which at this stage of the operation had been fully exposed, was thoroughly curetted with a sharp spoon to remove all the lining mucosa.

All bleeding was arrested by adrenaline packs before the flap was sutured into place, with OOO catgut on a No. 6 mersuture squint needle.

Temporary Fistulæ.

Case 1.—Referred from the dental department. Three days previously the second bicuspid on the right side had been extracted, the antrum was opened, but was not washed out. The patient complained of pain in the right cheek, and of a purulent discharge from the nose and into the mouth for the past twenty-four hours.

On examination, pus was oozing through the normal ostrum of the right antrum and trickling over the inferior turbinate, and escaping through the fistula in the gum into the mouth. The right antrum was washed out via the inferior meatus of the nose, and an abundance of thick foul-smelling pus was recovered. This washing out was repeated every day for a period of five days. On the fourth day the washings no longer escaped into the mouth. Then followed wash-outs on alternate days for a further week—there was now very little pus in the returned fluid, and wash-outs were continued twice a week for a further fortnight. The antrum was

then quite clean and the fistula soundly healed. This patient had no further symptoms.

Case 2.—The patient was referred from the dental department. The antrum had been opened when the first left upper molar was extracted four days previously. No probing or irrigation had been done. The patient was complaining of pain in the left cheek. On examination, the tooth-socket was filled with a sloughing mass, and the left antrum was found to be acutely infected. When the antrum was washed out, via the inferior meatus of the nose, pus was recovered, and the irrigating fluid flowed freely into the mouth, via the tooth-socket. This washing out was repeated daily for a week; after which time the fluid no longer escaped into the mouth, and the washings were much clearer.

Twice-weekly irrigations were now performed, and at the end of a fortnight the antrum was quite clean, and the tooth-socket soundly healed. The patient had no further symptoms.

Case 3.—The antrum had been opened when the second left upper biscupid was extracted three days previously. Infection of the antrum had occurred, and the patient had a considerable amount of discomfort. His antrum was washed out daily, via the nose, and after ten days the tooth-socket was soundly healed, and the antrum quite clean.

Permanent Fistulæ.

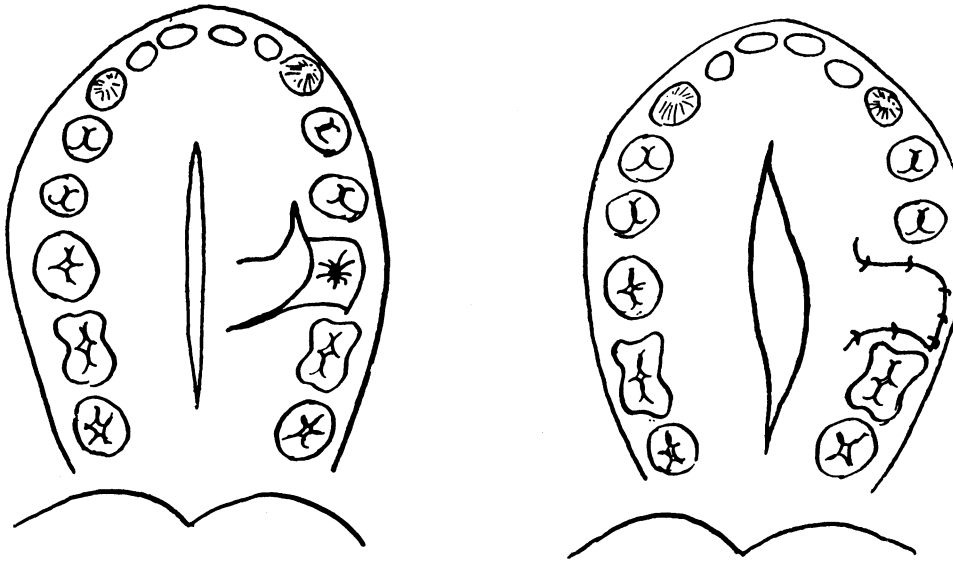
Case 4.—A persistent fistula after the extraction of the second left upper molar two years before. The patient complained of an unpleasant taste in the mouth, of a nasal discharge, that the air whistled into his mouth when he blew his nose, and that his voice had acquired a nasal quality.

On examination, on the left side of the upper jaw there was a fistula in the centre of the gum about 3 mm. in diameter, through which the mucosa of the antrum pouted. The antrum was washed out via the fistula, and a considerable amount of muco-pus was recovered. The patient was provided with a syringe and a length of rubber tubing and given instructions to wash out the antrum, via the fistula, with a solution of acriflavine 1 : 1000. After a month he returned, was admitted and the fistula repaired. The flap took well, convalescence was uneventful, and he was discharged from the hospital after ten days. When seen two months after the operation, the flap was soundly healed, he stated that his symptoms were relieved, and that the nasal discharge had ceased to worry him.

Case 5.—Persistent fistula in the right upper alveolus after the extraction of the teeth six months ago. The patient complained of the passage of air through the fistula and of an unpleasant taste in the mouth.

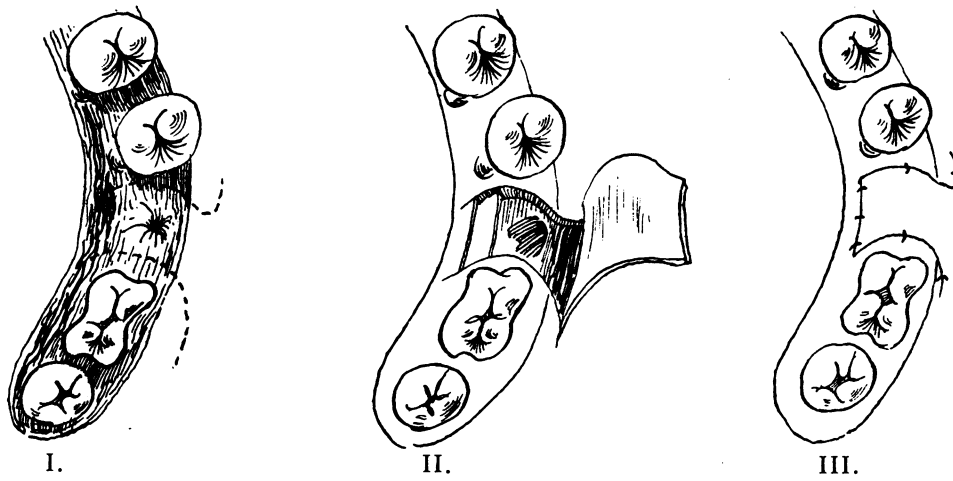
On examination, the second bicuspid and the first and second molars had been extracted from the right upper jaw. There was a small slit-like fistula over the centre of the gum in the region formerly occupied by the first molar. The area of the gum surrounding the fistula was extensively scarred, and it was not found possible to insert a probe into the antrum via the fistula.

The right maxillary antrum was washed out on two occasions, and as only a few blobs of muco-pus were recovered, the patient was admitted and the plastic



I. II.

METHOD OF WELTY AND ASHLEY



I. II. III.

METHOD OF AXHAUSEN AND BERGER

operation of the fistula proceeded with. At operation, a fistulous track was found leading through the gum from the fistula to the actual orifice in the antral floor, which was on the lateral side of the alveolus near the site of the removed second bicuspid, and was about 6 mm. in diameter.

After the operation the patient's progress was as follows:—

2nd day—Right cheek painful—very greatly swollen—right lower eyelid œdematous.

4th day—No pain. Swelling of cheek much less.

7th day—Slight sloughing round edges of flap.

12th day—Right cheek again very swollen and tender.

14th day—Swelling and tenderness subsided.

16th day—Cheek again very swollen.

18th day—Cheek still swollen and tender.

19th day—Right intra-nasal antrostomy.

20th day—Small area in centre of flap broken down.

23rd day—Quite severe bleeding from right nostril during the night. Right antrum washed out—antrum full of blood-clot.

27th day—Patient discharged. (There remained a small hole in the centre of the flap, which will require repair. The patient was moved out of the area and was lost sight of.)

Case 6.—This patient stated that eighteen months ago a tooth was extracted from the left side of the upper jaw. His antrum was opened at the time of the extraction, and for three weeks the dentist washed it out via the tooth-socket. Now he complains that he always seems to have a cold in his head, and that he has constant headaches over the left side of his forehead, and a bad taste in his mouth.

Three months ago a radical antrum operation had been done on the left side. He had no relief of his symptoms.

On examination, it was found that the first and second bicuspid and first molar had been removed, and there was a small slit-like fistula on the lateral side of the left upper jaw near the site of the missing first molar.

It was found easy to pass a canula from the nose into the left maxillary antrum, which was washed out and a considerable amount of muco-pus recovered. This washing out was repeated daily for three weeks, until the cavity was quite clean, and the patient made no complaint of nasal discharge.

At operation, the deficiency in the antral floor was found to be in the region of the missing second bicuspid and to be unusually large. The whole of the lateral portion of the alveolar ridge over the region of the missing tooth was absent, so that a fistula quite 7 mm. in diameter was found.

A little difficulty was found in shaping the flap, owing to the lateral position of the fistula and the extreme scarring which surrounded it.

The patient's convalescence was uneventful, beyond a transitory swelling of the cheek on the fourth day, and he was discharged on the fourteenth day soundly healed.

Case 7.—The patient stated that since teeth were extracted from the left side

of the upper jaw twelve months ago, he had suffered from a bad taste in the mouth —nasal obstruction, a profuse nasal discharge, and headaches over the left side of his forehead.

Three months ago he stated that a nasal operation was performed. His symptoms were not relieved. On examination, the upper jaw was found to be edentulous, and there were two very fine fistulæ in the centre of the gum on the left side—about the regions of the second bicuspid and first molar respectively—from which oozed beads of pus.

There was a deflection of the septum to the left, the airway was very inadequate on that side—the nasal mucosa was swollen and œdematous, and there was a profuse purulent nasal discharge. The patient was admitted to the hospital, and a sub-mucous resection of the septum performed. It was found that a previous intra-nasal antrostomy had been done. The antrostomy opening still patent, and a week after the operation, daily antrum wash-outs were instituted.

After three weeks all symptoms subsided, and there was no further discharge into the mouth. Since the fistula had apparently now closed spontaneously, no further operative treatment was undertaken. When the patient was examined six months later his symptoms had not returned.

Case 8.—The antrum was opened by the extraction of the right upper molar three months ago, and had been afterwards washed out through the socket by the dentist daily for three weeks. The patient now complained of a constant nasal discharge and of a bad taste in the mouth. On examination, the right maxillary antrum was found to be full of pus. The second bicuspid and the first molar had been removed from the right upper jaw, and there was a large fistula in the centre of the gum in the region of the first molar. The patient was admitted to hospital, and a right intra-nasal antrostomy performed. After ten days, during which the antrum was washed out daily, the fistula was repaired. Convalescence was uneventful, and the patient was discharged with the fistula soundly healed ten days later.

Case 9.—When the second left upper molar was removed six months ago, the antrum opened; the dentist washed out the cavity daily via the tooth-socket, for a period of three weeks. One month ago the patient complained of an evil-smelling discharge in his nose, and pain and swelling in the region of the socket of the extracted tooth. He returned to the dentist, who explored the fistula, removed a root which apparently had been missed at the first extraction, and continued washing out the antrum for a further three weeks.

On examination, the nasal septum was deflected to the left side, the left maxillary antrum was suppurating, and there was a fistula with very scarred edges in the left upper jaw leading into the antrum. This patient was admitted to hospital, and a sub-mucous resection of the septum and a left intra-nasal antrostomy performed. The antrum was washed out daily, and ten days later the fistula was repaired.

Convalescence was without incident, and ten days later the patient was discharged soundly healed.

Case 10.—This patient stated that two teeth were extracted from the right side

of his upper jaw fourteen months ago. The dentist washed out the antrum daily for a week, and after a month constructed a dental plate fitted with a small obturator, which plugged the hole. The patient got along very well by the aid of this device until six months ago. Then the plug became a less satisfactory fit—particles of food began to find their way into his antrum, and he began to suffer from a nasal discharge and a discharge through the fistula into his mouth, which caused him to have a continuously bad taste. When he removed his dental plate, there was a large fistula on the right side of his upper jaw leading into the antrum, in the region of the second bicuspid tooth, through which a trickle of pus was oozing. His antrum was irrigated every day for a week, via this orifice, and he was then admitted to the wards. In this case, since the antrum infection was judged to have subsided, a right intra-nasal ontrostomy was performed at the same time as his fistula was repaired. Four days after the combined operation his antrum was gently irrigated through the antrostomy opening—only a few shreds of debris and blood-clot were recovered. This was repeated three times, at intervals of two days, and again just before he was discharged from the hospital soundly healed, sixteen days later, on which last occasion the washings were quite clear.

I am indebted to Lieut.-Col. W. Stewart, R.A.M.C., for permission to record these cases, and to Sergeant Freeman, R.A.M.C., for the accompanying illustrations.

BIBLIOGRAPHY.

HIGHMORE, N. (1651): *Corporis Humani Disquisitio Anatomica,* pp. 226-228.

KEITH (1933): *Human Embryology and Morphology,* pp. 198-225.

VOORHEES (1927): "Bucco Antral Fistula Closure by Plaster Procedure," *Laryngoscope,* xxxvii.

AXHAUSEN, G. (1930): "Der Plastische Verschluss de Antrum-Mundhöhlen-Verbendungen,"*Deutsche Monatschr F. Zahnh,* xlviii, pp. 193-204.

BERGER, A.: "Oro Antral Openings and Their Surgical Correction," *Arch. of Otolaryngology,* xxxiii, 400—10.

ASHLEY, REA E. (1939): "A Method of Closing Antro-Alvælor Fistulæ," *Ann. Otolaryngology,* 48, pp. 632-642.

WELTY, CULLEN F. (1920): "Closing of Fistulous Openings through the Alveolar Process into the Antrum of Highmore," *Trans. Sect. Laryn, A. M.A.,* pp. 867-868.

GUTHRIE, DOUGLAS (1932): "The Operative Closure of Oro-Maxillary Fistula," *J.L.O.,* vol. xlvii, No. 7.

REVIEWS

DISEASES OF THE EYE. By Eugene Wolff, M.B., B.S., F.R.C.S. Second Edition. 1942. Pp. 222. Plates 98, many coloured. 21s. net. London: Cassell & Co., Ltd.

THIS well printed and carefully written book now appears in its second edition. It is a book intended essentially as a guide for students and practitioners, and right well does it fulfil its functions. Not only the text written in simple, straightforward English, but the plates, many of which are in colour, should help to make the subject of ophthalmology lose some of its terrors for the student in his final years and the young practitioner in his first 'locum' after graduation. As would be expected from one so long connected with the Department of Anatomy, University College, London, the anatomical descriptions of the eye and of the orbit are given with great accuracy and detail.

of his upper jaw fourteen months ago. The dentist washed out the antrum daily for a week, and after a month constructed a dental plate fitted with a small obturator, which plugged the hole. The patient got along very well by the aid of this device until six months ago. Then the plug became a less satisfactory fit—particles of food began to find their way into his antrum, and he began to suffer from a nasal discharge and a discharge through the fistula into his mouth, which caused him to have a continuously bad taste. When he removed his dental plate, there was a large fistula on the right side of his upper jaw leading into the antrum, in the region of the second bicuspid tooth, through which a trickle of pus was oozing. His antrum was irrigated every day for a week, via this orifice, and he was then admitted to the wards. In this case, since the antrum infection was judged to have subsided, a right intra-nasal ontrostomy was performed at the same time as his fistula was repaired. Four days after the combined operation his antrum was gently irrigated through the antrostomy opening—only a few shreds of debris and blood-clot were recovered. This was repeated three times, at intervals of two days, and again just before he was discharged from the hospital soundly healed, sixteen days later, on which last occasion the washings were quite clear.

I am indebted to Lieut.-Col. W. Stewart, R.A.M.C., for permission to record these cases, and to Sergeant Freeman, R.A.M.C., for the accompanying illustrations.

BIBLIOGRAPHY.

HIGHMORE, N. (1651): *Corporis Humani Disquisitio Anatomica,* pp. 226-228.

KEITH (1933): *Human Embryology and Morphology,* pp. 198-225.

VOORHEES (1927): "Bucco Antral Fistula Closure by Plaster Procedure," *Laryngoscope,* xxxvii.

AXHAUSEN, G. (1930): "Der Plastische Verschluss de Antrum-Mundhöhlen-Verbendungen,"*Deutsche Monatschr F. Zahnh,* xlviii, pp. 193-204.

BERGER, A.: "Oro Antral Openings and Their Surgical Correction," *Arch. of Otolaryngology,* xxxiii, 400—10.

ASHLEY, REA E. (1939): "A Method of Closing Antro-Alvælor Fistulæ," *Ann. Otolaryngology,* 48, pp. 632-642.

WELTY, CULLEN F. (1920): "Closing of Fistulous Openings through the Alveolar Process into the Antrum of Highmore," *Trans. Sect. Laryn, A. M.A.,* pp. 867-868.

GUTHRIE, DOUGLAS (1932): "The Operative Closure of Oro-Maxillary Fistula," *J.L.O.,* vol. xlvii, No. 7.

REVIEWS

DISEASES OF THE EYE. By Eugene Wolff, M.B., B.S., F.R.C.S. Second Edition. 1942. Pp. 222. Plates 98, many coloured. 21s. net. London: Cassell & Co., Ltd.

THIS well printed and carefully written book now appears in its second edition. It is a book intended essentially as a guide for students and practitioners, and right well does it fulfil its functions. Not only the text written in simple, straightforward English, but the plates, many of which are in colour, should help to make the subject of ophthalmology lose some of its terrors for the student in his final years and the young practitioner in his first 'locum' after graduation. As would be expected from one so long connected with the Department of Anatomy, University College, London, the anatomical descriptions of the eye and of the orbit are given with great accuracy and detail.

MEDICAL DISEASES OF WAR. By Sir Arthur Hurst. London: Edward Arnold & Co. 18s.

In this book the author has collected most of the medical diseases met with in the fighting forces. It will therefore be useful to medical members of the fighting services in particular, for in a few minutes they can refer to a book which is almost sure to contain the information they require. This may well be one of the reasons why the book has already entered its second edition. The author has chosen experts to help him in some of the most specialised subjects, and the *tout ensemble* makes a very readable book. The first thirteen chapters are devoted to functional nervous disorders. This may seem a lot, but in view of mistakes made in the last war in the treatment of these, and indeed of the failure to recognise these even at present, Sir Arthur Hurst's experience at Seale Hayne in the last war and after are a timely publication. There is a chapter by the late T. A. Ross on anxiety neurosis of war. This is excellent, and makes one realise the loss this author's death has made to practical psychology. There is also a chapter on the effort syndrome.

On the organic side, chapters are devoted to infectious and contagious fevers, including the more common tropical diseases. Digestive disorders, epidemic jaundice, nephritis, and tetanus are well considered, and Dr. A. W. Barber writes a very helpful chapter on skin diseases of war. This should be particularly valuable to those in charge of evacuees, as all skin disorders so prone to occur in this section of the community are discussed. The last chapter is devoted to the treatment of gas-poisoning. Criticisms are few, but the chapter on cerebral and spinal concussion might be improved. It is unfortunate that the words "shell-shock" should be mentioned, and even to justify its use in certain cases. The more modern term "blast" should commend itself, so that the use of the former term might be forgotten for ever. More of the physical signs in cerebral concussion would have been helpful, as little is yet known of the acute stage of this condition. Spinal concussion is treated better.

The book is of a handy size and the references are many. In spite of its price, it is a book to be recommended.

DISEASES OF THE NOSE, THROAT, AND EAR. By T. Simson Hall. Second Edition. 15s. Edinburgh: E. & S. Livingstone.

To quote from the preface to the first edition, the above is an effort to provide a textbook "for the busy practitioner and the student."

The result of this attempt is a well-written and profusely illustrated volume of most reasonable dimensions. The various diseases are adequately and clearly described, and in controversial matters extreme views are avoided.

The section on otitis media and mastoiditis is of particular merit, and one reads the very clear description of the diseases of the accessory nasal sinuses with pleasure. But it is disappointing to find how little the author has to say about the artificial aids to hearing, and how the deaf patient may be helped to overcome his disability—matters on which the practitioner would welcome information.

In the account of sulphanilamide therapy, though the author stresses the danger that the clinical signs of mastoiditis may be marked when this potent remedy is exhibited, and condemns what he terms the irrational employment of the drug, he does not make clear how it may most wisely be used, or how the doctor may avoid the pitfalls mentioned. Though he tells us that an attempt should be made to determine the organism responsible for the infection, it is not indicated how this knowledge is to influence our choice of remedy.

The often recurring phrase "full doses of sulphanilamide" could be replaced by more precise instructions as to what constitutes a full dose in adults and in children, or how the body-weight might influence the dosage. This section might well be expanded in future editions, perhaps at the expense of the pages devoted to acute coryza.

But these criticisms in no way detract from the merits of a most attractive and readable book, which should be a most useful and interesting addition to the practitioner's library.

MEDICAL DISEASES OF WAR. By Sir Arthur Hurst. London: Edward Arnold & Co. 18s.

In this book the author has collected most of the medical diseases met with in the fighting forces. It will therefore be useful to medical members of the fighting services in particular, for in a few minutes they can refer to a book which is almost sure to contain the information they require. This may well be one of the reasons why the book has already entered its second edition. The author has chosen experts to help him in some of the most specialised subjects, and the *tout ensemble* makes a very readable book. The first thirteen chapters are devoted to functional nervous disorders. This may seem a lot, but in view of mistakes made in the last war in the treatment of these, and indeed of the failure to recognise these even at present, Sir Arthur Hurst's experience at Seale Hayne in the last war and after are a timely publication. There is a chapter by the late T. A. Ross on anxiety neurosis of war. This is excellent, and makes one realise the loss this author's death has made to practical psychology. There is also a chapter on the effort syndrome.

On the organic side, chapters are devoted to infectious and contagious fevers, including the more common tropical diseases. Digestive disorders, epidemic jaundice, nephritis, and tetanus are well considered, and Dr. A. W. Barber writes a very helpful chapter on skin diseases of war. This should be particularly valuable to those in charge of evacuees, as all skin disorders so prone to occur in this section of the community are discussed. The last chapter is devoted to the treatment of gas-poisoning. Criticisms are few, but the chapter on cerebral and spinal concussion might be improved. It is unfortunate that the words "shell-shock" should be mentioned, and even to justify its use in certain cases. The more modern term "blast" should commend itself, so that the use of the former term might be forgotten for ever. More of the physical signs in cerebral concussion would have been helpful, as little is yet known of the acute stage of this condition. Spinal concussion is treated better.

The book is of a handy size and the references are many. In spite of its price, it is a book to be recommended.

DISEASES OF THE NOSE, THROAT, AND EAR. By T. Simson Hall. Second Edition. 15s. Edinburgh: E. & S. Livingstone.

To quote from the preface to the first edition, the above is an effort to provide a textbook "for the busy practitioner and the student."

The result of this attempt is a well-written and profusely illustrated volume of most reasonable dimensions. The various diseases are adequately and clearly described, and in controversial matters extreme views are avoided.

The section on otitis media and mastoiditis is of particular merit, and one reads the very clear description of the diseases of the accessory nasal sinuses with pleasure. But it is disappointing to find how little the author has to say about the artificial aids to hearing, and how the deaf patient may be helped to overcome his disability—matters on which the practitioner would welcome information.

In the account of sulphanilamide therapy, though the author stresses the danger that the clinical signs of mastoiditis may be marked when this potent remedy is exhibited, and condemns what he terms the irrational employment of the drug, he does not make clear how it may most wisely be used, or how the doctor may avoid the pitfalls mentioned. Though he tells us that an attempt should be made to determine the organism responsible for the infection, it is not indicated how this knowledge is to influence our choice of remedy.

The often recurring phrase "full doses of sulphanilamide" could be replaced by more precise instructions as to what constitutes a full dose in adults and in children, or how the body-weight might influence the dosage. This section might well be expanded in future editions, perhaps at the expense of the pages devoted to acute coryza.

But these criticisms in no way detract from the merits of a most attractive and readable book, which should be a most useful and interesting addition to the practitioner's library.

A POCKET MEDICAL DICTIONARY. Compiled by Lois Oakes, S.R.N., D.N., assisted by Thomas B. Davie, B.A., M.D., F.R.C.P. Fifth Edition. 1941. Edinburgh: E. & S. Livingstone. 3s. 6d. net.

In addition to an illustrated dictionary, this small volume contains useful appendices on First Aid, Gas Warfare, Poisons, Urine Testing, Dietary Tables, etc.

It is surprising to find in a fifth edition such typographical errors as assimil*l*ation (p. 31), per anu*s* (p. 254), quins*e*y (p. 278), an*a*line (p. 312). Of about thirty words taken at random the following were not found in the dictionary:—achalasia, aneurin, digoxin, granulocyte, narcolepsy, schizophrenia, thrombocyte. "Sulphapyridine" and "sulphathiazole" are included, but not in their proper alphabetical position.

Many of the definitions given require revision; for example, we are told that amyloid disease is a fatty disease, that œstrin is "a proprietary preparation of the œstrus-producing hormone of the placenta," that percaine is "employed for regional infiltration and spinal anæsthesia in the form of an ointment, Percainal."

In the Tables of Weights and Measures it should be made clear that in the Imperial System there are 437½ grains in one ounce.

On p. 256 we are told that the treatment of Pernicious Anæmia consists of "rest in bed, arsenic, blood transfusion in severe cases, and the Minot-Murphy (liver) diet," but no mention is made of injections of liver extract. If therapeutic suggestions are given, they should be up-to-date, even in a Pocket Dictionary.

In spite of such imperfections, this dictionary would appear to be in much demand, as the fifth edition has appeared just over eight years after the first edition.

TEXTBOOK OF MEDICAL TREATMENT. By various authors. Edited by D. M. Dunlop, M.D., F.R.C.P.Ed.; L. S. P. Davidson, M.D., F.R.C.P.Ed.; and J. D. McNee, D.Sc., M.D., F.R.C.P. Foreword by the late A. J. Clarke, M.D., F.R.C.P., F.R.S. Pp. 1179. 25s. net. 1942. Edinburgh: E. & S. Livingstone.

The first edition of this excellent textbook and a "reprint" were reviewed in this Journal in October, 1939, and April, 1940. We now welcome the appearance of the second edition, in which some mistakes have been corrected, the general text has undergone much revision, and, in particular, the articles on septicæmia, cerebrospinal fever, gonorrhœa, pneumonia, etc., have been brought up to date by the inclusion of the more recent work on the sulphonamides.

To quote from the Foreword:—"The volume provides a basis for the rational and critical judgment of modern therapeutic agents. A complete break has been made from the use of drugs as talismans of doubtful efficacy, which serve chiefly as placebos to physician and patient by convincing both that treatment is being given and received. Attention is centred on drugs which produce a recognizable effect, and the nature of the desired effect is clearly indicated."

Unfortunately, war-time prescribing is not considered; it will therefore be found that drugs are often recommended, the ordering of which could not be justified under war conditions. Thus tinctures could often be replaced by liquid extracts, and, as a rule, alternatives could be found for olive oil, liquid paraffin, etc. Better uses could be found at present for bismuth than to include it in stomach mixtures and powders. Further, it is respectfully suggested that proprietary names for B.P. drugs such as phenobarbitone, carbachol, phemitone, nikethamide, etc., should not be used, although they might be indicated in brackets.

We cordially recommend this textbook to practitioners and senior students, but suggest that the National War Formulary recently issued by the Ministry of Health should—at least whilst the war lasts—be consulted for guidance in war-time prescribing.

A POCKET MEDICAL DICTIONARY. Compiled by Lois Oakes, S.R.N., D.N., assisted by Thomas B. Davie, B.A., M.D., F.R.C.P. Fifth Edition. 1941. Edinburgh: E. & S. Livingstone. 3s. 6d. net.

In addition to an illustrated dictionary, this small volume contains useful appendices on First Aid, Gas Warfare, Poisons, Urine Testing, Dietary Tables, etc.

It is surprising to find in a fifth edition such typographical errors as assimil*l*ation (p. 31), per anu*s* (p. 254), quins*e*y (p. 278), an*a*line (p. 312). Of about thirty words taken at random the following were not found in the dictionary:—achalasia, aneurin, digoxin, granulocyte, narcolepsy, schizophrenia, thrombocyte. "Sulphapyridine" and "sulphathiazole" are included, but not in their proper alphabetical position.

Many of the definitions given require revision; for example, we are told that amyloid disease is a fatty disease, that œstrin is "a proprietary preparation of the œstrus-producing hormone of the placenta," that percaine is "employed for regional infiltration and spinal anæsthesia in the form of an ointment, Percainal."

In the Tables of Weights and Measures it should be made clear that in the Imperial System there are 437½ grains in one ounce.

On p. 256 we are told that the treatment of Pernicious Anæmia consists of "rest in bed, arsenic, blood transfusion in severe cases, and the Minot-Murphy (liver) diet," but no mention is made of injections of liver extract. If therapeutic suggestions are given, they should be up-to-date, even in a Pocket Dictionary.

In spite of such imperfections, this dictionary would appear to be in much demand, as the fifth edition has appeared just over eight years after the first edition.

TEXTBOOK OF MEDICAL TREATMENT. By various authors. Edited by D. M. Dunlop, M.D., F.R.C.P.Ed.; L. S. P. Davidson, M.D., F.R.C.P.Ed.; and J. D. McNee, D.Sc., M.D., F.R.C.P. Foreword by the late A. J. Clarke, M.D., F.R.C.P., F.R.S. Pp. 1179. 25s. net. 1942. Edinburgh: E. & S. Livingstone.

The first edition of this excellent textbook and a "reprint" were reviewed in this Journal in October, 1939, and April, 1940. We now welcome the appearance of the second edition, in which some mistakes have been corrected, the general text has undergone much revision, and, in particular, the articles on septicæmia, cerebrospinal fever, gonorrhœa, pneumonia, etc., have been brought up to date by the inclusion of the more recent work on the sulphonamides.

To quote from the Foreword:—"The volume provides a basis for the rational and critical judgment of modern therapeutic agents. A complete break has been made from the use of drugs as talismans of doubtful efficacy, which serve chiefly as placebos to physician and patient by convincing both that treatment is being given and received. Attention is centred on drugs which produce a recognizable effect, and the nature of the desired effect is clearly indicated."

Unfortunately, war-time prescribing is not considered; it will therefore be found that drugs are often recommended, the ordering of which could not be justified under war conditions. Thus tinctures could often be replaced by liquid extracts, and, as a rule, alternatives could be found for olive oil, liquid paraffin, etc. Better uses could be found at present for bismuth than to include it in stomach mixtures and powders. Further, it is respectfully suggested that proprietary names for B.P. drugs such as phenobarbitone, carbachol, phemitone, nikethamide, etc., should not be used, although they might be indicated in brackets.

We cordially recommend this textbook to practitioners and senior students, but suggest that the National War Formulary recently issued by the Ministry of Health should—at least whilst the war lasts—be consulted for guidance in war-time prescribing.

The History of the Belfast School of Obstetrics 1793-1933

By C. H. G. MACAFEE, M.B., F.R.C.S., F.R.C.O.G.

Presidential Address to Belfast Medical Students' Association 14th November, 1941

> "I hold every man a debtor to his profession; from the which, as men, of course, do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to be a help and ornament thereunto."—*Bacon.*

To those men who, throughout the years, have not only paid their debt but left us debtors, this address is dedicated.

THE histories of the Belfast School of Obstetrics and the Belfast Lying-in Hospital are so intertwined, that this address will, of necessity, deal more with the Hospital than the old Queen's College or University.

My historical review covers a period from 1793, when the Hospital was first proposed, to 1933, when the Royal Maternity Hospital was opened. This period of one hundred and forty years must be divided into four different epochs.

1. From 1793—1849. The period prior to the foundation of Queen's College.
2. From 1849—1867. During which period Professor Burden occupied the Chair of Midwifery.
3. From 1868—1920. The period when Professors Dill and Byers were successively in the Chair.
4. From 1920—1933, i.e., from Professor Lowry's appointment till the Hospital vacated Townsend Street.

The Belfast Lying-in Hospital was first proposed at a meeting held in the Linen Hall on the 23rd December, 1793, and is one of the oldest Maternity Hospitals in the British Isles, being the sixteenth to be founded between the years 1736-1799.

In the "Belfast News-Letter" of 20th January, 1804, we read: "This Humane Institution was first suggested by a most worthy young clergyman, now deceased, whose example in every particular deserves imitation. When visiting in this parish [i.e., St. Anne's] during the time of his curacy, he was struck with the very scanty accommodation and provision that could be afforded by poor householders in a confinement, that required some degree of comfort. He mentioned this subject to a lady, who was ready to second his benevolent idea."

The "most worthy young clergyman" referred to was the Rev. John Clark, who was curate of St. Anne's Parish Church from 1793 to 1795, and died in Oxford in 1800. The lady referred to was a Mrs. McTier, sister of Dr. William Drennan, a well-known Irish practitioner and man of letters.

The Charity was to be styled "The Humane Female Society for the relief of

Donegall Street, 1831

The Belfast Lying-in Hospital occupied No. 25 (lower left side) from 1794 till 1830

Lying-in Women." The Society started with about 180 members, each of whom paid 10s. 6d. per annum. They first applied for the use of the large centre room in the Charitable Institution to be used as a ward, but this was refused. On 4th January, 1794, the Committee rented a house in Donegall Street, then No. 25,* for the sum of twelve guineas per year. The Hospital had six beds.

Of the early years of the Institution the records are poor, and the only information available has to be gleaned from letters and the so-called "Visitors' Book." The Hospital was managed by a Committee of Ladies, who made rules and appointed weekly visitors, but there was no medical staff. One rule was "no unmarried woman is to be taken into the House the second time." There was a separate ward for unmarried women upstairs. I mention this because it removes one of the misconceptions that might arise on reading through the records of later years, namely, that this was a bone of contention between the doctors and the Committee.

As there was no medical staff an arrangement was made with a certain number of members of the medical profession whereby these gentlemen were engaged to attend the Hospital when required. This arrangement must have been altered at some period, probably about 1822, as in all the records after 1826 only one name is mentioned, that of Dr. Stephenson, and he stated in his letter of resignation in 1837 that he had been appointed in 1822.

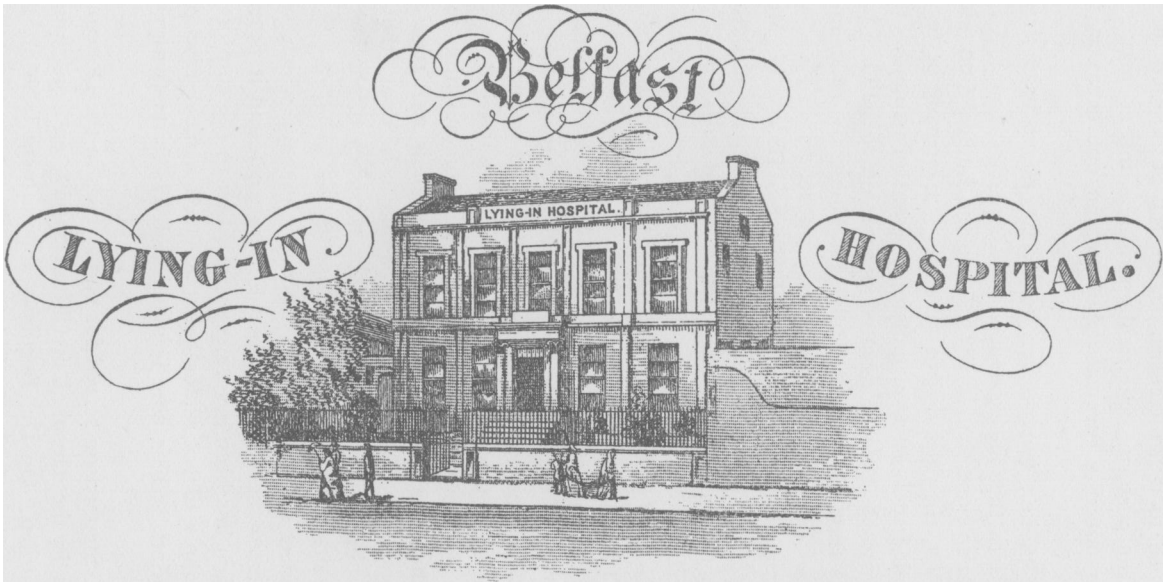
For the first seven years the number of annual admissions was considerably less than fifty, but afterwards they increased, and from 1800-1830 the numbers attended were over one hundred per annum.

The conditions in the original Hospital must have been deplorable, because Dr. Stephenson in his letter resigning from the medical duties of the Hospital in 1837 makes the following statement [the letter is in the third person] :—"At the time of his appointment it was suffering from the ravages of puerperal fever, its early friends and founders had been gradually cut off from its management and support, its yearly subscriptions had dwindled in consequence of the inactivity of the few that remained in the superintendence, and the wretched house rented for the reception of patients had become in every way unsuitable to their accommodation."

Of the habits of the patients in those days one gleans some knowledge from the following note made by one of the Lady Visitors : "I have endeavoured to make the midwife sensible that it is her duty to prevent the patients spitting on the walls at the head of their beds, and also to prevent some other dirty habits they sometimes have indulged in." She then proceeds to state "The House is as usual perfectly clean and in good order."

The diet of the patients is given in one report, and is as follows :—"Immediately after confinement—tea and bread; Breakfast at eight o'clock—tea, bread, and butter; Dinner at one o'clock—first and second day—gruel with bread; third day —rice with milk, or arrowroot with milk; on and after fourth day—soup and

*The authority for this statement is Dr. Malcolm's book published in 1851. In a Statistical Survey of County Antrim by the Rev. J. Dubourdieu on behalf of the Dublin Society, published 1812, it is stated that the Hospital occupied No. 35.



Institution for the Treatment of Diseases of Women and Children.

ESTABLISHED 1793.

The Belfast Lying-in Hospital, Clifton Street

bread; Tea at five o'clock—tea, bread, and butter; Supper at eight o'clock—gruel."

They obviously knew nothing about vitamin B or C in those days!

As far as can be made out, at this period the staff consisted of a "Nurse-Tender" or midwife and a maid, and these two women conducted all the deliveries, Dr. Stephenson being summoned to difficult cases. From the description of some of the cases he evidently did not perform obstetrical operations, but in cases requiring surgical treatment he summoned a surgical colleague, on one occasion from as far away as Lisburn.

For the period 1793-1830, i.e., thirty-seven years, the above brief description represents the state of affairs then in existence.

The accommodation was so poor that in 1828, when the Ladies' Committee had accumulated a fund of £550, they decided to take steps to provide better accommodation. They first applied to Lord Donegall for a grant of ground. This was unsuccessful, but the Charitable Society granted permission to build a Lying-in-Hospital on their grounds free of rent on certain conditions, the main one being that the Hospital could not be used for any other purpose.

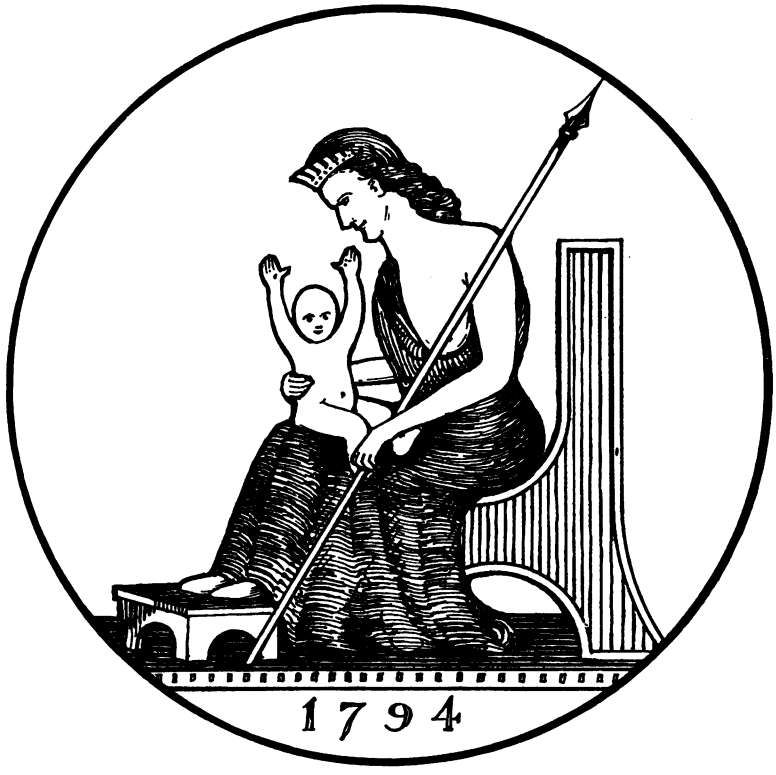
The following description of the Hospital is taken from Dr. A. G. Malcolm's "History of the General Hospital and other Medical Institutions of Belfast." I should explain that the portion of the Antrim Road referred to is now known as Clifton Street. The Charitable Society's Institution is still intact and is situated in the square formed by North Queen Street, Clifton Street, Glenravel Street, and Victoria Barracks. The ground granted by the Society to the ladies is situated on the opposite side of Clifton Street, and is now occupied by small shops.

"The new Hospital, which is a handsome square building on the Antrim Road, and cost upwards of £1,200, was opened for the reception of patients in August, 1830. It is rather small, being calculated to accommodate but eighteen patients, and the resident officials and servants—an amount of accommodation much too limited for the numbers that continually apply. The interior is well regulated and presents a rather neat appearance; and everything seems to be done, that can be, to ensure the utmost cleanliness and salubrity." The accuracy of the last remark is doubtful, as in one report the following note appears :—

"Owing to the continued smoking of the kitchen chimney, which was both disagreeable and injurious to the patients, your Committee found it necessary to put up a close range, which has been a very great addition to the comfort of your Hospital, the constant supply of hot water being in itself a most essential thing in an institution of this kind." This note is made in 1862, thirty-two years after the hospital opened.

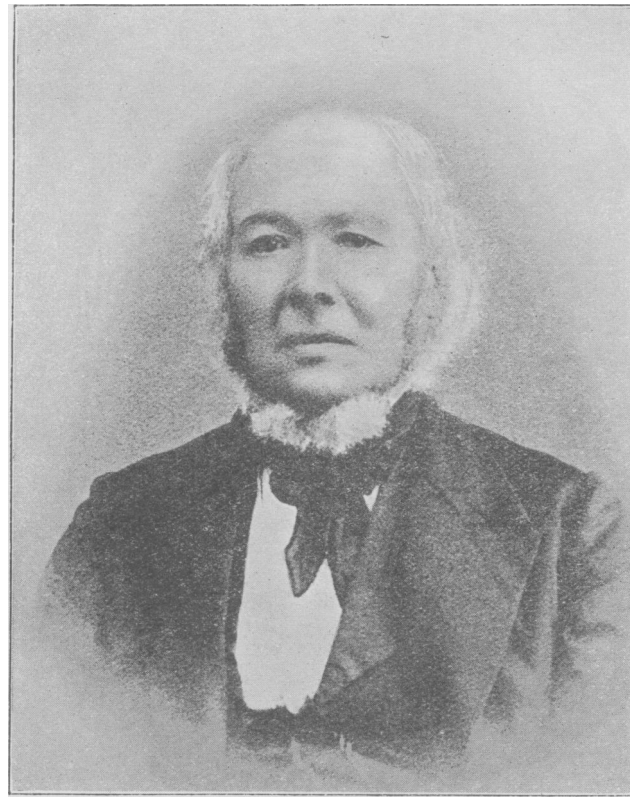
It will be seen that Dr. Stephenson served for eight years in the Donegall Street building and seven years in the Hospital in Clifton Street, and on resigning he was succeeded by Dr. Burden. On Dr. Burden's appointment in 1837, the same system of government was in vogue as in Dr. Stephenson's time.

In 1835 a Medical School had been founded in the Royal Belfast Academical Institution, and Dr. Little occupied the Chair of Midwifery in this school from 1835 to 1840.



Crest of Belfast Lying-in Hospital

Copied from Hospital Gold Medal
Awarded to Mr S.T. Irwin. 1901.



Professor William Burden, M.D.,
Professor of Midwifery, 1849-1867

Dr. Burden's advent on the medical staff of the Lying-in Hospital in 1837 had an important bearing, not only on the Hospital, but also on its future association with the School at the Academical Institution and the Queen's College, when the latter was founded in 1849. He succeeded Dr. Little as Professor of Midwifery in 1840. In the annual report of the Hospital in 1839 it is recorded "that during the absence of Dr. Burden, on a professional tour, on two occasions Dr. Stephenson and Dr. Andrews took charge of the Hospital." It is more than likely that the occasion of the "tour" was to ascertain the teaching arrangements and facilities in other medical schools and hospitals and to further his candidature for the Chair should it become vacant. In 1849, on the opening of the Queen's College, the Institution closed its medical school, and Professor Burden was one of the medical professors who was successful in obtaining a Chair in the new College.

Dr. Stephenson, in referring to Dr. Burden's appointment as his successor at the Hospital, makes the following remarks about him:—"In retiring from the attendance-in-ordinary at the institution, it has given him extreme pleasure to find that their choice has fallen on a successor of such gentleness of disposition and honourable feeling as Dr. Burden, and that he will undertake the duties of the office; both on account of the satisfaction that the ladies must have in their necessary intercourse with such a person, as well as on account of the steady interest he will take in the recovery and welfare of the inmates who are obliged to seek temporary asylum in the Hospital."

I am afraid the ladies must have been sadly disillusioned, because Dr. Burden was endowed to a remarkable degree with that pugnacity which seems to be a characteristic of successful Professors of Midwifery. He waged a war in the interests of the Hospital, patients, medical students, and nurses with a determination and singleness of aim which has only been surpassed by our present Professor. While he was unable to gain his objects immediately, he has left a mark on this School which is not sufficiently recognised and which, I regret to admit, I did not realise until I began to collect the material for this paper.

The onset of the approaching storm, which raged from 1852-1857, was heralded by an announcement which appeared in the annual report of 1852, and reads as follows:—"11th Oct., 1852. Your Committee were called together to receive an application from Drs. Burden, Andrews, and Ferguson [in another communication they were referred to as a "respectable deputation"] relative to our opening the Hospital to the Students studying Midwifery under Dr. Burden at Queen's College. The representations of these Gentlemen had weight with your Committee, and led them to acquiescing in an application so frequently made before, and so often rejected by former Committees. Yet what surprises your Committee is, that after assenting to the wishes of these gentlemen, with the proviso, that each student should contribute a fee annually towards the funds of the Hospital, no advantage has yet been taken of the liberty given."

It is not until the year 1854 that a note is made regarding the attendance of medical students, when the Committee state:—"We have not found as yet, any

reason to regret our consent to this measure." The following year the note is made, "The attendance of Medical Students had already been permitted for nearly two years past, and has not been found to be productive of inconvenience."

I was interested to find what the students of those days were like. On looking up the president's report for 1852, I found a paragraph eulogising the professorial staff. The next paragraph referring to the students says :—"It follows from the foregoing facts as an almost necessary consequence, that close habits of application, and Collegiate discipline should be found to exist amongst the ranks of the young men; and that such has been the effect of an organization, reaching from the Chairs of instruction to the benches and private studies of the taught, the Collegiate records of the attendance, good conduct, and diligence of the students affords satisfactory testimony."

"It is important in connection with this, to refer to the provision that has been made for the religious instruction and discipline."

"Your Majesty has been pleased to appoint four Deans of Residence who have in accordance with the Statutes, the moral care and spiritual charge of the students of their respective creeds. . . . These gentlemen, at the termination of the Collegiate Session, returned to me, as President, very satisfactory reports respecting the manner in which the students under them had conducted themselves and their general attention to their religious duties."

It is a change from to-day, when the average medical student does not recognise a common Biblical quotation and confuses the words of St. Paul with those of Professor F. J. Browne!

This eulogy sounds too good to be completely true, and I was relieved to find among the by-laws for students of those days one which made me realise that they had something in common with most of those who have succeeded them. The by-law reads :—"Each Professor is empowered to deprive any student of credit for attendance at the Lecture of the day, if, when called on, he be not prepared with the business of the class, and it appears to the Professor that such want of preparation arises from idleness, such student shall be liable to a fine not exceeding two shillings to be inflicted by the Professor."

Yet we must give them credit for being made of tougher stuff than we are, when we realise the difficulties under which they had to do their work and receive their instruction, compared with the relative luxury, ease of access, and multiplicity of instructors which are available to-day.

When I hear the present-day student objecting to an examination paper containing six questions and lasting three hours, I wonder what he would say and do if confronted with the Midwifery Paper of 1852, which contained twelve questions, with no alternative, for the same period of time.

Question No. 5, for example, was as follows :—

"What is the ordinary duration of human gestation? How best calculated? Can usual period be abridged or protracted without suspicion of moral delinquency? What are the arguments furnished by analogy in lower

animals? Is the period of quickening invariable, or is it subject to variety?"

If a present-day examiner set a question that meant a discussion on prematurity, postmaturity, medical jurisprudence, comparative anatomy, and a discussion on "quickening," and then followed it by number 6, which had five distinct headings, and ten more questions of similar length, he would have to drive about in an armoured car with a police escort.

At this stage the medical curriculum only extended over four years, and an ordinance of 1852 arranged that the lectures on Midwifery should be given on four days per week for six months and, in addition, the candidates must have attended "Practical midwifery at a recognised Midwifery Hospital, with the clinical lectures therein delivered, for a period of three months, in a hospital containing not less than thirty beds; or six months in a hospital containing not less than fifteen beds."

It is hard for you to understand what an advance the above regulation meant and what it would actually have meant had it been supported by legal means. In the period with which we are dealing, the General Medical Council had not been established. The Medical Act doing so was not passed until 1858. Although the Irish Medical Schools demanded the requirements for practical training in Midwifery mentioned, it was not until 1886 that a new Medical Act was passed, and for the first time Midwifery is mentioned as a necessary subject for qualification. Up to this, it was possible in some English medical schools to qualify without being examined in Midwifery, and no practical course was required or enforced.

Professor Burden's curriculum for his systematic lectures was as printed on next page.

He also had instructions for his practical class, of which the one copy in existence is reproduced.

It will be noticed that Professor Burden instructed his students to visit their patients weekly before delivery. Had he mentioned the importance of this visit and the necessity for testing the patient's urine, he would occupy the position in Obstetrics now associated with the name of Ballantyne.

The curriculum contains no reference to gynæcology, but one must remember that gynæcology as a separate subject had only celebrated its seventh birthday in 1852, and as such was not yet recognised.

This scheme of systematic lectures draws attention to one interesting feature of the times, namely, the reference to "wet nurses." At the present time, if breast-feeding is unsuccessful, one can resort to many varieties of artificial feeding, which were not available in those days, and in those cases where it could be afforded a wet nurse was employed. The importance of this is reflected by two instances, namely, that a question on the choice of a wet nurse frequently appeared on a midwifery paper at that time, and that for several years the following announcement appeared in the annual report of the Hospital:—

"A register of wet and monthly nurses is also kept for the convenience of the public, and is open to the inspection of subscribers for the payment of one shilling and to all others on payment of half-a-crown. The proceeds from this source,

MIDWIFERY

PROFESSOR WILLIAM BURDEN, M.D.

Lectures four times a week, during the winter months, consist of the following subjects:—

Anatomy of the Pelvis, so much as is required for Midwifery. Its measurement and pelvimeters.

Contents of the Pelvis. The functions of the Uterus in its virgin state.

Conception—Length of Gestation—Changes of the Uterus and its appendages during Gestation.

Growth of Child from its earliest seen form until its full Parasitic size.

Graafian Vesicle and Corpus Luteum. Fœtus, its Circulation, Signs of Maturity, Weight and Length.

Plural Births.

Proportion of Births and Deaths of Males to Females.

Superfœtation.

Signs of Pregnancy.

Signs of approaching Labour.

Natural Labour, its Progress, also Positions and Progress of Child till its separation from its Mother.

Management of Normal Labour, including the arrangement of the bed and bedroom, and the proper Dress and Posture of the Patient.

Tedious Labour, its Causes and Treatment.

Labour requiring the use of Instruments; their application taught on Models in the Class.

Cæsarean Section and Sequltean Operation*—How to prevent the Fœtus getting large in the Uterus.

Premature Labour—How to bring it on, and when it is necessary to do so.

Cross Births and their Treatment.

Abortion—How to Prevent it.

Extra Uterine Fœtations—How they occur, and their Treatment.

Management of Women after Delivery, and Treatment of such Accidents and Diseases at this period.

Management of Children after Birth, Washing, Dressing, Food, etc., and the choice of a Wet Nurse, and the Treatment of such accidents as take place at this period, or soon after.

Practical Midwifery taught by Pupils attenting Patients in their own houses and in the Lying-in Hospital.

*Sigaultean operation.

Queen's College, Belfast.

PRACTICAL MIDWIFERY CLASS,

IN CONNEXION WITH THE LYING-IN HOSPITAL,

UNDER THE SUPERVISION OF

Professor BURDEN, Master, Lying-in Hospital;
Doctor PIRRIE, Attending Physician, Lying-in Hospital; and
Doctor HENRY BURDEN, Demonstrator of Anatomy, Q.C.B.

A STUDENT is to attend to any patient placed under his care; if not in labour, to give her his card with his name and address, and that of his associate, legibly written thereon.

To visit his patient once a week, or as often as necessary, and to mark the date of each visit on the recommendation paper.

He must so arrange as to be always easily found when sent for; if unavoidably absent, to provide a substitute.

Any Student consenting to take another's place, shall be held responsible during his attendance.

When called on to attend, to take his associate with him, or, in his absence, some other Student of the Class.

In any case of *danger*, *difficulty*, or *doubt*, immediately to send for

DOCTOR PIRRIE, 5, FISHERWICK PLACE; or,
DOCTOR HENRY BURDEN, 16, ALFRED STREET.

After confinement, the patient is to be visited every day, for at least eight days.

As soon as visits have ceased, the paper, accurately filled up, is to be returned to Professor BURDEN, 16, Alfred Street.

To enter every case attended during the course, with the name of the patient, and when and where confined, in a case book, which must be shown at the close of the session to the Professor; if this be not done then, the number of cases attended shall not afterwards be inserted in the certificate.

Infringement of a rule, or misconduct, visited by fine, suspension, or expulsion.

DIPLOMA.

EXAMINATIONS are held on the first convenient day, on or about the 25th April and the 25th October of each year.

Candidates must have attended a course of lectures, and six months' practice given, by the Professor of Queen's College, Belfast; and must have their names entered at the time fixed by the Professor, when he announces the day, hour, and place of examination.

Fee One Guinea, which will not be returned if candidate should be rejected, but another examination may be had at either of the two following terms, without a charge. For every subsequent examination, the usual fee will be required.

If any person, qualified as stated above, should apply for an examination at any other than the stated periods, he may have it, if convenient to examiners. The Fee in such a case is Three Guineas.

Gentlemen should secure the Certificate and Diploma at the end of their respective sessions.

The Examiners will have the names of Gentlemen who have obtained the Diploma, inserted in at least one of the local newspapers, soon after examination.

K

including the registration fee paid by nurses, are appropriated to advertising and other expenses connected with this department."

It is not until the College Calendar of 1853 that the Lying-in Hospital is mentioned as a training school, and it was not until 1854 that there is any record of students having attended the Hospital. In that year three students were courageous enough to defy the difficulties associated with the taking out of the practical midwifery class.

To-day the medical student lives in relatively luxurious quarters, situated in the hospital, from which, in the middle of the night, he or she can emerge clad in an amazing variety of gaily coloured garments and, without coming in contact with the cold night air, proceed to the labour ward, where, under the supervision of an experienced sister or tutor, they deliver the patient.

I cannot tell you exactly the conditions in 1854, but at a later period in the century it was the custom for the students to secure lodgings as near the hospital as possible. Dr. J. S. Morrow tells me that in his time the lodgings were in Upper Townsend Street, and in Professor Lowry's time, 20 Regent Street was the recognised lodging-house.

Upper Townsend Street is some distance from Clifton Street, and the recognised method of warning the students that a case was in labour was by placing a white card in the window of the labour ward, which looked on to Stanhope Street at the side of the Hospital.

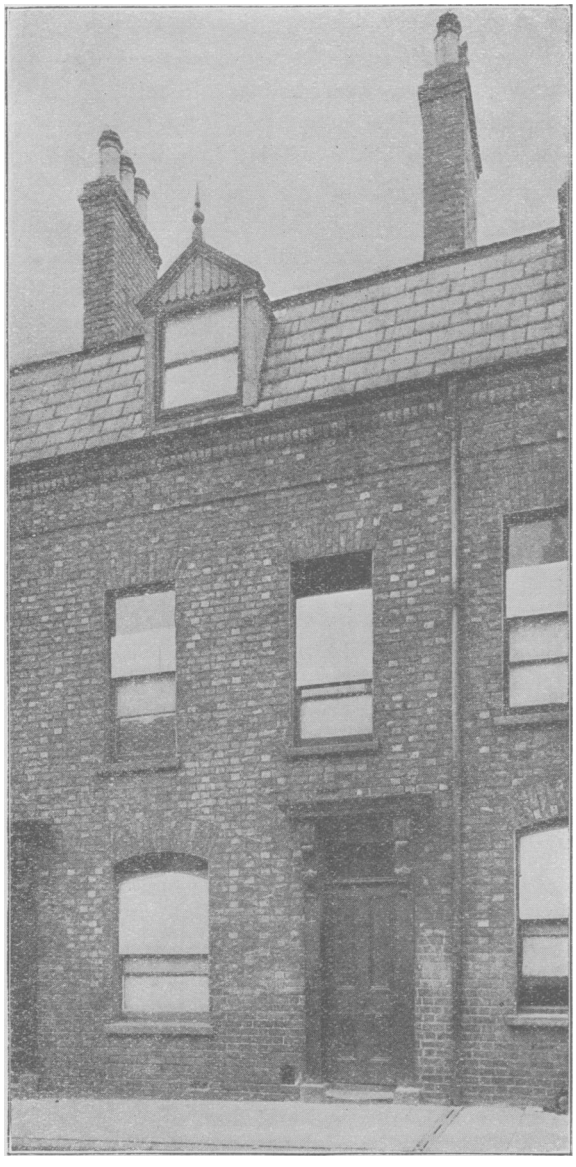
This entailed some student being frequently in Stanhope Street to keep the window under observation. To obviate this a "Tele" boy was employed to keep watch on the window, and when he notified the presence of the card to the student in Upper Townsend Street, he received the sum of sixpence. I understand the penalty for false notification was the threat of an operation which plays a large part in the Jewish ritual!

A Mrs. Moore was the landlady of 20 Regent Street, and when a student "took out" his cases depended not on when the Hospital could accommodate him, but when Mrs. Moore could give him a bed.

Regent Street is situated quite close to the site of the old Clifton Street Hospital. The students slept in a room at the top of the house, which had a bell in it attached to a long string which hung down into the street. At night, the nurse in charge had to leave the patient, run out of the hospital up to 20 Regent Street and pull the cord attached to the bell. The objection to this method was, that the early-morning workers going to the "Island" in playful mood at 5 a.m. used to ring the bell as they passed.

At this period during the day-time the student was notified by a bar being placed in a certain position in the fanlight above the front door.

Up to 1855, Professor Burden was the only recognised member of the staff of the Hospital, but having secured the admission of medical students, he next proceeded to advocate the appointment of additional members of staff. Reference to this achievement is made in a letter which has fortunately been preserved, and the following quotation is taken from this letter :—



20 Regent Street
Formerly Students' Lodging-House
up to 1904

"In the following year (1853) a deputation of medical men awaited upon the ladies, and represented that it would improve the position of the Charity and make it more generally known and useful, were the ladies to permit them to join and lecture to students in attendance."

Following this, a medical staff was formed composed of :—

Professor W. Burden, described as Master.

Dr. R. F. Dill.

Dr. J. M. Pirrie and Dr. A. G. Malcolm as secretary and registrar.

The advent of a medical staff and medical students produced a reaction from various quarters. First, from the Charitable Society, the ground landlords of the Hospital. It will be remembered that the ladies were granted the plot of ground on which the Hospital was built free of charge on condition that it was not used for any other purpose. The Charitable Society now claimed a rent of fifteen pounds per annum on the grounds that, having converted the Institution into a training school for medical students, they were using the Hospital for a purpose for which it was not intended. The managers of the Charitable Society stated that "they have no wish to make a profit out of the Hospital, but will not allow others to do so."

That the feeling against the admission of medical students was intense is shown by the following letter written by Bishop Knox, then Lord Bishop of Down, to the then secretary of the Hospital :—

"Madam,—In reply to your letters soliciting Mrs. Knox's subscription to the Lying-in-Hos., I think it right to mention that I consider that Institution has quite altered its character since Mrs. Knox sub. : and I am borne out in this view by a long discussion we had on this subject at the Charitable Society last Saturday . I now find it is a Medical School where students may pay fees for instruction and it is more of a private speculation than a free Institution. Under these circumstances I would require further information before I ask Mrs. Knox to sub.

I am, yours truly,

R. B. Down.

[The contractions are the Lord Bishop's.]

In spite of his narrow-minded retrogressive attitude, we are indebted to this prelate because his short letter drew from the ladies a reply which covers six pages of closely written foolscap of great historical value. I cannot afford the time to read you this letter, although it is most interesting, but I would like to quote the following extract :—

"We shall now state a few of the advantages we feel the Hospital derives from its connexion with a medical staff and attendant students. In the first place we have the constant and unpaid attendance of one of the Medical Staff which is a very great advantage, indeed we know that it was owing to the skill and attention received from these Medical men that several poor women's lives were saved during the past three years, then the Students who attend have been most kind and atten-

tive at all times to the poor, and when there could not be an efficient nurse procured, their attendance was of the greatest importance."

The ladies had accepted a medical staff and students against their wishes, but when they found that the Charitable Society wished to force them to dispense with what they had acquired they, assisted by Professor Burden, fought the Society tooth and nail.

The dispute was ultimately settled by the Hospital paying an annual nominal rent of £3. 3s.

The Charitable Society did not forget this incident, as in 1900 the Society took a High Court action to evict the ladies from the site.

Now, although these ladies had professed such kindly feelings for the medical staff and students while defending *themselves* in public against the Charitable Society, they did not show the same gratitude towards them in private, for, in 1858, they wrote a letter to Professor Burden demanding an annual payment from each member of the staff for the privilege of attending the Hospital.

The medical staff objected, "as (in their own words) we had no idea that, after having so long attended the Hospital we should now be required to pay for attendance." They stated that if the ladies persisted in this attitude, "We must try to get from each student who may hereafter attend the Hospital, half-a-guinea extra." Robbing Peter to pay Paul!

The reply to this was as usual very lengthy, and I will only quote a portion.

"25 Chichester Street,

"Jany. 31st, 1859.

"My Dear Sir,—I read your letter of the 31st ult. to the Ladies who met at the Hospital on Monday, 3rd inst., and in reply I have been instructed to say that they feel it to be their duty as Trustees for the funds of that Charity, to insist upon the payment of a small sum by each student who receives the accommodation of the Hospital.

"The very small sum which they now demand will not cover the additional expenses for coal and light, not to speak of the losses in subscriptions which they have met with in consequence of admitting the Medical Men and Students, and also the additional trouble and expense incurred by cleaning after them.

"In consideration of these things, the Committee feel bound as Trustees to guard the funds from being encroached upon or diverted from their legitimate object, which is the relief of poor women, and the Hospital being founded for that object alone, it cannot be considered as a proper disposal of the funds to expend them for the accommodation of Medical Students who cannot in any way be regarded as objects of charity." There are three more pages of the letter which I will not read.

At this period the training of nurses for maternity work was in chaos. The fully-qualified midwife, as we know her to-day, was non-existent, and the majority of cases only received the attention of a "handy woman," who attended cases by virtue of the fact that she probably had had several children herself and had been present at the confinements of many of her neighbours. Those who took the trouble to acquire any training in a maternity hospital were in the minority, and

practised by virtue of a certificate presented by the hospital in which they were trained. There was no Central Examining Body until 1905, although the London Obstetrical Society granted a diploma by examination from 1872.

The Belfast Lying-in Hospital had for a short period before Professor Burden's regime admitted women for training, but this arrangement had lapsed. Owing to frequent appeals from doctors in the city for properly trained midwives, Professor Burden had evidently tried to have the training of midwives revived, but it would appear from a letter that he had been unsuccessful. He was not prepared to confess defeat, so he admitted a Mrs. Hamil for training with the status of a medical student, charging her a student's fee and giving her private tuition as "she had to be instructed alone."

The two letters in existence concerning this incident, parts of which I will quote, are amusing, and the ladies of my audience will kindly remember that one of them was written by ladies about a member of their own sex.

The ladies, while allowing the nurse to be admitted, objected to this step on two counts. First, they stated that "It was with considerable reluctance that the Ladies revived the old custom of admitting nurses into the Hospital, as it had generally been productive of great Annoyance." [Annoyance is spelt with a capital "A".] Secondly, they regarded the charging of a students' fee as an imposition and the private tuition as unnecessary "When they know it is impossible a woman could require or would be capable of receiving so much instruction."

Professor Burden's reply consisted of a very dignified, but nevertheless pointed endeavour to tell the ladies to mind their own business.

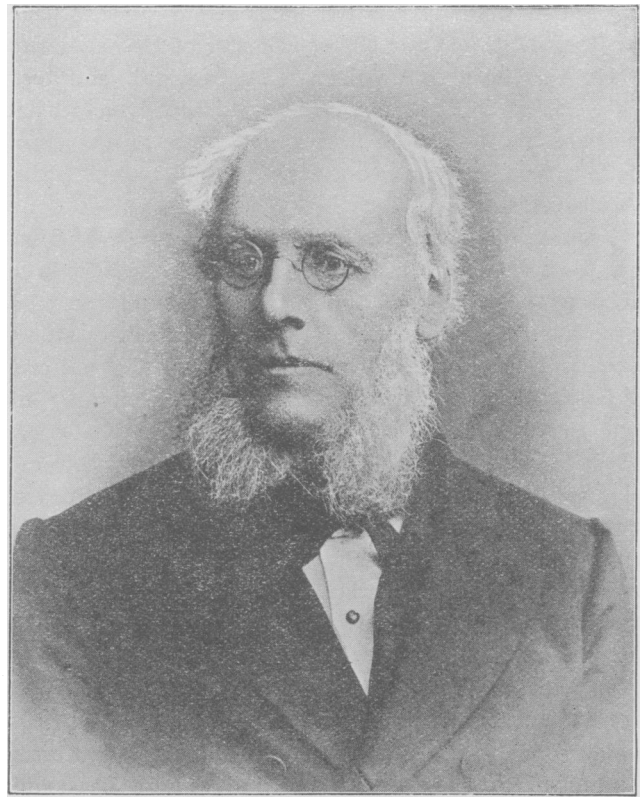
This incident reveals the pertinacity of Professor Burden, but in spite of this, it was not until 1879 that the training of nurses was regarded as one of the necessary and important functions of the Hospital—a function to which the ladies on many occasions refer with pride.

Professor Burden by this action had done two things. First, by charging a students' fee he was endeavouring to secure a better type of nurse for the work than had hitherto been possible; and secondly, he had instituted lectures to midwives, which have continued since in spite of the ladies' opinion that women would be incapable of receiving so much instruction.

It will be noted that Dr. Burden mentioned that the nurse had to be instructed alone. This refers to the fact that she could not attend the clinical lectures to students which he had instituted in 1857. In one of the two medical reports of this period it is noted that "Clinical Lectures were delivered weekly by Drs. Pirrie and Dill, and at the end of each Session, all the attending Students received certificates for regular attendance at Lectures and assiduous attention to both intern and extern practice."

Professor Burden retired from the Chair in 1867, although his name appears in connection with the Hospital until 1869.

Dr. Burden during his eighteen years as professor accomplished much in the face of narrow-minded opposition. He secured the admission of medical students and nurses to the Hospital, arranged and supervised their training, instituted a



Professor Robert Foster Dill, M.D.,
Professor of Midwifery, 1868-1893

visiting medical staff, and attempted to procure a type of government for the Hospital which was only defeated by the machinations of the Charitable Society. His type of control in its essentials was that adopted by a later authority in 1901. In spite of his great achievements, he was allowed to retire from the Hospital without a single note of regret, a simple statement being made that he had removed from Belfast. The president of the College at the time went one better, and did not even mention that he had retired.

Following the retirement of Professor Burden, Professor R. F. Dill was appointed Professor of Midwifery. Professor Dill was a son of the manse, and belonged to a distiguished Ulster family to whom our present Chief of Imperial Staff, General Sir John Dill, and our Ulster Minister of Home Affairs, Sir Dawson Bates, belong. He was born in Castlefin, Co. Donegal, and for a short time practised with his uncle, Dr. Marcus Dill, in Limavady. He had qualified in Glasgow, and perhaps his inclination towards an obstetric career may have been influenced by the fact that he was, at one stage, associated with Sir James Young Simpson of chloroform fame.

Professor Dill was unique. He was not only professor of midwifery, but was also city coroner. In his application for the Chair of Midwifery he included forty-two testimonials, one of which was followed by eighty-seven signatures. This imposing array of material was headed by one from medical students ! in which the writers remark, "We can all bear testimony to the uniform punctuality, unwearying assiduity, and earnest zeal which characterised your intercourse with us."

During Professor Burden's tenure of the Chair, Dr. Dill became a member of the staff of the Lying-in Hospital in 1855, but in 1861 as a result of some difference of opinion with the Ladies' Committee, he was not re-elected. I cannot make out the cause, but there is a letter in existence in which he appeals against their decision not to re-elect him as an active member. In an article in the "Belfast News-Letter" in 1932, he is described as being "combative and at times pugnacious, but was essentially kind-hearted."

His pugnacity in dealing with the Ladies' Committee may have been the explanation of his failure to be re-elected.

He was thus placed in the anomalous position of being a professor of midwifery without being attached to a maternity hospital, where he could give clinical instruction to his students.

I was anxious to find how he surmounted this difficulty, and I am indebted to his daughters, the Misses Dill, who are still alive, for giving me this information.

From the time he was appointed to the Chair in 1867, he had evidently adopted the method immortalised by "The Master of British Midwifery," William Smellie.

Professor Dill lived in Fisherwick Place, and a great number of poor women came to his house before their confinement to get what was popularly known as "a line." This meant that they were given the address of a medical student who was then doing his practical course, and when the case was to be delivered, Professor Dill accompanied the student and supervised the delivery.

When one thinks of the amount of work this must have entailed on top of his University lectures, his civic duties (because remember riots were common in Belfast during this period, and during one of them he lost an eye), and his extensive general practice, it is surprising he lived to the ripe old age of eighty-one, having held the Chair for twenty-six years.

During these twenty-six years the Hospital passed through a phase when its position in the eyes of the public and the medical student generally deteriorated. I venture to suggest that an important factor in this loss of prestige was owing to the Hospital having ceased to have any official connection with the College, although it was still a recognised training school.

Professor Dill had no connection with the Hospital during the years he occupied the Chair, and his successor, Sir John Byers, had occupied the Chair for nine years before he was appointed to the staff in 1902, even then he was placed in a most invidious position. Thus from 1868-1902—thirty-four years, the Hospital and College were not professionally allied. At various times during this period (1868 to 1902) eight members of the staff were replaced, one, officially, for going on a trip to America, and another for not attending to his duties at the Hospital—a bad sign in any Hospital. In spite of this there were several outstanding events.

In 1868 the Hospital authorities recognised the value of the medical students, because the following note appears in the annual report :—"In the early part of the year, during the absence, caused by severe illness, of the nurse, the Committee secured the Superintendence of a qualified Student, who resided in the House and who was consequently within call in case his services were required by any inmate." This is the first record of any student living in the Hospital; he had, however, already taken out his cases. The honour of having been the first students to reside in the Hospital while taking out their cases falls to two ladies in 1898, who were permitted to stay in the Hospital, because suitable lodgings were not available, "paying £1 each weekly on the understanding that they would leave if the beds were required for patients." The Ladies' Committee later considered "the arrangement inadvisable, and wished the remaining ladies to be informed so." [Several ladies had applied for admission.]

In 1883 there was an outbreak of puerperal sepsis in the Hospital, which resulted in the death of eight women and caused the Hospital to be closed for four months. Following this, the medical staff wished "The Committee to take into consideration the best means of preservation in the future, and for this purpose they propose that a small ward should be built in the garden quite separate from the House, where any doubtful cases would be sent."

This would have cost one hundred and fifty pounds, but the Committee considered it too expensive; in other words, the eight women who died were valued at less than twenty pounds each.

The following quotation is from the annual report of that year (1883) :—"The importance of this Institution is attested by the fact that arrangements are being made in some other hospitals of the town to add a department for such cases as are treated here." One wonders was it the "Importance" or the inefficiency of the

Institution, which resulted in other hospitals taking this step. This may refer to the proposed department in the Union Infirmary. From its foundation in 1840, the Union Infirmary reserved No. 11 Ward for lying-in women, but it was not until 1893 that a separate department was built.

In 1885 the nursing of patients in their own homes was instituted, and it was carried out by sending a senior and junior student to the case with an experienced nurse.

In 1891 an amusing incident occurred.

The Committee inserted the following advertisement in the local papers :—

"Belfast Lying-in-Hospital, Clifton Street.

"The Committee require an assistant physician for intern duty; Applicants must be married and reside in the immediate neighbourhood of the Hospital. Particulars to be obtained from, and application made before 1st October to, the Hon. Sec., Mrs. Deacon, Mossville."

This drew two short leaders from "The British Medical Journal" and "Lancet," parts of which I will quote.

"We notice that this Hospital is advertising for an assistant physician, and that one of the conditions of the election is that the applicants must be married men. We deprecate such an invidious distinction as this, which is unworthy of a charitable institution. No one can justly say that an unmarried man is pro tanto disqualified in any way from attending midwifery cases, and such a stipulation as that to which we refer is only pandering to an unworthy prejudice among the vulgar. The Committee of the Belfast Lying-in-Hospital occupy a particularly indefensible position, inasmuch as they within the last year elected an unmarried man as one of their Assistant Physicians. What new light, it may be asked, has dawned upon them in the meantime."

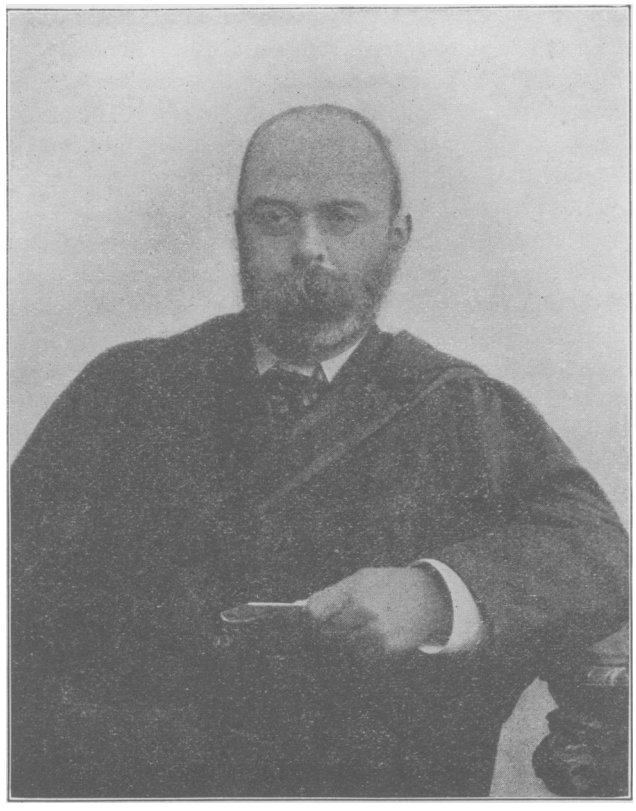
"The only requirements of the Ladies' Committee, it would seem, are 'Marriage and residence in the immediate neighbourhood of the Hospital.' Without these, Scholarship, University distinctions, and experience are nothing—indeed quite useless accomplishments in the opinion of the Ladies."

I mention these events to give you an insight into the outlook and dictatorial powers of those who governed the Hospital at this period.

As to the training of medical students in the Hospital during this period I cannot give you authentic evidence, but a claim is made in the medical report of 1876 that "A number of Senior Students attend each year a course of Clinical instruction in the Hospital, and your Staff have much pleasure in bearing testimony to the punctual attendance and gentlemanly behaviour of these gentlemen."

I thought much of this statement until I found that it was regularly repeated until 1889, except for three years, when the attendance of students is not mentioned.

If the clinical instruction of this period was not better than that in the latter years of the last century and the first twenty years of this, I am afraid I must doubt the accuracy of these repeated claims. I have it on the authority of Mr. S. T. Irwin, who attended this Hospital about 1901, that no clinical instruction in midwifery was given, apart from that given by the then matron—Miss Porter. He



Professor Sir John W. Byers, M.A., M.D., M.Ch.,
Professor of Midwifery, 1893-1920

says that during the three years in which he lodged in 17 Regent Street, as a student, he was frequently called upon by the matron to go to difficult midwifery cases, as the members of the staff were either not available or would not go.

The matron usually sent him round the forceps, and he secured the services of a resident pupil from the old Royal Hospital in Frederick Street, with a "rag and bottle," to act as anæsthetist. During those three years he thinks he delivered upwards of one hundred cases of this type—before obtaining his degree, and he won the Hospital gold medal. Surely the obstetricians may claim that the seeds of his success as a surgeon were sown by them!

By another student of that time, Professor Lowry, I am told that he never heard a clinical lecture in midwifery until he gave one himself!

In 1893 Professor Dill died. This year was the centenary year of the Hospital, and the name was changed from the Belfast Lying-in Hospital to the Belfast Maternity Hospital. This was the name of the Hospital until the year 1900, when, in order to obtain legal status, the name was changed to the Incorporated Belfast Maternity Hospital.

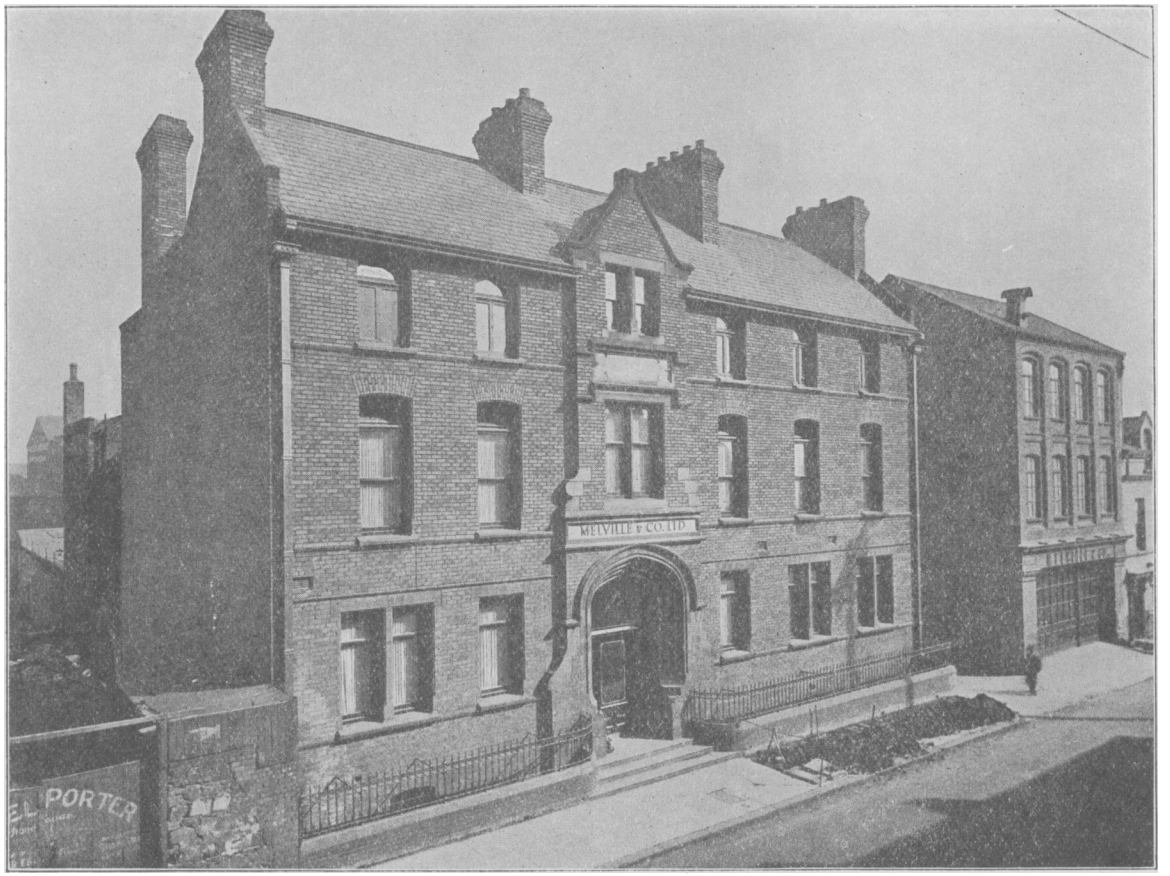
On the death of Professor Dill, Professor Byers was appointed to the Chair. Professor Byers, like his predecessor, was a son of the manse, and his association with educational establishments was hereditary, as his mother had been the founder and principal of Victoria College.

He had many interests outside medicine, and his main hobby was the study of the Ulster dialect. In a paper on this, he pointed out that in 1887 for an Englishman to read Shakespeare, he would require a glossary of two thousand words, whereas an Ulsterman would only require a glossary of two hundred words, as so many Shakespearian words were in constant daily use.

Professor Byers held the Chair for nine years before being appointed Junior Assistant Physician in 1902. His appointment to the staff was opposed by the then members, and when appointed he was only allowed to take part in the extern duties of the Hospital, and then only in alternate months. This meant that he only attended the Hospital for six months of every year, and had no facilities for giving instruction to medical students on midwifery in the Hospital, as the extern department, of which he had charge, only saw gynæcological patients. The only occasions on which it was possible for him to give practical instruction to his students was when summoned to emergencies on the Hospital district.

In the year 1900, the Charitable Society again raised its head and attempted to evict the Ladies' Committee. In view of this dispute it was decided to rebuild on a new site.

After various sites had been considered, it was decided by the Board of Governors to build in Townsend Street. The Hospital there, now occupied by Melville Ltd., was opened for the reception of patients on 7th November, 1904, and cost £9,682. The Hospital contained twenty-six beds. This site was chosen against the wishes of the medical staff, and finally, having raised their objections, they seem to have washed their hands of the scheme. One must remember that at this stage the active medical staff, even though it had as one of its members the professor of midwifery,



Incorporated Belfast Maternity Hospital

had no representative on the governing body. From the minutes of the time one gathers that the medical staff was regarded as a necessary encumbrance of the Hospital, and some of its members were occasionally allowed to "wait upon" those who controlled it. In the matter of the site their advice was not taken. Compared with the pleasant relations which exist between the medical staff of the Royal Maternity Hospital and one of the most progressive committees in the city to-day, the conditions at this time must have been less harmonious.

It was not until the year 1908 that Sir John Byers was allowed to take any official part in the intern duties. This was after some pressure by the Board of Governors and was only temporary. It is therefore easy to explain why the attendance of students at the Hospital gradually diminished from the beginning of the century until in 1918 only £2. 1s. 9d. was received as students' fees.

It was not until 1904 that a resident house-surgeon was appointed, and then only after repeated appeals by the medical staff. The first house-surgeon was Dr. Massy Burnside, who is still in active practice in the city. The position was entirely unpaid for many years.

In 1907 the house-surgeon was Dr. C. G. Lowry, who is distinguished by the fact that he is almost the only house-surgeon who is *not* mentioned in the medical report as having given "entire satisfaction." His reforming activities, even at this stage, must have disturbed the equanimity of the Hospital.

On the death of Sir John Byers in 1920, the Chair of Midwifery and Gynæcology was divided : Professor C. G. Lowry being appointed professor of midwifery and Professor R. J. Johnstone (later Sir Robert Johnstone) professor of gynæcology.

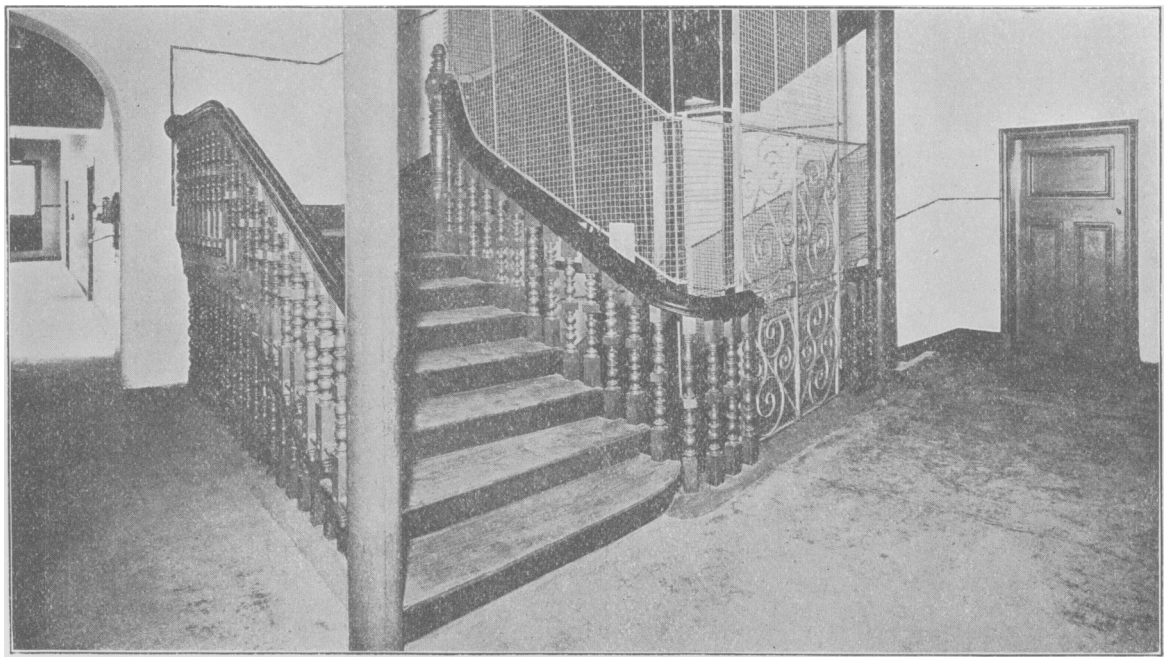
Neither was a son of the manse, although both of them had been intended for the ministry.

It has been said that it is not in good taste to deal with contemporary history, but in this I must take the risk of perhaps being both misunderstood and adversely criticised. Admittedly, I may approach this portion of my address with feelings of gratitude and respect for certain persons concerned, which may have biased my judgment. I hope, however, when I have finished you will agree with me that to have omitted this part would have meant an unfinished tale, and that I should have failed to render credit where credit is due.

Professor Lowry had been an unsuccessful applicant for a vacancy on the staff in 1909, but on his appointment as professor he was invited to join the staff by the Board of Governors.

In view of the treatment received by his predecessor, Sir John Byers, he did so, on conditions to which the Governors agreed.

Professor Lowry's arrival on the staff is reminiscent of Professor Burden's. Within five years of his appointment the medical staff had two representatives on the Board of Goverors, an ante-natal clinic had been inaugurated, the medical staff with one exception were all consultants, there were four clinical assistants, and the connection with the University had been increased by the appointment of a University tutor in obstetrics, and the opening of a residence for students. Without



Lobby on First Floor, where Students' Lectures were held
Incorporated Belfast Maternity Hospital

64-66 Townsend Street
Students' Hostel, 1925-1933—now District Nurses' Home

determined and courageous leadership, this rapid sequence of reforms would have been impossible.

I had the privilege of being the first University tutor-in-obstetrics, and I can remember well my arrival in the Hospital. I had never seen the Hospital until I became the resident tutor, which was perhaps as well. It was dingy, was on a main cross-town thoroughfare, and its proximity to a posting establishment made one suspect that the Hospital had been cursed with one of the ten plagues of Egypt.

It was not until the spring of 1925 that the University Hostel in 64-66 Townsend Street was opened. Prior to that, a fair number of students had been taking out their cases by coming each night, sitting in a small room near the ante-natal department, and waiting their turn for either an intern or extern case. Is it any wonder our students drifted towards the Rotunda and other teaching hospitals?

In addition to this type of student, there was a large number who had taken their practical midwifery elsewhere and who came to attend the clinical lectures given three times a week—another improvement in the clinical teaching made by Professor Lowry.

There was no lecture theatre or room large enough to accommodate all the students, so the lectures were held on the lobby on the first floor outside the labour ward and the lying-in wards.

The improvements which took place in the Hospital and in the facilities for students meant that the demand on the accommodation in both departments exceeded any extension possible on the present site.

The medical staff, influenced by Professor Lowry, was anxious for the Hospital to be amalgamated with the Royal Victoria Hospital, whereas some influential members of the Board of Governors were anxious to ensure that it should not be moved from its site in Townsend Street, and actually purchased a neighbouring piece of ground on which the Hospital was to be extended.

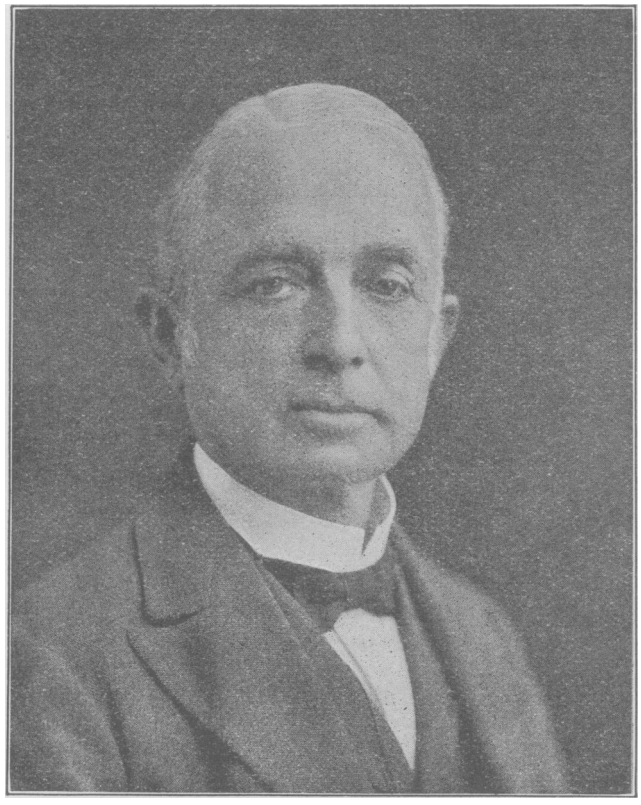
That this was ultimately defeated and the amalgamation completed was due to the efforts of the late Professor Lindsay, Emeritus Professor of Medicine, Professor Lowry, and our present Prime Minister, who was the first to publicly advocate the step, when Minister of Labour.

Physicians from time immemorial have been the bitter opponents of obstetricians, but we to-day are reaping the benefit of having had, fortunately for us, at that stage in the history of the Hospital, a physician gifted with long vision. Professor Lindsay, in his capacity as chairman of the Board of Management of the Royal Victoria Hospital and member of the Board of Governors of the Maternity Hospital, was an ideal person to further the project. His quiet disposition, unruffled temper in debate, and his enthusiasm smoothed out many a difficulty.

To these men you are indebted for the conditions under which you work to-day. However, it takes a great many people to get a great ship to sea, but the ultimate responsibility for its safe arrival at its destination depends on one man—the captain.

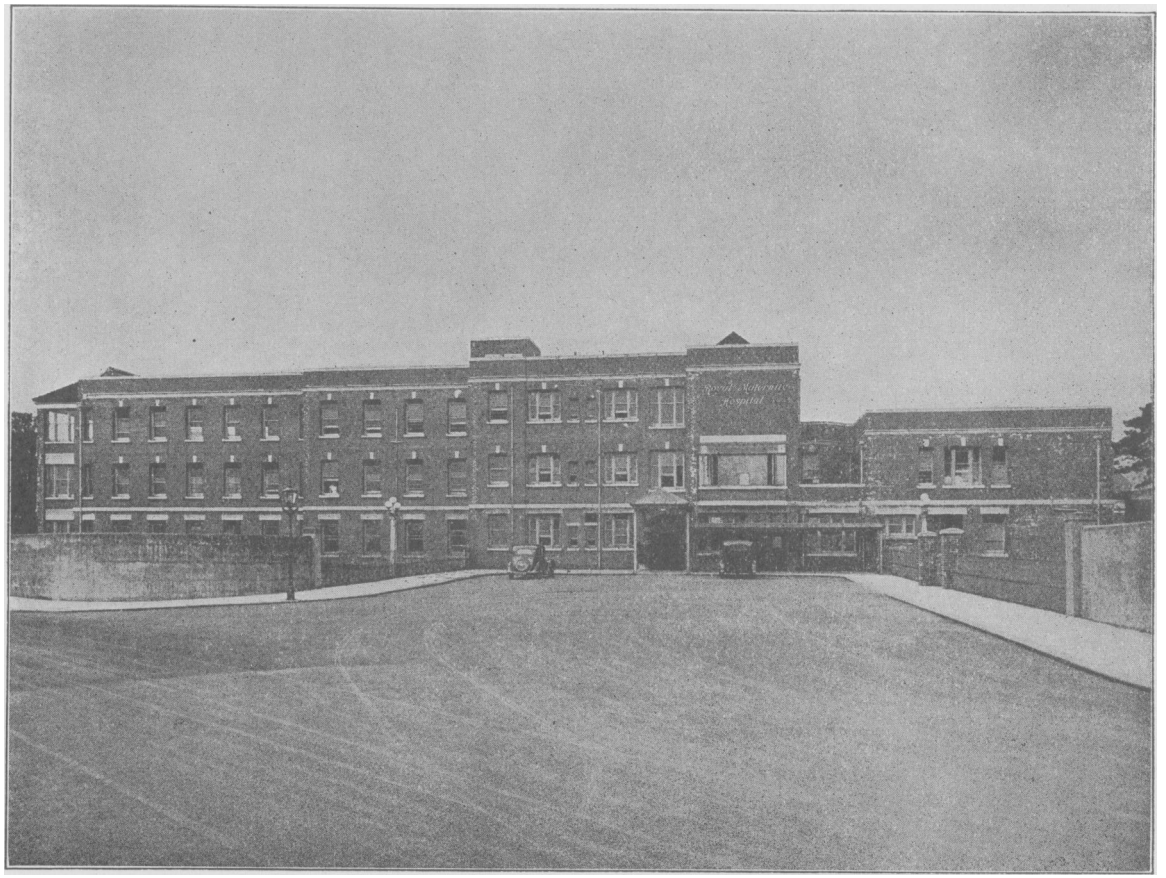
"A thousand may be reapers where one has sown the seed,
If idle were the thinker, undone would be the deed."

In July, 1933, the Royal Maternity Hospital opened its doors to receive patients,



Professor James A. Lindsay, M.D., F.R.C.P.
Professor of Medicine, 1899-1923

Chairman of Board of Governors,
Incorporated Belfast Maternity Hospital



The Royal Maternity Hospital, Belfast **Opened 21st October, 1933, by Mrs. Baldwin**

and it is fitting that the first child born in the Hospital should have had as its surname "Wisdom."

This Hospital had cost £114,000 and has one hundred beds.

You will see, ladies and gentlemen, that much was accomplished from 1920 to 1933, and that for the second time in its history the Hospital has been rejuvenated by its University connection—and I think I can fairly claim that as a teaching institution we are still progressing.

I show you this picture of the Royal Maternity Hospital, not because you cannot see it every day in life, but to remind you that nothing is static, "All things are in revolution; in change from moment to moment, which becomes sensible from epoch to epoch."—*Carlyle.*

Some future president, in addressing a future audience of the B.M.S.A., may show this picture as a relic of antiquity.

I leave you here. It is for another to write the history of my generation and yours, and it is to be hoped that, when he does, he will find that we also have contributed something of value.

I have to express my indebtedness to many persons for their assistance in either supplying me with information or providing material to illustrate this address. To the Vice-Chancellor, for permitting the reproduction of some of the photographs; to Mr. Turtle and the Committee of Management of the Royal Maternity, for permitting me to have access to the records and old minute books; to the officials of the University Library (especially Miss Hammond), the Central Library, and the Linen Hall Library; Mr. Holmes of the photographic department of the "Belfast Telegraph," for taking photographs; and the military authorities, for permitting these to be taken; Messrs. Melville & Co., for permitting the use of their photograph of the building in Townsend Street; and Mr. Baker of Messrs. Young & Mackenzie, for searching for plans prepared in 1887.

I am also indebted to Mrs. M. H. Stewart for the loan of the print of Donegall Street in 1831, which is reproduced in this address; and to Mr. J. F. Cunningham of Messrs. Rodman's, for discovering and presenting me with the certificate belonging to his brother, Dr. Dunville Cunningham. It is from this certificate that the picture of the Clifton Street Hospital has been reproduced.

My grateful thanks are due to the Misses Dill for their illuminating account of the difficulties of clinical teaching in a bygone day, and also to four of my colleagues who gave me information about various incidents in their student days: Dr. J. S. Morrow, Mr. S. T. Irwin, Professor Lowry, and Mr. T. S. S. Holmes.

I am indebted to Miss Halliday for all the trouble she took in preparing lantern slides and putting these in permanent form for presentation to the Royal Maternity Hospital. I must also thank Miss Cunningham, the secretary-accountant of the Royal Maternity Hospital, for the trouble she took with the typing of this address.

Gas Attacks: What To Do and When To Do It.

By Sir Joseph Barcroft, c.b.e., f.r.s., (hon.)m.a., m.d., d.sc.

So far as concerns the civil population, enemy gas attacks may be regarded as essentially urban affairs. Primarily, therefore, in addressing a conference of doctors in civilian practice, I shall discuss the subjection of towns, Belfast or Derry for instance, to gas attack, and leave the countryside out of the picture.

By way of preface, let me say this: In the last war gas was launched on what would be considered to-day as only a moderate scale, and as its possibilities became more fully appreciated, the scale increased. There is no reason to suppose that anything of that sort will occur in this war. Germany's capacity for making poison-gas is very great, and there seems little doubt that if she uses it at all, it will be without notice and in very large quantities. You in Belfast know better than most people what can be achieved by a surprise and massive attack. We must lay our plans for dealing with the deposition of tons, tens of tons, perhaps hundreds of tons in an attack, but the hopeful side of the picture is, that these plans can be laid. Of all forms of attack, perhaps gas is the one the dangers of which are most easily guarded against by due foresight. We must preserve a proper perspective: there is every reason for precaution, but no reason for dread.

As in the case of so many human disabilities, the medical aspect of gas has both a protective and a curative side, and I will say something about each.

Historical.

Historically, the medical aspect of gas commenced in a very simple way. There was but one gas, chlorine; its action was confined to the respiratory tract, so that the preventive aspect consisted in the devising of some sort of respirator, whilst the curative aspect consisted in the treatment of pulmonary œdema. Both were the province of the R.A.M.C.

This simple state of affairs did not last very long. The gases against which protection was required became both more numerous and more diverse in their action. Lachrymators were used, demanding the protection of the eyes in addition to the lungs, and to chlorine were added other and more powerful pulmonary irritants—notably phosgene. These alterations necessitated specialised knowledge, both in the selection of chemicals to put in the respirator and in the design of the respirator itself. This specialised knowledge was rather outside the province of the doctor. Nor was this all: it very soon became apparent that the efficiency of the respirator depended, at least as much on the conscientiousness with which it was used, as in its technical capacity to resist gas. There is the story, for instance, of the Irish regiment in the days when the respirator consisted of a sort of medicated hood, which completely covered the head and tucked into the tunic. This hood they regarded as a sort of talisman, and cut holes in the same, through which they could smoke their pipes. The lamentable result was a large number of unnecessary graves in France. This story has its amusing side, but do not let us laugh at the regiment concerned without asking ourselves whether we are really in a position to do so. It still remains a fact that at least fifty per cent. of the protective value of the

respirator lies in the knowledge of how to use it, and the rest in the design of the respirator itself. A comparatively primitive respirator in the hands, or rather on the face, of the person who can put it on accurately and rapidly, is of more use than the best respirator in those of a bungler, who wastes time getting it out of the case, and then fails to adjust it properly to his head. To this matter I shall come again, but now let me go back to the historical development of gas protection.

The complications of design and the importance of drill in use of the respirator made it desirable as a matter of administration to take gas protection out of the R.A.M.C. and associate it with the general army gas organisation, which was known as the Special Brigade of the Royal Engineers. Logically, this change may seem wrong, but in practice it was right, if only because the design of the respirator was not merely a question of producing an apparatus which would stand up against any likely gas—*that* the R.A.M.C. could have done—but of producing millions of such respirators in a very short time—a problem which introduced all sorts of subtle questions of supply and the capabilities of the parts of the design for mass production—these demand a specialised knowledge, which as time has gone on has not only taken the production of respirators out of the Army Medical Organisation, but out of the Army itself, and placed it in the Ministry of Supply. The extent to which the design of the respirator is governed by supply may be illustrated by two statements. The first is, I think, apocryphal in the literal sense, but it is "as near as makes no matter." It is this: In the first three months of 1918 three million army respirators were turned out by us, the demand for two million of which was quite unexpected—one million for the Americans, one million for the Italians, and one million for ourselves. The other statement is, that in 1936 we were suddenly asked to produce a design for the civilian respirator, such that it could be made at the rate of one million per month, starting in January, 1937, up to a total of thirty or forty million. The performance of such a feat would have been out of the question if the thirty million gas-masks had had to be made, respirator by respirator, after the fashion of the Army mask; it could only be done by reducing the design to so simple a form that without serious loss of efficiency, the parts could be stamped out by the hundred for subsequent assembly.

Yet, completely as has the design of the respirator been taken out of the doctor's hands, the medical profession cannot divest itself of a certain ultimate responsibility for it. In the last resort, the gas-mask is but an extension of the man's or woman's or child's own respiratory system.

But to return to 1917. Mustard-gas was added to the list, which meant not only an additional threat to the eyes and respiratory passages, but the production of casualties by blistering the skin. In fact, it meant more. Hitherto when the gas-cloud passed—a matter of only a short time—the threat was over, but here was a gas which, in quantities almost imperceptible, hung about for days, gradually getting down its victims, and, conveyed like an epidemic on clothing, infected many who had not been actually at the seat of the attack. Distributed in shell, mustard-gas presented a menace to the civil population which the asphyxiant gas had not held out. Indeed, although in some of the attacks with asphyxiant gases the gas

went many miles behind the lines, the civil population suffered singularly little—the moral being that a decent house is a very good protection against a passing gas-cloud; but Armentiers, which was heavily shelled with mustard, had to be evacuated. It was primarily mustard-gas which brought the civilian into the picture, and which presents the greatest danger to him to-day, less because of the sort of lesion which it produces than on account of its insidious and lingering nature.

At the end of the last war there appeared another kind of gas, the sternutator, a gas capable of being extremely inconvenient, but one which produces little in the way of serious lesions.

The subject for treatment then concerns chiefly the asphyxiant-gases and mustard-gas. So far as a statement can be made in a few words about treatment at the close of the last war, it amounts to this: For the asphyxiant gases, rest and warmth so far as possible, venesection in the plum-coloured cases, in which there was venous congestion; and oxygen in cyanosed cases, whether plum-coloured or grey. So far as mustard-gas was concerned, the skin burns were considered just to be burns, and were treated as such; for the eyes (and over eighty per cent. of all the mustard-gas casualties in the American army showed eye lesions), no special treatment was discovered; the lung lesions were rather of the broncho-pneumonic type, they tended to become septic, and were treated along the lines of broncho-pneumonia. So matters stood at the end of the last war.

General Remarks on Administration as Things Stand To-day.

The whole gas situation has been altered since 1918 by the ever-growing potentiality of the aeroplane as a weapon for the administration of gas. The civilian is not now incidental, he is or may be the "front line" in so far as that expression can be used of warfare in which there is no line. No city in the British Isles is immune from the possibility of sudden subjection to gas attack, and only one consideration will decide whether Belfast or any other town is or is not so subjected, namely, whether the enemy considers the operation to be worth his while. The better you are prepared, the less worth while to the enemy will be the use of gas.

The necessity for the protection of the civil population as well as the combatant forces introduced fresh administrative complications. Now the design of civilian respirators is in the hands of the Ministry of Supply, their production, distribution, and the method of their use is in the hands of the Ministry of Home Security, as also is the collection of the hospital cases, whilst once these cases are in hospital, they pass over to the Emergency Medical Service, i.e., to the Ministry of Health. To finish the picture, I suppose the Ministry of Pensions should come in somewhere, but I do not exactly know where. At all events, ideally there should be some machinery for the prevention of all sorts of people claiming disability as the result of gas-poisoning where no such claim can really be justified. At all these points the doctor comes in—I will treat them in the reverse order to that in which I have named them.

Pensions.—I will say no more about the question of pensions.

Treatment in hospital.—I have already pointed out that the ideal respirator may be unobtainable because it cannot be mass produced, and I emphasise that not merely on account of its own importance, but because the principle applies to everything relevant to gas attacks on the general population. This is eminently true of treatment: there is no use recommending forms of apparatus, however ingenious and however perfect from the point of view of an individual patient, which are inapplicable for mass treatment. A very good example of what I mean is furnished by a treatment for burns which I have come across, which seems to be nearly ideal, but impossible, as it requires something like one nurse to each patient. Any form of treatment employed must be capable of administration to great numbers of persons and rapidly.

The collection of cases in some ways presents greater difficulties from the medical point of view than their actual treatment—for one thing, it is less in the hands of the doctor. Actually, as I have said, it is administratively in the hands of the Ministry of Home Security: nevertheless, that Ministry must be advised by the medical profession, and I think it is a duty on the part of the Emergency Medical Service to see that the cases which the Ministry of Home Security hand over to them are not prejudiced by defective first-aid treatment.

Civilian protection.—The protection of the civil population presented a number of problems which were quite foreign to that of the army. This was certainly so with regard to the respirator. As a rough general statement, it may be said that a single type of respirator suffices for the protection of every fighting man—but once the design of the thirty million respirators had been cleared off, it became apparent that only a portion of the general population, though by far the greater portion, had been catered for. I am not now speaking of those who were concerned with the maintenance of active operations—for these the civilian duty respirator had already been provided; I allude to two classes of people: (1) those who have not the intelligence to use the civilian respirator; (2) those whose respiratory systems for one reason or another will not stand the strain or are ill adapted to taking it. The two deficiencies may be combined in a single person, as indeed they are in the case of babies.

Special Respirators.

1. The baby respirator was the first to claim our attention after the general civilian respirator had been produced. It has been one of our most difficult problems. In the first place, the baby's chest was not big enough or powerful enough to breathe through any respirator; in the second place, the baby would not tolerate it; and in the third, the mother's psychology presented almost as much difficulty as that of the baby. We had some very curious times over the baby respirator: it was a fundamental article of our creed that nothing should be recommended to the public that had not been thoroughly tried. Yet the public were not very co-operative, and this was particularly the case with the class of person who chiefly mattered. Our concern was less with the educated and well-to-do mothers, who were already more or less apparatus-minded, than with the untutored women of the slum population—these had a natural repugnance to any apparatus which came

as a barrier between them and their babies. They regarded it as somewhat of an imposition that they should be singled out as objects for experiment, and in addition, politically their advisers were at that time averse to anything which would make the general population war-minded, or far worse still, gas-minded. I mention these points to emphasise my appreciation and the thanks which the nation owes to those mothers who, in the early days, took the more difficult path of helping us in experiments, which it must be admitted were at first rather alarming.

But here is the baby helmet. It is not really a respirator, but rather a hood, through which the mother pumps filtered air several times a minute. It is not absolutely air-tight, but the maintenance of a positive pressure inside the helmet prevents impure air from entering any of the crannies where the cover is secured.

Helmet respirator for special cases.—The principle of the baby helmet solved certain other difficulties. Tracheotomy cases, for instance, obviously cannot breathe through a respirator, and there are also numerous patients with asthma and other grave cardiac and respiratory troubles, for whom the respirator offers too great a resistance. These can wear a helmet and, unlike the baby, can themselves pump the air into it.

Respirators for less grave cases.—A very good respirator for the aged and for those suffering from dyspnœa not of sufficient gravity to demand a helmet, is made by fitting the ordinary civilian face-piece with an expiratory valve. We know from our knowledge of asthma itself how great is the disability produced by any impediment in expiration—the expiratory effort is ordinarily so much smaller than the inspiratory effort that any addition to it forces itself on one's attention, and is very irksome. Fitted with an expiratory valve, the civilian gas-mask can be cleared of air at once and with no great effort. This has a double advantage: firstly, the sense of being stifled, which the infirm may feel, is dissipated; and secondly, so small a fraction of the time occupied by the respiratory cycle is taken up with expiration, that nearly the whole is available for inspiration. This means that during inspiration air can be drawn through the filter at a much slower pace, reducing correspondingly the sense of effort necessary for inhalation.

Collective protection.—Lastly, there are circumstances in which no form of individual protection is to be recommended if collective protection can be obtained. You will not be surprised to hear that in this respect a distinguished Ulsterwoman has taken the initiative. Dame Louise McIlroy, who is head of the Fulmar Maternity Hospital for officers' wives, has installed a couple of rooms ventilated with filtered air: one room for the expectant mothers and another for the new-born infants. There are about thirty beds in the hospital. Everything is so designed that the expectant mothers can be carried from their beds to the gas-proof room with the minimum of inconvenience to themselves.

Before I leave the subject of respirators, I should like to give the answers to one or two questions which are often asked of me.

Question I.—You advise me to practise doing the ordinary affairs of life in my respirator, but does not that reduce the life-time and efficiency of the respirator?

Answer.—The respirator is unaffected by the breathing of pure air through it.

Question II.—How long will the respirator last against gas?

Answer.—The respirator will last out many gas attacks—against mustard-gas it will in practice last for ever; against some other gases it will not last for ever. The first sign of the 'dying' would be the letting through at the peak of an attack of a "tell-tale" but quite innocuous amount of gas. If this happened, the respirator should not be taken off, as the peak of an attack can only last a few moments. A new container should be obtained after the raid.

Question III.—Why should the Army be given a much better respirator than the civil population?

Answer.—A rifle bullet has much greater powers of penetration than the prickle of a shot-gun. Why do people not take rifles to shoot duck? In other words, the rifle is best for its purpose, namely, shooting big game whose skins shot would not penetrate; the shot-gun is best for its purpose, namely, shooting birds on the wing, for which the penetration of the projectile matters less than the "pattern." So with respirators.

Given the following conditions, the army respirator is best:—

(*a*) The necessity to do heavy work in high concentrations of gas.

(*b*) The necessity for the respirator to stand "the racket" of campaigning abroad, where renewal is difficult or impossible.

(*c*) A pair of "he-lungs" powerful enough to operate the respirator.

But in other conditions the civilian respirator proves to be best; namely:—

(*a*) Where heavy work is not required.

(*b*) When a new respirator is easily obtainable if the old one gets injured.

(*c*) Where the respirator must serve (with the exceptions to which allusion has already been made) for all ages and sexes, strong or infirm.

I should like to emphasise the condition (*b*), namely, durability. Durability means expense, and expense means in practice national effort, and national effort must not be wasted. The army respirator stands an enormous amount of knocking about, but remember, every army respirator consists of a great number of parts, each of which is individually tested. The expense to the country of the mere testing of the parts of one army respirator is about the same as that of the total production of two civilian respirators. But taking one civilian with another, his gas-mask has a long enough life to last him through any war with reasonable care, and in the odd cases where it does not, he can replace it by another.

You may think I have strayed a long way from my title, "Air-Raids: What To Do and When To Do It"—but it is not so. True, I have said little about air-raids and much about protection. But have you got all the facilities which I have mentioned? If I were to go round to your Emergency Medical Service hospitals, for instance. Have you got the necessary stores? Would I find the oxygen cylinders? Would I find the means of administration of oxygen to large numbers of patients? Would I find the personnel versed in such administration? Would I find the stores necessary for the treatment of burns? Are you satisfied that the right patients would get to the hospitals without prejudice to either? "The time to do it" in all these matters is not after the first gas attack, but before it; therefore, I have mentioned these matters before treating of the attack itself. In short,

the time to satisfy yourselves on all the points which I have mentioned is *now*. How are you going to do it?

We are behind-hand in this respect. One locality which acquired a higher degree of gas-consciousness than its neighbours staged a mock gas attack. They went through the whole performance of collecting their cases, giving first-aid treatmet, taking them to hospital, etc. As might have been expected, they found some pretty bad gaps, not so much that each department involved had not conscientiously done its work, as that the points at which the various departments interdigitated left much to be desired. That was a most useful exercise, and I would advise you in Belfast to follow the example.

The Air-Raid.

No one can, of course, foretell what may happen in an air-raid. Nevertheless, there are certain contingencies which it will be useful to consider :—

1. The phosgene bomb, with or without the accompaniment of high explosive.
2. The mustard bomb, with or without high explosive.
3. The mustard spray.
4. The arsenical cloud.

Let us pause to consider the nature and the extent of the hazard from each of these methods of distributing gas.

The phosgene bomb, or bombs of a similar character, is only likely to be a menace, and probably would only be used under conditions such as a hot night, when the gas would lie as a cloud, drifting away but slowly. Under these conditions, a large bomb dropped opposite Robinson & Cleaver's shop, if the drift was up Donegall Place, would probably kill any person in that street, and perhaps some way up Royal Avenue, who was unprotected by a respirator and who remained out in the street. The cloud would drift out into the side streets, but nowhere would it be fatal beyond the distance from the bomb which I have mentioned. That, perhaps, does not seem a very pleasant prospect, yet it has certain mitigating conditions. As I have said, it assumes a low wind velocity—let us put the wind at five miles an hour. If the bomb drops on you, of course, as the expression goes, "you are for it," but if you are a hundred yards away you have forty seconds in which to put on your respirator, and the respirator will give complete protection. You should, in fact, be able to put on your respirator in twenty seconds, which in theory would save you if fifty yards from the bomb. If you can so far keep your head, remember that most people can hold their breath for half a minute.

The first thing to do then is to put on your gas-mask. What next? Two possibilities offer themselves; the first is to run away, and the second to get indoors. Which alternative to take depends, of course, upon circumstances, and both in a black-out present difficulties, but even if you can only run six miles an hour, if you run away from the bomb you will outstrip the cloud, and a few hundred yards will take you out of the lethal zone. The policy of going indoors is a good one if you are certain of getting indoors at once, but not if you have to ring bells, which you probably cannot find in the dark, or otherwise muddle about. I have already said that once in a house you have acquired a large measure of safety, but if there

is high explosive as well as gas, the windows may be blown out, and though the concentration may not be as high indoors as out, it may last longer. Indoors you would have a little longer to put on your respirator, but it would be fatal to use that time and more looking for it. It should be accessible night and day, for the fact is, that many phosgene bombs dropped into a neighbourhood where the windows were broken and the people had not gas-masks would produce a very large number of casualties.

The mustard-gas bomb.—The menace from the mustard-gas bomb is of a different character. It is principally that of gas drifting in small concentrations from contaminated wreckage. Here again the weather will make a great difference, in that in hot weather the danger is much greater. But here you have this safeguard, namely, that the Ministry of Home Security is between you and the danger, they will tell you the spots to avoid, and in any case the dangers from inhalation of mustard-gas are not of the sudden character which they are in phosgene. High concentrations are not rapidly built up, and you have time to get away. The vapour danger is that of staying, say for ten or twenty hours, in a barely recognisable concentration of this gas. The organs affected are chiefly the eyes, but to some extent the respiratory system. The protection to these organs offered by the respirator is complete.

The mustard spray.—The danger from the mustard spray (or Lewisite spray) is principally that of contamination of the clothing, the skin, or possibly of the eyes with the liquid in the form of droplets. Except in cases where the drop falls on the bare skin, or where it is so large as completely to penetrate the clothing, the burn is a vapour burn, caused by the emission of the vapour from the liquid. The importance of appreciating this fact lies in the deduction from it that, if the victim divests himself of his outer clothing, he has probably gone a long way towards saving himself from the inconvenience of skin-burns induced by mustard spray. In other words, if there is any danger of this menace, carry a mackintosh—a procedure not entirely unknown in Belfast even in peace-time—put it on if there is a gas alarm, take it off when the raid is over if you have reason to think that it is contaminated. The looser it is the better; it is the places where your clothing fits most tightly, e.g., the shoulders, that contamination can most easily reach the skin. For the protection of the head and shoulders, the umbrella is a very useful complement to the mackintosh, and for the civilian not an undignified one.

In some ways a mustard spray forms a contrast to a phosgene bomb. It may have no discrete focus and it may cover a great area. There is nothing to be gained and something to be lost by trying to run out of it: emphatically, get under cover—any cover.

When once they are contaminated, take off your mackintosh and lay aside the umbrella, but do not leave them indoors, for, as I have said, the real danger of mustard-gas is that of the vapour from contaminated objects hanging about in closed spaces; to this the eyes are vulnerable and the respiratory tract. It may also reach those parts of the skin which are specially easily affected, such as the groin. The mackintosh should be aired out of doors for some days.

When that has all been said, let me try to reassure you about the menace of mustard spray on the civil population in towns. I am now expressing merely my own views. It all sounds very alarming, but what does that menace amount to? That depends upon treatment. Grant that the civilian gets five, or ten, or twenty blisters in various places, each the size of a florin, what then? In the first place, these blisters take a long time, some hours, to rise, so that he has every opportunity of getting them treated; in the second place, if the blisters are not allowed to go septic, the majority of cases will not be more than walking cases. The blisters don't hurt very much; it is not very pleasant to be a walking case with a dozen small dressings on one's back and shoulders and even one's face, but I do not see these cases—unless they are neglected—filling up your hospital beds in large numbers, still less your graveyards.

But remember that, though twenty drops of mustard on your mackintosh may not make you more than a walking case, that same mackintosh, if it be hung up in a small room, such as the bedroom which I am at present occupying, and ill-ventilated, would, if you were exposed to the atmosphere for twelve hours, certainly put you to bed and not improbably into the graveyard.

I have said nothing about protective ointments, nor do I know quite what to say. It is a question of "when to do it." Anti-gas ointment works like a charm—you can pour mustard over your arm, and if you put the Number 2 ointment on immediately afterwards you will get away unscathed. But every minute that elapses between the contamination and the application of the ointment tells against this treatment—after five minutes its efficacy is much reduced, and after ten minutes it is useless. You can therefore see for yourselves its limitation. It is wise to have the ointment, and if you get suspicious drops on your skin, put it on it at once, or if you have to handle contaminated clothing, put it on your hands.

The arsenic cloud is very unpleasant: you will sneeze, or your throat may smart, or for the moment you may feel desperate—this will pass off and you will find yourself unhurt. It is the most alarming of all clouds at the moment you strike it, and it is the least harmful. Put on your respirator at once, and keep it on. Some of the arsenicals take a little while to act, therefore, having once felt it and having donned your respirator, the pain may get worse for a few minutes, even though no gas is coming through; don't say, "Oh, this respirator is no good," and take it off. That is what the enemy hopes you will do. It is very important to understand this. So important is it to know this and so harmless is the gas itself that I personally would, in a very guarded way, use it in the sort of trials in which tear-gas is used at present.

Pathology and Treatment.

I have left till the end the subjects of pathology and treatment. Let me take these matters up at the point to which I brought you in my historical statement at the commencement of this lecture.

As regards pulmonary irritants, notably phosgene and the variant of it, diphosgene, which the Germans used extensively during the last war, I told you that rest (i.e., absence of exercise) and warmth were essential—that bleeding was desirable

when there was obvious venous congestion, and that oxygen should be administered to relieve the anoxæmia.

What should be added to these statements to bring them up to date?

1. Firstly, as regards the question of muscular exercise; it is for you to work out in your own locality, with the transport facilities at your disposal and the hospital beds in ascertained institutions, how you can get the patients to hospital with the least effort to themselves. It seems clear that the graver patients must be brought to the doctors. In general, however, I think this must be taken as a provisional statement, that if the patient has to walk a portion of the way himself —say to a clearing station—the sooner he does it after being gassed, the less likely he is to be seriously prejudiced.

My advice to you would be to get over the consultant in gas to the Emergency Medical Service, Professor Ryle, and have a conference with him and reap the benefit of his experience in other localities.

2. Having collected the casualties, the question will arise: When and to whom should oxygen be given? Here we must be guided by practical considerations. I once took part in a committee which considered the stocking of certain service hospitals with oxygen, on the assumption that every person who might be gassed with phosgene would be given oxygen—remember this only applied to what was then a relatively small arm of the Service, much less to the civil population. Even so, the number of oxygen cylinders required ran into almost astronomical figures. It is quite clear that oxygen must be conserved for the cases which really demand it. It is for you as clinicians to make up your mind as to what the index should be—obvious cyanosis, rapid pulse, distressing dyspnœa—here again you have a consultant with whom to discuss the matter.

3. In all serious cases of phosgene poisoning there is a large element of shock. A great deal has been found out about secondary shock since the last war, and you are sure to ask yourselves this question: Should a solution of dried serum be injected? In coming to a decision, you must remember that loss of fluid in phosgene poisoning is primarily a leakage into the lung, and you must ask yourselves whether the fluid injection will not simply add to the intra-pulmonary leakage: if it does, of course, the patient will suffer from a correspondingly increased degree of asphyxia, and the remedy will only aggravate the complaint. A very comprehensive research has been undertaken on this subject: till it is finished it would be premature to make any authoritative pronouncement, but as an interim statement which may have to be revised, I would say: "Don't inject serum until you really know more about what you are courting."

About mustard-gas, I said that at the close of the last war the skin-burn was regarded merely as a burn and treated as such, whilst there was no specific eye treatment to be recommended.

As regards the skin: after the war the question was taken up: Is the mustard-burn merely a burn, or has it characteristics peculiar to itself? The reason for thinking that the mustard-burn had some sinister quality lay in the fact that a

mustard-burn took considerably longer to heal than an ordinary burn of the same gravity.

A very careful piece of work was done on this subject by Professor Dean and the late Dr. Swan. Their finding, in a few words, was, that a mustard-burn was not just an ordinary burn, because in the mustard-burn the re-forming tissue keeps breaking down in a way foreign to an ordinary burn. All the work which has been carried out since points in the same direction, though in the light of more modern research it might be expressed in different phraseology. This fundamental piece of pathology has an important effect upon treatment.

In the years between 1918 and 1939 much knowledge has been gained on the treatment of burns. Perhaps the most spectacular advance was the introduction of tannic acid to form a crust over the injury. Our experience of tannic acid for large burns has not been a happy one, and probably for the reason which I have given—the crust which forms is not on a sufficiently solid foundation; aggregates of fluid accumulate underneath it, and finally it floats off the wound.

We have tried many other sorts of treatment—simple saline, cod-liver oil, triple dye, albucid paste, and so forth: up to the present we recommend, after cleaning up, the application of amyl salicylate.

In comparing mustard-burns to thermal-burns, one point which, of course, has its repercussion in treatment should be remembered: the mustard-burn is not essentially painful in the early stages.

As regards eye treatment, have we made any progress? Here, perhaps, I am rushing in where angels fear to tread. In the circles in which I have been moving, the question of "albucid soluble" has been much canvassed. It is a sulphanilamide derivative, which, unlike others, is neutral in reaction. It would not be claimed that its effects are dramatic, or indeed that in very mild or very bad cases it has much effect at all, but rather that in intermediate cases the conjunctivitis and, to a less extent, the keratitis clears up more rapidly than if only saline is used. That is certainly so in rabbits. It is a soothing treatment, patients like it, and in cases where one eye has been treated with albucid and the other with saline, the patients have given their verdict in favour of the albucid. Whether there is more in it than that the eye being comfortable the patient lets it alone, is another matter: but even that is something.

Before I leave the subject of mustard-gas, there is one phase of its action to which I should make some allusion. In common with Lewisite, it has a capacity for "getting you down," which is something apart from a purely local action. Indeed, an amount of either gas might conceivably be put onto a person in an extreme case which might prove fatal, though I think there is no history of fatalities of this nature from mustard in the last war; of course, in it Lewisite never was used. However, I am now drifting into a region in which the information is all too scanty and the moral to be drawn is even more obscure, so let me, after thanking you for the patience with which you have listened to me, draw my remarks to a conclusion.

Functional Phenomena in Organic Disease

By Robert Marshall, M.D., F.R.C.P.I.,
Physician to the Royal Victoria Hospital
and the Ulster Hospital for Children and Women, Belfast

One of my treasured possessions is a notebook, the clinical lectures of a very great teacher who had a clear, and one might say, a classifying mind. He dearly loved tables of contrast between the various forms of disease, and a classical example is his table of the points of difference—fifteen in number—between functional and organic nervous disease. I suppose it was my own fault, but certain misconceptions seem to have been present in my mind as a result of that sharp line of cleavage. First, that "functional" phenomena affected only the nervous system and were in the main the concern of the neurologist. Secondly, that these two conditions were mutually exclusive; patients were either the sheep with a diagnosable—if often intractable—organic disease, or the goats with a stigmatic label "functional," and there the matter ended. No specific enquiry into the cause for these disturbances of function was made; most cases were treated with potassium bromide and hope, and a few with the forcible application of cold water. More rarely, and then only in such clearly defined cases as hysterical hemiplegia, was six weeks seclusion prescribed on the lines advocated by Weir Mitchell.

At that time, thirty years ago, some diseases were regarded as functional which are now recognised to be organic. In the 1912 edition of Osler's "Medicine," Parkinson's disease and chorea are classified with epilepsy, hysteria, and neurasthenia, under the vague heading "general and functional diseases."

And here, perhaps, I should give what I think is a reasonable definition of "a functional phenomenon"—it is a disturbance of physiological process, which is not due to any known pathological lesion of the body.

This definition excludes those disturbances of function which are universally regarded as due to toxæmia, but even these are apparently linked up with the psychical constitution of the individual. There appears to be an increasing tendency among psychiatrists to seek for focal sepsis as a cause of psychoses. Indeed, Graves (1938) regards it as the common cause of the functional insanities. Elfeld (1940) found that, of 483 consecutive admissions to Delaware State Hospital, 155 were diagnosed as psychoses due to some definite physical defect, 64 to toxic conditions, including alcohol, and 8 to metabolic disorders; therefore, nearly fifty per cent. were due to physical causes. The "constitutional" factor varies with the individual: while all of us are depressed when we have influenza, some are relatively cheerful, and others wallow in self-pity. One patient with pneumonia may have delirium and recover, another may remain clear-minded until he dies; just as one alcoholic gets cirrhosis of the liver and another gets delirium tremens.

Certain organic diseases produce disturbances of function which are so closely associated with them as to be almost specific for them, but even these have their pitfalls. Not every patient with grandiose delusions has G.P.I., for chronic

alcoholism can cause them too, and indeed there are more cases of G.P.I. with mental depression than delusions of grandeur.

Euphoria is an example of disturbance of intellectual function most often seen in cases of obvious toxæmia, such as sepsis and tuberculosis, but why should it be so common in disseminated sclerosis? It seems to be a symptom of ill-omen to which insufficient attention is paid, for in the index - volume of a recent great encyclopædia, the only reference to euphoria directs the reader to its incidence in spino-cerebellar ataxia.

Many and varied symptoms have been attributed to toxæmia, from poetry to crime. It is frequently difficult to distinguish them from those which are truly psychogenic, but the former are relieved by treatment directed against the toxæmia, while the latter frequently resist such treatment, but often respond to some form of psychotherapy.

Hurst was, I think, one of the first to recognise that the dividing line in the time-honoured table of contrasts was not a fixed frontier. In his paper, "The Hysterical Element in Organic Disease and Injury of the Central Nervous System," originally published in 1918, he has even given a diagram of geometrical exactitude, showing the proportional representation of the degree of incapacity due to organic disease and to super-added functional impairment in disseminated sclerosis. I feel that the importance of this paper and the thesis it presents are not even yet fully appreciated. There has appeared, however, in the past five years a large number of papers, particularly in American journals, on psychopathic manifestations in physical disease. Many articles have been published in support of the belief that mental processes can cause not only functional disturbance of the body, but also can cause structural change: whether these mental processes are again wholly dependent on endocrin chemistry opens up a question to which we do not know the answer. The term psychosomatic disease is described by Halliday (1938) as having connotations both of ætiology and mechanism, and that it indicates that a psychical cause has brought about changes in chemistry, rhythm, secretion, and even structure in one or more parts of the body. Halliday suggests that a considerable proportion of cases of gastritis, rheumatism, bronchitis, anæmia, debility, and even heart-disease are psychosomatic in origin. Curiously enough, he does not mention asthma, which presents a composite picture of functional disturbance, endocrin unbalance, structural pathology—and neurosis.

Failure to bear in mind the principle involved in Hurst's paper, namely, that "functional" disturbance may be superimposed, not only on neurological conditions, but on many other forms of organic disease, may lead to two dangers.

On the one hand, if the presenting symptoms are apparently "nervous" in origin, the organic base may be neglected. Many patients—and their friends—like to think that "the whole thing is only nerves," and seek so-called psychological treatment at the hands of persons, in some cases clergymen, actuated no doubt by the highest motives, and in others, laymen whose motives are sometimes not so high. It is even possible that when a doctor is consulted, the "functional" element of the case is so paramount that the physical examination is, if not perfunctory, at least

insufficient. No more drastic example of this form of error can be found than in the case of subdural hæmatoma, where the original accident, which caused the hæmatoma and the syndrome, may be overlooked in the presence of apparently "mental" symptoms.

It is unwise, too, to expect a response to psychotherapy in a case of Simmonds' disease, incorrectly diagnosed as anorexia nervosa. These however are uncommon conditions. A much more practical example is to be found in many cases of nocturnal enuresis, where psychotherapy in some form is tried all too often before having the urine examined for the pus cells and organisms of a renal infection.

Again, the observation that his patient is swallowing large gulps of the air in his consulting-room, does not justify a doctor in an airy diagnosis of aerophagia, for his patient may have one of several organic lesions. "The stomach is a sympathetic creature, and cries out loudly at the sorrows of her neighbours."

On the other hand, the reverse can happen, and the presence of obvious organic disease can cause us to fail to realise that on this organic base there has been erected a superstructure of functional change. Hurst gives an excellent illustration of this in describing how, when rheumatoid arthritis has subsided, the disablement of the joints may be largely due to functional contraction.

At first glance, the relationship of functional phenomena to organic disease seems to be a tangled skein, and I tentatively suggest the following as a classification :—

(a) When functional phenomena precede the signs of organic disease.
(b) When functional phenomena accompany the march of organic disease.
(c) When functional phenomena are a sequel to organic disease.

Briefly to consider these groups in turn :—

GROUP 1.

It is inherently probable that symptoms which are *apparently* functional—or even frankly hysterical—are more likely to herald organic disease of the brain or cord than of other organs. The following brief accounts of cases illustrate this.

Some years ago I saw a girl with the late Dr. Smiley. She had fallen in the street in an unexpected way on three occasions, and then developed weakness of her legs. On testing her tactile sensation while her eyes were closed she said "yes" when she felt the stimulus, but "no" when she didn't, a response which I had been brought up to regard as hysterical. Her C.S.F. showed no increase of either protein or cells, the so-called "negative Froin," but lipiodol showed a block, and Mr. Purce removed a spinal-cord tumour.

Some months ago a man was admitted to Ward 6 with two days history of pain in his back. He plunged about in bed, and his transfer to Purdysburn Mental Hospital was discussed. Physical examination was negative, including normal fundi. Lumbar puncture was performed under general anæsthesia. He stopped breathing. Some six hours later his discs showed early papillœdema. At immediate operation, Mr. Purce found the cerebellum tightly wedged against the foramen magnum. At post-mortem, a small medial cerebellar tumour was found.

It is not only in diseases of brain and cord that apparently functional disturbances may precede demonstrable organic disease. Dally (1936) says that in some cases

of essential hypertension "there is a history of ill-defined vasomotor manifestations during the latent period, which precedes even by years the elevation of blood-pressure." This suggests that the physical fact of hypertension is only part of a large concept, and perhaps not an essential one.

Apparently functional disturbances may be the first symptoms in several endocrin disorders, as in the mental hebetude of hypothyroidism, the sexual impotence of acromegaly, and the muscular weakness of Addison's disease. In diabetes, irritability and depression may herald the first appearance of glycosuria; and Noyes (1940) has found the psychical disturbances of hypoglycæmia so varied that "no single psychic syndrome is characteristic of the condition."

In some cases, as I have said, the presenting symptom is apparently functional, but its true cause is missed by insufficient or misguided search. Some years ago I saw a clergyman whose only symptom was anorexia. He had had what he thought had been a similar phase of loss of appetite five years before, but a consulting physician had given a prescription which speedily restored him. X-ray of his stomach showed an hour-glass shadow, which Professor Crymble regarded as not due to organic disease. He admitted to no symptoms pertaining to micturition, but his residual urine was found to be twenty-seven ounces, and latent uræmia, due to enlarged prostate, explained his apparently "functional" anorexia.

Group 2.

The second group—where functional phenomena accompany the march of organic disease—may be expanded to contain many widely differing conditions.

For some time it has been my custom in trying to teach students, to speak of the bridescake phenomenon. When the ordinary man—neither a bride nor a pastrycook—contemplates a bridescake, he sees a mass of white sugar (or used to), and while he knows that there is cake, he doesn't know how much is cake and how much is simply sugar. Examples of this may be seen in every ward. In a recent final examination, a student greatly pleased me by saying that his diagnosis of his case was disseminated sclerosis, but that many of the patient's symptoms were functional in type. We all know two widely differing kinds of cardiac patient, the cheerful patient with a big heart in more senses than one; and the poor creature who has long since lost heart because his doctor has told him that he has one.

Noyes (1940) considers that mental symptoms of varying severity may be found in five to ten per cent. of cases of serious heart disease. Cerebral anoxæmia is probably important in many cases and anxiety in all, and anxiety is the mother of neurosis. It is a sign of ill-omen in the cardiac delirium of senile myocarditis when the patient, even in his own bedroom, wishes to be allowed to go home. It is, perhaps, only in children that we see the symptoms and signs of heart disease uncomplicated by any element of neurosis. We know how every kind of symptom can hang on a sphygomomanometer, and how some patients will tell us that they "used to have blood-pressure, but they are all right now"; "where ignorance is bliss, 'tis folly to be wise."

Organic lesions of the alimentary tract are liable to be associated with a functional superstructure. How often do we see patients whose symptoms of duodenal ulcer

have subsided after a period of rest and treatment in hospital, and whose gastric acidity and X-ray findings are quite unchanged? The psychosomatic view is, that emotion may cause alterations, not only in secretion and motility, but actual structural change.

Of the endocrin diseases, disorders of the thyroid are most commonly associated with emotional factors; in at least one American hospital every patient with goitre is examined by a physician, a surgeon, and a psychiatrist (Blalock, 1939). A paper might well be devoted to the psychological disturbances of gynæcological and obstetrical states, of which I shall mention only two. Eardley Holland (1936) says of dysmenorrhœa: "It is small wonder that the cumulative effect on the nervous system often produces psychoneurotic symptoms." The menopause is so productive of neuroses, that there is a very real danger that we may too easily ascribe to it symptoms which are really due to organic disease.

GROUP 3.

The third group—when "functional" follows organic disease—is also seen in many diseases. It has been wisely said that in every case where a child or young person develops an alteration of behaviour, enquiry should be directed to a history of encephalitis lethargica or evidence of congenital syphilis. Emmanual Millar (1938) has said that "enlarged or inflamed tonsils, adenoids, oral sepsis, untreated ocular defects, spinal malformations, and even intestinal parasites can all be regarded as possible irritants which release mental peculiarities. . . . Tonsillar infections are prone to produce mental hebetude and irritability of temper. Postural defects are often associated with emotional retirement in some children and truculence in others. Early abdominal disorders, such as cœliac disease and tabes mesenterica, are found to produce, years after recovery, not only a general stunting of growth, but a type of mental attitude popularly equated with feelings of inferiority and the effort to compensate for them."

When John Parkinson tabulated the possible sequelæ of coronary thrombosis, he included cardiac neurosis. This is not surprising, for the knowledge by any patient, perhaps especially a medical one, that he has sustained a clot in the heart-muscle itself is alarming. Veneral diseases, even when cured, frequently are followed by a neurosis which is very difficult to treat.

Chronic illness, with its cumulative effect of painful stimuli, gives rise to neurotic symptoms which may be studied by the bedside of many a querulous invalid. Similar neurosis is often a pitiable sequela of war-wounds. The wounded hero who, in his earlier days in hospital gains the admiration of doctors and nurses alike, may, after many weary months, grumble at "a crumpled rose-leaf." Human endurance of pain lessens, so that a time is reached when even a tiny addition to the burden of pain is intolerable.

A more cynical view is sometimes justified when the patient is unwilling, with convalescence from an acute illness, to give up the important rôle of invalid with its domestic advantages.

Abdominal surgeons know best how often symptoms of "chronic abdomen" follow

an operation undertaken with every hope of cure, but surely the most remarkable disturbance of function in such a case is that which happened to a patient of the late Mr. Robert Campbell. He had an operation which involved the resection of some twelve inches of intestine. Afterwards, defæcation occurred regularly and exactly every twenty-three hours, which he said was sometimes awkward, but only to be expected, because the human intestine, as everyone knew, was twenty-four feet long, and his had been reduced to twenty-three feet.

The foregoing is at best a superficial review, but I submit that it justifies certain conclusions.

First, that the dividing line between "functional" and "organic" is not as sharp as it was in my notebook.

Secondly, that it is probable that the types of people who are prone to develop neuroses for purely psychical causes are also prone to develop "functional phenomena" as a result of organic disease.

Thirdly, that one should do all one can to find which is cake and which is sugar. (There was once a teacher in this school, J. W. T. Smith, whose slogan was "examine, and examine, and examine.")

Fourthly, that "purely functional" should be a last diagnosis, after adequate examination has disclosed no recognisable organic base; and that doctors should be taught more about psychology.

Finally, that the great quacks and the successful physicians have this in common, that they break down the superstructure, even if they are as helpless as you or I against the base. The evil man does it for gain and by promising what he cannot possibly perform. He claims that he can cure the disease, and by his dishonest assurances he creates an illusion of hope and confidence, which for a time dissolves the functional superstructure, while leaving the organic base untouched. This effect is not always brought about dishonestly : was it not Osler himself who recorded the case of a patient with gastric carcinoma, who gained ten pounds in weight after the visit of an unduly optimistic consultant? But the good doctor remembers the old adage, that he must treat the patient as well as the disease. One sometimes wonders at the amazing success of the great physicians of those early days, who knew even less about disease than we know now, and whose armament was pitiable in its feebleness. Can this have been their secret : that knowing less of the strength of their adversary, they kept on fighting where you and I, perhaps unconsciously, accept defeat as inevitable?

References.

Graves, T. C. (1940) : *British Medical Journal,* 1, 608.
Elfeld, P. F. (1940) : *Delaware State Medical Journal,* 12, 84.
Hurst, A. F. (1924) : "Medical Essays and Addresses," London, p. 235.
Halliday, J. L. (1938) : *British Medical Journal,* 2, 11.
Dally, J. F. H. (1936) : *Br. Encyclop. Med. Pract.,* 2, 503.
Noyes, A. P. (1940) : *Penn. Med. Jour.,* 43, 1269.
Blalock, J. R. (1939) : *Virginia Med. Mon.,* 66, 92.
Holland, E. (1937) : *Br. Encyclop. Med. Pract.,* 4, 354.
Miller, E. (1938) : *Ibid.,* 10, 205.
Parkinson, J. (1938) : Cardiac Society Discussion, Bristol.

ULSTER MEDICAL SOCIETY

It was the wish of the Fellows and Members at the last annual meeting of the above Society, that meetings should be continued during the session 1941-1942. It was further decided to hold the meetings jointly with the Northern Ireland Branch of the B.M.A. and with the R.A.M.C. The hour of meeting was fixed at 4.30 p.m.

The first meeting of the Society was held on 30th October, 1941, when the outgoing president, Mr. T. S. S. Holmes, introduced his successor, Dr. G. G. Lyttle. The latter then delivered his presidential address entitled "The Medical Examination of Recruits." Dr. S. R. Hunter proposed, and Mr. A. Anderson seconded a vote of thanks to the new president.

The second meeting took place on 27th November, 1941. Dr. R. Marshall read a paper entitled "Functional Phenomena in Organic Disease," and his paper is published elsewhere in this Journal. He was followed by Dr. J. E. Morrison, who contributed a paper on "Crush Anuria." Both papers were much appreciated.

The third meeting took the form of a clinical demonstration by the members of the staff of 31st General Hospital, by invitation of Colonel A. Hedley White, D.S.O., R.A.M.C. This meeting was well attended; Dr. Lyttle and Dr. Montgomery expressed the Society's thanks to the staff of the hospital.

The fourth meeting of the Society was held in the Classic Cinema on 10th December, 1941, when the members were invited to a preview of a film entitled "The Birth of a Baby." This film was sponsored by Health Education Films Ltd. Fellows and Members were asked to express their opinion as to the film's suitability for showing to the general public, and the result of the ballot was in the affirmative.

On 8th January, 1942, the fifth meeting was held, and at this meeting two papers were read, the first by Dr. Eileen Hickey on "An Observation on Disseminated Sclerosis." This was followed by one by Dr. J. S. McCann on "Sulphapyridine in Urinary Infections." These papers were well discussed, and Dr. Montgomery thanked the lecturers for their very interesting papers.

The sixth meeting took place on 5th February, 1942, when two papers were contributed. Mr. W. W. Bassett read a paper on "Typhoid Carriers." This was followed by Dr. Douglas Boyd reading a communication on "Cholecystography." At the conclusion of the papers the president welcomed Colonel Brenn of the U.S.A. Army Corps, and hoped that his officers would consider themselves as honorary members of the Society for the duration of their stay in Northern Ireland.

The seventh meeting of the Society was held on 5th March, 1942. Mr. Wheeler opened the meeting with a paper on "A Review of the Treatment of Concomitant Strabismus." This was followed by a contribution by Mr. Withers entitled "A Short Review of the Painful Shoulder." Both papers were well discussed.

Several other papers have been promised for the remainder of the session, and it is hoped the good attendances will be continued.

H. Hilton Stewart,
Honorary Secretary.

18 Malone Road, Belfast.