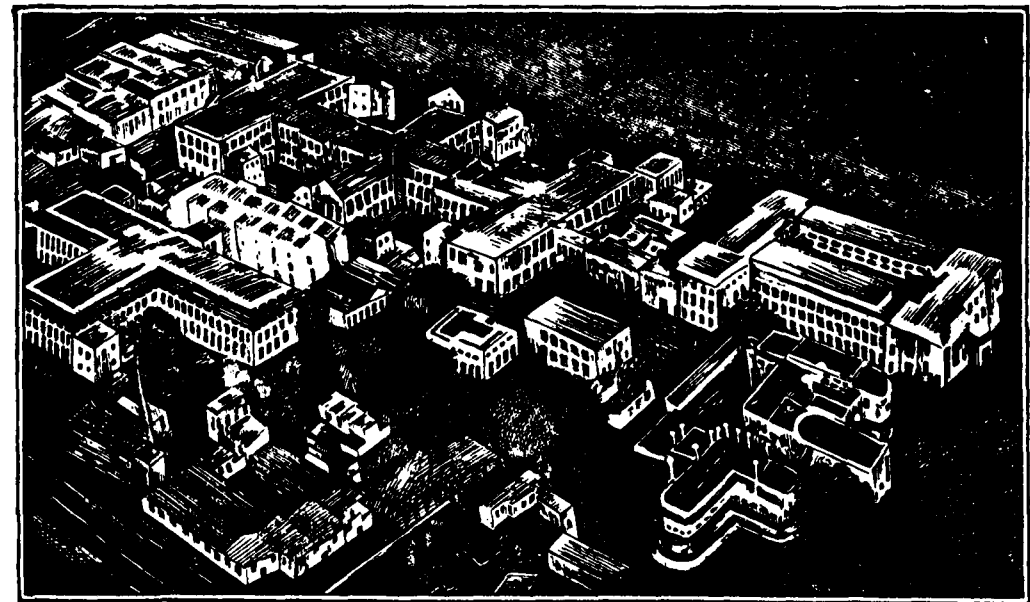
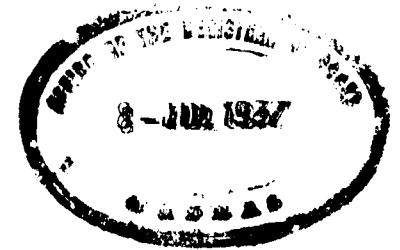


The Madras Medical College Magazine



ESTEROL-STEARNs

(Benzyl Succinate)

$(CH_2COOCH_2C_6H_5-CH_2COOCH_2C_6H_5)$

FOR SMOOTH MUSCLE SPASM

Benzyl medication was introduced to the medical profession in 1919 by Dr. D. I. Macht of John Hopkins University, as a satisfactory non-toxic substitute for opiates in the control of pain due to cramps, spasm or excessive contractions of unstriated muscles in the various structures of the body.

Benzyl Succinate is a snow white crystalline powder, practically tasteless and odorless, and absolutely devoid of all nauseating tendencies.

INDICATIONS.

In general, Esterol steams is indicated in the treatment of any condition due to spasm of smooth muscles.

Among these conditions are:

Dysmenorrhœa
Diarrhœa with cramps
Singultus or Hiccough
Asthmatic conditions
Spasmodic circulatory conditions
Spastic constipation
Biliary colic
Uretral colic

CATALOGUE ON APPLICATION.

Sole Distributors for Madras Presidency:—

APPAH & COMPANY,

CHEMIST DEPARTMENT,

MADRAS.

When writing to advertisers, please mention this Magazine

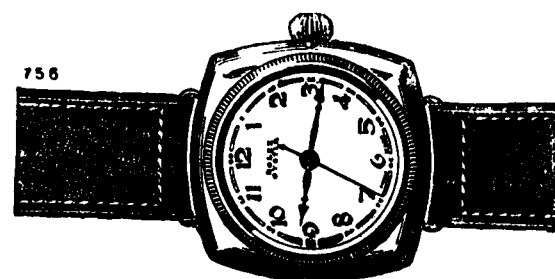
THE "ROLEX"

DOCTOR'S OYSTER

Special Seconds Recording Hand

27 WORLD'S RECORDS FOR ACCURACY

Guaranteed for a lifetime but kept in good going order for a period of 2 years breakages excepted.



- SANDPROOF
- WATERPROOF
- UNTARNISHABLE CASES

Standard oyster.

Stainless Steel ... Rs. 90 nett.

Precision Oyster.

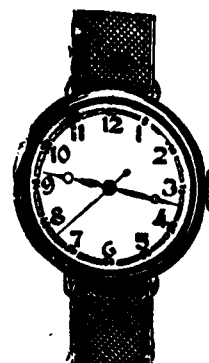
Stainless Steel ... Rs. 113 nett.

9 ct. Gold ... " 198 "

18 ct. Gold ... " 267 "

NURSES' WRIST WATCHES

SPECIAL SECONDS RECORDING HAND



Y 193

Y 193

10 1/4" size, crystal shape
Nurses' Wrist Watch as
illustrated, 15 jewelled
lever movement.

TUDOR GRADE.

Snowite ... Rs. 48 nett.

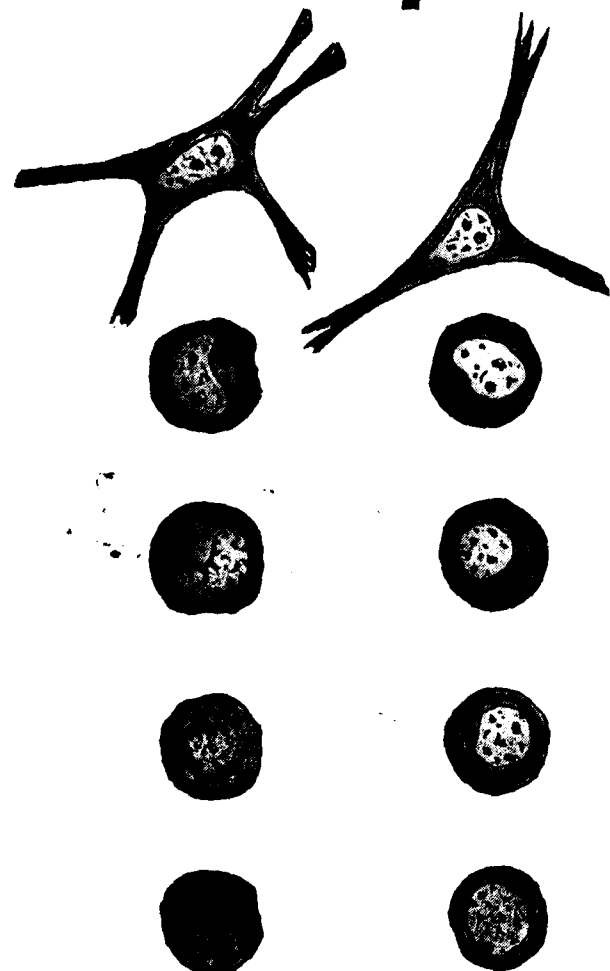
9 ct. gold ... " 85 "

18 ct. gold ... " 130 "

Send for a Copy of Our Beautifully Illustrated Watch Catalogue.

P. ORR & SONS, LTD., MADRAS.

The **CELLS** that **REPAIR** WHETHER *of the* **WANDERING** or **THE FIXED TISSUE SERIES** respond well to the stimulus of the heat and therapeutic qualities of **Antiphlogistine**



The activity of these
 cells, as well as the
 enhanced capillary
 circulation, is an
 important funda-
 mental factor in all
 healing.

★
 Generous clinical
 sample, together
 with literature sent
 on request to

THE DENVER CHEMICAL MANUFACTURING CO.
 163 VARICK STREET • NEW YORK, N. Y.

When writing to advertisers, please mention this Magazine.

DEPENDABILITY
 HIGH CLASS FRAMES OF
TESTED MERIT!!



Patronised by Maharajas, High
 Court Judges, Doctors, etc.,

RADHA BROS.,

Ophthalmic Opticians,
 174, BROADWAY, MADRAS.

TO LET

SELECT MEDICAL PUBLICATIONS

	Rs.	A.
The American Illustrated Medical Dictionary Dorland, 17th Edition	20	10
Medical Annual—1935	13	8
Gray's Anatomy—1935	25	0
Frazer—Anatomy of the Human Skeleton—1933	19	4
Berkeley and Bonney—Text book of Gynaecological Surgery—1935	30	15
Beaumont—Essentials of Medicine—1935	14	0
Kelly—Gynaecology	34	6
Bourne—Synopsis of Obstetrics and Gynaecology—1935	10	5
Eden and Lockyer—Gynaecology—1935	26	0
Boyd—Text book of Pathology—1934	30	15
Clarke—Applied Pharmacology—1935	12	0
Barker—Treatment of the commoner Diseases	8	9
Kelly Ward—Electro-Surgery	24	1
Diseases of skin—Mackenna—1933	13	12
A Text Book of Bacteriology with a section on pathogenic protozoa—Zinssir and Bayne, Jones 7th edition	20	10
Surgery of the Chest—George P. Straub	36	1
Shorter Orthopaedic Surgery—Broke—1932	7	4

P. VARADACHARY & COMPANY,

Medical and Law Book-sellers,
 LINGHA CHETTY STREET, :: :: MADRAS.

When writing to advertisers, please mention this Magazine.

Mofussil Orders will not be executed without advance of Rs. 5

THE COLLEGE BOOK COMPANY,
BOOK-SELLERS & PUBLISHERS,
(Appah Buildings' Upstairs)
286, ESPLANADE, MADRAS.
LATEST EDITIONS ONLY WILL BE SUPPLIED,
LIST OF MEDICAL BOOKS

	Rs.	A.	P.		Rs.	A.	P.
Gray's—Anatomy Edn. 1935	25	0	0	Jellet—Manual of Midwifery	16	14	0
Cunningham's Manual of Practical Anatomy	7	8	0	Berkley—Ten Teacher's Midwifery 1934	11	7	0
3 Vols. I, II & III each 1935	12	0	0	Hutchisons—Diseases of Children 1930	13	14	0
Macgregor's Surgical Anatomy 1934	9	12	0	Goodheart and Still—Diseases of Children...	18	10	0
Treves Surgical Applied Anatomy 1934	16	10	0	Cole's—Physiological Chemistry 1933	8	8	0
Taylor's—Practice of Medicine 1930	19	0	0	Clark—Applied Pharmacology	11	0	0
Price—Text book of Medicine 1933	17	12	0	Bigger—Bacteriology 1935	8	8	0
Saville—Clinical Medicine 1933	14	0	0	Cameron's—Bio Chemistry	10	5	0
Conyberc—Medicine 1932	8	0	0	Cushni—Pharmacology 1934	15	12	0
Wheeler & Jack—Hand-book of Medicine...	9	8	0	Manson and Bars—Tropical Diseases	20	8	0
Rogers and Megaw—Tropical Medicine	16	0	0	Hutchinson and Hunter—Clinical Methods	7	14	0
1935	26	6	0	1935	7	15	0
Starlin—Human Physiology 1933	18	0	0	Pearce Gould—Surgical Diagnosis	7	5	0
Howell's Physiology 1933	18	4	0	Treves—Surgical Operations 1930	12	2	0
Rose and Carless—Surgery 1933	11	12	0	Parson—Diseases of the Eye 1934	10	4	0
Romanis & Mitchner—Surgery 2 Vols. 1934	22	8	0	May and Worth—Diseases of the Eye 1934	27	12	0
Haygroves—Synopsis of Surgery 1933	17	3	0	Rosenae—Hygiene and Preventive Medicine	10	5	0
Muir—Text-book of Pathology 1933	14	7	0	Shattock—Surgical Diagnosis 1930	10	5	0
Green's Pathology 1934	9	0	0	Tidy—Synopsis of Medicine 1934	14	7	0
Beaumont Medicine for Practitioners 1934	6	14	0	Holder & Gow—Medical Diagnosis	10	14	0
Do. and Dodds—Medicine 1934	8	9	6	Samson Wright—Applied Physiology 1934	11	4	0
Hale White—Materia Medica 1935	7	8	0	Houstons Inter Physics	7	3	6
Whitla—Materia Medica 1933	11	7	0	Borradaile Manual of Zoology	11	0	0
Gosh—Materia Medica	11	4	0	Hamilton Baily Physical Signs in Clinical			
Berkley Ten Teachers—Diseases of Women				Surgery			
1934				Ballp and Love Short Practice of Surgery			
Johnstone—Midwifery 1934				in one Vol. 1935	20	10	0

TO LET

When writing to advertisers, please mention this Magazine.

Phone: 8156.

THE

Members of the Medical Profession

- Serve humanity by relieving human suffering. And it is OUR PROUD PRIVILEGE to serve the members of the Medical profession throughout the Madras Presidency in meeting their printing requirements.
- In Expert and clean workmanship, distinctive quality, prompt delivery and courteous service our concern has a modest reputation, all its own.

For Your Next Printing Order Please Consult :

GORDON & CO., LTD.,

QUALITY PRINTERS.

(Printers of The Madras Medical College Magazine, The Madras Medical Journal,
The All-India Veterinary Journal, etc.)

768-770, Triplicane, High Road, MADRAS.



HOW
to dress
Stylishly
and yet
within
one's means

?

P. Mahomed Meyan

GENTS' TAILOR
(REGD)

233, GOVINDAPPA NAICK ST, MADRAS.



When writing to advertisers, please mention this Magazine.

The Madras Medical College Association

All "Old BOYS" of the College are earnestly invited to become members and keep in touch with their "Alma Mater".

SUBSCRIPTION.—Annual for old student members Rs. 5 including free issue of the Medical College Magazine and other publications of the Association.

The Madras Medical College Magazine.

Issued quarterly under the auspices
of the Madras Medical College Association

The activities of the Association and the Madras Medical College and original articles on Medical Subjects, Clinical lectures and case reports on interesting cases are published in the Magazine.

Rates of Subscriptions.

	Rs.
Students (including postage) per annum	2
For non-members	4
Single Copy	1

A GOOD MEDIUM FOR ADVERTISEMENTS.

Rates of Advertisements.

	Full Page	Half Page	Quarter Page.
	Rs.	Rs.	Rs.
Ordinary pages—One insertion	7/8	4/8	2/4
Four insertions	22/8	13/8	7/8
Outside of cover—Four insertions...	45 per page.		
Inside of cover—Four insertions	30 per page.		

For further particulars, please apply to—

THE EDITOR,

Madras Medical College Magazine,

Medical College, Madras.

The Madras Medical College Magazine

GENERAL EDITOR

Dr. R. V. Rajam, M.B., M.S., M.R.C.P.



Vol. XVI, No. 4

MAY, 1937.

THE MADRAS MEDICAL COLLEGE MAGAZINE

Published under the auspices of
The Madras Medical College Association

MAGAZINE COMMITTEE

President :

Lt.-Col. K. G. Pandalai, F.R.C.S., I.M.S.

General Editor :

Dr. R. V. Rajam, M.B.M.S., M.R.C.P.

Associate Editor :

Dr. N. S. Narasimhan, F.R.C.S.

Student Editors :

Mr. N. Money.

Mr. S. Ramalingam.

Honorary Treasurer :

Dr. K. S. Viswanathan, B.A., M.B.B.S., B.S.Sc.

Secretary and Publisher :

Mr. K. Nagappa Alva.

Asst. Secretary :

Mr. B. Krishna Rao.

Contributions are invited from members of the Medical
Profession. All communications should be addressed to :—

The Editor, Medical College Magazine, Madras.

THE MADRAS MEDICAL COLLEGE MAGAZINE.

Vol. XVI

May 1937

No. 4

CONTENTS.

PAGE

1. OPHTHALMOLOGY IN RELATION TO
GENERAL MEDICINE
By Rao Bahadur Dr. K. Koman Nayar, L.R.C.P. & S.,
D.O.M.S. ... 291
2. PERSPECTIVE AND POISE IN PRACTICE
By R. A. Young, C.B.E., B.Sc., M.D., F.R.C.P. ... 325 ✓
3. A CASE OF GONOCOCCAL SEPTICAEMIA FROM
THE SPECIAL DEPARTMENT
By N. Money ... 333
4. THE TREATMENT OF CHOLERA
By U. Srinivasa Rao (Final Year) ... 338
5. EDITORIAL ... 345
6. COLLEGE COMMENTS ... 346
7. OUR PERSONALITIES
By S. R. ... 348
8. LEST WE FORGET—Mr. K. I. Paulose and Mr. T.
Dandapani.
9. WE POOR DOCTORS OF TO-MORROW
By "Nivis" ... 351
10. LOUIS PASTEUR
By P. A. Paul (4th Year) ... 353 ✓
11. A FEW CONFESSIONS AND IMPRESSIONS
By N. Money ... 358

	PAGE
12. PERSONAL	... 360
13. BRAIN-BRIGHTNERS	... 361
14. MEDICAL COLLEGE STUDENTS' HOSTEL DAY.	362
15. MADRAS MEDICAL COLLEGE SPORTS, 1936-37.	367
16. BRAIN-BRIGHTNERS (Answers)	... 368
17. SMILE A WHILE	... 369
18. ASSOCIATION NOTES	... 370
19. U. T. C. ANNUAL REPORT	... 374
20. EXCHANGES	... 375
21. UNIVERSITY OF MADRAS	... 376

The Madras Medical College Magazine

VOL. XVI

MAY 1937

No. 4

Ophthalmology in relation to General Medicine*

BY RAO BAHADUR DR. K. KOMAN NAYAR, L.R.C.P. & S., D.O.M.S.

LECTURE I.

Ophthalmoscopic Appearances in Some of the Common General Diseases.

It is said that von Graefe, when he first saw the fundus of the living eye, exclaimed "Helmholtz has unfolded to us a new world! What remains to be discovered?" One can very well imagine with what amount of enthusiasm the invention of the ophthalmoscope was received by the master-minds of ophthalmology in the year 1851 A.D. and what future possibilities they expected of it in those olden days. Later years brought on several improvements in the construction of the ophthalmoscope until at the present day we have several highly useful and convenient models, with which magnified and clear views of the fundus of the living eye are obtained. This has enabled the ophthalmologist to correlate and corroborate his findings with those of the clinician, and to be of help to him in the better elucidation of the diagnosis of certain diseases. Very early changes in the vascular system of an individual can be observed in the fundus of his eye

before they can be detected by the clinician and also the effects of several affections occurring in the cranial cavity on the nerve elements in the fundus. Many of the common general constitutional diseases or disorders show their characteristic changes in the eyes, and often it is found that the patient is aware of his defective vision and seeks the help of the ophthalmologist first, who is then in a position to send him to the physician with valuable data for the proper diagnosis and treatment of his condition. The value of the ophthalmoscopic examination of cases in general medicine has been recognised to such an extent that every physician appearing for the higher professional examinations is now-a-days expected to be able to use the ophthalmoscope as a routine in his examination of cases.

Now we shall consider what valuable information the ophthalmoscope

* The Maharaja of Travancore-Curzon Lectures (University of Madras) 1936-37.

gives us in the examination of some of the common general diseases.

Arteriosclerosis.—The retinal vessels are typical of the vessels of similar size throughout the body; hence sclerotic changes can be well observed from its very early stages in the fundus of the eye. The important changes to be looked for are:—

1. *Changes at the arteriovenous crossings.*—The arteries are most often in front of the veins at the crossings; in these cases, the veins are invisible, not only the portion lying under the artery but also a little distance on either side of the artery; later the course of the vein is diverted, it gets a "sigmoid twist", *i.e.*, passing under the artery at right angles to it. This is the result of compression and is a pathognomonic sign of arteriosclerosis. "Banking" of the peripheral portion of the vein as a result of compression by the artery is said to be "of quite unusual occurrence." In cases where the vein crosses above the artery, it is flattened and raised up over the sclerosed artery.

2. *Irregularity of the lumen of arteries* is also a sign of a high degree of arteriosclerosis. The lumen of the artery is narrowed in places and normal in between, and often towards the periphery of the fundus the artery assumes its normal calibre. This is ascribed to localised proliferation of subendothelial tissues taking place in an eccentric manner.

3. *"Copper wire" arteries.*—There is first seen an increase in the brightness of the light reflex from the surface of the arteries, giving the appearance of burnished copper wire. It is due to a thickening of the middle coat of the artery and is of diagnostic value chiefly in cases where secondary and tertiary branches of the artery

are involved; if this wide light reflex shows a beaded appearance, it is of great value in diagnosis.

4. *Tortuosity of arteries* (or "corkscrew" arteries, as termed by De Schweinitz). This sign is of value when seen in the finer branches near the macular area.

5. *Hæmorrhages.*—There are mostly seen in the posterior part of the fundus and are small and flame shaped usually.

6. *Retinal exudates*—This is a late manifestation in arteriosclerosis. The exudates occur usually as small bright white spots with no oedema around them. They are situated in the outer molecular or reticular layer and are formed of a hyaline looking material. Rarely, the exudates form into plaques and sometimes they are seen arranged in the form of a star or fan shaped figure in the macular region. According to Foster Moore, the condition is unilateral in about 40 per cent of cases.

7. *"Pipestem sheathing"* around the arteries is seen in very advanced cases; in these cases, the perivascular sheaths are affected but the arterial lumen is not interfered with. In other advanced cases, some of the small arteries may be converted into and appear as thin white cords with no blood in them.

Reduction of blood supply to the retina may cause a gradual atrophy of the retina and optic nerve; sometimes a mild cedematous condition of the optic disc is seen. Paroxysmal attacks of dimness of vision or even blindness, lasting for short periods, may occur as a result of angiospasm or a sudden decrease of general blood pressure in a patient with sclerosed

arteries. In advanced cases, the kidney is also secondarily affected, when the ophthalmoscopic picture will be altered to some extent, as will be described later.

In considering "some aspects of vascular change in the fundus oculi and of retinal arteriosclerosis in particular," *Evans*⁽¹⁾ (Birmingham) states that though retinal arteriosclerosis occurs in conjunction with similar general vascular changes it is no reliable indication of the degree of generalised arteriosclerosis. He says that the earliest changes are seen in the veins; that the gross changes of arteries occur usually late; and that retinal exudate is not a common feature of the arteriosclerotic fundus, is usually late in appearance, but of grave prognosis.

Williamson Noble⁽²⁾ says "The condition of the small vessels passing to the macula may be of great importance in cases of arteriolar sclerosis. In fact, in some cases of vascular disease of the most serious type, these may be the only vessels showing any visible change," such as alteration in their course (corkscrew like) and an increase in brightness of their reflex (silver wire like).

Regarding the retinal vessels in hypertension *Sallmann and Kahler*⁽³⁾ state "narrowing and straightening of the arteries, accompanied by bright and clean cut reflexes are the most important ophthalmoscopic signs of hypertension: the nicking of the veins and its higher degrees, as also tortuosity of macular veins indicate arteriosclerosis. These are seen in hypertension of central origin; but also in arteriosclerosis without hypertension. Tortuosity of macular veins is commonly found in patients with hypertension; but also in patients with

cardio-vascular diseases without hypertension." They are inclined to consider tortuosity of macular veins a sign of a congenital anomaly of the vascular system.

Guist⁽⁴⁾ speaks of two types of vascular changes in the retina in hyperpiesia. (1) Primary hyperpiesia in which the blood vessels are healthy to start with, the later stages coming on in the following sequence; corkscrew tortuosity of small veins,—distension and tortuosity of larger veins—narrowing of arteries—white stripes along arteries; arteriovenous compression is a relatively early sign. (2) Toxic hyperpiesia, in which the arteries are thin from the beginning, white stripes along arteries are present early, smaller arterioles are seen with difficulty, tortuosity of vessels is not so marked as in primary hypertension and white stripes and marked arteriovenous compression are the most significant features.

Adams⁽⁵⁾ considers the arteriosclerotic changes in the eye to be "the result of several different pathological processes, some of which are but dimly understood." He, however, groups them under the following three headings:—

Group I.

Hyperpiesia in which there is simple high tension without signs of arterial or renal disease.—He calls this the presclerotic stage, which he says may be made to disappear, without arteriosclerosis developing, in many cases. The main symptoms complained of by the patient and for which he may be referred to the eye specialist are headaches on waking in the morning and pain in the muscles at the back of the neck. The two earliest signs of high blood pressure before the onset of arteriosclerosis are (1) the

small size and the pale colour of the arteries, quite apart from thickening or exaggeration of the light reflex and (2) at arteriovenous crossings, the absence of the light reflex for some short distance up and down the vein—seen even before the appearance of obvious pinching or indentation at crossing.

Group II.

Arteriosclerosis with associated high tension, renal and heart changes.—The important signs are:—

1. Irregularity of calibre of arteries with a general diminution in their size: considered a most certain and valuable sign of arteriosclerosis when present.
2. Tortuosity of arteries, a rarer and less valuable sign: corkscrew vessels near the macular region is a corroborative sign.
3. Exaggeration of the central light reflex—a hard sharply defined bright streak indicates high blood pressure; but several cases of high blood pressure do not show this sign.
4. Loss of translucency of arterial wall.
5. Changes at arteriovenous crossings.
6. In later stages, arteriosclerotic retinitis of Foster Moore, retinal exudates.

Group III.

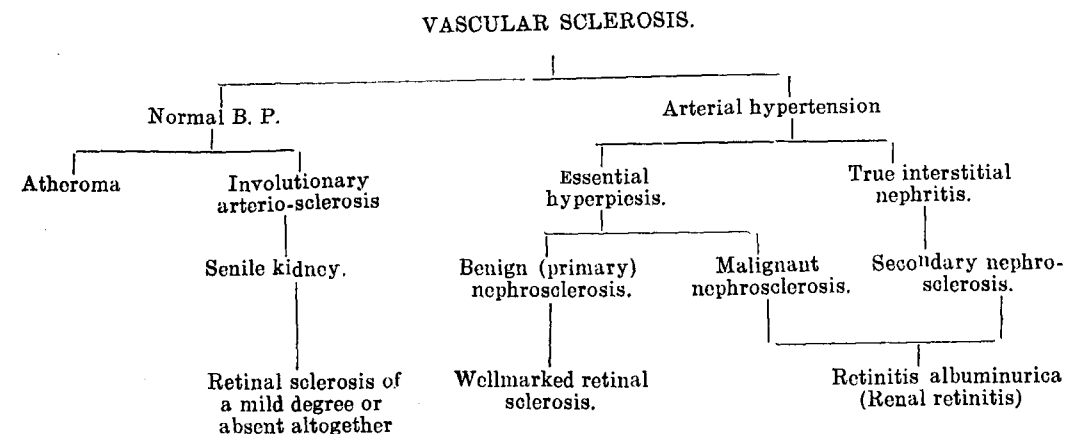
Chronic nephritis with secondary high blood pressure, arteriosclerosis and heart changes.—The primary lesion is in the kidney; the other changes are secondary.

Barlow⁽⁶⁾ in an article on "fundus changes in hypertension" mentions that the best classification of fundus changes in cardiovascular renal disease is that of Wagener of the Mayo Clinic, who divides the cases into four groups: (1) Arteriosclerosis of hypertension type with hæmorrhages but no actual retinitis, (2) arteriosclerotic retinitis, probably the result of severe endarteritis, showing the small white spots, (3) retinitis of hypertension with nephritis in which a toxic factor is also present, and which shows slight œdema of retina, scattered hæmorrhages and few exudates and (4) retinitis of nephritis with its classical fundus picture.

Pines⁽⁷⁾ who made a careful study of 464 cases of arteriosclerosis makes the following observations regarding the order in which the fundus changes were noted by him:—

"Translucency of the retinal vessels is the first to disappear when any pathological change occurs in them. They change their colour next; then 'dot' their light reflex; next the sclerotic perivascularis appears, first as white lines at crossings and later taking a leading part in arteriovenous compression." He is of opinion that essential hypertension aggravates and greatly increases all the sclerotic signs of retinal vessels and that the sclerosis of the perivascular channel of the arteriole is the cause of the centripetal deflection of the vein, where crossed by the artery.

Pines⁽⁸⁾ has shown in the following table in a graphic way the interrelationship between vascular sclerosis and retinal lesions, with and without affection of the kidneys. In late stages of vascular sclerosis the kidney often gets affected.



Zavalia and Brandan⁽⁹⁾ observe that ophthalmoscopic changes are constant and early in the hypertension of arteriosclerosis without renal insufficiency and that they are seen at a stage when few symptoms are present in other viscera. In 40 per cent of cases of hypertension, sclerotic changes are seen in the choroidal vessels, which they consider a very important factor in enabling one to distinguish essential arteriosclerotic from nephritic hypertension.

Next we shall consider how far the different signs and symptoms indicate the progress or prognosis of these cases.

Pines⁽¹⁰⁾ gives a good summary of his views which is quoted below:

"Involutionary arteriosclerosis implies only limitation of function; essential hyperpiesis is much more dangerous; interstitial nephritis (malignant or secondary nephrosclerosis) means a quick and tragic end. In the retina the first is seldom seen and may be absent altogether; the second means sclerosis of the perivascularis, change in lumen of vessels, hæmorrhages and exudation; the third is accompanied by inflammation of the parenchyma,

œdema and its special form of exudation. One cannot rely upon the blood pressure, retinal picture or the kidney efficiency tests alone in the prognosis; they must all be combined. Retinal hæmorrhages are less important if the blood pressure is steady; but if they increase, in spite of the blood pressure being steady or even lower, the outlook is gloomy. The silvery wire and tortuous independent small vessels around the disc are a bad omen. Worst of all is œdema of the retina which shows as a fine veil covering the vessels on the retina which may disappear but come on again and again. In the majority of cases the kidney efficiency tests will coincide with this œdema, which is always connected with arterial hypertension."

Gager⁽¹¹⁾ says that hæmorrhage into the retina with arteriosclerosis indicates progress of hypertension and if excessive suggests the malignant character of the process; further, that exudation is exclusively associated with hypertension and that if it occurs without vascular sclerosis, a purely inflammatory process including nephritis is likely. In retinal arteriosclerosis, exudation is not often inflammatory but is evidence of an advanced stage, or with hæmorrhage

and oedema, of the malignant type of hypertension.

Evans ⁽¹⁾ is of opinion that the prognostic significance of retinal arteriosclerosis is very unreliable, it being often only a localised lesion and that if properly treated, it is not so serious a condition as recent literature would have us to believe.

Bailliant ⁽¹²⁾ considers the prognosis of these cases in terms of the proportion between the local retinal arterial pressure and the brachial diastolic pressure. In hyperpiesics, the local retinal arterial pressure remains usually 0.45 or 0.5 of the brachial diastolic but in nephritics it may reach 0.7. The progress in hyperpiesics will be more grave, in his opinion, if the retinal pressure exceeds the usual proportion, even when the usual signs of renal retinitis are not present.

Brana and Schiff ⁽¹³⁾ divide the cases into three groups as regards their prognosis:

(1) High blood pressure without corresponding ophthalmoscopic changes, in which he says the prognosis is good, (2) blood pressure not high, but ophthalmoscopic examination shows positive changes, prognosis bad, (3) optic atrophy with hæmorrhages and retinal degeneration—indicates predisposition to apoplexy.

It has been recorded by *O'Hare and Walker* that "retinal arteriosclerosis with a normal or low blood pressure indicates the existence of a previous hypertension, with a subsequent myocardial weakening or loss of vascular tone." Such patients undergo the risk of getting thrombosis of cerebral vessels or retinitis exudativa.

Hypotension in the retinal arteries has been studied by *Bailliant* and

Tillie. They have demonstrated that "a retinal artery hypotension is of as much importance as hypertension."

Laignier ⁽¹⁴⁾ (Paris) reports a case in which the patient complained of difficulty in reading printed characters. The only abnormality found in the eyes was that the left eye had a retinal arterial tension of 28 m.m. while the right one was normal at 55 m.m. The patient's vision was normal, but he had alexia with left homonymous hemianopia; the pupillary light reflex was preserved in the hemianopic area; he had also valvular disease of the heart. Another case is reported in which a patient complained of spots before his right eye and loss of memory; he had also a systolic aortic murmur. His retinal arterial tension was 30 m.m. in the right eye and 60 m.m. in the left. This question of retinal arterial hypotension does not come into one's practical work on account of difficulty in its estimation, but it is interesting to know the bad effects produced by this condition.

Atheroma of the heart or large vessels does not cause any changes in the retinal vessels, unless there is an added essential hyperpiesis, when there are found marked and advanced retinal changes, depending chiefly on the degree of arterial hypertension (*Pines*).

Renal Disease.—Retinitis is a common feature in cases of renal disease. We have already considered the part played by vascular sclerosis and hypertension in producing renal disease and how the fundus changes in the former are often mixed up with those in the latter. According to *Foster Moore*, retinitis is present in one-third of the cases of nephritis sufficiently advanced to require in-patient treatment,—excluding cases of acute neph-

ritis, trench nephritis, pregnancy cases, and arteriosclerosis,—ordinarily the presence of retinitis is an indication that the renal disease is of considerable standing. It is very frequently seen in cases of chronic interstitial nephritis, but not so common in chronic parenchymatous nephritis; it is very rare in children. High blood pressure is most often present in cases of renal retinitis, but as stated previously, retinitis is often absent though the blood pressure is high.

We shall first consider the typical ophthalmoscopic changes found in a case of renal retinitis. They consist of exudates, oedema and hæmorrhages.

(i) *Exudates*, mainly of the variety known as "cotton wool patches"—dull white, soft edged and wooly looking patches, found mostly in the central region of the retina. These are seen in large numbers in cases of nephritis where there is a preponderance of the toxic element, such as in pregnancy cases, parenchymatous nephritis, etc. The exudates are mostly in Henle's layer where there is extensive infiltration with fibrinous material, which becomes hyaline later. They may get absorbed but new ones keep on forming.

In many cases, the exudates form a partial or complete star figure at the macula; when partial or fan shaped it is seen as lines radiating from the macula to the optic disc. The figure is made up by dense white narrow rods, with sharp edges, in complete or, more often, broken lines radiating from the macula; the exudate is composed of hyaline material or, according to some, formed by patches of varicose nerve fibres. Although a star figure at the macula is considered a very characteristic feature of renal retinitis

it must be mentioned that it may occur also in cases of syphilitic retinitis, thrombosis of central vein, papilloedema of brain tumour, especially in children, etc. In later stages, these exudates are to some extent absorbed, leaving a white powdery residue.

(ii) *Oedema*.—Some amount of oedema is said to be present in all cases; in some cases, there may be seen neuritis with blurring of the optic disc margins. The oedema is due largely to a toxic effect on the capillary endothelium. In some cases, especially pregnancy cases, the oedema and effusion of fluid is so great as to cause detachment of the retina.

(iii) *Hæmorrhages*.—These are always present and are seen mostly in the central region of the retina; often in the superficial layers and hence flame shaped. They get absorbed but fresh ones keep on forming.

Besides the above main features, one may see in long standing cases, evidences of arteriosclerosis in the fundus.

A reduction in the size of the veins is the earliest sign that the retinitis is subsiding; the veins develop white lines along them; similar changes are seen in the arteries. The optic disc shows atrophic changes, the disc margins being hazy; the exudates become powdery in appearance; and there may be seen irregular spots of pigment scattered in the retina.

Two types of retinitis are mentioned, the vascular and the toxic varieties. The toxic prevails in parenchymatous nephritis; the arteriosclerotic kidney is primarily of vascular origin; and the secondary contracted kidney is said to be an intermediate form between these two.

McAlpine ⁽¹⁵⁾ suggests that the term "Hypertensive retinitis" should replace "albuminuric or renal retinitis" inasmuch as the retinal changes usually described under these names may occur in the absence of any appreciable renal disease. He is of opinion that in certain cases of hypertension with albuminuria, "the kidney is merely sharing in the effects of a widespread arteriolar constriction, the result of which may be apparent also in the fundus, brain, heart and extremities." The same view is held by *Elwyn* ⁽¹⁶⁾ who says that the changes in renal retinitis can be ascribed primarily to arterial constriction; for, retinitis is absent in those forms of renal disease where there is no generalised arterial narrowing, *i.e.*, those forms of nephrosis due to pregnancy.

Huber ⁽¹⁷⁾ quotes Volhard, Kahler and Sallmann as having shown that hypertension was the essential etiological factor for albuminuric retinitis, while the function of the kidneys may be perfectly normal.

Pines ⁽¹⁸⁾ writing about "Retinitis nephritica or albuminurica" makes the following observations:—

The fine veil seen covering the larger retinal anterior vessels in odema of the retinal anterior layers, when fully developed, leads to the "wool patches" in the retina. As mentioned before, this oedema is in proportion to the extent and degree of the renal insufficiency and invariably it is seen that arterial hypertension is also present. With a normal blood pressure, retinal oedema means only a deficient oxygenation of the retinal cells. Retinitis albuminurica always means an inefficient kidney, although biochemical tests may be satisfactory; roughly speaking, increase of blood urea means only an incomplete

oxidation by the tissue cells. *Pines* suggests that, as it is not yet proven that retinitis albuminurica is caused by disease of the kidney, it may be that both the organs may be suffering from the same toxin.

Kleiber ⁽¹⁹⁾ has reported a case of albuminuric retinitis in a 14 year old girl with generalised arteriosclerosis and very high blood pressure, who died nine months later of uræmic coma. Post-mortem examination revealed the presence of hæmorrhagic nephritis which marked contraction of both kidneys.

Cannady and O'Hare ⁽²⁰⁾ writing about the retinal lesions in chronic glomerular nephritis says, that ophthalmoscopic differentiation between lesions of nephritis and of primary vascular hypertension was impossible in most cases. In 30 out of 32 cases observed, retinal changes developed before death; 25 of them showed advanced arteriosclerotic retinopathy or hypertensive neuroretinopathy. Elevation of blood pressure preceded the appearance of retinal arteriosclerosis in 13 out of 17 cases. All the above patients developed uræmia and died, the minimum period of life after the observation of the fundus changes being 7 months and the maximum 23 months.

Retinitis of Pregnancy may be mentioned here. The ophthalmoscopic signs in the fundus are the same as in ordinary renal retinitis but on account of the severe toxæmia, copious exudates and a severe form of oedema are present. The oedema and formation of fluid in the retina may be so severe as to cause detachment of the retina. The prognosis in these cases is much less grave; the retinitis may get resolved to a great extent and some recovery of vision is possible;

even the detached retina may settle down by itself.

Morris Jaffe ⁽²¹⁾ of New York says that retinal detachment is not rare in eclampsia and that spontaneous reattachment takes place in a large number of these cases; he mentions retinitis and papillitis as being responsible for the deterioration of vision in most of the cases.

In an article published by Lt.-Col. R. E. Wright ^(21-a) and others from the Government Ophthalmic Hospital, Madras, a case was reported of a girl of 18 who lost her vision after eclampsia at nearly full term and in whose eyes, ophthalmoscopic examination failed to reveal any abnormal fundus changes. It was a case in which the lesion was in the upper neurone and attributable to eclampsia. In 37 cases of eclampsia and pre-eclampsia examined at the Government Hospital for Women and Children, Madras, detachment of the retina was not observed. In two instances, recent retinal hæmorrhages were seen. One case had marked deterioration of vision; and later had pale disc and distinctly narrowed arteries. Spasm of arterioles, as described by recent observers, was not seen in the cases reported; but there was slight oedema of the retina in some.

Clapp ⁽²²⁾ observed six cases of detachment of retina in less than two years at Baltimore, but does not seem to have seen any during the previous 14 years.

Kyrieleis and Schroeder ⁽²³⁾ published an article on their observations on the changes in the retinal vessels in the last few months of pregnancy, from which the following is taken. "In 35 per cent of normal pregnancy women, a tonic contraction of retinal

vessels is seen, without retinal exudate, hæmorrhage or loss of vision. In one group, it was associated with an increase in the blood pressure; in another, a sudden increase in body weight without oedema developed along with fundus changes and in a third class, increase in both blood pressure and body weight occurred. After delivery, the vessels returned to normal in a short time.

Uræmia.—A few words may be said about the changes in uræmia, in which blindness sets in. It is usually sudden in onset, pupils react to light and the retinal changes (of renal retinitis) are disproportionate to the gravity of the general condition. The lesion in these cases is cortical in origin. Very few cases die of uræmia without showing retinal changes. If recovered from, the sight is recovered to a great extent and that fairly quickly.

Diabetes and Diabetic Retinitis.—The question has been often discussed whether there is such a separate entity as "diabetic retinitis." For, retinitis is very rarely seen in the severe types of diabetes occurring in young people; and, in most cases, there is present albuminuria and arteriosclerosis with high blood pressure in association with the diabetes. But Foster Moore contends and the view is accepted by many ophthalmologists that there are certain distinctive features which characterise diabetic retinitis. The retinal exudates are described as solid, soapy, or waxy looking, with sharp, clear cut margins, and they are distributed irregularly in a circle well wide of the macula. "Cotton wool" patches are not seen. Hæmorrhages are seen generally in the deeper layers of the retina and are roughly circular in outline; a star figure is uncommon nor is there any appreciable amount of oedema.

The optic discs look normal and have clear cut margins. Retinal pigment spots are not seen.

Several cases of diabetic retinitis have been recorded in which albumin never appeared in the urine and the blood pressure was not raised. In many cases, it has been noted that the immediate cause of death was diabetic complications. Prognosis is much less grave in diabetic retinitis as compared with renal retinitis. As a rule, diabetic retinitis does not occur in persons under 35 years of age.

It must be borne in mind that diabetics are more liable to intraocular hæmorrhages. *Humphrey Neame* says that diabetic patients, free from retinitis, frequently get intraocular hæmorrhages, either subhyaloid or into the vitreous. It has been observed that fresh patches of retinitis may form even during periods when the urine is sugar free or the patient is undergoing insulin treatment; some patches may get absorbed; but they have not been observed to disappear while the patient was under active treatment.

Bessiere (24) (Bordeaux) discusses the question "Does diabetic retinitis occur in the absence of renal disease?" and says that of 18 cases of diabetic retinitis that he saw practically all of them had evidences of a greater or less degree of chronic nephritis. Retinal changes did not parallel the severity of glycosuria. In his opinion Insulin treatment may cure glycosuria but has little effect on the progress of a diabetic retinitis. He goes so far as to draw the conclusion that retinitis in a diabetic who shows no albuminuria "should be considered a premonitory sign of approaching renal insufficiency." He says that "every diabetic who is the subject of an

exudative retinitis is in reality an undiscovered renal case," but is of opinion that though the question demands further investigation, diabetic and albuminuric retinal lesions are analogous.

Williamson Noble (25) says that the hæmorrhages and exudates in diabetic retinitis are characteristic; that "arterial sclerosis and renal disease are concomitant, possibly contributory, but not causative of diabetic retinitis." He thinks that the essential lesion in the retinitis is the recurrence of the deep seated retinal hæmorrhages.

Dirion (26) (Cleveland) says that out of 68 cases examined by him for ocular complications, 58 showed pathological changes in the retina; there was albuminuria in 33 patients, and hypertension in 34. Practically all the retinas showed vascular pathological changes. He observed that the amount of hæmorrhage had no relation to the degree of vascular sclerosis present; that improvement of the diabetic condition did not improve the retinal condition; and came to the conclusion that diabetic retinitis is not a definite entity.

Hogg (27) (Tasmania) considers that retinitis is usually associated with the type of diabetes in which there is only defective storage of carbohydrates and that the multiple punctate hæmorrhages scattered over the fundus, sometimes at the periphery, and few in number, are pathognomonic of diabetes.

W. A. Gray (28) in an article on "ocular conditions in diabetes mellitus," states that "a characteristic form of retinitis occurs in diabetes" and that "the small amount of sclerosis of retinal vessels is an important point of differentiation from retinitis of

other origin." He thinks the "hæmorrhages may be due to the effect of toxins causing secondary changes in the vessels or to hypertension, the latter being probably a mechanical factor."

Commenting on the above paper of *Gray, Pines* (29) said as follows:—"Pre-dominance of capillary degeneration is sufficient to explain the peculiarities of diabetic exudates and hæmorrhages. The same or perhaps another missing factor eventually produces as a rule, an arterial hypertension. It is seldom as pronounced or as advanced as in essential hyperpiesis and correspondingly the sclerosis of the retinal vessels is not so marked. In diabetes, the sclerosis of the retinal vessels is a phase intermediate between senile and hyperpietic changes." He says that even mild diabetes attacks the retinal vessels, but retinal oedema is a deciding factor in the diagnosis of nephritis.

Cohen (30) in a paper on "The eyes in diabetes mellitus," draws the following conclusions:—"Diabetic retinitis is due mainly to disease of the retinal vessels and in some cases, diabetes influences the fundus picture in an early stage. Diabetic retinitis is either a retinal arteriosclerosis in diabetes, or if the vascular lesion is severe, an arteriosclerotic retinitis in diabetes." Of course the distinction between the two is very fine.

Adams (31) reported an interesting case of diabetic retinitis in a patient aged 22 years, which is a rare condition. In this case, there were retinal exudates in the macular region in one eye and small punctate hæmorrhages about the fundus in the other. The blood pressure was normal, and there was no obvious sign of diseased blood vessels. The urine sugar was 2.2 per cent and

the blood sugar 0.3 per cent. There was also noted a very faint trace of albumin in the urine.

Wagener, Dry and Wilder (32) gave statistics of 1,052 cases of diabetics examined by them. 5.5 per cent of these showed only retinal hæmorrhages; 12.2 per cent showed hæmorrhages and exudates in the retina. 12 per cent were entirely free from vascular disease. Retinal lesions were usually associated with hypertension or other evidence of vascular disease. They came to the conclusion that diabetes injures the finer arterioles and venules, probably the latter; and that if hypertension is also present, the lesion characteristic of diabetes is superimposed.

Gresser, (33) on an examination of 100 cases of diabetes, found clinical signs of hypertension and retinal vascular sclerosis in 38 per cent of them, and associated nephritic lesions in 23.5 per cent. He found that "the duration of the diabetic state was not apparently a direct factor in the production of retinal pathology." 30 per cent of his cases showed signs of retinal vascular sclerosis without any other vascular or retinal changes; and 32 per cent showed no alterations in the retinal vessels or tissues.

Folk and Goskin (34) made a comparative study of the fundus oculi in 150 diabetic and 150 non-diabetic patients of the same age group. They found that the incidence of retinitis in diabetics was greater, but the incidence of sclerosis of retinal vessels was only little higher in the diabetics.

Analysis of the records of 1917 fundus cases observed at the Government Ophthalmic Hospital, Madras, during the five years 1931—1935 showed 26 cases of albuminuric retinitis, 10 cases of diabetic retinitis and 4 cases in

which both the conditions were seen mixed together. Only 13 cases of pure arteriosclerotic changes in the fundus were noted, although there were 83 cases recorded in which the blood pressure was raised. Of these 83 cases with high blood pressure, 40 had albumin in the urine, but only 14 of them showed signs of albuminuric retinitis; 6 had glycosuria but 5 of them showed signs of diabetic retinitis and 3 had both albumin and sugar in the urine, of which 2 showed signs of both albuminuric and diabetic retinitis in the fundus.

From the above, it is seen that the fundus lesions in the arteriosclerotic, nephritic and diabetic cases show many points of similarity and all of them with rare exceptions occur after the middle period of life. Some amount of vascular degeneration is met with in most cases; one or more of the factors may be present in a single case; at the same time, cases are seen in which the distinctive features of

only one variety are present in each case. Whichever factor is predominant in a particular case has to be found out by ophthalmoscopic and clinical examination of the patient, and the value of the results assessed as regards prognosis, course and treatment of that case. Some idea can be obtained about the duration of life and the final complications that are to be expected or looked for before the death of the patient. Although different observers have given different opinions regarding the existence of such a separate entity as diabetic retinitis, there is no doubt that in several cases, special typical features are seen in the fundus picture which are characteristic of the diabetic affection and there are many cases in which there is no suspicion of the existence of an arteriosclerotic or nephritic condition along with the diabetes. Anyhow, ophthalmoscopic examination gives very valuable information to the clinician in these diseases and should never be neglected.

REFERENCES.

- Foster Moore's*.—Medical Ophthalmology.
Bercus.—"The Eye and its diseases".
Maitland Ramsay.—Clinical Ophthalmology for the General Practitioner.
1. Br. Jour. of Oph., May 1933.
 2. Lettsomian Lectures, Lancet, June 1932.
 3. Arch. of Oph., December 1934 (Abstract.)
 4. Br. Jour. of Oph., April 1932 (Abstract.)
 5. Br. Jour. of Oph., July 1920.
 6. Arch. of Oph., July 1927.
 7. Br. Jour. of Oph., April 1929.
 8. Br. Jour. of Oph., March 1929.
 9. Amer. Jour. of Oph., Sept. 1933 (Abstract.)
 10. Br. Jour. of Oph., May 1929.
 11. Arch. of Oph., Sept. 1929.
 12. Br. Jour. of Oph., June 1932 (Abstract.)
 13. Amer. Jour. of Oph., Feb. 1935 (Abstract.)
 14. Arch. of Oph., Feb. 1936 (Abstract.)
 15. Lancet, Nov. 26, 1932.
 16. Arch. of Oph., Feb. 1934.
 17. Amer. Jour. of Oph., Sept. 1932 (Abstract.)
 18. Br. Jour. of Oph. March 1931.
 19. Amer. Jour. of Oph., May 1932 (Abstract.)
 20. Amer. Jour. of Oph., Sept. 1934 (Abstract.)
 21. Arch. of Oph., Dec. 1933.
 - 21a. Br. Jour. of Oph., Jan. 1935.
 22. Amer. Jour. of Oph., July 1919.
 23. Amer. Jour. of Oph., Jan. 1932 (Abstract.)
 24. Amer. Jour. of Oph., Aug. 1932 (Abstract.)
 25. Lancet, June 1932.
 26. Arch. of Oph., May 1933.
 27. Br. Jour. of Oph., May 1934 (Abstract.)
 28. Br. Jour. of Oph., Oct. 1933.
 29. Br. Jour. of Oph., Nov. 1933 (Abstract.)
 30. Arch. of Oph., Nov. 1929.
 31. Br. Jour. of Oph., Jan. 1932.
 32. Amer. Jour. of Oph., Sep. 1935 (Abstract.)
 33. Amer. Jour. of Oph., July 1933.
 34. Amer. Jour. of Oph., May 1935.

LECTURE II.

Ophthalmoscopic Appearances in Some of the Common General Diseases—(Contd.).

We shall now consider the ophthalmoscopic appearances in some of the blood diseases and see how they vary in the different kinds of anæmias.

Pernicious anæmia.—Retinal hæmorrhages are seen in plenty; and it is said that it is unusual to find a case without hæmorrhages. They are mostly small and flame-shaped or may be sometimes roughly circular in outline. They occur in the central region of the fundus; often hæmorrhages with pale centres may be seen. Tendency to retinal hæmorrhages is said to commence when the corpuscles have dropped to 32 per cent of the normal or thereabouts. Sir Humphrey Rolleston suggested that a low platelet count is responsible for this. Retinal hæmorrhages "imply a pathological condition of the endothelium of the blood vessels" and is usually the result of a diseased state of the blood; a reduction of blood platelets to less than 50,000 per c.m. (instead of a normal of 200,000 to 300,000 per c.mm.) is said to bring on liability to hæmorrhage, on account of defective and insufficient formation of fibrin. According to some observers, the first and most important sign of an anæmic fundus (especially in pernicious anæmia) is the translucent column of blood. Besides hæmorrhages, small rather woolly looking areas are sometimes seen. The retinal vessels are engorged and there may be seen an opalescent haze over the retina and optic disc. The optic disc is rather pale; there is some disparity between the pallor of the fundus and the anæmia.

Chlorosis.—Hæmorrhages are said to be of quite unusual occurrence in

chlorosis. Papilloedema is often present but, of course, one must be careful to exclude other causes of this sign.

Secondary anæmia.—There is a faint general haze over the disc, with a general pallor of the fundus. Retinal vessels are distended, but contain pale blood—the colour of the arteries and the veins nearly approximate each other. The more important fundus changes are retinal hæmorrhages and white patches; hæmorrhages are few and superficial and are situated close to the optic disc; they do not bear any definite proportion to the degree of anæmia present; few soft edged white patches are seen in the nerve fibre layer. Both the hæmorrhages and white patches may get absorbed, leaving no traces.

Leukæmia.—The ocular changes in this disease are "grosser and more constant in the myelogenic variety." Foster Moore divides the fundus changes seen in leukæmia into three stages. The earliest change noted is an engorgement of the retinal veins. In the next stage, which is more common, there is distension of either the veins alone or both the veins and the arteries. The vessels are paler than normal; and the veins and arteries approximate each other in colour. The veins are "cut into" where the arteries cross over them, but are not altered in their course as in cases of arteriosclerosis. Hæmorrhages occur in the retina; they are either small or of medium size and may be either extensive or scanty; subhyaloid hæmorrhages may also occur. Some of the patches of hæmorrhages are diamond-shaped with a pale

centre. There is seen also a broad sheathing of veins due to perivascular infiltration, the sheaths being widest along the convexity of their curves. In the third stage, which is rarely seen, there is a general leucocytic infiltration of the retina and the choroid in addition to the changes noted above. The fundus reflex acquires a pale yellowish or orange colour.

Loss of vision from severe bleeding may be considered here. Though rare, the most common cause is gastrointestinal hæmorrhage; next comes uterine hæmorrhage. It is worthy of note that traumatic bleeding does not cause loss of sight. In the early stages, the fundus changes consist of slight œdema of the optic disc with very few small retinal hæmorrhages; the retinal vessels are pale but full. Later stages show an optic atrophy, with pale discs and very narrow retinal vessels.

Retinal hæmorrhages.—A few points regarding the significance of retinal hæmorrhages may be mentioned here in spite of a little repetition in some cases. The presence of retinal hæmorrhages always signifies a pathological condition of the endothelium of the blood vessels. In some cases it is due to a diseased state of the blood, as in the anæmias; in others, it may be the result of the toxins circulating in the blood, as in infectious diseases, and other general diseases mentioned previously; diseases of the vessel walls, as in arteriosclerosis, is responsible for some cases; arteriolar bleeding may be embolic in origin, as in cases of endocarditis, pyæmia, etc.; venous obstruction, as in thrombosis of the central retinal vein or of one of its tributaries, papilloedema, etc., is another cause. Other cases may be traumatic in origin, either direct injuries such as birth injuries, fracture of the skull, sudden relief of intraocular tension

during operations, or any severe strain on the part of the patient. The hæmorrhages are subhyaloid when they are on the anterior surface of the retina between the nerve fibre layer and the internal limiting membrane; flame shaped, when they are in the nerve fibre layer; roughly circular in outline when in the layers of the retina deeper than the nerve fibre layer, which have a retiform structure. All hæmorrhages tend to get absorbed gradually, the time taken depending on their size. During absorption, the patches appear mottled (red and white) as a result of the separation of the blood constituents. It is of interest to remember that if the hæmorrhage is confined between the two limiting membranes of the retina, it may completely disappear without any pigmentary disturbance.

Wullenweber⁽¹⁾ writing on the significance of retinal hæmorrhages makes the following remarks:—

“Retinal hæmorrhage in sepsis may be the one manifestation that the disease has begun to metastasize. In endocarditis, it makes the prognosis much worse. The retinitis of pregnancy is a manifestation of arterial spasm. In essential hypertension, retinal hæmorrhage is to be evaluated like cerebral hæmorrhage.”

Syphilis.—Next we shall consider the ophthalmoscopic appearances produced in the eyes of persons as a result of *syphilis*.

Kirkpatrick⁽²⁾ mentions an incidence of over 60 per cent. of cases of venereal disease in over 500 fundus disease cases recorded in the Government Ophthalmic Hospital, Madras. Thus it is seen that a very large proportion of cases of fundus disease are directly or indirectly due to venereal disease in this country.

Congenital syphilis is responsible for retinochoroidal affections. *Huguenin*⁽³⁾ describes three forms: (1) Mild cases, in which there are scattered, small reddish yellow spots with fine pigment points, usually seen only in the periphery of the fundus; the optic disc may be pale; the disease shows little tendency to progress. (2) Pigmented patches, isolated or conglomerate, situated mostly in the periphery, and found after the subsidence of interstitial keratitis. These are usually stationary. (3) Round or oval light yellow areas with a heavily pigmented border, in most cases peripheral, but may spread to the posterior pole of the eye; hence the prognosis in these cases is less favourable—a widespread diffuse chorio-retinitis with narrowed retinal vessels and pigment proliferation.

In *acquired syphilis*, an acute syphilitic retinochoroiditis may occur. Very fine dusty vitreous opacities give a hazy fundus view with the ophthalmoscope. The optic disc may show some hyperæmia and slight swelling; there may be seen fine white streaks along the arteries; a partial star figure of exudates may be seen at the macula. Rounded spots of choroiditis due to lymphocytic infiltration of the choroid are seen scattered over the fundus, with the overlying retina appearing grey and cloudy. There may be seen few fine hæmorrhages. Later on, when the condition quietens down, we get a picture of general atrophy of the retina and the inner layers of the choroid. There may be discrete white patches, round or irregular in shape, with plenty of pigment around them, and the retinal vessels are often found passing over them. The retinal vessels may show narrowing with slight perivascular exudate along them. Typical disseminated choroiditis is rarely seen in this country.

Optic neuritis and postneuritic atrophy are fairly common and the commonest cause of these conditions is syphilis, especially when the inflammation has affected the meninges. In optic neuritis, the optic disc is hyperæmic, and assumes almost the same colour as the rest of the fundus, the margins of the optic disc become blurred, and exudate fills the physiological cup on the disc; the retinal vessels are full; exudates may be seen along the vessels outside the optic disc; there may be exudates poured out into the vitreous also. There is also some œdema of the optic papilla but the swelling is seldom more than 2 D. The retina surrounding the optic papilla is also frequently involved. Small hæmorrhages may be present on the disc surface. This condition of optic neuritis has to be diagnosed from a pseudo-neuritis which is a congenital condition seen in cases of high degree of hypermetropia and astigmatism; in pseudo-neuritis there are no exudates or hæmorrhages, the condition does not change and there is no deterioration of vision, proper glasses bringing the vision upto normal. Optic neuritis has also to be diagnosed from papilloedema, about which mention will be made later.

Cases of optic neuritis go on to a secondary atrophy in which the destroyed nerve fibres are replaced by newly formed connective tissue. The optic disc is whitish, its margins are hazy and the physiological cup is filled with organised exudate; retinal vessels are narrowed, especially the arteries; organised exudate is seen along the retinal vessels in places, as a perivascular sheath. According to Kirkpatrick, the most common variety of optic atrophy seen in the Government Ophthalmic Hospital, Madras, is “a deeply pale disc, with clean edges and

a complete absence of cupping." He considers it as "apparently following a very mild inflammation or one situated behind the globe."

Tabes and general paralysis—In some of these cases, optic atrophy may be a very early sign; diminution of vision complained of by the patient leads to an ophthalmoscopic examination which may reveal the optic atrophy; in these cases, it is a true primary or simple optic atrophy that is met with. The optic disc is grayish white, its margins are clear, the lamina cribrosa is well seen; there is present, in late stages, a shallow atrophic cupping of the optic disc and the retinal vessels may remain normal in size and calibre for a long time. A similar kind of optic atrophy may result from direct injuries to the optic nerve or compression of the optic nerve by new growths, such as tumours in the region of the hypophysis, etc.

Disseminated or insular sclerosis which usually affects persons between the ages of 15 and 35, is occasionally seen. In the majority of cases, the fundus of the eye shows a temporal pallor of the optic disc, a descending atrophy following a chronic retrobulbar neuritis. Of course, a note of warning should be given here that normally in every eye, the temporal side of the optic disc is paler than its nasal side. So, a temporal pallor should be diagnosed with great caution and only when there is a definitely well marked pallor. The papillomacular bundle of nerve fibres is often affected and marked disproportion has been noted between the colour of the optic disc and the defect in vision. In some cases, an active lesion may occur just behind the optic nerve entrance, when the fundus appearance is that of an acute retrobulbar neuritis, *i.e.*, a slightly swollen

optic disc with perhaps a few fine hæmorrhages and exudates on the disc. There is some tenderness when the eye is moved or pressed backwards into the orbit. These fundus changes may remain only for a short time, and may be followed later by signs of optic atrophy. The optic disc may show varying degrees of atrophy; but very rarely complete atrophy is seen. Optic neuritis is seen in about 5 per cent of the cases of disseminated sclerosis. It is said that the optic nerves are more affected in this disease than in tabes or any other disease of the central nervous system except brain tumours. In disseminated sclerosis there may be great variations in the eye affection, in that there may be periods of partial recovery, quiescence or recurrence intermingled.

Harold Gjessing,⁽⁴⁾ discussing the value of eye symptoms in the diagnosis of general disease, says: "The new diagnostic triad for multiple sclerosis should be, (1) pronounced fatigue following insignificant body exercises and accentuation of symptoms already present, (2) increase in tendon reflexes and (3) passing eye symptoms with a tendency to recurrence. According to him, acute scotomatous retrobulbar neuritis is the most important eye symptom, and is seen in about 50 per cent of the cases.

Retrobulbar optic neuritis occurs in other diseased conditions also, which may be considered in this connection.

Williamson Noble ⁽⁵⁾ says that at one time it was thought that the majority of cases of retrobulbar neuritis were due to nasal sinus disease, but that it has been proved to be not so. He quotes Davis as having found that out of a series of 76 cases, only 5 were due to sinus disease and that, of 46 cases of which the cause was defini-

tely ascertained, 14 were due to disseminated sclerosis and 7 to syphilis. He came to the conclusion that disseminated sclerosis is the commonest single cause of retrobulbar neuritis. He also warns against the varying colour of the optic disc as seen with different forms of illumination and says that "an apparent pallor may be noticed when using an electric ophthalmoscope with a new lamp and battery."

Benedict ⁽⁶⁾ quoting from the Mayo Clinic figures, says that out of 225 cases of retrobulbar neuritis, 155 were due to insular sclerosis, 28 to alcohol and tobacco, 14 due to diabetes, 14 due to pernicious anæmia and tobacco, and only one to nasal sinus disease; the rest were due to other causes.

Lillie ⁽⁷⁾ gives meningoencephalitis also as an important cause of retrobulbar neuritis.

Nasal sinus disease as a cause of retrobulbar neuritis has been belittled by many observers and there has been a great controversy regarding this in the ophthalmic literature. The Mayo Clinic figures show it as one of the rare causes.

Benedict says that sinus operations which are largely resorted to in cases of retrobulbar neuritis, are "not justifiable unless obvious suppuration is present. He adds that "the beneficial effects reported may be due to (1) congestion of the nasal mucosa—a late result of adrenalin packing and (2) an autovaccination effect of absorption of the patients' own blood.

Von Hippel ⁽⁸⁾ says that the "so called successes of nasal therapy are produced by spontaneous recovery and not the result of nasal operations." There are others who hold quite an opposite view, among whom may be mentioned

L. C. Peter ⁽⁹⁾; who gives the following "clinical types of ocular pathology due to disease of para-nasal sinuses."

(1) Retrobulbar neuritis, of which he says "infection from the sphenoid is a more common cause than insular sclerosis." (2) Neuroretinitis and papillitis, (3) Papilloedema, (4) Chiasmal and tract disease and (5) Residual optic atrophy in a large number of cases. He mentions that the likely path of infection is through the central vein of the retina as a result of stasis occurring in the cavernous sinus which allows the toxins to pass back into the venous circulation, and he points out the "importance of sinus exploration even in the absence of signs."

Such divergence of opinion as regards the role played by nasal sinus disease in causing retrobulbar neuritis, should make the clinician alive to the importance of a very careful examination of the patient in looking for and eliciting signs of disseminated sclerosis or sinus disease in the patient, before coming to a diagnosis.

Tobacco and alcohol amblyopia may be mentioned here as another cause of retrobulbar neuritis, showing a temporal pallor of the optic disc. The scotometric signs of retrobulbar neuritis will be discussed in a subsequent lecture. The condition is rather rare but should be thought of as a possible cause of retrobulbar neuritis.

Carrol ⁽¹⁰⁾ (New York) reported 55 cases of tobacco-alcohol amblyopia and said that 0.3 to 0.5 per cent of all new eye patients in one New York hospital were found to be suffering from this complaint. The rate of incidence seems to be high indeed, as compared with our figures. He says that only two out of the 55 were women,

and that susceptibility is of more importance than the quantity of tobacco or alcohol used.

Tubercular diseases affect the choroid and produce characteristic ophthalmoscopic appearances. Three types have been described:— (1) *Miliary type* in which small spots, 1 to 2 mm. in diameter, are noted in the choroid in both eyes, more often near the optic disc. They start in the choriocapillaris and the overlying retina is normal. They occur in very young subjects, and are the result of an hæmatogenous infection in the late stages of generalised miliary tuberculosis. (2) *Solitary conglomerate tubercle* in the choroid—an endogenous infection occurring in the young. It is often surrounded by small nodules. (3) *Diffuse tuberculous chorioiditis* in which there is extensive development of granulation tissue throughout the uveal tract. This tends to progress affecting the retina and vitreous and later perforates the eyeball, either at the limbus, along the exits of the venæ vorticosæ or at the optic nerve entrance. These conditions are rarely seen in this country in the ophthalmic clinics.

Foster Moore says that the presence of tubercles in the choroid is of great diagnostic value in miliary tuberculosis; but not so their absence.

Increased intracranial pressure, the result of brain tumours or brain tumour equivalents, and the effect it produces on the ophthalmoscopic appearance of the fundus may next be considered. If the increase in pressure is directly communicated by fluid from the cerebral subarachnoid space to the subarachnoid space of the vaginal sheath of the optic nerves, a condition of papilloedema (or choked discs) is produced; but if the new growth exerts its pressure in such a

way as to block this communicating passage, direct pressure is brought to bear on the optic nerves, producing a primary optic atrophy. Other pressure effects such as changes in the field of vision will be dealt with in the next lecture.

We shall first consider what is papilloedema, how it is produced and in what conditions it is met with. It is an oedematous condition of the optic disc, the result of "a physically produced oedema, due to obstruction to the outflow of blood and lymph from the eye." The increased pressure from the cranial cavity is communicated directly to the vaginal sheath of the optic nerve, through which the central retinal vessels have to pass in traversing between the optic nerve substance and the orbital cavity before joining the parent vessels. The pressure markedly narrows the veins and lymph vessels on account of their very thin walls, thus affecting the outflow; the inflow is not much affected as the arterial wall can stand the pressure much more. This obstruction to the outflow produces partial stasis and consequent oedema. The tissues of the optic disc and the anterior layers of the lamina cribrosa are infiltrated with fluid and the optic disc is swollen; the amount of this swelling can be measured accurately with an ophthalmoscope. As the swelling increases, the retina is automatically displaced laterally and is thrown into concentric folds around the optic disc. The peripheral nerve fibres are more curved, and the central fibres are raised up, thus filling the physiological cup, which is also filled up further by fluid under the internal limiting membrane. In severe cases the swelling of the optic disc may go up to 6 or 7 D. Small hæmorrhages may be seen on the disc surface and also quite close to it. On account of the extreme swelling and bulging forward

of the optic disc, the retinal vessels are bent and take a curved course as they come over to the edge of the disc; the vessels are seen interrupted in places on the disc surface and also show local loss of the light reflex. Fine radial streaks may appear on the papilla. The retinal veins are dilated.

The earliest sign of papilloedema according to Foster Moore is a haziness of the optic disc margin in the superior nasal quadrant; sometimes a star figure, most often only a partial one, is seen at the macula especially in children; the dots comprising the star figure are much finer than those seen in renal retinitis.

Leslie Paton⁽¹¹⁾ says that the earliest changes in papilloedema are seen at the upper and lower borders of the optic disc, and that it is only at a later stage that the nasal margin is affected; he attributes this to the fact that normally there is more overcrowding of the nerve fibres, above and below in the disc.

Koepppe and Meesman say that the first sign of papilloedema is a veiling of the centre of the optic cup caused by forward protrusion of the central vessels which is seen as gray streaks along the vessels. Van der Hoeve says that both the above processes are possible.

Regarding the formation of papilloedema Lauber⁽¹²⁾ says, "Low diastolic blood pressure in the retinal arteries with normal intraocular tension and simultaneous rise of venous retinal pressure are the main conditions leading to formation of papilloedema. The proportion of the retinal venous to the arterial pressure is of importance not only for the formation but also for the further development of papilloedema. In low arterial pressure even a com-

paratively slight increase of intracranial and consequently, of retinal venous pressure, leads to great prominence of the optic disc, pronounced venous stasis, and retinal hæmorrhages, and an early appearance of secondary inflammatory symptoms. Early decompression is especially necessary in these cases."

The papilloedema may be present for months or even years, according to van der Hoeve, without causing any decrease in vision. It may disappear completely or more often relapse. In the later stages of the disease, degeneration of the nerve fibres takes place with the result that the fundus shows a condition of post-papilloedemic atrophy with a pale optic disc, blurred margins, and retinal vessels showing a marked curving on the surface of the disc.

The chief cause of papilloedema or choked disc is increased intracranial pressure, especially brain tumour (in about 70 per cent of cases); other causes are cerebral syphilis, cerebral abscess, meningitis, thrombosis of cavernous sinus, etc. Among brain tumours, the largest numbers are among those of the cerebellum and corpora quadrigemina.

Papilloedema has to be diagnosed from papillitis or severe intraocular neuritis; in some cases it may be very difficult to do so, especially in early cases of papilloedema. In early choked discs, there is oedema without signs of inflammation, the vision is often normal, and the swelling of the optic disc is usually high. In papillitis, there is oedema with inflammation of the nerve, disturbance of vision and the swelling of the optic disc is not high.

Parsons⁽¹³⁾ introduced the term "papilloedema" first in 1908 for cases

showing more than 2 D swelling of the papilla. In 1911 *Holmes and Paton* adopted the term to describe all cases of oedema due to increased intracranial pressure and distinguished between papilloedema with no primary inflammatory changes and papillitis in which swelling of the disc was associated with inflammatory changes and loss of function. Of course, one cannot lay down any arbitrary limit of swelling required to distinguish the condition as belonging to one group or the other. *Van der Hoeve* has laid down the following data as a guide in diagnosis:—

1. Slight swelling of the optic disc with great loss of vision = Papillitis and not choked disc.
2. Marked swelling of optic disc with no loss of vision = Choked disc and not papillitis.
3. Great swelling of optic disc with diminution of vision = Usually a choked disc; very rarely papillitis.
4. Slight swelling of optic disc with no loss of vision = Usually early choked disc; but may be early papillitis.

The importance of distinguishing papilloedema from papillitis depends on the great difference in the prognosis and treatment of these two conditions; and the earlier the condition can be correctly diagnosed, the better for the patient. Of course, increased intracranial pressure manifests itself in other valuable cerebral symptoms such as severe headache, giddiness, vomiting, etc., which help in the diagnosis. Diagnosis of the cause of the trouble can also be helped by ascertaining the mode of onset of the disease; for example, a sudden onset is more in favour of a vascular lesion, such as spasm, embolism or hæmorrhage; a rapid onset signifies an inflammatory disease, such as

retrobulbar neuritis or acute toxic amblyopia, and a slow onset, a slowly advancing interference, such as a tumour or a chronic toxic amblyopia (*Traquair*).

It has been suggested above what the general principle underlying the production of papilloedema or primary optic atrophy is in the case of brain tumours or brain tumour equivalents. Here mention may be made of the effects produced on the fundus of the eye by the different kinds of new growths, etc., occurring in the cranial cavity. The following is extracted from *Hartmann's* article in the "Eye and its diseases" by *Berens*. Gliomata developing in the frontal lobe and meningiomas attached to the vault or the falx cerebri, usually cause no ocular symptoms. Meningioma growing from the sphenoidal ridge causes optic atrophy and impairment of vision on the same side as the tumour; in some large tumours, papilloedema may be observed on the opposite side. Meningioma growing from the olfactory groove often causes papilloedema; and if it extends backwards may produce the same symptoms as a supra-sellar or sphenoidal ridge meningioma (*i. e.*, optic atrophy). Intracellar tumours are mostly adenomata or cystic new growths of the pituitary gland; in these, primary optic atrophy is the usual result; papilloedema is of unusual occurrence (*Foster Moore*.) *Cushing* and *Walker* say that in a few cases where the subarachnoid spaces are not cut off completely, a low grade of oedema with new tissue formation may be superimposed on the primary optic atrophy. Supra-sellar tumours, which include meningioma from the olivary eminence, craniopharyngioma, adenoma and glioma of optic nerves or chiasma, produce primary optic atrophy; but if

they extend upwards and backwards, papilloedema may be superimposed on the optic atrophy. In tumours of the cerebello-pontine angle, and of the occipital lobe, choked discs appear early. Pineal and quadrigeminal tumours, tumours in the region of the fourth ventricle and cerebellar tumours produce marked increase of intracranial pressure with early appearance of papilloedema, which increases very rapidly. Sub-cortical and pontine tumours produce papilloedema only if they have involved the basal nuclei or cerebellum respectively. Aneurysmal angiomas are usually seen with papilloedema but venous angiomas are rarely accompanied by a choked disc. Brain tumour equivalents, such as cysts, aneurisms, localised arachnoiditis, gumma, tuberculoma and slowly developing abscesses show the same symptoms as cerebellar tumours.

Kennedy and *Cushing* mention that papilloedema is always more pronounced in hypermetropes than in myopes. *Foster Moore* says that it is a "great rarity in myopic eyes, on account of the peculiar relations of the optic disc with the nerve sheaths."

Though papilloedema is a very important sign in the diagnosis of increased intracranial pressure, its localising value is not much; for this, other signs have to be looked for. *Osler* says "choked disc is constant in tumours of the corpora quadrigemina, present in 89% of cerebellar tumours and absent in nearly two-thirds of the cases of tumour of the pons, medulla

and corpus callosum." Its absence, however, cannot be said to negative the existence of a new growth; occasionally it appears very late—after other definite signs and symptoms have appeared to establish the diagnosis; in such cases, according to *Gowers*, "it is a sign of impending death."

Victor Horsley⁽¹⁴⁾ thought that in 95% of cases, the tumour was located on the side where the greater amount of oedema of the optic disc was found. But *Paton* and *Hirschfeld* deny this contention. *Parker* says that if there is a difference in intraocular pressure in the two eyes, the papilloedema is situated on the side where the pressure is lower. *Paton* is of opinion that a plain papilloedema, in connection with continuous headache, which varies in intensity, confirms the diagnosis of an intracranial tumour. *Foster Kennedy* says: "optic atrophy in one eye and papilloedema in the other denotes location of the tumour in the anterior end of the temporo-sphenoidal lobe or in the base of the frontal lobe, on the side collateral with the atrophy."

From the above, it is seen that an ophthalmoscopic examination of the fundus of the eye is invaluable in all cases of continuous headache, giddiness, vomiting or other cerebral symptoms, so that early attention may be drawn to the existence, if any, of increased intracranial pressure, which is of serious import and which can be dealt with more satisfactorily the sooner it is diagnosed.

REFERENCES.

- | | |
|---|---|
| <i>Foster Moore's</i> Medical Ophthalmology. | 6. Arch. of Oph., June 1933. |
| <i>Berens</i> : "The Eye and its diseases." | 7. Amer. Jour. of Oph., Feb. 1934. |
| <i>Maitland Ramsay</i> : Clinical Ophthalmology for the General Practitioner. | 8. Arch. of Oph., May 1933 (Abstract) |
| | 9. Br. Jour. of Oph., Oct. 1932 (Abstract). |
| 1. Amer. Jour. of Oph., Jan. 1936 (Abstract). | 10. Arch. of Oph., Sep. 1935. |
| 2. Trop. Oph. by Elliot. | 11. Arch. of Oph., Jan. 1936. |
| 3. Amer. En cycl. of Oph. | 12. Arch. of Oph., May 1935. |
| 4. Br. Med. Jour. 31st March 1934. | 13. Arch. of Oph., Jan. 1936. |
| 5. Lettsomian Lectures, Lancet July 1932. | 14. Trans. of Oph. Soc. of U. K. 1934 (Gjessing). |
| | 15. Arch. of Oph., Jan. 1936. |

LECTURE III.

Perimetry in some General Diseases.

Perimetry or the examination of the visual fields has been recognised for a long time as a valuable adjunct in the diagnosis of several general diseases and in some cases has been found to be of immense help.

It is said that the early Greeks and Romans knew that the visual fields had definite limits; but the first person who tried to find out exactly these limits was Venturi,⁽¹⁾ who gave the vertical extent as 112° and the lateral as 135°. Boer have recognised the presence of scotomata or areas of blindness in the visual field in the year 1708 A. D. In 1723 A. D., Vater and Heinecks wrote that the right side of the retina of each eye received filaments from the right hemisphere of the brain and the left side from the left hemisphere. The credit for the earliest reliable observations regarding the area of the visual fields and the zone of acutest vision goes to Thomas Young, who in 1801 A. D. gave the limits as 50° upwards, 60° inwards, 70° downwards and 90° outwards. Contractions of the visual fields were first described by Beer in 1817 A. D. But the actual employment of the results of visual field examinations in aiding diagnosis of diseased conditions was reported by von Graefe, who published in 1855 A. D. his classic work on "Examination of visual functions in amblyopic affections." Hemianopic and sectoral defects, ring scotomas and superior hemianopsias of retinal detachments were familiar to him. It is mentioned that examinations of visual fields were done prior to the invention of the ophthalmoscope and made use of in differentiating diseases like retinitis pigmentosa, glaucoma, retinal detachment and optic atrophy due to brain lesions,

including those of the optic tract and chiasm. Von Graefe used a simple black board for the purpose. The idea of having a curved arm for the perimeter for marking out the limits of the visual fields first occurred to Aubert and Forester in 1856 A. D. and they determined with greater accuracy, the limits of the fields for white and for colours. De Wecker used the simple black board of von Graefe, but had it marked off in concentric circles of 10° each, thus bringing in definite measurements within the total field. Other improvements, *i.e.*, Steven's registering device and McHardy's mechanical propelling of the test object on the arm of the perimeter were introduced later. Priestley Smith introduced his scotometer in 1883 A. D. and described the principle of scotometry and the value of the test object being made to move in a circular direction instead of from the periphery to the centre. An improvement and modification of this instrument was brought out by Elliot in his scotometer much later, working on the same principle. In 1889 A. D. the central areas of the visual fields began to receive more careful attention as a result of the work of Bjerrum and his assistants in his Copenhagen clinic. He used the screen popularly known by his name and different sized test objects. This technique was popularised in Great Britain chiefly by Sinclair and Traquair and in America by Duane. Perimeters have been greatly improved, some of the latest models being Lister's and Ferree and Rand's, in which illuminating devices have been added besides other valuable improvements.

With these improved instruments and apparatuses, and also a thorough

knowledge of the anatomy of the visual organs and their connections, perimetry and its interpretation have become an art and a great aid in the diagnosis of several diseases.

Peter says "Perimetry is a valuable aid in the diagnosis of intraocular diseases and a *sine qua non* in the diagnosis of disease of the visual pathway posterior to the eyeball." Field study is of great help in cases where there is disproportion between the ophthalmoscopic signs observed and the vision of the patient; also in cases where confirmation of the exact significance of the ophthalmoscopic appearance is required; further, decrease in functional activity can be observed long before optic atrophy or other ophthalmoscopic or ocular evidence manifests itself. For example retrobulbar neuritis or the different kinds of hemianopsias often cannot be diagnosed without careful studies of the visual fields because changes in the optic discs occur either late, or, as in the case of lesions above the primary optic centres, not at all.

Normal field of vision.—The acuteness of vision differs in the different parts of the field, as a result of their difference in structure. At the fovea only cones are present in the neuro-epithelial layer of the retina; in the macular region, rods also appear; beyond the macular region cones get fewer and rods increase in number, while at the extreme periphery, cones are found in increasing numbers. In the macular region each cone is connected with the primary optic centres by a single axis cylinder while beyond the macula, a number of rods or cones are attached to one axis cylinder (Peter). This arrangement makes the following differences in visual acuity in the central and peripheral portions of

the field. In central vision, visual acuity is more acute, details of objects at rest are more pronounced, and images are sharpest in good light; in peripheral vision, there is less visual acuity, but moving objects are seen with greater accuracy than those at rest and light adaptation is better. Acuteness of peripheral vision gradually increases towards the centre of the field; it rapidly begins to increase at about 10° from the visual axis. It is this fairly large pericentral area that enables one to read swiftly along a line of print. Loss of central vision alone prevents a person from being able to distinguish the details of the object seen; reading or doing any fine work is rendered very difficult or almost impossible; while loss of peripheral vision manifests itself in the inability to walk about freely without bumping into things in the room and also a loss of the power of orientation. Ferree and Rand have shown that "the nasal and superior retina is more responsive to stimuli than are points on the same meridian located in the temporal and inferior parts of the retina."

The visual field is affected by various factors:—

(1) *Anatomical factors*, such as the configuration of the bony prominences around the orbital cavity, overhanging eyebrows, high cheek bones, a high or prominent nose, relative position of the eyeball in the orbital cavity, etc.

(2) *Refraction of the eye.*—Traquair says that the field is slightly larger in hypermetropes than in myopes, but he considers it as of no practical significance clinically. He says that this difference is seen only when small visual angles are made use of. Ferree and Rand⁽²⁾ say that "emmetropic and hypermetropic subjects

have the widest fields in the eight meridional quadrants considered separately, myopics next widest, and presbyopes the narrowest". The wider the pupil, the bigger is the field if small visual angles are used.

(3) *Illumination*.—In normal cases, slight variations of illumination do not produce any appreciable change; but in pathological conditions and for colour tests, marked changes will be noted. In diseases affecting the outer retinal layers, test in dim light will be found advantageous to elicit relative blue blindness. Seven foot candles is said to be the normal intensity of illumination required for accurate work.

(4) *Intelligence of the patient* is of course a necessity in getting accurate results. A slower rate of movement of the object is required in persons with slow cerebration.

(5) *Fatigue* on the part of the patient.

Now we shall see what one may consider as the *normal* field of vision, making allowances for the factors noted above. According to Traquair, "For clinical purposes, we may regard a field as normal when the extent of its boundaries and its sensitiveness over its whole area attain the standard found in the average healthy individual by adequate and practical methods of examination,"—a definition full of meaning. He says that "the extreme limits may be found by using a test object so large that an increase in its size produces no further extension." For this, an object subtending an angle of 9° at the nodal point of the eye is enough. The average normal field for white is usually given as 60° up, 60° in, 75° down, and 100° or a little more out, but the lower inner margin may recede to 50° or even

45° depending upon the configuration of the nose. With Bjerrum's screen, the normal field for a 1/2000 test should extend to about 26° all round, which will be almost the whole of the surface of the screen. The nasal edge of the field is very steep, but the temporal edge slopes gradually.

Colour fields.—Normally the field for colours is smaller than that for form or white; a much larger object is necessary to get a similar sized field as with white or a shorter working distance should be employed. With objects of the same size, the field for blue is the biggest, red is smaller, and green is the smallest. If the test object is sufficiently big, the colour is seen up to the periphery of the form field. The fields for complementary colours are similar in size (Traquair). A field for white 10/2000 is approximately equal to that for red 10/300. Ferree and Rand say "the peripheral retina is sensitive to red, blue and yellow to the extreme limits, but not so green. The limits of any colour field are always irregular because of retinal sensibility varying in the different meridians." They say that variations are found in each individual and even in the two eyes of the same person. It must be noted that the limit of the colour field should be marked only when the patient sees the coloured object with the colour fully saturated.

Methods of examination.—Next, we shall consider what methods are to be employed in plotting out the visual fields, and what are the important points to be looked for or elicited during the examination, so that the maximum help may be secured in arriving at a diagnosis of the diseased condition. Plotting the fields may be done either with a perimeter or on a screen as mentioned previously. Perimetric examination is mainly done for

marking out the peripheral and intermediate zones of the field beyond about 25° from the centre; detailed examination of the central area is best conducted on the screen at a longer distance, by which a magnified projection of the defect present may be marked out. Being a flat surface, the screen test introduces an error which increases the farther you go from its centre; the error increases rapidly beyond about 25° or 30° from the fixation point, as compared with the perimeter and the results are not of any value beyond this central region. The ease with which the test object can be manoeuvred on the screen is a great advantage and helps the test very much. The screen is ordinarily used either at one metre or preferably at two metres distance, whereas in the perimeter the distance from the patient's eye to the fixation point is 33 cm.

Perimetric examination is of two kinds, *quantitative* and *qualitative*. To quote Traquair, "*Quantitative perimetry* is based on the recognition of the principle that the peripheral sensibility of the retina can be graphically expressed by isopters representing the extent of field corresponding to the visual angles subtended by the tests employed." The visual angle subtended at the nodal point of the eye by the object, is made the basis for comparison; fields taken with the same visual angle, at different distances vary little in a normal eye, but much more in pathological conditions. If the peripheral field shows no abnormality with a particular sized object, we have to gradually reduce the size of the object and see whether any defect is noticeable. Use objects, whose isopters do not ordinarily lie close together, in making the different tests. Traquair advises the plotting of the following three

isopters for white 3/330, 1/330 and 1/2000 or 2/2000; and one or two for colour, *i.e.*, 5/330 and 10/2000 or 5/2000. From these isopters, one ought to be able to say whether a field is normal or not.

Qualitative perimetry with form and colour fields for comparison is very useful in some cases. Reduction of the field for blue in excess of that for red or green indicates impairment in the neuro-epithelial layer of the retina, while, a greater reduction of the field for red or green than that for blue indicates impairment of the conducting path, *i.e.*, the nerve fibres. In examining the relation of the field for white to that for colours, use test objects whose normal isopters are almost equal. It may be noted that colour fields are more sensitive to changes than form field; so colours of a standard hue which do not fade should be used. Ordinarily with colours the largest object which will show the defect should be used,—5 to 15 m.m. usually (Traquair). In plotting the fields, the rule to be followed is to pass the test objects from the blind to the seeing area, whether it be the defining of the limits of the periphery or of the blind spot. Nothing but the object should be seen by the patient, the handle on which it is mounted being black in colour and sufficiently long. Move the object slowly in any meridian, at the same time giving it a slow zig-zag movement across that meridian. The difference between the limits found by centripetal or centrifugal movements of the object should always be noted and verified by movements "to and fro, across and at right angles," to the margin. In working near the periphery of the screen, it is advisable to hold the object several inches in front of the screen to reduce errors.

Particular attention should be paid to the outside limits to see whether there is any peripheral contraction; to the presence of any sectoral defects, or scotomata, in the fields. Specially search for scotomata near or around the fixation area, above, below or around the normal blind spot, and also between the fixation area and the blind spot. Having spotted a scotoma, its exact boundaries should be defined. Fixation of the patient's head and visual axis should be carefully observed so that the results are not vitiated.

Accurate interpretation of visual field defects requires a thorough knowledge of the minute anatomy of the nerve paths from the eye to the cortical centres in the brain and the structures adjoining them, including the disposition of the fibres from different portions of the retina, at different levels in this pathway. In the diagnosis of lesions in the cranial cavity, accurate knowledge of the position of the optic chiasm in the floor of the cranial cavity and its relation to the neighbouring important structures is of great value. Equally so is the relationship of the optic tract and optic radiations to the neighbouring ventricles, internal capsule etc. It may be possible to differentiate lesions of the choroid from those of the retina at a time when ophthalmoscopic signs are doubtful, by carefully noting the nature of the colour fields, blue being more affected in choroidal diseases and affections of the rod and cone layer of the retina, and red and green more in the inner retinal lesions. There are only possible in the early stages of the disease. Another difference noted is the character of the scotoma, when present in the macular region; there is a positive scotoma in choroidal and outer retinal layer affections, and a negative one

in the inner layer retinal lesions. Peter, says that "if in choroidal lesions we see a contraction for red and green equal to or greater than that for blue and also a negative scotoma instead of a positive one, the probability is that the inner layers of the retina are also involved in addition to the outer neurones and the choroid." If the defect is greater in dim illumination, it is characteristic of a lesion of the outer layers of the retina. A one-sided field defect situated on both sides of the vertical meridian is always of sub-chiasmal origin; a one-sided defect sharply defined in the vertical meridian denotes a lesion at one angle of the chiasm, usually at the junction of the chiasm and optic nerve; chiasmal lesions are usually of the bitemporal hemianopic type; whereas lesions of the optic tract and optic radiations cause homonymous hemianopia. In the latter, if the scotomata are incongruous, the lesion is often in the tract; but if congruous, it is most frequently above the external geniculate body and as a rule, mostly in the posterior pole of the occipital lobe. Bilateral defects are due to affection of both nerves (rare) or if quadrantic, chiasmal or supra-chiasmal in origin. A homonymous hemianopia becoming bitemporal suggests a lesion commencing between the optic tracts. The most common cause of a binasal hemianopsia is distension of the third ventricle due to a brain tumour, which forces the optic nerves against the vessels of the circle of willis. We shall go into more detail later when dealing with lesions in the different portions of the visual pathway. (3)

The proportion between the fields for colour and for white is important. "Disproportion" shows that the lesion is in an active condition which may be either advancing or recovering, but if "proportion" is present, the lesion

may be considered to be stationary or only changing very slowly. The greater the degree of disproportion the more rapid is the change taking place and *vice versa*. Traquair says "The field for red 10/300 should be approximately equal to 10/2000 white; if red field is slightly smaller than this, say as small as 5/2000 white, no special inference need be drawn; but if markedly smaller, there is "disproportion" and it indicates an actively progressive process. "Field changes which suddenly appear or alter also indicate correspondingly active lesions; rapid change in the position, shape, extent or intensity means that the lesion in the nerve path is of an acute type—inflammation or rapidly growing tumour. When a field defect has a very sloping edge, the lesion is more progressive than one with a steep edge. The mode of onset also gives some idea of the progress and nature of the lesion; a sudden onset indicates usually a vascular lesion; a fairly rapid onset, an inflammatory lesion and a slow onset, a slowly advancing one, for example, a tumour." The visual pathway may be affected by the following conditions, which produce different results:—

(1) *Toxic and inflammatory conditions*.—These usually affect the sub-chiasmal path, less often the optic tracts and bring on retrobulbar neuritis and toxic amblyopias. The field defects are mostly central. Tendency to recover is often a predominant feature.

(2) *Pressure*.—Any part of the visual path may be affected; usual sites are the optic disc which is affected in glaucoma and the optic chiasm in tumours. Here both central and peripheral fields are affected; the lesion is progressive and recovery may be rapid if pressure is relieved early.

(3) *Vascular disease* affects more commonly, the geniculocalcarine portion, the retina and optic nerve; hæmorrhage, thrombosis, and angiospasm may occur. If the hæmorrhage is not into the visual tract but sufficiently near it, a pressure effect is noticed. Field defects depend on the nerve fibres affected at the particular site.

(4) *Trauma*.—Mostly, as fracture of skull and injuries in the occipital region. Some amount of recovery is possible. If the lesion is sub-chiasmal, central field defects are seen along with peripheral defects; if there are only central defects, the lesion is more likely to be cortical.

Traquair summarises the incidence of the above conditions as follows:—

The optic nerve has a monopoly of toxic and inflammatory conditions. Traumatism frequently affects the nerve; pressure and vascular disease uncommon in the nerve. In the chiasma, tumour pressure is the commonest, syphilis and multiple sclerosis less common. The optic tracts are affected in the same manner as the chiasma, but less commonly; pressure from temporal lobe tumours are more frequent in this region. In the geniculocalcarine pathway, vascular lesions are more frequent; tumour pressure is not uncommon; toxic and inflammatory lesions do not occur except from meningitis or abscess.

Having considered so far the general effects produced by diseased conditions on the visual field, we shall now proceed to the consideration of the peculiarities of the field in some of the ordinary general diseases.

Syphilitic Affections

Tabes and progressive primary optic atrophy.—There is a general depression

all over the field, early and rapid deterioration of red and green fields, concentric contraction for blue and yellow and later for white. The concentric contraction is progressive, Peter says that the nasal field is affected first and that central scotomata, at first relative and later absolute, are not unusual. One may see sector defects of irregular types also in this condition, with the affected area sharply marked out from the rest of the field.

Behr and Wilbrand say that energetic anti-syphilitic treatment is contraindicated in the following conditions:—

"(1) Impairment of central vision; early failure for colour with a normal or nearly normal field for white.

(2) Extreme concentric contraction, boundaries for white and colour same, normal or nearly normal central vision.

(3) Slight field changes which affect white rather than colour, normal or nearly normal central vision, well developed pallor of the optic disc and pronounced subjective light sensation." In tabetic progressive optic atrophy it is very doubtful any good will result from treatment, most cases ending in blindness.

Post-neuritic atrophy.—In the stage of neuritis, there are noted enlarged blind spot with early changes in the peripheral field; but in the atrophic stage, irregular contraction of both the fields for white and for colours is seen. Sometimes there are "large entering angles" leading to the fixation point. In optic atrophy following diseases of the retina and choroid, "a most varied and irregular field" is seen with scotomata either central, peripheral or annular.

In *Leber's disease or hereditary optic atrophy*, the central vision is badly affected; there is a large central scotoma, almost round or oblong, situated mostly around the fixation point or may be centrocæcal, covering the fixation area. The edge or the scotoma is fairly steep. The peripheral vision is also depressed both for colours and for white; there may be a "breaking through" inwards or up and in from the periphery. The central scotoma always remains and is not recovered from.

Gummatous meningitis.—Syphilitic processes in its neighbourhood affect the optic tracts; but field changes do not show as a typical isolated tract lesion.

Multiple sclerosis.—The field changes vary very much as may be inferred from the nature of the disease. The changes are of the toxic and inflammatory type. There is an irregular contraction of the form field; but the more characteristic change is the presence of central scotomata. In some cases, multiple small relative scotomata are seen, which may be central or paracentral, with sloping edges; small colour objects may have to be used for detecting these. In other cases, a single absolute central scotoma is seen. The characteristic feature of these is their variable and fluctuating course with frequent alterations. Tendency to recovery is well marked. Traquair says "a sudden or rapidly developing homonymous quadrant defect, especially in a young woman, and soon disappearing indicates multiple sclerosis of a primary nerve lesion in the optic tract."

Toxic amblyopia.—Uthoff divides the toxins producing amblyopia into two classes:

(1) Those which also produce peripheral neuritis, like lead, arsenic, carbon bisulphide, etc., endogenic poisons like beriberi, diabetes etc.—in these there is central scotoma without peripheral defect of the field.

(2) Those in which peripheral neuritis is rare, like quinine, salicylic acid, felix mas—in these there is peripheral and general depression of the field.

There are some variations from the above. The field changes in tobacco amblyopia are the same as those in the first group, although no association with peripheral neuritis has been noted. Inorganic arsenic compounds produce central scotoma which show a tendency to recover, whereas toxic organic arsenic compounds such as atoxyl bring on peripheral contraction which often leads to blindness.

Tobacco amblyopia.—The typical scotoma is a centrocæcal one; it is never pericentral; usually bilateral but may be more advanced in one eye than in the other. It is horizontally oval in shape. Peter describes its shape as that of a closed hand with the forefinger extended towards the fixation point and he says that a true finger scotoma is a diagnostic sign of toxic amblyopia. This scotoma is easily elicited by using small red and white objects. There are often small areas of greater intensity within this scotoma, which are the original starting points; these gradually increase in size and may coalesce; its margins are very sloping; defects for colour are more marked than that for white. At a later stage, impairment of colour field is noted on the temporal side; the scotoma enlarges and may break through the upper and outer quadrant and later at the lower temporal quadrant. In very bad cases, only a small field may remain on the nasal side, for red. Complete blindness has

never been seen to result though there is a general depression of the field for white. Recovery gradually takes place in the reverse order. The poison has a cumulative effect and so it may take some weeks before recovery is seen, although the tobacco has been stopped. Idiosyncrasy and power of resistance of the nerve elements are marked features. In very severe cases, a small central scotoma remains permanently.

Alcohol Amblyopia, usually the result of impurities in the alcohol. Both eyes are suddenly affected and rapid complete, or almost complete, blindness comes on. After a varying period, clearing of the field begins gradually from the periphery, finally leaving a very dense central scotoma. The defect is mostly pericentral. Guarded prognosis should be given as there is likelihood of a secondary atrophy supervening.

Lead.—In lead poisoning, there are seen pericentral, circular, bilateral scotomata. Periphery of the field is usually unaffected although sometimes a breaking through of the central scotoma to the periphery may be demonstrated in the colour fields. The onset is gradual usually; complete blindness is rarely seen.

Carbon bisulphide. Bilateral central scotomata usually pericentral but may extend more towards temporal side. Red-green blindness is a prominent feature. The changes in the periphery are more pronounced, (peripheral contraction and general depression of the field) and these distinguish it from tobacco amblyopia.

Quinine amblyopia.—In mild cases, there is only slight diminution of vision which passes off soon; but in severe cases, rapid and complete blindness usually occurs. After a variable period, which may extend

even to some weeks, the vision begins to improve; the improvement is more marked centrally; and finally peripheral contraction with a general depression of the field remains. Even though the central vision recovers to the normal, peripheral contraction may still be present. The edges of the field are steep and there is noted disproportion between the white and the colour fields, which last only till the recovery comes to a standstill. Very rarely, a central scotoma has been recorded, but it is not the usual feature. Permanent total blindness has not been recorded. Idiosyncrasy is a marked feature.

Acute retrobulbar neuritis, unilateral usually, with rapid onset and gradual recovery. Paracentral scotoma, with the fixation point eccentrically placed in it is present. Sometimes the sector defects are seen. The peripheral field is usually not affected but may show indentation towards the place where the scotoma extends farthest. Defects gradually get smaller in size and finally disappear.

Chronic retrobulbar neuritis apart from toxic amblyopia; field defects same as in acute form; macular disease should be excluded. Bilateral field changes denote a toxic cause due to systemic disease or are a local manifestation of a general disorder, *i.e.*, syphilis, diabetes, insular sclerosis, etc.

Nasal accessory sinus disease. Peter mentions an enlargement of the blind spot with a central scotoma as the characteristic feature. He says that recurrent attacks of temporary central amblyopia must make one investigate the condition of the nasal sinuses. Usually the condition is unilateral; it is a rare cause of retrobulbar neuritis. Traquair divides the cases into two groups:—

(1) Those referred by the rhinologist in which there is an enlargement of the blind spot with slight peripheral contraction, and

(2) Those seen by the oculist, *i.e.*, cases of central scotoma with or without peripheral depression.

Trauma.

In *commotio retinæ* with an oedematous appearance of the macula, "there is seen an excellent demonstration of the relative central scotoma for blue with well-preserved red perception." (Traquair). In severe cases, a small central scotoma for white is also present, in which case, there may be permanent impairment of vision. Peter says that in *commotio retinæ*, there is a positive central scotoma or more frequently a ring scotoma.

Detachment of the retina.—In the early stages, there is a corresponding indistinct scotomatous area, with blue blindness or a qualitative change in blue; in the later stages, an absolute scotoma appears which is always surrounded by an indistinct scotomatous area, with a sloping margin and varying intensity. When the retina is elevated by serous fluid, blue defect is more marked than red; in fact, in some cases the red field may be seen to overlap the blue. Peter says that blue-yellow blindness is an early symptom of retinal detachment. The blue may appear as green or black, and the yellow as white. In early and in recovering cases, it may be valuable to test in dim illumination. After subsidence of the detachment, the field for white may become normal but not so the colour defects. Traquair says that, in cases of recent detachment of doubtful origin, the presence of a circumscribed more intense scotoma, within the relative defect, or of two

separate defects one above and one below, is suggestive of tumour.

Eclipse blindness or solar injury.—A central or paracentral small scotoma is seen. It is a positive scotoma. This may be temporary or more often may remain permanent. This absolute scotoma is often surrounded by an area of relative colour defect. A large and dense scotoma indicates a bad prognosis, though one may later be able to read fine print if the scotoma becomes fairly small.

Functional diseases.—If gross inconsistencies are found by quantitative perimetry, in the absence of optic atrophy or other objective evidence, functional disease should be suspected. This is done by using the same visual angle at different distances or different angles at the same distance and watching for gross discrepancies in the fields of vision. Reversal of colour fields is a characteristic sign of functional disease.

Hysteria.—Bilateral concentric contraction of the visual field is seen. But there is no change in size of the field even when taken with different sized objects or at different distances (a tubular field). The field has steep edges which is contrary to what is usually seen in other conditions with concentric contraction. Fields may be altered by suggestion. Though the field is often very much contracted, peripheral vision is present as seen from the fact that the patient walks about freely and seldom stumbles or falls. Reversal of colour fields is noted; often a form and colour field of the same size are seen.

Neurasthenia.—The fields are characterised by instability and exhaustion:—typical "fatigue field" or "spiral field" of von Reuss. The field though contracted, goes on vary-

ing as it is repeatedly taken. If the object is moved from within outward, an enlarging spiral is obtained and if moved from without inward, a contracting spiral is the result. Sometimes the red field may be found larger than that for blue. In some cases, the object is seen and lost alternately as it is traversed along each meridian—an "oscillatory field."

Field defects in pregnancy.—Many observers have reported field defects in the later months of pregnancy, as a result of enlargement of the pituitary gland. Finlay⁽⁴⁾ (Havana) reports that of 108 cases examined by him, 67 per cent showed definite bitemporal loss of the fields, 21 per cent showed no field changes and in 12 per cent the changes were doubtful. He says that there was some tendency to limitation of the field loss to a quadrant or intensification in a quadrant; and that bitemporal contraction is more marked with small objects in the later stages of pregnancy and in multiparæ. He did not note any tendency for concentric contraction except in some when tested with colours. Carvill and Lancaster are also of the same opinion. On the other hand, Tr. Johns of Boston, who examined a large series of cases, did not find bitemporal hemianopsia, but in abnormal cases found only concentric contraction, for form and colour, of varying degree, with enlargement of the blind spot. Endocrine and X-ray studies also were made by her in her cases, the results coinciding with her field findings. There was noted a general lowering of the vital processes with consequent lowered retinal sensibility in the periphery and around the blind spot.

Pressure signs as shown on the visual fields.

(1) *Increased intracranial pressure producing papilloedema.*—An enlarged

blind spot without peripheral contraction is the earliest sign in papilloedema; or sometimes a relative scotoma surrounding the normal blind spot. If the oedema extends to the macular region, a small central relative scotoma will also be present. In these, if blue is well seen in relation to red, it is an optic nerve defect but if blue is badly seen, the defect is retinal. In the later stages as atrophy sets in, there is general depression of the whole visual field with peripheral contraction. If in the early stages, there is found to be peripheral contraction, it signifies an inflammatory process.⁽⁵⁾

(2) *Local pressure effect on the optic nerve.*—Wide sector-shaped defects are noticed in the visual field. Obviously the defect is unilateral. It may be one-sided quadrantic or hemianopic to start with, but very soon the defect crosses the vertical meridian. A local orbital source is to be suspected if there are no obvious hemianopic changes in a unilateral case.

Evans⁽⁶⁾ says that in frontal lobe lesions near the middle line, central scotoma is seen on the side of the optic atrophy and enlargement of blind spot on the side of the papilloedema (Foster Kennedy syndrome).

Gjessing⁽⁷⁾ says that the lesion is below the chiasma if there is one-sided central scotoma or complete one-sided blindness and the direct pupillary reaction is lost but consensual reaction is present. He advises in these cases careful examination of the field of the other eye with small objects; and if any defect is found, he says the lesion is situated close to the chiasma. Bilateral altitudinal inferior hemianopic changes are attributed to the nerves being pressed upwards against the sharp margins of the optic foramina. In cases of constriction of

the upper surfaces of the nerves by the circle of Willis, pressed upwards by a sub-chiasmal tumour, we may expect to see in one or both fields, defects of inferior altitudinal hemianopsia with signs of chiasmal interference.

(3) *Lesions of the optic chiasma.*—Bitemporal hemianopsia is the characteristic defect found in the visual fields. Traquair mentions two types of progress of the defect.

(a) *Scotomatous type*: In this, the earliest change is a depression in the superior temporal quadrant, which gradually increases; the whole quadrant shows some depression; and a scotoma appears at the apex of this quadrant which increases and advances to the peripheral depression; it also extends downwards into the inferior temporal quadrant, thus cutting off a temporal island of vision. Next the lower nasal quadrant is affected, the scotoma also invading the apex. The temporal island gradually disappears and the upper nasal quadrant is then affected; the scotoma extending to its apex also. Colour changes similarly occur, but precede the field changes for white. The fixation area may or may not be spared.

(b) *Non-scotomatous type*: Field changes are similar but the apex scotoma is absent. The isopter for 1/2000 does not encircle the blind spot, but leaves its upper part bare and is deflected inwards in the upper temporal quadrant. The progress of the loss of field is similar to that in the previous type. Fixation area is spared. The lower nasal quadrant may not be affected.

The changes noted above are typical of pressure on the chiasma from below, which may be seen in pituitary disease and sometimes in basal meningitis of gummatous origin. The scotomatous

changes are most marked in affections of the posterior edge of the chiasma. The "temporal island" field is absent when the lesion is pre-chiasmal and affects the inner sides of the two optic nerves. Scotoma is usually present only in inflammatory cases and actively growing tumours. Intracellar growths give the typical field noted above; while suprasellar and basal growths unconnected with the pituitary give atypical and aberrant field changes. As mentioned previously a homonymous hemianopsia developing into a bitemporal one indicates the position of the tumour to be between the optic tracts, such as infundibular cysts or extending pituitary adenomata. Sudden improvement or alteration in the field changes indicates a change in the position of the growth.

Lesions affecting the chiasma from above, i.e., a distended third ventricle, craniopharyngeal tumours, etc., produce partial or complete bitemporal hemianopsia, one or both of the inferior temporal quadrants being affected first. Binasal hemianopsia indicates either an advanced sclerosis of the internal carotid arteries or brain tumours pressing the chiasm against the arteries. Altitudinal hemianopsia is often due to pressure on the chiasma from above or below or gummatous meningitis affecting the upper or lower surfaces. It must be noted that the dividing line for form and colours is the same in all cases except the altitudinal variety in which the colour fields fall short of it.

Bitemporal hemianopsia or quadrantic defects of central field, which are rapid in onset, variable and wandering in character, help to distinguish a chiasmal retrobulbar neuritis from a tumour; while, slow developing bitemporal hemianopsia, often without central scotoma suggests intracellar pituitary adenoma; and, similar but

rapidly developing bitemporal hemianopsia, often without central scotoma suggests intracellar pituitary adenoma, and, similar but rapidly developing defects indicate tumours of more rapid growth.

(4) *Lesions of the optic tracts.*—A homonymous hemianopsia sharp and limited to one half is the typical picture of the fields. The hemianopsia in its typical form is an incongruous, relative, incomplete and progressive one and in the final stages becomes complete and absolute. In the seeing areas, normal fields for form and colours are present. Wernicke's pupil reaction which is present is a valuable diagnostic sign. Scotomata may be present at the apex of the quadrant.

(5) *Lesions of the radiations and visual cortex.*—Irregular homonymous hemianopsia with a tendency to loss of half vision in the later stages is seen. The macular area is preserved, especially so the more posterior the lesion. The defects in the affected field vary greatly as regards position, size, shape and intensity. They are sudden in onset, complete and absolute, often stationary or showing signs of more or less recovery. Homonymous quadrant defects indicate damage to the upper or lower lip of the calcarine fissure or to the upper or lower segment of the optic radiations. Small central hemianopic scotomata are very suggestive of cortical or sub-cortical damage if they occur suddenly in otherwise normal fields and without other signs.

Globus and Silverstone⁽⁸⁾ discussing the "diagnostic value of defects in the visual fields in supratentorial tumours of the brain." state that the defect on the side opposite the lesion was greater than that on the same side in homonymous cases. They are of opinion that

without doing ventriculography, it is not possible to differentiate between tumours of the posterior temporal and of the occipital lobes; but if cerebellar signs are also present, the lesion is more likely to be in the occipital lobe. In 171 cases verified by them, they expected visual field defects in 99 cases; but only 41 showed field changes which were of assistance in diagnosis; of course there were some others who were blind and others who were not in a fit general condition to allow of careful perimetric tests.

Traquair writing on "intracranial growths" says "cases with negative fields of vision require repeated examination. If normal, the tumour is not situated in the neighbourhood of the visual path." He continues, "I am aware that the value of perimetry as an aid to diagnosis is regarded with scepticism by some surgeons and physicians. This attitude I believe to be mainly due to inadequate perimetry.

Employment of quantitative perimetry is essential." (9)

It must be said that careful perimetry gives one very valuable signs which help in the diagnosis of some diseased conditions, but they have to be considered along with the ophthalmoscopic appearances seen and also the presence of other valuable central nervous system signs and symptoms elicited by the physician; all these put together have made a considerable advance in the art of accurate diagnosis in the conditions referred to above. Specially, neurosurgery owes a great deal to the help given by careful perimetric examination.

My thanks are due to Lt.-Col. R. E. Wright, C.I.E., I.M.S., for his valuable suggestions and kind criticisms and to Dr. T. R. Vythianatha Iyer for the figures from the statistics of the Government Ophthalmic Hospital, Madras, quoted in the first lecture.

REFERENCES.

- Traquair*.—"An introduction to Clinical Perimetry."
Peter.—"Principles and Practice of Perimetry."
Berens.—"The eye and its diseases." (Traquair's article on Perimetry.)
1. Arch. of Oph., April 1936 (Lloyd).
 2. Amer. Jour. of Oph., July 1933.
 3. (Traquair) Trans. Oph. Soc. of U. K., 1931.
 4. Arch. Oph., Aug. 1934.
 5. Traquair Oxford Oph. Con., 1931.
 6. Arch. of Oph., Aug. 1933.
 7. Trans. Oph. Soc. U. K., 1934.
 8. Arch. of Oph., Sept. 1935.
 9. Oxford Oph. Congr., 1931.

Perspective and Poise in Practice.*

BY R. A. YOUNG, C.B.E., B.Sc., MD., F.R.C.P.

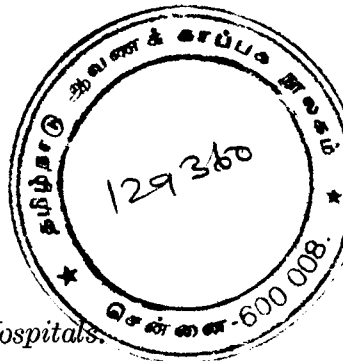
Consulting Physician to the Middlesex and Brompton Hospitals.

The discovery of perspective provided the artist with a third dimension and enabled him to give accuracy as well as beauty to his pictures. Perspective was defined by Dr. Johnson as "the science by which things are arranged in picture according to their appearance in their real situations." A better definition I have not yet found. It is of some interest to note the development and progress of the graphic art. It begins in the simple outlines drawn by primitive man, such as those on the walls of the caves of Altamira and those engraved on the tusks and bones of animals. Some of these are strikingly accurate in their presentation of form and in their suggestion of movement. Colour is even added in some instances. Presentation in silhouette seems to have been the next development, then shading followed by the addition of the cast shadows to suggest relief. Advances in technique and the discoveries of permanent pigments led to the production of pictures of striking beauty and great emotional expression, as we can see in Byzantine art and in that of the Primitives. There is, however, often a flatness, a lack of proportion between the main object or incident and the background, or a distorted expression of distance, even though the picture as a whole may be of great charm. The Chinese and the Greeks both seem to have had a sense of perspective, but its scientific study and applications date only from the early part of the fifteenth century. It is difficult to determine

to whom the greatest credit for this advance is due. Squarcione (1394-1474) and his illustrious pupil Andrea Mantegna (1431-1506) were among the earliest to develop it. Piero della Francesca (1416-96) probably did most to study its principles, and wrote a treatise on the subject; while Paolo Doni, called Ucello because he loved painting birds, devoted himself to its study so assiduously that Vasari says "he became more needy than famous." This has since been remedied, for his picture "Rout of San Romano" is one of the most popular in the National Gallery. The discovery of the importance of one horizon instead of many and of the vanishing-point of parallel lines rendered possible the masterpieces of the great painters, and gave distance, depth, and atmosphere to their work.

One of the great fascinations of words and their integration into language is their adaptability, their plastic character, and especially their use in a derived sense to express some idea having often only an indirect relation to their original meaning. The word perspective is an example of this. It has been used in a material sense to describe "a glass through which objects are viewed." It has also been applied to mental pictures, and it is in this special sense that I wish to use it now in discussing some of our medical problems. I may perhaps quote two definitions, one from Webster's Dictionary—"The capacity

* The Annual Oration delivered before the Medical Society of London on May 10, 1937, reprinted from the British Medical Journal, 22nd May 1937.



to view things in their true relations or relative proportions"—the other from the *Encyclopaedia Britannica*—"The interrelation in which parts of a subject are mentally viewed." My interest in this application of perspective was stimulated many years ago by the assessment of a distinguished and learned physician by one of his pupils, himself a man of great ability and practical turn of mind. Both have long since passed to where there are no horizons. "He has very wide range but no perspective," was his statement, made in no spirit of carping criticism but regretfully, for he had a real admiration for his teacher, but realized that his standards of the relative importance of details were often faulty. His opinion on a case was learned, but not infrequently unhelpful practically. He could not see the wood for the trees. In medicine as an art we want a horizon and the idea of a vanishing-point, or at any rate a point of focus.

The science of medicine is daily advancing and becoming more exact and more in touch with other branches of biology and with the physical and chemical sciences. The practice of medicine is a craft with many applications, playing an ever more and more important part in national life—indeed in the affairs of humanity in general; for medicine is the most catholic of all the sciences, and its practice the most liberal of all the arts. It is and should be the most international of all human activities. I thought, therefore, it might be of interest to this society if I called in this address a momentary halt to inquire into the modern cliché, "Whither medicine?"

The study of disease has advanced through stages comparable to those of the graphic art: the outlines studied clinically by masters such as Sydenham,

then filled in by the study of morbid anatomy, soon given greater detail through the microscope, then studied as actual processes through the advances of bacteriology, biochemistry, and biophysics. We are now acquiring means to discover and to study the causes of disease and the nature of the disturbances of function in the sick—in effect, the third dimension of disease. There is, however, need for perspective to adjust our attitude to these problems and to adapt treatment accordingly.

Perspective in Anamnesis and Examination

The investigation in the right manner of a patient who consults us is a matter of the first importance if we are to be successful in diagnosis and treatment. Taking a history of a patient seen for the first time is often a task requiring patience, tact, judgment, and sympathy. I believe that in our Medical Schools to-day more attention is being paid to instruction in the taking of histories, and I find that as a rule the practitioner nowadays keeps careful and documented notes of his patient's previous illnesses and records of any investigations which have been carried out. In my own work I prefer if possible to take out the history myself. By so doing it is possible to get in touch with the patient more intimately, to find out his own perspective of his symptoms, to assess his personality, and often to get in sight of a diagnosis, or at any rate to narrow down the list of possibilities and limit the necessary special investigations. It is often possible while doing so to form a perspective of the patient's complaints and then to elucidate obscurities by appropriate questions. The inquiries into occupation, diet, habits, home life, hobbies, and amusements are often revealing

and may afford suggestions in regard both to diagnosis and to treatment.

In any case of illness, even where the diagnosis appears obvious, examination should be as thorough and methodical as possible unless the condition of the patient is too bad to permit of this and the need for treatment is urgent and immediate. Personally I use a routine from which I rarely depart, embracing a brief review of all the systems, but devoting special attention to that chiefly involved. I am convinced that such a routine lessens the chances of making mistakes through missing some essential feature in the patient's condition and is better than immediate concentration on establishing the apparently obvious diagnosis. It is like looking first at a specimen under the low power of the microscope to get a general impression and then using the high power to focus details and refinements.

Perspective in Diagnosis

The numerous aids to diagnosis which modern research has afforded us are so easily available in hospital and institutional work that there is a tendency to rely upon them, to employ them as a routine, and to use them as the first approach to diagnosis rather than after careful clinical observation. This in my opinion is a wrong perspective of their use. I yield to no one in my admiration for and appreciation of the valuable aid given in the study of disease by clinical laboratory methods, bacteriological investigation, and biochemical tests. I employ them whenever possible in private practice, but I try to be selective, to use only the essential ones to supplement the full clinical investigation, not to supplant any part of it, and not to precede it; in other words, to support and extend the clinical diagnosis, or to negative it and give

fresh aids to the correct one. Let us not forget that even laboratory methods involve a human factor, depending as they do upon the interpretation of observed data, and that they are therefore not infallible.

In all difficult cases and in those with a prolonged course it is essential to keep an open mind and not try to fit in subsequent developments to the original diagnosis if they seem in the slightest degree to contradict it. It is wise from time to time to start again, as it were, and regard the problem as a fresh one, looking at it from a different standpoint. I am reminded of the importance of the point of view in an illustration I read in the preface to a book I have not so far been able to trace: "A church was situated half-way up a hill. It looked very different when seen from above and from below, but it was the same church. Everything depends on the point of view." The problem in the patient is the same problem, but a different attitude in its approach may prove illuminating. I am always suspicious of a double or composite diagnosis in a difficult case. It is like a picture with two horizons, and is usually out of drawing.

I am very much impressed with the fact that physicians with great experience of post-mortem work rarely make "tall" diagnoses, but often make brilliant suggestions in difficult cases from their wide knowledge of the distribution of the effects of disease. I lament the tendency nowadays for aspirants to hospital posts to avoid the routine of the performance of post mortems as pathologists, which formerly was almost the routine preparation for the staff.

Perspective in Prognosis.

Prognosis is admittedly one of the most difficult problems in the practice

of medicine. It depends upon so many factors, some of which are capable of expression statistically, while others are almost imponderable. In any given case its assessment depends upon an accurate estimation of the patient, together with the extent, nature, and character of his malady, but even then the individual experience of the practitioner is apt to influence his opinion more than a statistical statement as to the average.

Of one thing I am convinced, and that is of the wisdom of being hopeful even if the outlook is grave, and if possible infusing that hopefulness into the patient and those around him, whether relatives or nurses. In this connection I may quote Dr. G. F. Still to whose address on "Perspective in Medicine" I am much indebted. He says, "Certainly we have no right to close the door of hope so long as there is the smallest possibility of recovery," and adds, "That great clinician, Sir James Goodhart, when he was close on 70 years old said to me apropos of diagnosis, 'The older I grow the more hopeful I grow,' and certainly this has been my experience."

A special case often hard to deal with is the problem of what to tell to a patient with an obviously lethal disease, notably malignant disease of some vital area, such as the bronchi or mediastinum, recognised at a time when any opportunity of eradication or even of lengthy arrest is improbable. I have been much impressed with the fact that in such cases, when I have been dreading the direct question from the patient as to the nature of the disease and the outlook, how rarely it is asked. I have felt that the patient suspects but does not want to know. Believing this to be true, I have not often told a patient my suspicions unless I have been delibe-

ately asked as man to man my definite opinion, or unless I know that grave matters are at stake. I repeat that I think this problem one of the most difficult we have to face, with the knowledge that with the best intentions we may make the wrong decision. We must all have seen cases where the announcement that the condition was almost certainly lethal has embittered the last days of patient's life and accelerated the end. On the other hand I can recall one case where I was forced by the patient's wife to tell him that in my opinion he could not recover. I have never disliked a woman more than I did that one, but I was obliged to do as she demanded. I have never admired a man more; he said, "You mean, Doctor, that in the words of a South American proverb I have to pack my biscuits for the journey." On my answer in the affirmative he sent for his lawyer and his priest, arranged his affairs, and spent his last days in a calm and serene peace of mind that I shall never forget.

Perspective in Treatment.

In no phase of our work is a true perspective more necessary than in treatment. Though patients like a name to be applied to their condition they are more concerned with the measures suggested to restore them to health. We should always bear in mind that what we have to treat is a morbid state; that disease is not a clear-cut entity, but a condition of disordered function from organic damage or defect, or from disturbed balance of metabolic or endocrine activities, and that our efforts should be directed to restoration to normal or compensation for defects.

There was a time when instruction in treatment at medical schools was haphazard, and it was left to the

student, especially during his period in the wards, to acquire for himself such practical experience as the treatment of the cases there offered. It may be questioned whether even now the teaching of treatment is as organized and methodical as it should be, although clinical lectures and instruction in dietetics afford valuable aid in this direction. It is a commonplace now that treatment involves much more than the giving of drugs, useful as they often are. The modification of the patient's mode of life, alteration in his habits, change in his place of habitation, even in his amusements or relaxations, may be the chief factors in treatment. Strict dieting is often the only thing necessary. In regard to drugs the "therapeutic nihilism" of the mid-nineteenth century was followed by a spate of new remedies, which is ever more abundantly fed by complex products from chemical and biochemical laboratories, many of which are ephemeral and soon forgotten, while others have enriched us with therapeutic agents of the greatest value. There are fashions in treatment, and this aspect of therapeutics is to-day one of the most popular and fashionable, and probably one of the most promising for the future; but it is well to remember that there are "good remedies out of fashion," as one writer happily expressed it. Some of the drugs used by our predecessors, like antimony, apomorphine, and aconite, might be instanced; while serums, vaccines, and endocrine preparations no doubt still hold great promise for the future, though at the present time they are perhaps less prominent in treatment, except in certain well-established conditions, than they were a few years ago.

The various mechanical, electrical, and ray treatments are now being

developed and employed with almost feverish haste. That they are giving valuable aid in the treatment of disease and in the relief of suffering there can be no doubt. The time is not yet ripe for the determination of their true perspective in the therapeutic picture, but we may be sure that those of value will last and those that do not help will disappear.

There are so many special forms of treatment now available—including psychological psycho-analytical methods and suggestion for nervous disorders, special sanatoria for certain diseases, and varied treatment at spas in many countries, some of the most valuable being in our country—that it behoves us to be eclectic. We must be careful not to mistake enthusiasm for experience. The Biblical injunction, "Prove all things: hold fast that which is good," should be our maxim.

There is often a tendency to over-treat and to deal with symptoms rather than with causes. This is a wrong perspective, and is to be deprecated, except in regard to pain. It is our duty to relieve pain and prevent suffering whenever it is possible to do so.

Perspective and Specialism.

The public nowadays demand specialists. It is an economic axiom that demand creates supply, and there is an increasing tendency to specialize in all departments of medicine. This up to a point is doubtless good, for intensive study should lead to advance and to improvements in technique in relation both to diagnosis and to treatment. Special experience based on a wide general knowledge of medicine is the ideal to be aimed at in those who desire to practise in special departments. Over-specialization or too early concentration on such branches of the medical art is likely to

lead to professional myopia, and is to be deplored. If specialism develops, as it seems to be doing at the present time, into almost water-tight compartments, a closer co-operation with the family practitioner or the general physician will be necessary if incomplete or incorrect diagnoses are to be avoided, with grave omissions or mistakes in treatment, the consequence of studying a part instead of the whole of the patient.

Let us admit that with increasing developments in so many departments of medicine the role of the general practitioner or general physician is not an easy one, and that there is a tendency to specialize even in medical partnerships at the present time; yet it seems to me that it is still true that "they that are sick need a physician," using that term to indicate one person to be in charge, even though he call in specialized help in diagnosis and treatment when necessary.

In this connection I may quote Henry Adams: "Time and Experience alter all perspectives." It is difficult to forecast the future of practice. The increasing complexity of methods of diagnosis and treatment and the provision of more and more accommodation for private patients at general and special hospitals may eventually alter the whole scheme of medical practice. It is possible that in certain special department—for instance, diseases of the nervous system and of the lungs—owing to highly technical nature of diagnosis and treatment, a type of hybrid specialist may be evolved dealing with both the medical and the surgical aspects of these diseases.

Perspective in Medical Education.

The curriculum of medical study is one of the most exacting and expen-

sive of any of the forms of technical education. On all sides it is recognized at the present time that it is overloaded and ill balanced. It has been well said of medicine that there is no other art for which the most thorough education is so essential. This is true from the start, for a wide and good grounding in general knowledge and in habits of observation is most necessary if the complex details of the preliminary and intermediate subjects are to be intelligently assimilated. The specialization in teaching and examination in all departments needs overhauling and very close scrutiny. One wants to exclaim with H. D. Thoreau, "Simplify, simplify." Perspective in the curriculum is urgently needed, and although there is hope of amendment at present it is hope deferred.

The Profession, the Public, and the Press

It is somewhat of a paradox that whereas the doctor as an individual is popular and trusted, perhaps more than any other person, medical profession as a whole is not in great favour, either with the public or the lay press. Religion, medicine, and politics appear to be three matters in regard to which nearly everyone seems to feel competent to criticize and to offer suggestions to the experts. The lawyer, accountant, chemist, and engineer come in for much less comment in regard to their professions, and their opinions are generally accepted. Their only critics are as a rule other members of their own professions. The lay press no doubt contributes largely to this public attitude to our profession. While we must admit with gratitude that the Press is ever ready to help forward any appeal for assistance in regard to the work of our hospitals and other agencies for

the aid of the sick, suffering, and needy, it too often seizes on the sensational in medicine and champions the heterodox or the unproven. The fact that the legitimate practitioner of medicine does not advertise no doubt contributes to this attitude of both public and Press. The doctor is a public servant and his actions are often of public interest. His refusal to avail himself of the aid of the Press is misunderstood. It is not to withhold anything helpful but to prevent the exploitation of the public.

The medical press of this country is in my opinion wholly admirable. It is conducted entirely in the public interest and edited with tact and restraint. The best proof of this is the respect in which it is held by the profession and the rarity of any sensational extracts from it in the public press. There is so much that is dramatic and even romantic in medicine and medical research that it is to be regretted that the lay press neglects these aspects for the sensational and the bizarre.

Poise

Poise is a word with many derived meanings. In its original scientific application it is concerned with weight and balance. It has a pleasing sound, as have most words with a pleasant meaning. There is something about its lingering cadence which suggests balance and hovering. Shelley used it in this sense in the line "On poised wings held mute and moveless." In definition the learned Dr. Johnson again comes to my aid. He defines "poize" as "a regulating power," and then quotes Dryden: "Men of an unbounded imagination often want the poize of judgment." I want to stress the idea that poise means more than perspective; it is an artistic balance—a power and judgment with grace and dignity. It must be care-

fully distinguished from pose. Pose is an attitude, a self-conscious and conceited over-expression of self. It is rather interesting to note that the difference is only an "i," but it is a capital "I." The poseur is an egotist—the man with true poise is usually a philosopher and often an altruist. I often think that some of the general practitioners of my acquaintance have the truest poise in their relations to their patients. I so well remember one distinguished lady who said of her trusted medical adviser, "He is not our doctor only; he is our very dear friend;" and so indeed he was, for his advice was sought and followed not only on medical matters but on many of the ordinary affairs of life. Poise in professional conduct is inculcated in the highest degree in the Hippocratic oath, which is often quoted but seldom read.

While we often get gratitude from our patients it must be confessed it often happens that those for whom we do most are those who are least grateful and who sometimes even try to evade their liabilities. I am always suspicious when I hear, "No expense is to be spared, Doctor." I am reminded of a series of seventeenth century engravings, where the doctor is first represented as almost divine, then degraded to the rank of angel, then shown as mere man, and is finally represented as satanic when his account is presented.

The same idea occurs in the well-known quatrain:

"God and the doctor we alike adore,
But only when in danger, not before.
The danger o'er both are alike required,
God is forgotten and the doctor slighted."

How many of us must have wished that we need only see and treat the patients whom we like and who give us their confidence. I have, however,

learned one important lesson in poise—that often the patient who is gauche, taciturn, difficult, or even rude is self-conscious and shy, and that the attitude is often almost a subconscious protective reaction on his part. If we can get through this shell and probe the real person we can often help him greatly, but it sometimes needs great patience.

The happiest relation between doctor and patient is one of mutual esteem and confidence. The patient who goes behind his doctor's back to get what he calls an unbiased opinion seldom gets the best. On the other hand, the doctor who opposes a patient's request for consultation where there is a desire on the part of the patient or his friends for confirmation of an opinion or for help in treatment is lacking in poise, and is often not acting in his own or his patient's best interests. There are, however, some patients who collect doctors' opinions rather than take advice. Such are difficult to help, and they usually drift into the hands of the unorthodox, or crowd the waiting-rooms and clinics of foreign specialists whose reputations are not always greatest in their own country. This is not to belittle the value of international consultations. Our work is so responsible and our problems are often so complex that most of us welcome aid from those with greater experience, no matter whence they come. The aim of every true doctor is to help his patient. He can best do so if he knows that his patient trusts him. Money cannot always buy the best. I

often think of Kipling's "Last Rhyme of True Thomas":

"And some they give me the good red gold,
And some they give me the white money.
And some they give me a clout o' meal,
For they be people of low degree.

"And the song I sing for the counted gold,
The same I sing for the white money,
But best I sing for the clout o' meal,
That simple people given me."

My own criterion has been never to recommend or allow anything that I would not permit to one near or dear to me. La Rochefoucauld, probably the greatest writer of crisp epigrams of all time, said: "It is more necessary to study men than books." That is most true in our profession, and we must bear in mind that it is a sick, maimed, suffering, or sorry fellow-creature that we have to deal with. Oliver St. John Gogarty writes, "Humanity is all that matters to human beings." In these days, when Robert Burn's wonderful lines, "Man's inhumanity to man Makes countless thousands mourn," seem more than ever true, let us remember that our profession, and we as members of it, can and should set an example of true humanity in a world at present almost attuned, or at any rate inured, to cruelty, misery, and suffering. An Edinburgh surgeon, John Chiene, said to his students: "I always feel when I hurt a patient I have done wrong." The true perspective in medicine and the true poise in practice are summed up in the golden rule, "Do unto others as you would they should do unto you."

A Case of Gonococcal Septicaemia from the Special Department

BY N. MONEY.

Gonococcal Septicaemia occurs usually as a complication due to invasion of the blood stream by the specific diplococci, especially in those cases of gonorrhoea in which the primary lesions involve the posterior urethra, or the glands connected with it such as the prostate, the seminal vesicles, or testis. 'Usually' because, there are early and uncomplicated cases of Gonorrhoea, as the three described by Lautier in his thesis, in which the Neisser's coccus is present in the blood, and can be cultured.

The entry into the circulation is effected through the lymphatics and capillaries. Systemic infection is commoner in men than in women probably owing to the greater length of the male urethra, or due to the greater resistance offered, by the uterus and the pelvic peritoneum in women, to the spread of infection. And women it should be remembered are less liable to traumatic injury of the urethra and vagina. To allow the escape of gonococci or their toxins into the blood stream and lymphatics either a local retention with a subsequent trauma, or a break in the continuity of the protecting epithelium is essential. Trauma may be caused by two ways:—

(1) by the passage of instruments,

(2) by an extension of the disease process itself to the neck of the bladder, and the trigone, resulting in congestion, bleeding, and exposure of the smaller capillaries.

Congestion due to sexual excitement increases the chances of trauma. The present day view is that the systemic infection in the male may arise from any retention focus from the anterior urethra up to the renal pelvis. The chief focus, the 'parent and original' of all the trouble is probably the seminal vesicle, a real labyrinth of refuge to the Neisserian organism, though other foci like the Cowper's and Littre's glands play some, but nonetheless important part.

In ordinary acute cases of gonorrhoea, the blood culture is almost always negative, while positive cultures are often obtained in chronic cases, with stricture or epididymitis as a complication.

Once irrupted into the circulation, the organism like other members of the pyogenic group, settles down on certain predisposed parts, constituting a metastatic infection, penetrating to the remotest parts of the body to achieve its end. The synovial membranes of the joints and tendon sheaths, the valves of the heart, and less frequently the serous membranes, and subcutaneous cellular tissues are the special sites of election. The lesions being so varied and widespread that there is nothing remarkable in the fact that gonococcal septicaemia is seldom a pure septicaemia. The devastations produced in these places resemble more or less those caused by other pyogenic organisms.

Not in frequently purulent or serous effusions into the joints, warty vegetations on, and more rarely ulceration of the valves of the heart, and infection of the subcutaneous tissues leading to multiple abscesses, are some of the chief attempts at destruction by the gonococcus. Thus gonorrhœa may at any moment turn out to be a rapidly fatal septicæmia, or it may induce acute or chronic disease of the joints, ulcerative and proliferating endocarditis, pericarditis, bronchopneumonia, infarcts in the lungs or other organs, peritonitis, pleurisy, phlebitis, periostitis, iritis, meningitis, neuritis, and in fact to all 'the ills that flesh is heir to.' To bring order out of this chaos, Cole divides the systemic infections into four groups:—

(1) Those with endocarditis.

In gonococcal endocarditis of the valves, the aortic is the worst sufferer, and the right heart is involved more often than in endocarditis due to other organisms.

(2) Cases with local suppuration and with the general features of a pyæmia.

(3) Cases with no metastatic local affections, or perhaps with only a slight arthritis.

(4) Cases of gonorrhœal puerperal septicæmia.

Or closer scrutiny this classification, it will be evident, is at its best only an endeavour to put a semblance of order.

Recovery takes place in about 70 per cent. In all fatal cases endocarditis is present as a rule. 'Gonococcal Septicæmia thus owes its gravity chiefly to the cardiac complications, which it is apt to produce.'

Symptoms.—In its manifestations gonococcal septicæmia shares the characteristics of general microbic infections, *i.e.*, it starts with a pyrexia which may be of an intermittent, remittent, or continuous type. At the same time, an eruption composed of pinkish lenticular spots, often appears, which is not unlike the roseala spots described in typhoid fever. Marked pallor and a sallow tint of the skin, general weakness and lassitude, insomnia and debility are constant accompanying features.

Although fever is the simplest expression of generalised gonorrhœa, it is hardly, if ever, noticeable in ordinary uncomplicated cases. Yet it is true that attacks of fever, strongly resembling those of typhoid, occur in general gonococcal septicæmia, and that a hyperacute and hypertoxic form exists which takes a very rapid and fatal course. This galloping form might very well be termed malignant gonorrhœa.

Diagnosis.—Suspicion should be aroused with the onset of severe fever occurring in the course of an ordinary gonococcal infection. The absence of any acute complications, such as epididymitis or prostatitis, and the presence of rose spots on the abdomen, should suggest a Widal reaction or blood culture, to rule out enteric.

In cases where endocarditis is present diagnosis is by no means always easy as the cardiac lesions are usually preceded by articular lesions. If the latter lesions are present simultaneously they would indeed present some difficulties. As for example acute rheumatism especially in children, and rheumatoid arthritis in young women are conditions to be eliminated; but in both these conditions the flitting of the trouble from

one large joint to another, and gradual increase in severity usually establish the diagnosis, which can be confirmed by negative swabs from all possible sources of primary infection. If the septicæmia is accompanied by the polyarticular variety of arthritis which affects the small joints, it is liable to be confused with Zymotic fevers, which have to be ruled out.

The laboratory aids to clinch the diagnosis are:—

(1) *Blood culture.* Faure-Beaulieu recommends mixing the blood with ascitic broth and allowing it to incubate for 24 hours. Subcultures should then be made on a good solid medium. One negative subculture is hardly sufficient for a negative diagnosis. Harris and Johnson failed to grow the germ in two out of five trials on the same patient, while Faure-Beaulieu himself suffered defeat in three out of four attempts on one patient. It seems as if the fever did not progress in a steady, continuous manner, but that discharges of microbes into the circulation, took place at odd times. Clinically, the intermittent or remittent attacks of fever would correspond to them.

(2) *Complement fixation.* Gradwohl suggested that the compliment fixation test would be useful for the diagnosis of gonococcal septicæmia. No doubt it would be useful in some cases, where the existence of gonorrhœa was itself doubtful. Where however there was a definite local gonorrhœa a positive test would be expected in any case, and this would not help one to determine, whether or not the infection had gained an entrance into the circulation. Definite diagnostic evidence can only be obtained from a positive blood culture.

Prognosis.—Patients without cardiac complications usually recover,

but septicæmia with endocarditis is invariably fatal.

Treatment.—Rest in bed, in all cases of gonorrhœa complicated with continuous pyrexia is indicated. The temperature should be controlled by hydrotherapy. The administration of antipyretics or salicylates does not seem to have any beneficial effect and may on the other hand weaken the patient. Diaphoretics and alkaline diuretics may be given to aid the excretion of toxins.

All local treatment of the focus or foci of infection should be stopped during the pyrexial stage of the disease. The joint swellings and pain may be relieved by the application of Icthyol Belladonna pigment.

Treatment by the blood stream.—Opinion is divided acutely on the question of vaccine treatment. Some clinicians advocate the routine administration of a good brand of Gonococcal vaccine, others on the other hand assert, that it is irrational to push on any vaccine during the stage when the body is simply overwhelmed with gonococci, and their toxins, and it is not in a condition to utilize for antibody formation, an additional dose of toxin in the form of a vaccine. They claim that anti gonococcal serum is indicated in such cases, and should be given in massive doses, till the temperature drops, and the patient's general condition improves.

With these preliminary remarks, the following case is presented for discussion.

Case notes.—A female child H, aged 6 years, was admitted on 15-3-36 in the Special Department of General Hospital, for vulvo-vaginitis of nearly

one year's standing. The mother of the child was another patient of the same Department, who had attended for gonorrhoea off and on.

Examination of the child revealed a purulent discharge between the folds of the labia majora, with an inflamed succulent but intact hymen. On separating and cleaning the external parts pus was seen to ooze both from the vagina and urethra.

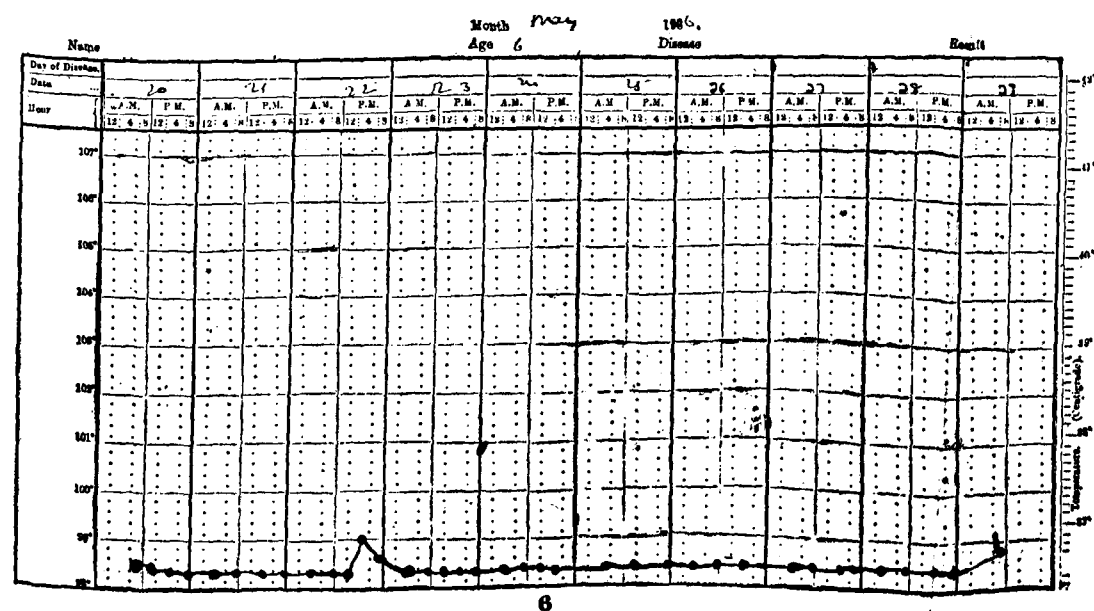
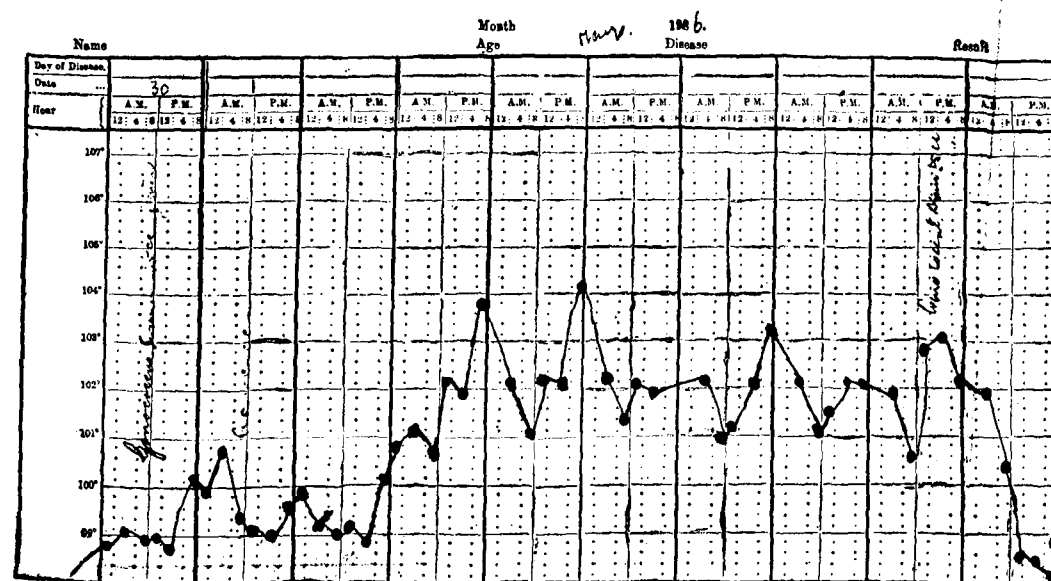
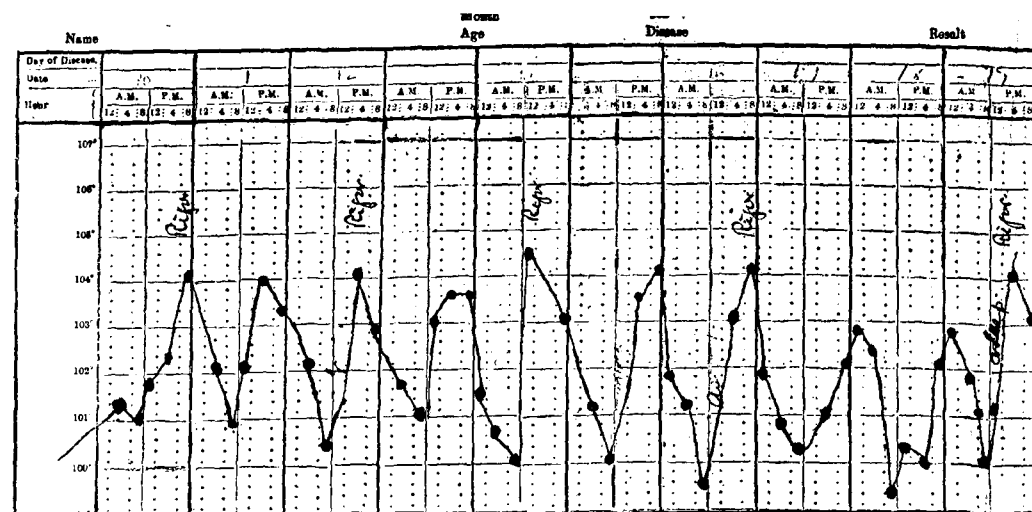
Smears from the urethra and vagina both showed a lot of pus cells, with gram negative diplococci both intra and extra cellular.

From 15-3-36 to 31-3-36 the child had the usual treatment for the condition, *i.e.*, (1) Sitz bath, (2) Swabbing the vagina with mercurochrome, (3) Urethral irrigation with potassium permanganate lotion 1 in 10000, (4) Weekly intra desmal injections of a diluted dose of Gonoderm.

On 31-3-36 after the third dose of Gonoderm, the child developed a severe rigor, and the temperature shot up to 105°. With the temperature, she developed polyarthrititis of the hip, knee, ankle, and the smaller joints of the hand. The child in a few days became very ill, extremely toxic, restless, irritable, scarcely sleeping at night except with the aid of narcotics. The temperature continued with remittent and intermittent variations for 43 days (from 31-3-36 to 12-5-36). The polyarthrititis was characterised by a minimum of swelling with a maximum of pain and limitation of movements. The long continued temperature was repeatedly punctuated with rigors. The accompanying chart records the temperature of the patient during the period of observation. Examination of the blood was negative to malaria. There was a slight leucopenia. The test for Widal was

negative on two different occasions. Repeated blood culture taken during the height of the fever or rigor was reported sterile. Weekly examination of the smears from vagina and urethra continued to be positive both to pus cells and Neisser's coccus till 30-4-36. Repeated and careful examination of the heart by one of the physicians of the hospital, failed to reveal any evidence of endocarditis. There was no enlargement of the liver and spleen. Examinations of the lungs, nervous system, and gastro intestinal tract showed no abnormality.

Treatment and progress.—The patient was on liquid diet with plenty of glucose. The temperature was controlled to a certain extent by hydrotherapy. To combat the septicaemia intravenous injections of one per cent mercurochrome in 50 per cent glucose was given on four successive days, without much benefit. Subcutaneous injections of 25 c. c. of anti-gonococcal serum (Bayer) was given on the 24th, 25th, 27th, 28th, 30th April, and on the 1st May. The temperature showed a dramatic response to serum treatment, nearly touched normal, and continued low for a longer time before going up a little in the evenings. Apart from the temperature the general condition improved appreciably, the joint pains disappeared and toxæmia was almost abolished. On the 30th April, 1st and 2nd May the temperature was the lowest on record. On the 3rd May again there was a secondary rise of temperature, which continued with variations till the 11th May. The second period of pyrexia was not accompanied or associated with any toxæmia, and was probably due to serum sickness. On the 4th May there was diffuse serum rash all over the body. In spite of the rash, and in order to avoid any risks, anti gonococcal serum (25 c.c.) was again adminis-



tered on the 6th, 7th, 8th and 11th May. Nothing untoward happened and the temperature reached normal on the 12th May and continued so till the patient was discharged on the 6th June 1936.

During convalescence, smears were examined on three different occasions and were found uniformly negative to either pus cells or diplococci.

The points of interest in the case are:—

(1) The Age of the patient.

(2) Gonorrhœal septicæmia arising as a complication of vulvo vaginitis is comparatively uncommon, and it is surmised that the infantile cervical canal must have been the focus for the metastatic infection.

Demonstration of gonococci in the blood by culture is by no means easy. And the repeated negative reports by

the bacteriologist does not militate against the diagnosis.

(3) The total absence of any involvement of the valves of the heart.

(4) The therapeutic response of the condition to massive doses of anti gonococcal serum.

(5) The spontaneous cure of the genital infection after the recovery from pyrexia. The cure of diplococcal vulvo vaginitis in children, especially from a bacteriological point of view is usually very uncertain by ordinary local and vaccine treatment.

I thank Dr. R. V. Rajam, M.B., M.S., M.R.C.P., the Venereal specialist, for his kind help and valuable suggestions in getting up this case report, and the Superintendent, General Hospital for permission to publish the same.

BIBLIOGRAPHY.

1. *George Luys*—Gonorrhœa and its Complications.
2. *David Thompson*.—Gonorrhœa.
3. *Sir William Osler*.—The Principles and Practice of Medicine—revised by Thomas Macrae.
4. *W. H. C. Romanis and Philip H. Mitchner*.—The Science and Practice of Surgery, Vol. I.

The Treatment of Cholera.

BY U. SRINIVASA RAO

(Final Year).

The course of cholera is usually described in four stages, namely, Stage I of premonitory diarrhoea, Stage II of copious evacuations, Stage III of collapse and Stage IV of Reaction, and hence the treatment also is conveniently described under those four headings.

The following changes occur in cholera :—

(1) Enormous loss of fluids from the system, (2) Loss of chlorides with the evacuations, (3) Specific gravity of blood greatly increased due to dehydration, (4) Power of absorption by the intestinal mucosa lost, (5) Function of kidneys greatly impaired and (6) Reduction of the alkali content of the blood.

Treatment must aim at replacement of the lost fluids and chlorides, destruction and removal of the vibrios, the neutralisation of the toxins, the prevention of secondary infection through the damaged mucosa the healing of which must also be assisted and the relief of symptoms.

General measures.—Patient should be kept warm in a fly-proof room, in horizontal position. His discharges and the excreta should be well disinfected.

Stage I. Premonitory Diarrhoea.

No purgatives should be given at all especially the saline purgatives as they deplete the blood of fluid. The pro-

diarrhoea mixture, namely Tomb's essential oil mixture is given.

Tomb's essential oil mixture.

R/	Oil of cloves	m. v.
	Oil of cajuput	m. v.
	Oil of juniper	m. v.
	Acid Sulpt. arom.	m. xv.
	Spts. etheris	m. xxx.

This dose in half an ounce of water, every half hour till 8 doses are given.

Calomel is also given, as it is an indirect cholagogue, intestinal antiseptic and disinfectant. Fractional doses check vomiting, are least harmful to the system and increase the recovery rate.

R/	Calomel	grs. 1/8.
	Soda bicarb	grs. ii.

Once every half hour for 10–12 doses.

Astringents like kino, acid sulphuric dil. could be given. Dose of 20 mins. of Tr. opii or 15 mins. of chlorodyne might be administered if the motions are still fæcal. *Opium should never be prescribed if the motions are rice water like.*

Stages II & III Copious Evacuations and Collapse.

I. To replace lost fluids and salts.—The main principle in the treatment of cholera is to counteract the frequent collapses by repeated administration of saline and this is guided

The Treatment of Cholera

339

strictly by the specific gravity of blood. Finally we would arrive at a point when there will be no longer any apprehension of recurrence of collapse.

The specific gravity of blood is determined by introducing drops of blood into varying dilutions of glycerine and water and noting the specific gravity of that mixture in which the drop of blood just floats for a second or two.

••••• Injections of saline might be given in the following ways :—(A) Intravenously, (B) Rectally, (C) Subcutaneously and (D) Intraperitonially.

A. Intravenous route.—Indications for this route are (1) profound collapse with cyanosis, restlessness and painful cramps, (2) Feeble or no pulse at the wrist, (3) Specific gravity of blood over 1056, (4) Suppression of urine and uræmia, (5) Frequent retching and nausea and (6) Systolic blood pressure less than 70 m.m. of mercury.

Contraindications are (1) Extreme Cardiac asthenia, (2) Bronchitis or bronchoypneumonia, (3) High rectal temperature of above, 102°F., (4) Distressing tympanitis, (5) High specific gravity of blood with fair pulse and (6) Low specific gravity of blood with nil or very feeble pulse.

Quantity of Saline to be injected.—This depends on the changes in the condition of the patient. A fair method of estimating the amount is by the specific gravity. If it be 1063-4-5-6, then 3–6 pints are given to adult males. The first pint should be alkaline solution and the remainder hypertonic saline. The aim must be to raise the blood pressure to 100–110 m.m. and to get that, 3 or 4 pints are usually given to adult men, 3½ pints to adult women, 2 pints to children of 10–15 years and 1 pint to children under

10 years of age. If severe headachel severe rigor, restlessness, pre-cordia, pain or cardiac embarrassment should be complained of, the infusion is stopped. Too little saline should not be administered, it only for the time being, saves the patient from collapse.

Varieties and Composition of Saline.

1. Hypertonic.

Sodium chloride	...	grs. 120.
Aqua distillata	...	pint 1.

2. Compound hypertonic or hypertonic with calcium chloride.

Sodium chloride	...	grs. 120.
Calcium chloride	...	grs. 4.
Aqua	...	pint 1.

3. Hypotonic saline.

Sodium chloride	...	grs. 60
Aqua	...	pint 1.

4. Isotonic saline.

Sodium chloride	...	grs. 90.
Aqua	...	pint 1.

5. Alkaline isotonic saline.

Sodium chloride	...	grs. 60.
Soda bicarb	...	grs. 120.
Aqua	...	pint 1.

6. Rectal saline.

Sodium chloride	...	grs. 60.
Soda bicarbonate	...	grs. 160.
Glucose solution		
5 per cent	...	dr. ii.
Aqua ad	...	pint 1.

Hypertonic saline is indicated especially in the collapse stage. Iso or hypotonic saline should not be given intravenously in the early or collapse stages as they are likely to increase the diarrhoea and also cause cedema of the lungs.

Temperature of saline.—This should be regulated by the rectal temperature (1) If the rectal temperature be between 96°F and 100°F that of the saline should be at the body temperature, (2) if it is 97°F or below, the saline should be between 102° F and 104°F, (3) if the rectal temperature be above 100°F, the temperature of saline should be much below normal and lastly (4) if the temperature of rectum be above 102°F the saline should be given at the temperature of the room.

The rate of flow of the saline must be rapid at first till the first two or three pints go in and then slowed down so as to allow sufficient time for the heart to adjust itself.

Methods of injection.

(1) *Open method* that is exposing the selected vein by dissection.

(2) *Closed or direct method.*

Open method is the one universally followed. The veins chosen are the median basilic, median cephalic and the vein in front of the internal malleolus of the ankle.

B. Rectal infusion.—Only very small amount is absorbed and the method is useless if to act urgently and if the systolic blood pressure is 70 m.m. or less. Normal saline $\frac{1}{2}$ —1 pint should be given every 2 hours during the stage of evacuation and every 4 hours after reaction begins and secretion of urine starts. If the urine is acid sodium bicarbonate 160 grs. to each pint might be added with advantage. Hypertonic saline is not at all absorbed from the bowel.

C. Subcutaneous saline is the method of choice for children and for adults if absorption is to take place slowly.

Advantages are (1) can push in quantity of fluid for slow absorption when collapse repeats frequently; (2) Useful (a) in hyperpyrexia with extreme collapse, (b) when the specific gravity of blood is just raised above normal and (c) in cases of asthenia with heart and lung involvement.

Disadvantages are (1) the operation is very painful, (2) large quantities of fluids cannot be pushed in, (3) absorption is very low, (4) very inferior to intravenous method, (5) sepsis and tetanus might occur, (6) alkaline solution cannot and should not be given subcutaneously.

Indications for subcutaneous saline are

(1) *Threatened uræmia* especially in the early stages of a mild or in the reaction stage of a more severe type of the disease.

(2) *Persistent retching, nausea and vomiting.*—This is due to insufficiency of fluid in the system.

(3) *Unsuitable veins.*—Here there is no other alternative available except the subcutaneous method.

(4) *Oedema of the lungs* occurring in cases where the intravenous method is contraindicated owing to the possibility of subsequent oedema of lungs as a result of sudden and rapid influx of saline into the blood. The thus diluted blood unable to get rid of its excess of fluids through the kidneys allows the water to accumulate in the internal organs especially the lungs.

Variety of saline to be injected.—Isotonic or if need be hypotonic saline should be used. Rogers advocates hyhertonic saline as it has the double advantage of replacing the lost chlorides and preventing rapid collapse.

If alkaline solution be used, it leads to abscess formation.

The quantity of saline used should not be more one pint at a time, at the temperature of the body. It could be repeated at different sites.

The common sites of injection are the axilla and the lumbar region.

D. Intraperitoneal injection.—In the case of adults this method is better than subcutaneous saline as it is simple, quick, less painful and enables a fairly large quantity to be injected with fairly rapid absorption and does not require previous training in the technique as in the intravenous method.

Two to three pints could be safely injected, at a time, in an adult within 10—15 minutes. There is no danger of subsequent hyperpyrexia or rigor. It is of no use in the collapse stage, when the heart fails necessitating a rapid absorption. The foot of the bed is raised and hypertonic saline is injected at about the body temperature or a little higher, 100°F to 104°F being the optimum temperature.

Fluids by mouth. Two ounces at a time at short intervals and ice to suck are beneficial.

II. Medical treatment during the stages of evacuation and collapse.

(i) *Atropine.*—1/100th grain atropine sulphate is injected hypodermically on admission and repeated subsequently night and morning.

Indications for atropine are (1) Extreme collapse with cyanoses, (2) Pulmonary complications, (3) When the heart is failing, (4) When response to pulse is not satisfactory after saline transfusions.

Contraindications are (1) High rectal temperature and (2) *tympanitis*.

[Opium in any form is contra-indicated.]

(ii) *Potassium permanganate.*

R/ Pot. permanganes grs. ii.
Kaolin } $\overline{aa}$ q. s.
Vaseline }

Fiat pilula one.

Immediately on admission into the hospital a pill is given every 15 minutes for 2 hours and then one pill every half hour till the motions change in colour, which occurs in about 12—24 hours. On the second day 8 pills are given in 4 hours and the same dose repeated on the third day, in severe cases to prevent relapse. This drug is said to oxidise the toxins of the cholera vibrios. Some Physicians are not satisfied with potassium permanganate, as it is irritating and nauseating and some patients treated with it run into uræmia and obstinate hiccough, whilst a few develop dysenteric symptoms. 2—3 ounces of potassium or calcium permanganate lotions 1—6 grains to the pint, given by the mouth are very good.

(iii) *Kaolin.* One part of kaolin with three parts of water, well stirred, can be drunk in tumblerfuls, to an unlimited extent. While acting as a soothing coating to the intestinal mucous membrane, it absorbs the toxins and prevents melæna. Eight ounces are given at once and two to three ounces given after every 15 minutes with potassium permanganate pills. In the Infectious Diseases Hospital, Tondiarpet, animal charcoal is used in place of kaolin and is found to be equally efficient.

(iv) *Adrenalin* is useful temporarily, only when given under the tongue

but it has the undesirable action of constricting the arterioles of the kidney.

(v) *Pituitrin* $\frac{1}{2}$ c.c. is injected subcutaneously once or twice a day. Urinary solids are increased so that it is useful in threatening uræmia due to deficient blood pressure and it stimulates urine production. Better it is to combine pituitrin with eserine sulphate or physostigmine salicylate to combat the intestinal paresis and tympanitis.

(vi) *Caffeine et Sodii Benzoas* is useful in cases with profound cardiac weakness and it sometimes acts like a charm in the early stages of uræmia by producing a fair amount of urine.

(vii) *Cardiac Drugs*. For cardiac failure 1/100th grain digitaline subcutaneously morning or evening, or 1/100th grain strophanthin intravenously for rapid effect are recommended. Camphor grains 5, in ether could be injected every 4 hours. At the same time in a mixture ammonium carbonate and spirits ammonia aromaticus are prescribed. To the above mixture Tincture nux vomica and Tincture digitalis might be added if blood pressure is not normal and urine secretion not free.

Main principles in Rogers' method of treatment. (1) When collapse occurs and blood pressure is below 70 m.m. the lost fluids and salts are replaced by hypertonic saline. Intravenous injections of sufficient amount to raise the blood pressure to normal if possible so as to ensure a rapid excretion of toxins through the kidneys are given.

(2) Oxidising agents to destroy the toxins formed in the gastro-intestinal tract, are freely administered by the mouth.

(3) The temperature during the reaction stage is carefully watched and controlled.

(4) The observation of blood pressure after reaction, is continued and all available means are used to maintain it at a point which will ensure a free excretion of urine.

Rogers' Technique.—(1) Hypodermic injection of atropine sulphate 1/100th grain given at once and repeated morning and evening throughout the treatment. The specific gravity of blood, the blood pressure, and the oral and rectal temperatures should be recorded.

(2) Repeated free use of saline infusions should be carried out to prevent collapse, to dilute the toxins to stimulate heart and excite free action of kidneys.

Apart from this, the rest of the treatment in the collapse stage is symptomatic.

Suppression of urine.—Bladder is catheterised and any urine present is withdrawn, while hot fomentations and dry cupping are applied over the loins. The colon is irrigated with 102°F hot isotonic saline using long rectal tubes. Injections of pituitrin $\frac{1}{2}$ c.c. subcutaneously and hypertonic saline with glucose, intravenously are of benefit.

Cramps.—Hot mustard froth bath or even hot baths and brisk rubbing of the legs should be done. Locally hot fomentations or mustard compresses or turpentine stupes to be given. If cramps are very bad, chloroform might be used as an anæsthetic.

Vomiting.—Stomach is washed out with weak Condyl's lotion or hot isotonic saline, while mustard plasters

are applied over the pit of the stomach and chopped ice given to suck, after withdrawing all the foods.

Collapse.—Saline infusions should be started early and the patient is kept warm by being packed with hot bottles. The sweat is constantly wiped off with a flannel. If collapse occurs a teaspoonful of alcohol is added to the saline infusion stimulant injections are given. Rigor, restlessness or delirium in the collapsed stage require careful treatment. If rectal temperature be 104°F packing with hot bottles is contra-indicated.

Stage IV Reaction.

The dangers in this stage are excessive febrile, reaction, continued suppression of urine leading uræmia and inflammatory complications. To control the febrile reaction, salines are administered at subnormal temperature. Rectal temperature is taken every 15 minutes and if fever is high, iced-water rectal saline not less than one pint is given at once by the drip method. If rectal temperature is 104°F or if temperature under tongue or axilla be 103°F, then ice is applied to head and cold sponging done. If the temperature goes higher, iced water enemata are administered. The diarrhoea of the after stage of reaction ought not be checked. Opium and lead acetate are fatal drugs, leading to uræmia. The diarrhoea should be treated by regulating the diet.

Convalescence is very rapid except in the old and the feeble. Sudden movements in and out of the bed should be prohibited so as to prevent sudden heart failure. Patients should be discharged only when three consecutive examinations of their motions bacteriologically for cholera vibrios have been negative.

Treatment of complications.

(1) *Tympanitis.*—If slight turpentine stupes to the abdomen should be applied, and flatus tube should be inserted. In addition injection of pituitrin 1 c.c. with physostigmine salicylate 1/000th grain would be welcome if severe.

(2) *Oedema of lungs.*—The lung complications are due to uræmia, pneumonias, extreme loss of fluid, general asthenia, myocardial weakness and hypostatic congestion. Atropine should be injected. Transfusion is contra-indicated while 50 per cent glucose 15 c.c. should be given intravenously.

(3) *Ureamia.*—(a) Alkaline mixtures are given freely one ounce every 4 hours, (b) glucose and soda drinks are given liberally, (c) glucose and normal saline are administered per rectum by the drip method, (d) one ounce of castor oil, to start with, is given and is repeated until the bowels move freely, followed by 4 per cent soda bicarb 10 ounces intravenously, (e) dry cupping and fomentations are applied over the loins, (f) caffeine and atrophine injections are given, (g) diuretin 7–10 grs. twice or thrice a day is prescribed, (h) if no urine be passed 4 per cent soda bicarb should be repeated after 24 hours, intravenously, (i) if still there is suppression of urine, 25 per cent glucose 15–20 c.c. are injected intravenously, (j) magnesium sulphate is given as enemata and purgative.

(4) *Epistaxis, bleeding gums and melæna.*—For this calcium lactate 10 grains are given 3 times a day or intravenous injection of 2–5 c.c. of 10 per cent calcium chloride should be resorted to.

(5) *Head-ache* is treated with cromides or chloral hydras.

(6) *Gastric irritation* is allayed by tincture iodine two minims in one ounce of water or chloretone.

(7) *Hiccough*.—Castor oil ounce one is given at the outset. Tincture iodine minim one in half ounce of water to be given every half hour for 6—8 doses while 10 grains of chloretone twice a day might also be tried. 1/100th grain of atropine sulphate should be injected hyhodermically and mustard plaster should be applied to the epigastrium.

(8) *Corneal ulcers*.—Eyes are washed with normal saline and liquid paraffin drops put in, cauterisation of the ulcer with tincture iodine is the other alternative. Atropine drops and yellow oxide of mercury ointment should be applied at nights.

(9) *Pneumonia*.—Ammonium Carbonate in used.

(10) *Suppurative parotites*.—Its treatment is incision.

Anti-cholera serum.

(1) Dr. H. N. Ghose's serum, 25 c.c. mixed with 75 c.c. of normal saline is give intraperitonially.

(2) Bayer's anti-cholera serum 25 c.c. is injected through the vein.

Bacteriophage.—One grain of soda bicarb is given to the patients and after a few minutes one ampoule of 2 c.c. cholera phage is given, to be repeated every 4 hours. This done in addition to the other usual routine methods. But Rogers is of opinion that the phage treatment is not effective.

Diet.—In the acute stages, only barley water and black coffee are given. This is continued during the reaction stage as milk or soup induce relapses. Thin butter milk or whey are next best. When acute diarrhoea has stopped for two or more days, "pepper-water" or "rasam" and sufficient well squeezed rice could be given. The diet is gradually increased. All these things except barley water and butter milk should be withheld until the kidneys are acting freely.

In conclusion I have to thank Dr. Abdul Hadi, L.M.S., Medical Officer in chage of the Infectious Diseases Hospital, Tondiarpet, for the very great help that he has rendered me in getting up this article.

BIBLIOGRAPHY.

1. *Abdul Hadi*.—A case of Post Choleraic acute Uræmia—Madras Medical College Magazine, Vol. X, No. 2.
2. *Bakshi, H. N.*—Saline treatment in Cholera—Antiseptic, Vol. 34, No. 2.
3. *Barua, H. S.*—Cholera and its modern treatment—Antiseptic, Vol. 34, No. 2.
4. *Chatterjee, B. C.*—Cholera—Antiseptic, Vol. 34, No. 2.
5. *Le and Chatterjee*.—Textbook of Bacteriology.
6. *Manson-Bahr*.—Tropical Medicine.
7. *Patel, P. T.*—Diagnosis and treatment of Cholera—Antiseptic, Vol. 34, No. 2.
8. *Rogers*.—Recent advances in Tropical Medicine.
9. *Rogers and Megaw*.—Tropical Medicine.
10. *Shastry, T. S., Lt.-Col.*—Cholera and its treatment—Antiseptic, Vol. 32, No. 12.

The Madras Medical College Magazine.



JOHN Davison Rockefeller is dead. He had not the gift of the silver spoon at birth, but by means best known to himself, amassed a fabulous wealth, as found, perhaps in few persons, in a millennium. In his earlier days John D. Rockefeller stood to the world as a symbol of the evils of capitalism and monopoly. Later the name of the oil magnate came to stand for philanthropy on the 'sky-scraper' scale. Out of the vast fortune that he hoarded, he devoted a great part amounting to over a hundred and fifty million pounds for such worthy causes as to 'assist, encourage, and conduct investigations in medicine, surgery and allied subjects' and 'to promote the well being of mankind throughout the world.' Rockefeller's contributions are the largest ever made and they exceed that of Andrew Carnegie by fifty million pounds. For most men who are endowed with riches, if at all charity begins, it begins at home, and what is more, ends there. They earmark their donations, usually for the betterment of the particular community or nation to which the donor belongs. But happily Rockefeller was not affected by such a glaucomatous vision and his munificence was not limited by any communal or national bias. The methods by which he multiplied his millions might not have promoted the welfare of mankind, but it cannot

be denied that the Rockefeller millions have contributed to a great extent towards the improvement of human felicity and well being.

The three primitive human instincts are said to be the self, the sex, and the herd instincts, and out of these the first two dominate the third. In an address to some of our students, referring to unemployment, recently Dr. T. Satakopan said that the dire malady would be much mitigated if the policy of the profession were 'to live and let live.' He stressed that men on the topmost rungs of the ladder should take those at the bottom under their wings. It is indeed a noble suggestion, and we earnestly trust that the physician's appeal would stir up the third instinct in the medicoes.

While congratulating the students who qualified for the degree in the recent examination, we draw their attention to the fact that unemployment stares them in the face, now, not so rudely as it used to do. After a lapse of several years once again recruitment of men in civil assistant surgeons is to be made, and we hope our college graduates will be preferred to others.

Lt.-Col. C. M. Plumptre, I.M.S., the Principal, Medical College, has been elected a Fellow of the British College of Obstetricians and Gynæcologists. We offer him our hearty felicitations.

College Comments.

April Examination.—We congratulate all those students who were successful in the last April Examinations. Dr. Vaidhya's achievement in obtaining a First class in the Final M.B. Examination is very creditable. First class results nowadays seem to be a very common place affair; there has again been a First class in the Second M.B. and another in the First M. B. Examinations.

Coronation Honours.—Lt.-Col. Clive Newcomb, I. M. S. (Retd.) till lately our Principal, has been made a C. I. E. in the recent Coronation Honours. In congratulating him on this unique honour, we cannot do better than quote the following from the *Madras Mail* of March 11, 1937. "The honour of C. I. E. is belatedly conferred upon Lt.-Col. Clive Newcomb, whose excellent record of work in a variety of capacities in the Medical department has just concluded."

College Association.—At a meeting of the General Body of the College Association held in March last a resolution brought up by one of us recommending that the Association Subscription be raised from Rupee One to Rupees Two had to be withdrawn owing to the great opposition evinced against it by some students. At the conclusion of the meeting, many of the members who attended and loudly shouted down the proposition came to the mover and asked him what the resolution was which he moved! On being told of it, they expressed their complete agreement with the resolution and added that they shouted down the proposition, not because they were averse to it but they liked to have a

little fun. That only goes to show what keen interest the members take in the Association. The mover of the proposition had no axe to grind in the matter and it was only because he had the interest of the Association at heart (considering its precarious finances) that he ventured to bring up such a proposition.

Farewell Party.—On the eve of the departure of Lt.-Col. Newcomb, I. M. S., from Madras, a joint farewell function was arranged by the staff and students to bid farewell to him and also to Lt.-Col. R. E. Wright, I.M.S. On behalf of the staff Dr. M.R. Guruswami Mudaliar spoke eulogising the qualities of the head and heart of Lt.-Col. Newcomb and traced his connection with the College the time he first came to Madras. This was followed by the presentation of an address by the students and the unveiling of a photograph of the retiring Principal, which was presented by Dr. S. Ramakrishnan. Appreciative references were made of Lt.-Col. R. E. Wright. The guests replied suitably. In the end, Kumara Raja M. A. Muthia Chettiar Avl, B.A., the Education Minister with the Government of Madras, who presided on the occasion made a short speech associating himself with the sentiments expressed by the students and staff about Lt.-Col. Clive Newcomb and Lt.-Col. R. E. Wright. The meeting over the party adjourned for Tea. The chief guests moved freely among the students. Lt.-Col. Newcomb and Lt.-Col. Wright were 'chaired' to the tune of 'Old Medicos never die' and 'He is a jolly good fellow' and were taken round the lawns in procession. With three cheers called and

responded to lustily, the pleasant function terminated.

College Sports.—The College Sports came off in February last when Lt.-Col. Clive Newcomb presided and Mrs. Newcomb gave away the prizes. The Surgeon-General, Sir Frank Conner was present on the occasion as a distinguished visitor. Referring to the defeat of the staff at the hands of the students in Tug of war the Surgeon-General humorously remarked that the defeat was due to want of sufficient training and exercise. He added, that if he remained long enough he would insist that the staff do go into rigorous training. This year's sports was a better conducted function than in former years. Proper attention had been paid to the accommodation of the students and the staff. In the interval between the events, humorous songs and speeches were relayed through the microphone, and the onlookers did not get the ennui. We congratulate Mr. Thomas Kuruvilla, the popular sports secretary on the success of the function and for the excellent arrangements.

Ourselves.—With this issue we cease our connection with the Magazine though technically we shall remain Student Editors till the next elections. We should like to express our grateful thanks to the General Body of the Madras Medical College Association for having given us an opportunity of serving in the cause of the College Magazine which has been at the same time both a pleasure and a privilege. We shall be failing in our duty if we do not give expression to our deep sense of gratitude to the Editor Dr. R. V. Rajam for his uniform courtesy and kindness to us during our association with him. Indeed, beyond exercising a controlling and sobering influence over us he has allowed us a free hand in editing the Magazine as he feels and has so often expressed to us that the College Magazine should be a Magazine of the students, by the students, and for the students. In conclusion we thank all those who have helped the Magazine by their contributions or otherwise. We bid farewell to all our readers.

The Student Editors.

Our Personalities No. 4.

T. SATAKOPAN.

BY S. R.

A hushed whisper, "The boss's come" and silence reigns in Niblock ward. The students cease their idle chatter and pretend to be writing case sheets or discussing cases. The nurse in charge of the ward looks prim and busy. The House-Physician stands at attention with the prescription book and the X-ray pictures. Followed closely by his assistant, the boss enters the ward with his stethoscope carried unobtrusively in his left hand.

A very tall and distinguished figure, standing, as described in the usual fiction, well over six feet in his socks, stiff, silent, and formidable, he comes into the room like the Day of Judgment, searching, implacable. A pillar of ice cannot lower the temperature more completely. "The Englishman" said O. Connel "has all the qualities of the poker except its occasional warmth." This might very aptly be said of Tindivanam Satakopan too.

The physiognomy of the students posted in the ward afford an interesting study to an onlooker, when the boss enters. When he spends more time than is usual on a particular case, then the students know that they are in for it, for probably it is a difficult case and some of them might be questioned on it. The final year students, who probably know the least (it is a senile degenerative process from the third year to the final year) try to reach the periphery of the circle of students to escape the boss's eyes. But more often than not they are

frustrated in their efforts when the boss in clear cut tones asks the final years' to 'line up' in front of him. This is the signal for a severe palpitation in the hearts of these students, who stand shaking and quivering, each praying fervently to his chosen god to spare him from the wrath of his master that day.

It is a case of fever with enlargement of the spleen. A great believer in the supreme value of the physical examination of a patient he likes to train the students in the art of inspection, palpation, percussion and auscultation. He casts his eyes slowly over the circle of 'eager' students and finally they alight on a nervous individual who is making herculean efforts to look away from the scene of interest. "Palpate the spleen and tell me how much it is enlarged" he says. The student slowly advances near the patient, all the time wishing he had eyes on the back of his head to watch the expression in the boss's face as he palpates. "Go near him, he won't bite you" says the boss finding the student standing well away from the patient. Now starts the great ordeal for the student as he proceeds to palpate the spleen. He probably has worked before under other physicians with their own pet methods of spleen palpation which the student has noted well. He now proceeds to imitate them faithfully to the least detail, all the while forgetting, that, now, he is working under another physician whose method also

he should have learnt before coming to that ward. He asks the patient to look up, open his mouth, put his tongue, draw up his knees, then he gives him a slap on the abdomen and asks him to relax it and proceeds to palpate the spleen in the piano playing method. A broad smile slowly spreads over the face of the boss, as he watches the preliminary manoeuvres of the student. "What's all this exercise for" asks the boss, laying a kindly hand on the shoulders of the student; and then tells him with sympathy that in palpating the spleen, a course of physical instruction for the patient is unnecessary. And then he asks him to stand on the right side of the patient, place his right hand parallel to the costal margin and press after asking the patient to take a deep breath. The student respectfully palpates the spleen by the new method and mentally adds it on to the other methods learnt in other wards. It may be of interest in this connection to recall what Hamilton Bailey has to say about abdominal palpation. "Some clinicians make it a rule to have the thighs somewhat flexed, believing that better relaxation is thereby ensured. Personally I think that any advantage this may have in bringing about initial relaxation is soon counterbalanced by the effort to maintain the legs in this slightly flexed position."

Dr. Satakopan does not expect the student to know about the recent advances in Medicine nor the latest researches. It will suffice if the student appreciates the salient features of any disease. The student who mentioned, inadvertently, blood examination instead of splenic enlargement as the first point in the diagnosis of a case of Malaria, was almost annihilated when the boss said in rebuff "Rubbish I don't think you know

how to hold the slide." Another student who when describing the breath sounds in a case of tuberculosis started first with crepitations surely asked for trouble and got it. For he is expected to describe first the character of the breath sounds, what the inspiration is like, what the expiration is like and whether there is any pause between the two. Crepitations are last in point of importance.

He has no mercy for the student who neglects the ward work or is irregular in case sheet writing. He is particular not only with regard to the facts of a case but as regards its presentation and language. The student who believes in coming to the ward only occasionally and evades writing case sheets will soon find that Niblock ward is the least congenial place for him. Dr. Satakopan will make it too hot for him until he improves.

On a former occasion, when a student complained about his severity of criticism in the ward, Dr. Satakopan remarked that it was because he expected a higher standard from his students in case sheet writing than merely blackening ink on paper. The student went away satisfied that the standard, if not high, was at least satisfactory. But even that much of satisfaction has been shortlived, for he is reported to have said recently to his assistant. "If ever you teach your students, do not think that anything is too silly to be taught to them. They simply do not know anything." The students can well ponder over these words for a long time.

Though usually very alert, Dr. Satakopan, it is said, was once completely taken in by a student. The student had forgotten to write a case that had been posted to him, when as

ill luck would have it, the physician chanced to alight upon the very case on first coming to the ward. While examining the patient, he wanted to know who the student in charge of the case was. The student's name was mentioned and the Physician asked him to read his 'notes'. The case sheet was really blank. But this fact escaped his observation as the temperature chart completely hid the case sheet. The student on seeing the blank case sheet was stunned. He only vaguely remembered about the case and had either forgotten or neglected to write up the 'notes.' But he was one of those students, unfortunately too few, who have a ready wit and an ability to tide over any difficult situation. Promptly he took up the case sheet and began reading from his imagination which his ready wit had supplied. It was pure bluff from start to finish. He had observed from the temperature chart the sudden onset of a high temperature, and noted the anxious look and rapid breathing of the patient who was wrapped in blankets. Putting two and two together, he came to the conclusion it was probably a case of Lobar

Pneumonia. He adjusted his description to coincide with the usual physical signs in a case of Lobar Pneumonia. The bluff succeeded and Dr. Satakopan went away perfectly pleased with the student.

But his sarcasm which literally bites into the flesh is very hard to bear. But the students may take consolation from the fact that it is not they alone who are the butt of his sarcasm but the House Physician too. On a certain occasion, *apropos* of something, he said "The one good thing about this ward (Niblock) is that it has a smooth floor and (turning towards the House Physicians) excellent staff. They are wondering to this day whether it was a real compliment or the usual sarcasm.

His sarcasm however stops short of the wards: one does not meet with it outside the wards or in the Examination. The students like that examiner most who gives them a fair deal at the examination. Judged by that, it can safely be said without fear of contradiction, ~~that~~ no one is more popular in the Hospital than Dr. T. Satakopan, M.D.

LEST WE FORGET



MR. T. DANDAPANI

On the 12th March 1937 at 4 p.m. T. Dandapani, a student of the Third year class of our College passed away, another prey to that dreadful scourge of diseases, Pulmonary Tuberculosis, from which he had been suffering for nearly a year and a half. He was first struck down by an attack of haemoptysis early in October 1935, for which he had active treatment and later Sanatorium treatment at Tambaram and Gudiyattam. He appeared to recover but the disease took an active turn and he became rapidly worse and passed away on that fateful day.

After passing the Intermediate Examination from the Madras Christian College, he joined the Medical College in July 1931. Though luck was not very kind to him in the Examinations he stuck on manfully where a lesser man might have become dispirited. Quite unostentatious by nature, simple in his living, courteous to a fault, popular with every one whether at College or Hostel, Mr. Dandapani leaves a gap among his friends, which is hard to fill.

To his aged and sorrowing parents whose only son he was and to the other members of the bereaved family we offer our heartfelt condolence, and pray that his soul may rest in peace.

"The Lord gave—and the Lord hath taken away—Blessed be the name of the Lord."

S. RAMALINGAM.

LEST WE FORGET



MR. K. I. PAULOSE

Days go by-events are forgotten but not the life of our noble and gentle friend Paulose. One of our esteemed professors described him as "well bred, well behaved and dignified".

Born in an ancient and respectable Syrian Christian family of Travancore, educated in the Madras Christian College, he joined the Medical College only to be snatched away by death in the final year of his studies unexpectedly after a short illness. Little did we realise that it was his end though he, as his good nature would have it bade good-bye most gratefully to his friends and such others who ministered to him, even from 3 p.m. on that fateful day the 17th of May 1937. In spite of the best that medical aid could do, God willed it otherwise and took him at 8-15 p.m. to adorn His Heavenly Home where there is no more sorrow or pain.

He has left behind him the best of memories of his pure, simple and orderly life. Quiet as he was, we felt his influence in all aspects of life in the hostel and we miss the inspiration and help we always had from him. We as hostel-mates and friends mourn his loss but how much more painful it is to his aged parents and relatives. To them we offer our deepest sympathy. May God in His great mercy console them.

Exult, O dust and ashes
Thy God shall be thy part !
His only, His for ever,
Thou shalt be and thou art !

The Staff and Members of the King Hostel.

We poor Doctors of to-morrow.

BY "NIVIS".

The world to-day is more 'disease-conscious' than it ever has been; I am almost tempted to say that it is more conscious of disease than it has a right to be. A man is naturally interested in his own body and so long as he confines his interest to the structure and functions of the normal human body, well and good; but when he allows his thoughts to wander into the realms of vitamin, venom and virus, he is in imminent danger of becoming morbid. In fact, it seems that modern man is more concerned about the treatment of disease than the maintenance of health; that is a confusing statement; it is almost a paradox, but it is intended to imply that there are very few people nowadays who can boast of having a healthy mind in a healthy body; the best of them have splendid bodies, but minds which dwell far too much upon Pathology to be entirely non-pathological. The average man's conception of health appears to be little better than a mixture of various Phobias. He is inclined to be conservative rather than constructive; inclined to keep his body as it is; inclined to prevent it getting unhealthy rather than build it up into something healthier.

The chief cause of the trouble is that the knowledge peculiar to Medicine is disseminated indiscriminately amongst the lay public. People glean scraps of information here and there from the doctor, the nurse and the chemist; and in their anxiety to find out all they can about themselves and their own diseases they eagerly devour every trifling remark, very often misconstruing innocent statements which are

later served up to their friends in entirely unrecognisable forms. It would be unfair to throw all the blame upon these patients because there are times when the professional people themselves are guilty of indiscretion.

A doctor sometimes talks too much, either out of a desire to frighten his patient into obeying instructions, or to impress him with the depth of his knowledge. Of course, there are times when the doctor finds it unavoidable to impart a certain amount of technical information; for instance dietetic instructions must be accompanied by suitable explanations. However discreet the doctor might be, the patient must and will learn something; and what he learns he usually misunderstands. This acquirement, on the part of lay people, of scraps of technical knowledge is rather unfortunate, for it cannot but prove an impediment to the practitioner and is a source of continual annoyance to him. That a little knowledge is a dangerous thing is nowhere better illustrated than it is in the relationship between practitioner and patient.

If the lay people are to obtain any medical information, let it be given to them in a sensible way. Systematic and simple medical instruction in schools, organised propaganda, broadcast talks: all these things will help to remove the misconceptions that arise in the lay mind from time to time. Let them be instructed in the fundamentals of Anatomy and Physiology, the essentials of Hygiene and Preventive Medicine, and the

rudiments of Nursing. A great deal of attention should be paid to the question of Diet; this is one of the favourite topics of discussion amongst the general public; if the essentials of a balanced diet were explained to them by means of carefully sifted facts, and in well chosen words which are not likely to be misunderstood, there would be fewer cranks and less confusion in the realm of Dietetics.

The innumerable 'Grandmothers Legends' that still exist in a so-called civilised world, lend ample support to my point. I remember very well, when I was a little boy, being told by a fussy old lady that if I ate too many sweets I would grow up to be a diabetic young man. All I knew at that time was that if your urine attracted ants then you had Diabetes. Well for some days afterwards I refused to eat sweets, but I soon made up my mind that I would rather have the Diabetes with my sweets than no sweets at all.

On another occasion I was told that if I drank a glass of water immediately after eating watermelon or marsh-melon, I would die of Cholera. Well I took good care not to do it; probably that is why I am alive to-day!

When I was at school, the cleverest boy in my class used to say that he always came first because his mother made him eat as much fish as he could. Another common schoolboy belief traceable back to Grandma, was that ants were good for the eyes; I am ashamed to admit that on account of

this a number of us little chaps were prolific ant-eaters. These school boy superstitions are perhaps not as common nowadays as the more fashionable 'scares' like Tetanus and Anophylaxis.

Almost every man in the street is capable of delivering a five minute lecture on the dread disease, Tetanus. Over-anxious mothers have come to look upon an Anti-Tetanus injection as an indispensable precaution. They know that a wound contaminated with the spores is dangerous, but they do not know that only a deeply lacerated wound is dangerous, and that the wound must be grossly contaminated and that strictly anaerobic conditions must prevail before Tetanus can develop. Hence if the child acquires the slightest abrasion he is rushed off for an injection of Heaven-sent serum.

Common people know that there is such a thing as Anaphylaxis, but they do not know that it is exceedingly rare. They do not know that there is such a thing as 'Serum Sickness', which is not Anaphylaxis; and which is not dangerous. Any serum reaction to them is a terrible Anaphylactic shock!

Simple and proper medical instruction imparted in a systematic manner will not only have a beneficial effect on the mind of the general public, but will also greatly facilitate the job of the practitioner. Let us hope that this ideal will be achieved in the not very distant future.

Louis Pasteur

BY P. A. PAUL (4th Year)



these sciences as a result of his talented researches. His life provides a fascinating drama of genius fighting against difficulties, discouragements and deprivations and in the long last, commanding world-wide recognition.

Louis Pasteur was born on the 27th of December 1822, at Dole, Franche-Comte. He received his education at the Ecole primaire and later in the college at Arbois. In those early days, no signs of distinguished talents could be noticed in the young student. In October 1838, he was sent to the metropolis for higher education. But Paris was not the place for the nervous and excitable boy, his health soon broke down. "If only I could smell the tannery once more," he is said to have remarked to his friends, "I should feel well." So to his village home Louis hurried back. But his ambition was to become a 'normalien' and soon he entered the Royal College of Besancon. Step by step he attained his end and in 1840 he became a bachelor of letters and soon after was made an assistant mathematical master in the college. Two years later he passed the examination of the 'baccalauréat es sciences', enabling him to become a candidate for the 'Ecole Normale'. But in his diploma, the examiner stated that Pasteur was 'mediocre' in Chemistry—a subject in which he was to be the acknowledged head of the distinguished savants of the 19th century!

"In the field of observation chance only favours those who are prepared." These significant words were pronounced by the son of a poor French tanner, who was destined to be one of the greatest scientists of his age and a most brilliant pioneer of scientific investigation in the field of Bacteriology. He is no other than the immortal Louis Pasteur. His enduring patience, his fortitude to withstand stormy days and the scientific methods he made use of in his quest for knowledge won for him many a remarkable success and brought to humanity, unforgettable and everlasting benefit. He is probably now remembered as a great bacteriologist but as a true genius his faculties were versatile. He has been able to clarify many a vexing problem in Physics and Chemistry and to contribute considerable knowledge to

Pasteur began his career as a chemist, and as a chemist he climbed up to the highest rung of the ladder and no one would have dreamt in those days, and least of all himself, that he would

attain equally great eminence as a bacteriologist. He was initiated into the study of Chemistry on hearing the famous J. B. A. Dumas' lecture at the Sarbonne. Shortly afterwards he was appointed a laboratory assistant by A. J. Balard, and he made use of the opportunity for intensive chemical work. These early days of his systematic research are especially significant for here Pasteur first educated himself in the exact methods of chemical and physical research which enabled him, later on, to elucidate many an apparently incomprehensible phenomenon of disease and to bring them under the domain of scientific laws.

It was reserved for the young and ambitious chemist from Franche Comte to solve the problem of isomerism which was baffling the leading chemists of the day. This won him a place of honour among the French chemists and as a recognition of his merit he was immediately appointed Professor of Chemistry at the Faculty of Science at Strasburg. Here he married Mlle. Laurent who proved herself to be a loving and noble partner in his life. In his attempts to prepare artificially the inactive form of Tartaric Acid, he was led to the commencement of his classical researches on the phenomenon of fermentation.

Now we pass on to that transitional stage of his life in which the great Chemist turned to be the great Bacteriologist. He observed that when the inactive Tartaric Acid (dextro- and levo-) was placed in contact with a specific type of mould (*Penicillium Glaucum*), the right-handed variety alone was destroyed while the left-handed one was left alone. This observation probably awakened in the vigilant chemist an interest in the study of the lower forms of life. The diseases of beer and wine had long

defeated all attempts at cure, Pasteur set his wits to the problem in his own systematic way. He obtained sound and unsound samples of beer and examined the yeasts under the microscope. He found that the globules from the sound beer were nearly spherical while those from the sour beer were elongated. This led him to the discovery of the minute organisms responsible for the vinous, acetous and lactic fermentations. This discovery, simple though it may seem to us, had far-reaching influence on biological science, for, it marked the beginning of a marvellous series of experimental researches which conclusively proved that the theory of spontaneous generation is nothing but a fanciful conception. Pasteur gave a most vivid explanation to the phenomenon of fermentation—a task which proved to be too hard for eminent scientists of the calibre of Berzelius and Leibig. He proved that fermentation was caused by micro-organisms existing in the air and that it could be completely prevented by freeing the air, exposed to the fluid, of all the micro-organisms. "The chemical act of fermentation," writes Pasteur, "is essentially a correlative phenomenon of a vital act beginning and ending with it." In the interior of the grape or in the healthy animal tissue no organisms exist but you crush the grape or wound the tissue and you get either fermentation or putrefaction. But exclude all the micro-organisms from the crushed grape or the wounded limb and the grape remains sweet and the wound clean. These deductions of Pasteur has revolutionised the old conception regarding the souring of milk, the change in the crushed grape or the suppuration of an unclean wound. The application of these facts to surgical operations in the talented hands of Lord Lister has produced very beneficial results and has caused

fundamental changes in the practice of Surgery. Antiseptic Surgery, as practised to-day, is indebted for its conception to these remarkable discoveries of Pasteur.

It was not without vigorous opposition that Pasteur pursued his researches. Biot, the veteran chemist of those days, publicly announced that his enterprise was nothing but a boggy. Dumas advised him not to spend more of his time on such a chimerical subject. Yet Pasteur persevered. "Travailler, travailler toujours" was his motto. In those days of trials and disappointments and as a matter of fact, to the very end of his useful life "work" was his constant inspiration. His indomitable patience was always rewarded with success; his researches established the mastery of exact scientific knowledge and banished, from the field, empiricism and quackery.

In June 1865, he was called to the south of France to investigate into a fatal epidemic of silk-worm disease. Here, again, his powers of patience and accurate observation were put to severe test. Though he had never seen a silk-worm, before in his life, in the short space of three months, he was able to ascertain the cause of the disease and to devise means of preventing its recurrence. "There is no greater charm," says Pasteur, "for the investigator, than to make new discoveries; but his pleasure is heightened when he sees that they have a direct application to practical life." And true to his wishes, Pasteur had the good fortune of seeing the results of his work applied to the benefit of both the human race and the animal world, in a way, no one could have presaged in those days. He next investigated Chicken Cholera, a scourge which was destroying large

numbers of French fowls. Pasteur's preventive methods reduced the mortality rate to below 1 per cent. Nevertheless, the most epoch-making discovery was made when the bacteriologist successfully isolated the organism responsible for the fatal cattle plague, known as Anthrax. By a series of delicate experiments, he was able to attenuate the bacillus and by inoculation of the attenuated organism the animal was rendered immune. This simple fact marks the basis of preventive medicine which has played and is playing a memorable part in preventing the onset of many dreadful diseases. Following the above discovery many millions of sheep and oxen have thus been inoculated and the mortality rate from Anthrax reduced from 10% to less than 1%. T. H. Huxley makes the remarkable statement that the money value from these discoveries was sufficient to cover the war indemnity paid by France to Germany in 1870.

The story of his most fascinating and beneficial investigation in preventive and curative Medicine remains to be told. This is no other than his memorable fight against the invisible Virus of the fell disease of Hydrophobia. His long drawn out, patient but systematic research led him to the conclusion that the rabies virus selected the nerve centres as its abode and that the inoculation of a portion of the spinal cord matter of a rabid dog into the body of a healthy one produced in the latter, symptoms of rabies. Even at this stage, the leading French physicians were watching Pasteur's progress with contempt and suspicion; they refused to accept Pasteur's findings and theories regarding Hydrophobia. One day some of them paid a visit to Pasteur's laboratory. He explained to them that the Hydrophobia germs were ultra microscopic.

They could only be demonstrated by the symptoms produced when some of the spinal cord material of an infected dog was inoculated into a healthy one. He pronounced that the emulsion he held in his syringe would easily kill a man if injected into him. But the distinguished visitors declared the whole idea as moonshine. One of them dramatically seized the syringe from Pasteur's hands and injected the contents into his forearm. He went about triumphantly proclaiming that Pasteur was advocating mere phantom theories and that his safety that day was proof positive as to the hollowness of the assertions of the Scientist. To his intense chagrin, Pasteur saw the doctor survive the dreaded injection. He refused to eat or sleep before he could hit at the proper explanation of this strange happening. His wife tried to help the great man in the dark hours of his mental agitation. She suggested that probably the virus in question was too old and therefore impotent. Pasteur at once jumped at the idea. A probable explanation flashed through his brains. He ran to his laboratory. Procuring the rest of the specimen he used on that memorable day, he injected adequate amounts into a number of laboratory dogs. He watched them anxiously. Nothing happened. He now inoculated into the same dogs fatal doses of freshly prepared, virulent organisms. The animals still lived! Pasteur viewed the strange phenomenon in its true perspective; he did not attribute his findings, unlike ordinary investigators, to faulty technique or discrepancy of his observations. He reasoned out that the Hydrophobia virus lost its virulence through age, and that an inoculation of such an attenuated sample of virus into dogs, instead of causing their death, conferred on them

certain degree of immunity against a subsequent dose of virulent Hydrophobia virus otherwise fatal. Further experiments proved that his arguments were perfectly right. But this was not enough. It was one thing to experiment upon dogs and quite another to do so on human beings. Would an inoculation of the attenuated virus have any remedial effect on a man already bitten by a rabid dog? If so, one would be able to save the life of a victim who was sure to die otherwise. Nevertheless Pasteur ventured to try. And to his immense joy, he succeeded. In this success he earned the undying gratitude of the human race. On the 14th November 1888, L'Institut Pasteur was founded by public subscription. Subsequently other Pasteur institutes were established throughout Europe, U. S. A. and other parts of the world including the ones in our own land. Thousands of people all over the world bitten by rabid dogs are treated in these institutes by anti-rabic inoculations, the basis of which is the discovery of an unassuming but nevertheless a great man born in a humble village in France. As a result, the death rate from this horrible disease, has been reduced to less than 1 per cent.

At the inauguration of the L'Institut Pasteur, the great bacteriologist closed his impressive oration with the following words which are specially interesting and significant in these days when war clouds are casting their dreaded shadows on Europe.

"Two opposing laws seem to me now in contest. The one, a law of blood and death, opening out each day new modes of destruction, forces nations to be always ready for the battle. The other, a law of peace, work and health, whose only aim is

to deliver man from the calamities which beset him. The one seeks violent conquests, the other the relief of mankind. The one places a single life above all victories, the other sacrifices hundreds of thousands of lives to the ambition of a single individual. The law of which we are the instruments, strives even through the carnage to cure the wounds due to the law of War. Treatment by our antiseptic methods may preserve the lives of thousands of soldiers. Which of these two laws will prevail, God only knows.

But of this we may be sure, that science, in obeying the law of humanity, will always labour to enlarge the frontiers of life."

Grown grey in the service of humanity, covered with honour and glory, straightforward to the very last, but simple-minded, affectionate and loving like a child, this great benefactor of his species passed away in peace, near St. Cloud, on the 18th September 1895.

A few Confessions and Impressions.

BY N. MONEY.

The present issue of the magazine is the last one to be published by the existing editorial staff.

"It was a summer evening,
Old Kaspar's work was done,
And he before his cottage door
Was sitting in the sun."

With the publication of this issue, we, the general, associate, and student editors, like old Kaspar might well lean back upon our chairs and cry out all in one breath "Our task is done."

I personally loved to exchange my place from one who had to dance attendance upon the Editors with requests to accept one's contributions, to the Editorial forum from where one could dictate others to dance. My colleague perhaps might have been of the same opinion. But soon there came a great disillusionment! I cannot exactly state what the General Editor's hopes were before he joined the staff, because he was pitch forked into the office. We realised that we had to be contributors, as well as Editors, and in fact do everything for the magazine except the advertisements. That too, I have a notion, we have advertised ourselves well enough through our own articles. Having gained a knowledge of the real state of affairs the full significance of Mark Antony's harangue to 'Friends, Romans, and countrymen.'

'If you have tears, prepare to shed them now.'

dawned upon us.

The cause of our malady is only too well known. "The Staff care not to contribute and the students will not." It is such a hackneyed complaint like other chronic ailments it has to run its course, and end by itself. The magazine plods its weary way. That is probably the only consolation. Appeals for contributions have been made time and again and met every time with the same response. So much so I doubt whether any useful purpose will be served by a request from me now. We have never been in clover as far as things sent in for publication are concerned, and I would really envy the student Editor to whom articles flow like milk and honey in the Promised Land.

Yet in spite of the many handicaps we have achieved what best we can, and I don't propose to blow our own trumpets, and that too from our own housetop. We found it necessary to change several wheels of the magazine machinery, from the grooves in which they had been running from time immemorial. We started with the cover page and an ideal cover page is a desideratum. Some artistic talent among the readers may some day come to the aid. Of other things, I don't propose to say, as what we did would have been obvious to the reader.

It would not be out of place to let you know something about the Magazine Committee. It is indeed unfortunate that the President had to go on long leave, and I hope it would be possible for him, all the same, to let us avail ourselves of his valuable services.

About the Editor, Dr. R. V. Rajam, I cannot say anything except that he was as an Editor, a round peg in a round hole. It is a pity that he was unable to spare as much time as he wished, to the magazine owing to his heavy work. But having trained himself to be very orderly and punctual, he was able to do much more in a little time than those who can with plenty of leisure. If at all he had any fault he gave too much responsibility to the student Editors, on the plea that it is a students' magazine, and should be run by students themselves.

Dr. Narasimha Iyer was in fact a Belisha beacon. He warned us of the dangers ahead and made us steer clear of rocks and whirlpools wherein we might get stuck. In case of emergency we could depend upon Dr. Narasimha Iyer to come to our aid with some pages of good material.

The treasurer was as popular with us as he is everywhere and in fact a Rothschild of the Medical College. I really wonder how Dr. Viswanathan handles the accounts of so many associations.

Dr. A. Bhaskara Menon, so we should style him now, as the publisher voluntarily abdicated all his powers to us. He did this probably to break up the tradition that his predecessors did not get out of the final year in the first attempt. Indeed we should congratulate him on his success. His assistant Mr. Krishna Rao relieved us of some of the additional responsibilities of the publisher which fell to our lot.

About my colleague Mr. Ramalingam, I am afraid to say anything. He might write something about me and we would start a mutual admiration society. Mr. Ramalingam is as versatile with his tongue as he is capable with his pen. It is really remarkable to possess two such gifts all at once.

On behalf of the Editorial staff, I thank those who were good enough to respond to our invitations to send in contributions, and also those who did a lot of help in our correction of proofs, manuscripts, etc., and rendered various other minor yet invaluable services. Au revoir.

Personal.

Lt.-Col. M. M. Cruickshank, I.M.S., has taken charge as Superintendent and Surgeon, General Hospital.

Brevet Major Collins, I.M.S., has been transferred to Vizagpatam as Principal, Vizagpatam Medical College and Surgeon, King George Hospital, Vizagpatam.

Captain B. T. Krishnan, Professor of Physiology, has been granted four months' leave out of India.

Dr. Alahasingari to act as Professor of Physiology during the absence on leave of Capt. B. T. Krishnan.

Lt.-Col. C. M. Plumptre, I.M.S., Superintendent, Government Hospital for Women and Children and Principal and Professor of Midwifery, Medical

College, Madras, has been granted leave for four months.

Dr. A. P. Kuriyappan, M.D., is appointed to act as Assistant Superintendent, Government Hospital for Women and Children and Second Obstetric Physician, vice Dr. A. Lakshmanasami Mudaliar on leave.

Dr. K. N. Pisharoti holds charge as Physician, General Hospital, vice Captain Minchin, I.M.S., granted leave.

Dr. S. K. Sundaram, M.D., holds charge as Physician, General Hospital vice Dr. M. R. Guruswami Mudaliar on leave.

Dr. N.S. Narasimhan, F.R.C.S. (Eng.), holds charge as Surgeon, General Hospital, vice Dr. N. Mangesh Rau on leave.

Brain-Brightners.

CONDUCTED BY

THE B IN THE BONNET.

I. What was the name of the ship in which Florence Nightingale and her volunteers sailed to the Crimean War?

II. Who is the ruler of an Indian State who is a Medical man?

III. Who was Jean Martin Charcot?

IV. Whence is the custom of drinking of healths derived?

V. Who said the following :—

(1) "Science will obey the law of humanity, and will always labour to enlarge the frontiers of life."

(2) "When the heart beats low, and the eyes grow dim, and pain has exhausted every limb."

(3) "For the world, I count it not an inn, but a hospital, and a place not to live, but to die in."

(4) "A Doctor of Physic rode with us along,

There was none like him in this wide worlds' throng,

He knew the cause of every malady,

Were it of cold, or hot, or moist, or dry,

And how engendered (what the humours were.)

He was a very perfect practiser.

The cause once known, and root of the disease,

Anon he placed the sick man at his ease."

IV. Which Medical man wrote the following works :—

(1) The Testament of Beauty. (2) A Mortal Antipathy. (3) The Pot of Basil. (4) White ladies.

(For answers turn to page 368.)

Medical College Students' Hostel Day.

The third Annual Day of the Hostel at "Jaya Mansions" was celebrated on the 5th of March amidst great enthusiasm under the chairmanship of Lt.-Col. K. G. Pandalai. There was a large gathering of students and staff of the college and other guests. Dr. T. Satakopan addressed the gathering.

After refreshments the meeting was held on the beautiful decorated terrace.

The Chairman after thanking the students for the honour conferred on him and for their appreciation of what little he might have been able to do for them and for the great sympathy expressed by the students and staff in various ways in connection with recent events said that this celebration of the annual day was one which should be kept up because that was perhaps the only way in which the teachers and the taught could come together in an informal and friendly way and exchange thoughts. "Let us hope that these desirable meetings will grow more and more frequent and let us long for the day when we would have a home where we may meet together more frequently," said Col. Pandalai.

Annual report of the Hostel was next read by the student Warden Mr. K. N. Alva.

"Mr. President, speaker, guests of the evening and friends,

It is indeed with great pleasure that I welcome you all most heartily. We are happy to have in our midst this evening, Lt.-Col. K. G. Pandalai. The interest of this hostel is always at his heart and we are grateful to

him for having kindly accepted our invitation to preside over to-day's function. Our thanks are also due to Dr. T. Satakopan who without much hesitation kindly accepted to deliver the address.

I consider it a great privilege to report to you for the third year in succession the work, progress and activities of this hostel.

Most of you are well aware of the hardships that the students of our College were put to, owing to the fact that there was no hostel at all which they could call their own. It was under these circumstances that the idea of starting this institution saw the light of day. Having once undertaken the responsibility of managing this institution I can say with all sincerity that it has been my earnest endeavour all along to carry it through as efficiently as I could. This hostel stands out as a monument of Students' enterprise inspite of the various difficulties that are uncoun-tered with, in running one of its magnitude.

The hostel was started on the 1st of September 1934 and it was full within three months. During the academic year 1935-1936 the strength of the hostel was ranging between 75 and 80 and this has been kept up ever since. The present strength is 76. It was indeed a painful duty for me to have refused several students of our College admission into this hostel owing to lack of accommodation. May I therefore appeal once again most emphatically to the authorities the great need of establishing a permanent hostel to suit the conveniences of

the students in every possible manner?

We are continuing to have two messes a vegetarian and a non-vegetarian. A Committee is in charge of each. The messes still continue to be run by contract. And I need not make it clearer that such messes usually lack efficiency. We are trying our best to see that we run a mess of our own at an early date.

Each flat has got a representative of its own who looks to the complaints of the members regarding sanitation of the flat, etc.

Coming to the social side of our life we have got a separate common room with improved amenities. We have at present 3 dailies, 4 weeklies and 3 monthlies. Carroms and Ping-Pong are our popular indoor games. Another improvement this year is the starting of a small library which is having to-day about 100 books presented by the members. We shall be grateful to all those who will be kind enough to provide us with some more books and magazines especially of medical interest. I take this opportunity of thanking Dr. Rama Kamath for sending us a free copy of the *Medical Practitioner*, and in particular I thank Dr. R. V. Rajam, Venereal Specialist, General Hospital, Madras, for sending a number of Medical journals and magazines.

Our examination results were satisfactory throughout being comparatively better than in previous years; a notable feature being our hostel scoring the only first class in the final year, which by itself is a rare event.

Coming to the general activities, I can simply say that we are in the public eye. We have attracted the

attention of the people high and low with all sorts of selfless activities keeping in with the trend of the events of the student world of to-day. It is a proud fact that within a short period of 3 years Jaya Mansions takes the foremost stand among the institutions of its sort.

Turning to our finances it is a sad thing to note that we have run into some arrears. This is mostly due to the slackness of the members in paying up their monthly dues regularly. A strong finance committee therefore has been formed to look into this matter and take the necessary steps. It has also got to supervise the accounts every month. In this connection may I once more impress upon all the members of this hostel their primary duty of being regular in their payments. Else the safety of this hostel will be at stake.

Dr. K. S. Viswanadhan continues to be our treasurer. We are thankful to him for this onerous duty which he has taken up ungrudgingly. We are also thankful to Dr. Guruswamy Mudaliar and Dr. Lakshmanaswamy Mudaliar for their kind advice and guidance. I take this opportunity of tendering our grateful thanks to Mr. S. P. Jayarama Nadar our landlord who has showered his generosity and kindness on us throughout.

Recently a deputation from the College Association with the Warden of this hostel as the leader waited on the Hon'ble Minister of Education with the Government of Madras and impressed upon him the urgent necessity of a hostel. The Hon'ble Minister gave a patient hearing and promised to take up the subject on hand. He said that already provision had been made in the 1937-38 budget and work will be commenced

this year. Still recently we hear that our Principal Lt.-Col. C. Newcomb has recommended to the Government for running a temporary hostel. And in this connection Khaleeli mansions has been freely mentioned. We wish to make it clear that so far as Khaleeli Mansions is concerned it is in no way better than Jaya Mansions which has continued to be the abode of this unofficially recognised hostel for the last 3 years. The location of Khaleeli Mansions is far away from the College. Its surroundings are not ideal. Accommodation inside was primarily for business. And it is desirable that the Government looks to a more ideal place. The fear that if a temporary hostel is to come into existence the construction of the permanent hostel may be kept in abeyance is constantly lurking in our minds. And we feel it our duty to remind the authorities about this.

Lt.-Col. Clive Newcomb is going on leave preparatory to retirement. He and Mrs. Newcomb will be shortly leaving Madras. They have evinced keen interest in our hostel from the very day of its inception. We thank them for all that they have done for us and wish them a happy and peaceful life. I take this opportunity of thanking Sir Frank Connor, Surgeon-General with the Government of Madras, for having graced this occasion with his presence.

Ladies and gentlemen, I thank you all for having responded to our invitation. Lastly I thank all the members for their willing and happy co-operation."

Dr. T. Satakopan then delivered an interesting address in the course of which he dwelt on the merits of hostel life. He said that the want of

a hostel for the Medical College students has been a time-worn theme. The Government had after all moved in the matter and it appeared that the construction of a hostel would not be further delayed. He hoped that in the selection of the site consideration would be given not only to the necessity of giving a lodging for the students but also to the necessity of isolating the students from the noise and din of business life of the city. The speaker next complimented the members of the hostel on leadership, loyalty and spirit of sacrifice shown by them in running the hostel.

Speaking about the future of the profession which concerned them most the speaker said that if they looked around them they were depressed by the sight of struggling doctors and the thought of what would happen to them when they finished their studies. The one great cause for the difficulties of the medical profession which were not merely local, provincial or even national, but almost universal was lack of charity and it rarely occurred to the senior and the successful man to lend a helping hand to the junior practitioner. "If we can shape our practice a little more on the old principle of 'live and let live' there would be greater happiness in the profession. But this is a principle which it is a little difficult to follow," he concluded.

Mr. Jayarama Nadar, the owner of the Mansions speaking next paid a tribute to the student warden and the students for the excellent way in which they were conducting the hostel and thanked them for the kindness and courtesy shown towards him.

Sir Frank Connor after congratulating the student warden Mr. Alva,

addressed a few words. He said that he regretted as much as any of them that they had not an official hostel established before now. There had been many reasons for the same, the chief of which was financial one. At present plans were ready except that at the last moment it was thought by some that an improvement might be made on the site chosen now at Vepery which he believed was the best available. He could not give the assurance which they had heard from the report as being given by the Minister that work would be put on hand during the official year 1937-38. The College, the General Hospital and other hospitals being situated as they were it was obviously difficult to get a very successful and perfect site. They must make the best of what they could get. He then expressed his appreciation of the manner in which the students were running the hostel.

Lt.-Col. Newcomb then proposed a vote of thanks to the Surgeon-General on behalf of all those present. He said that the students could be proud of the fact that they were running the hostel themselves without looking to the College or the Government for help. "You have shown that when the need arises, you as a corporate body can shift for yourselves."

In the interval there was a short programme of music and magic.

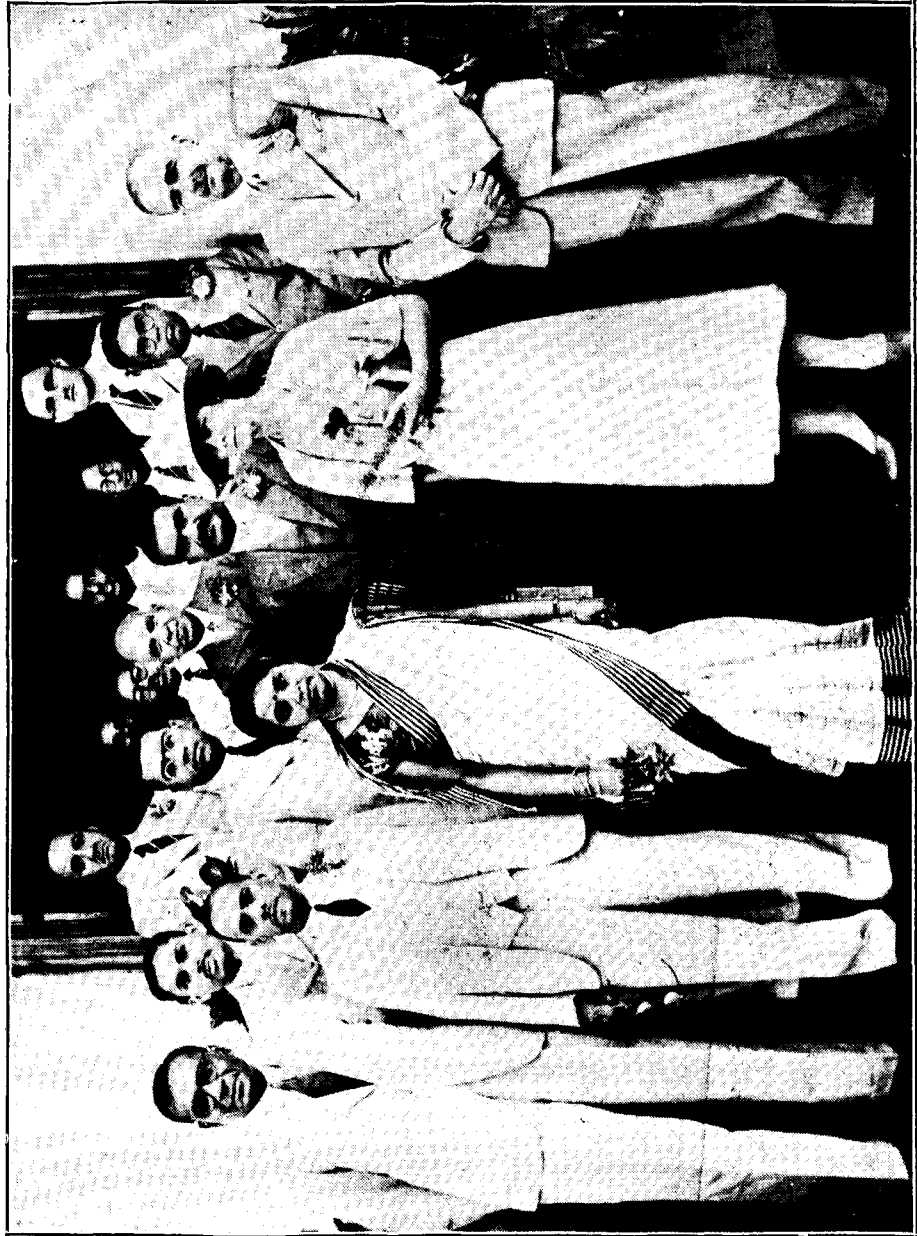
Mrs. Pandalai then distributed the prizes to the winners in the games and sports organised by the students.

Lt.-Col. Pandalai in his concluding remarks said that they all hoped that this infant institution would remain as a permanent testimony of the initia-

tive of the Medical Students. There seemed to be some apprehension on the part of the owner as to what might happen to this building in future. In the event of the Government providing for a hostel could it be that this building would become superfluous and not wanted by the students? He did not think so. He knew that the capacity of the building proposed by the Government was not more than 250. That was all they intended to cater for whereas there were about 700 students in the College, a hundred of them being ladies. If the Government built two hostels instead of one as they intended at present perhaps there might be a chance of this building being discarded. Not otherwise. There was not the chance of the Government doing that for many years to come. Even with regard to the construction of one hostel he was afraid that the scheme was as far as ever and if as they feared the future turned out to be an era of expenditure anything which had not been started might not be started at all.

Proceeding the Chairman said that it would be a splendid thing if Mr. Jayarama Nadar built another hostel without waiting for anybody else to do it. He felt that in the matter of hostel for our boys and girls the question had been treated in an academic way. One set of people wanted to do it in the cheapest way possible, another wanted it to be put off. He knew that various steps had been taken, but the trouble was no one would make a start and unless a thing was started it would not become a fact.

In conclusion he thanked the students and the staff for the great kindness extended to him and his wife



that evening. "We have been together for many years; the staff and students of the College and myself, we have known each other for many years perhaps longer than anybody else. I have been connected with this College off and on for 15 years with only very short breaks on two occasions. I claim therefore very intimate acquaintance with all that has happened in this College all these years. Every aspect of College life has been known to me.

Although temporarily, I am away I hope it is only very temporary, I shall be in your midst and when that happens the students will always find in us the same old friends that we have always tried to be."

With a vote of thanks and three cheers proposed to Col. and Mrs. Pandalai and Dr. T. Satakopan, the gathering dispersed.



Standing : — Hughes, McCullagh, Bird, Dique, Chacko, Nicholas,
Sitting : — Toomy, Pereira, J. Williams, B.A., L.T. (*Physical Director*), Ralston, Satur,
 Herbert Gnanavelivu.
 D. Stephens.

Madras Medical College Sports 1936-37.

RESULTS.

Cricket Ball Throw, 1st C. W. Chacko; 2nd Hughes; Dist. 298 ft.
200 metres Hurdles, 1st B. J. Pereira; 2nd D. J. Toomey; 3rd Shambu Shetty; Time 28 seconds.
Hop, Step and Jump, 1st C. J. Antony; 2nd D. S. B. Stephens; 3rd B. Mahadevan; Dist. 39 ft. 10 1/2 inches.
800 metres Race, 1st B. J. Pereira; 2nd A. J. Nicholas; 3rd Shambu Shetty; Time 2 min. 13 seconds.
1600 metres Race (College), 1st A. J. Nicholas; 2nd H. Gnanavolivu; 3rd Shambu Shetty; Time 5 min. 21 seconds.
110 metres Hurdles, 1st B. J. Pereira; 2nd D. J. Toomey; 3rd D. Steptens; Time 17 3/5 seconds.
Shot Put, 1st Wilson; 2nd B. Mahadevan; 3rd G. W. Bird; Dist. 32 ft 6 inches.
100 metres Race, 1st F. Satur; 2nd B. J. Pereira; 3rd D. J. Toomey; Time 12 4/5 seconds.
Discus Throw, 1st D. J. Toomey; 2nd G. W. Bird; Dist. 102 ft. 6 inches.
400 metres Race, 1st A. J. Ralston; 2nd B. J. Pereira; 3rd D. J. Toomey; Time 55 2/5 seconds.
Long Jump, 1st C. J. Antony; 2nd A. J. Ralston; 3rd C. W. McNamara; Dist. 20 ft. 1 inch.
High Jump, 1st B. Mahadevan; 2nd D. J. Toomey; 3rd V. P. S. Naidu; Dist. 5 ft. 5 inches.
Inter-class Relay, III Year; Time 2 min. 40 1/5 second.
U. T. C. Race, 1st L/Cpl. Shirazi; 2nd Cpl. Joshi.
Old Boys' Race, 1st Dr. Nicholas; 2nd Dr. Shanker; 3rd Dr. Gani.
Ladies' Obstacle Race, 1st Miss Welsh; 2nd Miss Asirvadam; 3rd Miss Rajamanickam.
Student's Mixed Race, Miss Hughes and partner.
Staff Mixed Race, 1st Miss Galliot and Dr. Shanker, 2nd Miss Simpson and Dr. Chandrasekaran.
Sack Fight, 1st O'Neil; 2nd D. J. Toomey.
Tug-of-War (Inter-class), 1st Year.
Tug-of-War (Staff), Asst. Surgeons.
Disguise Competition.
Fast Cycle Race, 1st C. J. Hart, 2nd Wilson.
1600 metres Race (open), 1st K. Ramaratnam (Loyola); 2nd Narayanasamy (Christian); 3rd P. S. Natarajan (School of Technology); Time 5 min. 3 2/5 seconds.
College Servants' Race, 1st Samuel; 2nd Marimuthu; 3rd Kuppusamy.
Champion Athlete, 1st B. J. Pereira; 2nd D. J. Toomey.
Football, Final Year.
Hockey, Final Year.
Cricket, 2nd Year.
Best Batsman, A. K. Haridass.
Best Bowler, Rama Rao.
Tennis Singles (Gents), Winner: Final Year, Antony; Runner up: Repr. of Staff, Mr. Ranganathan.
Tennis Double (Gents), Winners: Final Year, Cullen and Antony; Runners up: 2nd Year, Haridass. and Somayya.
Tennis Singles (Ladies), Winner: Miss Thoraisingam; Runner up: Miss L. Bal.
Tennis Doubles (Ladies), Winners: Miss L. Bal and Miss Sharada; Runners up: Miss Thoraisingam and Miss M. D'Souza.
Mixed Doubles, Winners: Miss Asirvatham and Thomas Kuruviila. Runners up: Miss Rajamma and Mohanrangam.
Tennikoit, Winners: Miss Saguna and Miss Shabari. Runners up: Miss S. Chandy and Miss A. Waters.
Badminton (Ladies), Winners: Final year.
U. T. C. Annual Musketry Course—
Best among Trained Men, Shamshuddin.
Best among Recruits, Dasannah.
Best Turn out at Parade, Ramanujachari.
Best attendance at Parade, Umamaheswara Rao.

Y. WILLIAMS, B.A., L.T.
Physical Director.

Brain-Brightners (ANSWERS.)

I. The 'Vectis'.

II. His Highness Shri Baghva Singhjee, G.C.I.E., M.D. & C.M., F.R.C.P., D.C.L., LL.D., etc., Maharajah Thakore Saheb of Gondal.

III. Charcot was a French Physician (1825-1893). He established a neurological clinic in Salpetriere, and became famous for his work on nervous and mental diseases. He was a pioneer in the use of hypnotic methods of treatment. The Charcot's joint is named after him.

IV. The drinking of healths derived from ancient ceremonies of pouring libations to the Gods, and drinking to

the departed at solemn feasts, survives in the social custom of drinking toasts at banquets. 'Toasts' is said to be so named from the pieces of toast which formerly were placed in one's liquor to improve the taste.

V. (1) Pasteur.

(2) R. D. Blackmore.

(3) Sir Thomas Browne.

(4) Geoffrey Chaucer.

VI. (1) Robert Bridges.

(2) O. W. Holmes.

(3) John Keats.

(4) Francis Brett Young.

Smile a While.

Asked to propose a vote of thanks to the Chairman at a public dinner, the proposer made the following speech: "Gentlemen,—There is an old Eastern legend which says that these whom the Gods love, they kiss at birth. If they kiss a baby on the lips it becomes a great singer; if they kiss it on the ears it becomes a famous musician; if on the eyes, a great artist. I won't tell you where I think they kissed Sir Charles; but I'm sure you will all agree with me that he is a marvellous Chairman!"

The following school boy "howlers" are taken from Cecil Hunt's "Further Howlers":—

King Henry VIII's marriage was childless because a blight was put on the onion.

An interdict is when a Pope is annoyed with a country, such as England some centuries ago. He generally gives a punishment, such as stopping all births, marriages, and deaths for sometime.

Mary, Queen of Scots was playing golf with her husband when news was brought to her of the birth of her son and heir.

A patient came to the venereal department, stripped himself and stood with his back to the specialist. However much coaxed or threatened

he would not face the doctor for examination.

The specialist "All his modesty seems to be confirmed only to the front, with none left for the back."

Some students of Winnipeg University like strong drink—at all events when they attend dances—but others of that ilk think the preference conducive neither to dignified recreation nor sound embryonic citizenship. So these latter have formed themselves into an Association for the Protection of Student Morality, and when they attend a dance or other party, go armed with a baseball bat! Should they see a young man's hip pocket bulging with what looks like a whisky flask, they bring the bat down on the bulge, and of course, that to the end of whatever lay hidden under the coat and pants.

A mother was in the habit of teaching her little daughter all matters relating to sex with reference to flowers, plants, etc. The girl had to act as a bridesmaid, one day, at a friend's wedding. Immediately the ceremony was over, the bridesmaid approached her mother and asked, "Will he give her his pollen just now, or soon after going home."

Elhel Mannin—'Confessions & Impressions.'

Association Notes.

16th Annual Report of the M. M. C. A. for the year 1936-37 presented at the General Body Meeting held on the 12th March 1937.

MR. PRESIDENT & GENTLEMEN,

It is with pardonable pride that I am here to submit the 16th Annual report of our College Association—a College that has entered into the second century of useful humanitarian work.

General Body Meetings.

There had been four General Body meetings this year and again it had fallen to my unfortunate lot to convey the sympathies of the members of this association to the members of the bereaved families on three occasions. On 9th July 1936 a general body meeting was held to express our heartfelt condolence at the sudden demise of that unique nationalist Dr. M. A. Ansari, an 'old Boy' of our College. We again met on 4th January 1937, this time to express our sympathies at the unfortunate death of Mr. Padmanabha Rao (Third year student), who met with an accident while out sea bathing. At the last General Body meeting held on 1st March 1937, references were made and a resolution of condolence passed regarding the demise of Dr. C. Natesa Mudaliar, a distinguished "old Boy" of our College.

On 12th November 1936, we met to welcome Mr. E. J. G. Cullen (Final year), Madras's only representative in the Indian Olympic Hockey Team which won laurels for India, at the World Olympics, Berlin, in 1936. As a mark of appreciation of the members of this association, Mr. Cullen was presented with a trophy. Needless

would it be for me to mention here how meritoriously Mr. Cullen acquitted himself at the World Olympics.

Executive Committee Meetings.

The Executive Committee met twice—once on the 4th August 1936, to discuss measures to be taken for the Graduates' reception, and again on the 26th February 1937.

Elections.

Regarding the elections, the Assistant Secretaryship and the Sports Secretaryship were keenly contested. Messrs. B. K. Rao and Thomas Kuruvilla were elected.

Graduates' Reception.

The usual annual event of the Reception to the new graduates of the year was conducted in a luxurious manner, on 2nd September 1936, in the new Examination Hall. For the first time in the History of our College, did the ladies appear on the stage with the gents, to enact pieces so successfully. In this matter no pains were spared by Mrs. Nimbkar, who was mainly responsible for getting up the major items. It is my fervent hope and earnest desire, that in future years, the lady students would harmoniously co-operate with their brethren in getting up such items. The members of the Executive Committee, in all, especially Messrs. P. Anantha Kumara Menon and

Sebastian Zecharias rendered untiring help on this occasion.

Other activities.

We rendered good help to 'the King George V Memorial Fund' on 26th August 1936 when students of our College went out selling flags.

Common Room.

The authorities have consented to remove the existing almshouses and other wooden structures which occupy at present an appreciable space of our common room. We requested the President of the College Library Committee for copies of periodicals after the perusal of the staff. We were informed that this request could be acceded to if a full time peon be kept in charge of these periodicals when left in the common room. In addition Lt.-Col. K. G. Pandalai, President of the Magazine Committee, has allowed us use of the periodicals, dailies and weeklies received in exchanges of our Magazine. Since the Government is not prepared to grant the appointment of a peon for this purpose, the matter was discussed at the last General Body meeting when it was decided that in view of the enhanced subscription to drop out the idea.

Restaurant.

A separate spacious room was provided for the Restaurant early this year. The old Restaurant Proprietor having given us notice that he is leaving the place, the question of a successor was discussed at the Executive Committee held on 26th February 1937 and it was decided at the General Body meeting held on 1st March 1937 that an attempt be made to run the Restaurant on a co-operative basis. But since the time was so short we finally decided to

allow Messrs. Neo Komala Vilas to run the Restaurant temporarily.

Hostel.

The question of building a permanent Hostel for the male students seems to be more or less settled. Regarding this matter we waited in deputation on the Hon'ble Minister of Education and Public Health on 25th November 1936 when the question of a permanent hostel was discussed. The Hon'ble Minister promised us that finances for the construction will be sanctioned in the next Budget. It is hoped that till the permanent hostel is ready the existing Students Hostel would provide some accommodation for the students. Meanwhile it will not be out of place to mention that Jaya Mansions the sole abode of Gentlemen Medicos continues to cater the needs of a minor percentage. In this matter Mr. K. N. Alva's untiring help is commendable.

Magazine.

During the academic year, under the new Editorship of Dr. R. V. Rajam the Medical College Magazine has been singularly fortunate in receiving innumerable articles for publication. In this matter the Student Editors Messrs. N. Money and S. Ramalingam have rendered invaluable help despite the short time at their disposal. Let us hope that under the renewed fervour of Dr. Rajam the College Magazine will obtain a unique position in the Medical world. Our thanks are due to Lt.-Col. K. G. Pandalai to whose untiring efforts the present stable position of the finances of the Magazine Committee is due.

Coming to the close of a year's work it remains for me to express on our behalf the unfortunate series of

events that have culminated in the separation of our beloved President of Magazine Committee Lt.-Col. K. G. Pandalai, I. M. S.

Let me take this opportunity to thank our President and Vice-President for the timely help and kind advice which they have from time to time given us. My thanks are due to Dr. K. S. Viswanathan who is ever prepared to render every possible help to the Association. I have to thank Mr. B. Krishna Rao also (our Assistant Secretary) who stood by me in my time of Office.

In conclusion let me thank the members of the Executive Committee for their help.

Standing now as I am before you on this the last occasion in the capa-

Medical College Magazine

city of the Secretary, I take this opportunity to express my gratitude to all our Patrons, well-wishers and members of this Association. Although I lay down my office now and cease to be a member of this Association, I shall deem myself most fortunate if at any future time I may be of any help to this Association.

Finally I wish this Association many more years of useful work and prosperity.

(SD.) B. M. AMBADY,
General Secretary,
Madras Medical College
Association,
12th March 1937.

Association Notes

Receipts and Payments Account of the Madras Medical College Association and Magazine for the year ending 28th February 1937.

RECEIPTS.	RS. A. P.	RS. A. P.	PAYMENTS.	RS. A. P.	RS. A. P.
To Cash Balance as on 1-3-1936 :—			By Association :—		
Association	302 5 1		Stationery	1 4 0	
Magazine	2,176 13 0	2,479 2 1	Graduate Day reception	806 10 6	807 14 6
„ Association :—			„ Magazine :—		
Subscriptions	755 0 0		Printing and Stationery	1,928 3 9	
Guest charges for graduate reception	47 0 0		Cooly and Conveyance	6 8 0	
Memorial Fund Receipts	29 15 0		Bank Charges	1 4 0	
Physical feats entertainment	13 8 0	845 7 0	Establishment	190 0 0	
„ Magazine :—			Postage	27 0 0	
Subscription	1,589 0 0		Group Photo	10 12 0	
Advertisement	398 10 0		Prize for best articles in Magazine	60 0 0	2,223 11 9
Interest from Bank	24 14 2	2,012 8 2	„ Closing balance as per cash book :—		
			Association	339 13 7	
			Magazine	1,965 9 5	2,305 7 0
Total ...		5,337 1 3	Total ...		5,337 1 3

P. S.—The above statement of accounts is exclusive of the sum of Rs. 2,000 from the Magazine account invested in 5 year Post Office Cash Certificates on 11-11-1932 in the name of the President, Madras Medical College Association.

Examined and found correct.

K. S. VISWANATHAN, B.A., M.B.B.S., B.Sc.
Honorary Treasurer,
Medical College Association.

K. JOHN & CO.,
24-6-1937.
Registered Accountants, Auditors.

C. NEWCOMB, LT.-COL., I.M.S.,
President,
Medical College Association.

U. T. C. Annual Report for the Year 1936-37.

BY UNDER OFFICER S. G. RAJAGOPALAN.

The beginning of the year saw us with 55 men out of a possible 77 and the vacancies were rapidly filled up by selecting the best of the 27 students who applied for enrolment. By the end of August we exceeded the limit by six cadets whom we had to keep in reserve. The routine parades were carried out as usual and it was noticed that the cadets were smarter and keener than those of the previous years. The percentage of attendance was 88.2 which showed an increase of about three per cent on our last year's record. Barely two days before we left for the camp we were shocked to hear about the sad and untimely death of Cpl. Padmanabha Rao, under tragic circumstances. He was a smart and efficient Corporal. At the funeral, the Corps was represented by Capt. K. S. Thimmayya, Lieut. K. S. Viswanathan and Under-Officer S. G. Rajagopalan. We tender our heartfelt condolence to the members of the bereaved family.

On the 6th December we set off in high spirits for the Annual Camp at Pallavaram. We were allotted the same barracks as in previous years. Though we were hard-worked, the diversions such as songs, dances, speeches and jokes helped to keep the spirit of the camp life at a high level.

The battalion concerts brought the medicoes to the fore-front. Dr. Mathuram Santosham, our ex-medical Corporal was in great demand and he entertained the audience for a full hour with his jokes and songs. We take this opportunity of thanking him for his services.

The competition week saw some real *esprit de corps*. We fared very well this year, having secured five trophies. Our O/C by retaining the Cup for officers shoot, raised the number to six. Together with the Engineering College contingent we won the Hockey Cup and Interior Economy Cup. The guard-mounting cup was easily snatched away by us and we congratulate C. Q. M. S. Dhirar, L/Cpl. Viswanathan and the men of the Guard for the efficient work they did. We are proud to say that the Drill Competition Cup which was never seen by us during the last dozen years was creditably won by our men this year. In this connection mention must be made of Privates Y. K. Subramaniam and Shivarajan, who were mainly responsible for the cleaning of the rifles, which carried us a long way in the competition. The Cup for the best shot among the trained men of the battalion was won by L/Cpl. Shamshuddin.

During the annual athletic sports of the College, the following prizes were awarded. Best Shot among trained men: L/Cpl. Shamshuddin; Best Shot among recruits: Cdt. Dasanna; Best Turn out on parades: Cdt. Ramanujachari; Best Attendance at Parades: Recruit Umamaheswara Rao; Alarm Race: L/Cpl. Shirazi.

Our thanks are due to S. S. I. Carter and our temporary instructor Montford for the pains they took in training our men. Last, but not the least, our thanks should go to our kind officers Lieut. Viswanathan and 2nd-Lieut. Chandrasekharan (*alias* Anna), the moving spirits of our contingent.

OUR EXCHANGES

The Medical Digest—May 1937.

The Journal of the Stanley Medical School—December 1936—March 1937.

The Medical Practitioner—May 1937.

Medico-Surgical Suggestions—May 1937.

The Indian Medical Record—April 1937.

Loyola College Magazine—February 1937.

NOTICE

Contributions for the next issue of the Magazine should be sent so as to reach us not later than 15th August 1937.

EDITOR,

The Madras Medical College Magazine.

FIRST M.B. & B.S. EXAMINATION—APRIL 1937—(Contd.)

PART I—(Contd.)

Register number and name of candidate.

87	Govindarajulu, M.	110	Ramachandran, C. K.
88	Gnanadokam, V. J. D.	111	Ramachandran, P. V.
89	Issac, Kamala Bai	112	Ramachandra Rao, Y. R.
91	Jayaraj Aiya Nadar, C.	114	Ramaratnam, T. S.
94	Krishnamurti, P. V.	115	Rangaraj, A. G.
95	Krishna Rao, P. S. R.	116	Sanjiva Rao, K.
96	Kumaravelu, P. S.	117	Sarada, A.
99	Lazarus, Muriel E.	118	Sengottayyan, K. N.
100	Muttukumaraswami, M.	119	Seturamalingam Pillai, C.
101	Mutturangam, T. R.	120	Sitapati, T. M.
102	Narayanan Nambissan, C. N.	123	Urumese, M. A.
103	Noble Adishesayya	124	Varughese, J. K.
104	Padmanabhan, V.	125	Vasanta Rao, K.
105	Padmanabha Reddi, B.	127	Vurghese, Ruby
106	Pankajam, V.	128	Arokyadass, Shantha
108	Raghavan, A.	131	Lushington, L. T.*
109	Rajasekaran, N.	133	Prabhakaran, K.

The following candidate completed the First M.B. & B.S. Examination by passing in Part I:—

SECOND CLASS.

Register number and name of candidate.

98 Muhammad Tajuddin.

The following candidates completed the First M.B. & B.S. Examination by passing in Part II:—

FIRST CLASS.

Rank.	Regr. No.	Name of candidate.	Rank.	Regr. No.	Name of candidate.
1	157	Jagannadha Reddi, D. **			

SECOND CLASS.

1	144	Channabasappa, M. N.	12	206	Subrahmanyam, C. T.
2	213	Thanaratnam, P.	13	222	Venkataramanan, G. N.
3	220	Velayudhan Pillai, K.	14	185	Pereira, B. J.
4	223	Venkatarama Rao, B.	15	201	Somayya, C. I.
5	128	Arokyadass, Shantha	16	160	Jansen, R. A.
6	191	Rebello, J. I.	17	173	Lionel Sylvester
7	170	Krishnaswami, N.	18	133	Prabhakaran, K.
8	149	Gopalakrishna Ayyar, S.	19	193	Sankaran, S.
9	177	Madhava Rao, T.	20	161	Jayaram, D.
10	186	Radhakrishna Chetti, M.	21	200	Simcock, Ruby
11	176	Madhava Rao, R.	22	181	Moses Christiana.

Register number and name of candidate.

131	Lushington, L. T. *	141	Balraj, Devakirubai
136	Aga Muhammad Raza Shirazi	142	Bhaskara Varma, K. R.
139	Arputha Raj, S. T.	143	Chandrasekharan, C. R.

* Already qualified for the L.M. & S. Degree.

** Gained distinction in Physiology.

University of Madras.

MEDICAL EXAMINATIONS, APRIL 1937.

The following is the list of successful candidates at the recent Medical Examinations held in April 1937:—

Medical College, Madras.

PRE-REGISTRATION EXAMINATION—APRIL 1937.

SECOND CLASS.

Rank.	Regr. No.	Name of candidate.	Rank.	Regr. No.	Name of candidate.
1	51	Russell, D. A.	6	25	Krishna Reddi, M. V.
2	22	Kodandapani, C.	7	2	Arumugam, C.
3	66	Venkatesvara Rao, P.	8	59	Soundararajulu, T. N.
4	4	Bonjour, J. F.	9	64	Umamahesvara Rao, K.
5	30	Leelakrishnan, A. G.	10	19	Jayaram, T. K.

Register number and name of candidate.

1	Arumugam, A.	42	Padmanabha Rao, N.
3	Balraj, Dorothy	43	Padmavati, N.
5	Chakrapani, V. C.	44	Parthasarathi Nayudu, V.
6	Dayananda Shetti, A.	48	Rajagopalan, S. *
8	Dias, D.	49	Ramachandran, P. S.
9	D'netto, Edgar Joseph	50	Rangaswami, V.
12	Etirajam, T. R.	52	Saldanha, F. A.
14	Gonsalves, E. P.	54	Seena, V.
15	Govindarajulu, N.	56	Seshagiri Rao Nayudu, P.
17	Humara Begum	57	Shidikhi Mahmood Kalilurrahman, C.
20	Jonas, W. M. S.	60	Sudarsan Lal, S. K.
26	Krishnaswami Reddiyar, V.	61	Swaminathan, M.
28	Kunjan, K. R.	62	Syed Muhammad
29	Kuppuswami, E. L.	63	Thorpe, R. D.
32	Mallayyaswami, R.	65	Vadivelu, C.
33	Mohanarangam, P.	67	Victor, D. A.
34	Muhammad, V. B.	68	Victor Selvaraj
38	Narasimha Reddi, D.	69	Welsh, Hazel
39	Narayanankutti, P.	70	William, S. A.

FIRST M.B. & B.S. EXAMINATION—APRIL 1937.

PART I.

Register number and name of candidate.

71	Adikesava Rao, K.	79	Chandrasekhara Reddi, P.
72	Aiyappan, C. R.	81	Duraiaraj, T.
74	Babji, P. V.	83	George, T.
76	Balakrishnan, P. P.	84	Girdhar Prabhu, G.
77	Burhanunissa	85	Girija Bai, M.
78	Chandrasekharan, N.	86	Gopalaratnam, M. R.

* Already qualified for the L.M. & S. Degree.

FIRST M.B. & B.S. EXAMINATION—APRIL 1937—(Contd.)

SECOND CLASS—(Contd.)

Register number and name of candidate

148	Ganapati, S.	194	Samuel, Annamma M.
151	Gumashta, S. P.	203	Srinivasan, N. A.
156	Ipe, C. P.	204	Stevenage, V. N.
162	Jitendranath Nandi	205	Subbaramayya, J.
165	Komalavalli, B.	209	Sundaram, P. V.
166	Krishnamurti, S.	210	Swarnambal, S. V.
171	Kuttikunhan Raja, A. C.	211	Syed Muhammad Hanief.
174	Loganatha Raja, V.	214	Thiagarajan, A.
179	Minakshisundaram, K.	218	Umamahesvara Rao, P.
182	Mummurti, C.	224	Venkat Rao, K.
183	Narayanan, P. K.	225	Vijayaraghavan, C.

SECOND M.B. & B.S. EXAMINATION—APRIL 1937.

PART I.

Register number and name of candidate.

226	Achyutan, T.	266	Raghavan, T.
228	Anandan, K. P.	267	Rajagopal, S. G.
229	Arthur, D.	268	Raja Rao, S. V.
230	Asirvatham, Josephine	270	Ramanujahari, C.
231	Atmaram Rao, G.	272	Ramaraju, P.
232	Balakrishnan, T. K.	273	Ramaswami, C.
233	Balraj, Devakirubai	274	Ranganatha Pillai, T. V.
234	Bhavadasanunni Nayar, K. P.	275	Rapson Sylvia, M.
235	Buultjens, Gusta	276	Saguna Bai, M.
236	Chandy, Saramma	277	Sampath, S. K.
238	Dominic, Josephine.	278	Sam Johnson, Y.
239	Dorairaj, T.	279	Samuel Victor, J.
240	Enoch, Jasmine	280	Somasundaram, M.
241	Erancis Chandradoss	281	Srinivasa Rao, K.
242	Ganapati, K. C.	282	Sukumaran, R.
243	Hamid, M. A.	283	Sunanda Bai, K.
244	Jaganivas, B.	284	Sundararaj, L.
245	Jayaram Rao, D.	285	Thiagarajan, A.
246	Joseph, K. P.	286	Tiruvengadam, C. R.
247	Kaveramma, K. C.	287	Udaya Varma Rajah, K. C.
248	Kesava Pillai, E. K.	288	Vedakkan, Daisy
249	Korula John	289	Venkat Rao, K.
251	Krishnamurti, T. R.	291	Vergheze, Mary K.
252	Krishna Rao, J.	292	Yusiff Siddiq
253	Krishna Rao, S.	294	Gumashta, S. P.
254	Mahalakshmi, S.	295	Harbhajan Singh
256	Mohanarangam, C.	296	Joshee, C. L.
259	Narayanan, G.	297	Kapoor, G. C.
261	Ninan Varghese	299	Narayanamurti, V. V.
262	Orton, F. G.	302	Samuel, W.
265	Perhearow, Ray M.	303	Syed Muhammad Hanief

The following candidates completed the Second M.B. & B.S. Examination by passing in Part II:—

FIRST CLASS.

Rank, Regr. No. Name of candidate.

1 347 Ramachander, P. *

* Gained distinction in Hygiene and Pathology

SECOND M.B. & B.S. EXAMINATION—APRIL 1937—(Contd.)

SECOND CLASS.

Rank.	Regr. No.	Name of candidate.	Rank.	Regr. No.	Name of candidate.
1	325	Madhava Rao, D. N.	9	309	Chakravarthy, S.
2	355	Satya Joseph, H. A.	10	323	Kuriya, A. L.
3	297	Kapoor, G. C.	11	321	Kumaran, V. C.
	357	Srinivasan, A.	12	350	Rama Rao, K. R.
5	349	Ramanathan, A. N.	13	319	John, Sosamma
6	324	Lakshmi, S.	14	326	Manikkamuttu, C.
7	353	Sambasivan, V.		352	Rithuparnam, T. K.
8	331	Money, N.	16	320	Krishnamurti, B. N.

Register number and name of candidate.

302	Samuel, W.	345	Rajamanikkam, H. Mabel
304	Aleem, G. A.	348	Ramalingam, S.
306	Balakrishna Kini, M.	351	Ramunni Menon, P. R.
311	Connor, Gladys nee Chester	356	Sivanandam, T. V.
313	Duraiswami Ayyar, H.	358	Srinivasan, P. C.
327	Manuel, Miriam	362	Subrahmanya Ayyar, G.
330	Mathew, T. M.	363	Subrahmanyam, R.
332	Muhammad Abdul Subhan	364	Sumitra, K.
335	Muthulakshmi, P. S.	366	Venkatachalam, T. N.
336	Natarajan, M.	367	Venkatachalapati, R.
338	Padmavati, I. K.	368	Venkatakrishnan, S. M.
340	Pancharatnam, Mary E. P.	369	Venkata Rao, K.
344	Raghava Rao, T. V.		

FINAL M.B. & B.S. DEGREE EXAMINATION—APRIL 1937.

PART I.

Register number and name of candidate.

372	Anandakumara Menon, P.	410	Srinivasa Rao, U.
373	Annamalai, A. S.	411	Subrahmanyam, R.
374	Antony, C. J.	412	Sundaram, G. A.
375	Balakrishna Rao, P.	414	Thiagarajan, A. *
376	Chandroya Chetti, K.	416	Tyagarajan, M. K.
377	David, C. J.	417	Abraham, M.
378	Eapen, Mary	418	Damodaram, P.
379	Francis, O.	419	Govindan Nayar, M.
380	George, T. M.	420	Gundu Rao, M.
382	Gopala Pillai, S.	421	Humphreys, G. H. F.
383	Gumashta, S. P. *	422	Jagannathan, M. R.
384	Hariharan, V.	423	Kailasam, P.
387	Koshi, K. G.	424	Kesavan, C. K.
388	Krishna Bai, L.	425	Krishnan Nayar, K.
390	Krishnan, A.	426	Krishna Pillai, V.
391	Maruthi Rao, U.	427	Miran Rowther, K. M.
392	McNamara, C. W.	428	Muhammad, K. C.
393	Mohan Rao, U.	429	Narasinga Rao, B.
394	Mohammad Abdul Subhan	430	Paise, O. F.
396	Raghavendra Rao, M.	431	Paul, T. C.
397	Rajagopalan, V.	432	Raghavan, E.
398	Rajamma, B. N.	434	Rajagopala Reddi, R.
399	Ramakrishnan, S. P.	435	Ramachandra Sastri, P.
400	Ramakrishna Rao, K.	436	Samuel, G.
401	Ramakrishnan Tampi, K.	437	Sankaranuuni, T.
402	Ramanarayana Reddi, N.	438	Sivarama Ayyar, N.
403	Rebello, E. R. F.	439	Srinivasa Rao, B.
404	Sadanandam, T. M.	440	Subbalakshmi, K. S.
405	Sarangapani, N. E.	441	Subrahmanya Chetti, M.
406	Shillong, D. W.	442	Subrahmanyam, N. R.
407	Sitaraman, N.	443	Vasunni Nayar, M.
408	Sivaraman, S.	444	Verma, S. N.
409	Sivarama Kini, U.	445	Vittaldoss, S.

* Yet to complete the Second M.B. & B.S. Examination.

FINAL M.B. & B.S. DEGREE EXAMINATION—APRIL 1937—(Contd.)

The following candidate qualified for the M.B. & B.S. Degree by passing Part I of the Examination:—

SECOND CLASS.

Register number and name of candidate.

415 Thommen, K. C.

The following candidates qualified for the M.B. & B.S. Degree by passing Part II of the Final M.B. & B.S. Degree Examination:—

FIRST CLASS.

Rank.	Regr. No.	Name of candidate.	Rank.	Regr. No.	Name of candidate.
-------	-----------	--------------------	-------	-----------	--------------------

1	552	Vaidya, D. R.
---	-----	---------------

SECOND CLASS.

1	467	Desai, M. D.	8	557	Velayudhan, A.
2	537	Shrivastwa, G. P.	9	477	Gangamma, K. M.
3	556	Vasava Menon, S.	10	457	Bhaskara Menon, A.
4	479	Gibson, Heywood B.	11	469	Dharmaraj, J. J.
5	558	Venkatachalam, P. V.	12	451	Anantakrishnan, T. A.
6	482	Jacob, T. M.	13	551	Titus, T.
7	473	Elizabeth, P. K.			

Register number and name of candidate.

440	Subbalakshmi, K. S.	507	Narayanan Nayar, M. K.
442	Subrahmanyam, N. R.	509	Nayanar Krupabai.
447	Abraham, M.	510	Padmanabhan Nayar, M. G.
462	Chandy, Jacob	516	Kaghava Ayyangar, S. A.
463	Christodoss Williams, J.	517	Rajabather, A. T.
472	Duraiswami, N. S.	518	Rajagopalan, G. N.
474	Eromanunni, T.	519	Rajam, K.
475	Ganapatisundaram, S.	520	Ramachandran, V. S.
481	Gunasagaram, P. K.	528	Rangabrahmananda Rao, I.
484	James, F. M.	531	Rangaswami, A. R.
487	Kalyanarama Ayyar, P. K.	533	Razack, M. A.
488	Kamath, M. V.	540	Sivaraman Nayar, M.
492	Lakshminarasimhan, K. V.	541	Sivasankara Kurup, P.
500	Mallesu, G. M.	548	Sundararajan, G. A.
501	Marikar, Abusha Bibi	555	Varkki, M. I.
502	McNamara, L.	559	Venkatacharya, P.
503	Mukunda Prabhu, S.	561	Venkatashwami, Pushpam
504	Muhammad Ismail, M.	566	Ward, W.

FINAL L.M. & S. DEGREE EXAMINATION—APRIL 1937.

PART I.

Register number and name of candidate.

389 Krishnamurti, P.

The following candidates qualified for the L.M. & S. Degree by passing Part II:—

Register number and name of candidate.

496 Madhavan, K. R.

512 Pakiam, J.

LIST OF FAILURES.

PRE-REGISTRATION EXAMINATION, APRIL 1937.

Inorganic Chemistry (written)	... a	Physics (practical and oral)	... d
Do. (practical and oral)	... b	Biology (written)	... e
Physics (written)	... c	Do. (practical and oral)	... f

Regr. No.	Subjects failed in.	Exemption earned in.	Regr. No.	Subjects failed in.	Exemption earned in.
7	absent	...	35	f	...
10	f	Chemistry and Physics.	36	a b c e f	...
11	a b	Physics and Biology.	37	e	Chemistry
13	a	...	40	a b c	Biology
16	c	Chemistry and Biology.	41	a b c d e f	...
18	a b c d e f	...	45	a b c	...
21	a b d e f	...	46	d e	...
23	b	Physics and Biology.	47	c d	Biology
24	Not permitted to sit for the examination.	...	53	a b e f	Physics
27	a b d e f	...	55	e f	Chemistry
31	a b	Physics	58	a b c d	Biology

FIRST M.B. & B.S. EXAMINATION, APRIL 1937.

Organic Chemistry (written)	... a	Anatomy (dissections and oral)	... d
Do. (practical and oral)	... b	Physiology (written)	... e
Anatomy (written)	... c	Do. (practical and oral)	... f

Regr. No.	Subjects failed in.	Exemption earned in.	Regr. No.	Subjects failed in.	Exemption earned in.
73	b	...	159	e f	Anatomy.
75	b	...	163	e f	Do. ...
80	a b	...	164	c d e f	...
82	a b	...	167	e f	...
90	a b	...	168	c d e f	...
92	a b	...	169	e d	Physiology.
93	a b	...	172	e f	Anatomy.
97	a b	...	175	c e f	...
107	absent	...	178	c d	Physiology.
113	a b	...	180	c d e f	...
121	a b	...	184	c	Physiology.
122	a b	...	187	e	...
126	absent	...	188	c	Physiology.
129	a b c d	Physiology.	189	c d e	...
130	a b c d e f	...	190	c d	Physiology.
132	a b c e f	...	192	e f	Anatomy.
134	a b c d e f	...	195	c e	...
135	c	Physiology.	196	c d e f	...
137	e f	Anatomy.	197	e f	Anatomy.
138	Not permitted to sit for the examination.	...	198	c d e f	...
140	e f	Anatomy.	199	Not permitted to sit for the examination.	...
145	absent	...	202	c d	Physiology.
146	c d	Physiology.	207	e f	Anatomy.
147	absent	...	208	c d	Physiology.
150	c d	Physiology.	212	e f	Anatomy.
152	e f	...	215	e	Do.
153	c e f	...	216	c d f	...
154	e f	Anatomy.	217	e f	Anatomy.
155	c d	Physiology.	219	c d e f	...
158	c e f	...	221	e	...

SECOND M.B. & B.S. EXAMINATION, APRIL 1937.

Pharmacology (written)	...	a	Pathology, etc. (written)	...	e
Do. (practical and oral)	...	b	Do. (practical and oral)	...	f
Hygiene (written)	...	c	Ophthalmology (written)	...	g
Do. (practical and oral)	...	d	Do. (practical and oral)	...	h

Regr. No.	Subjects failed in.	Exemption earned in.	Regr. No.	Subjects failed in.	Exemption earned in.
227	a b	...	315	ef	Hygiene and Ophthalmology.
237	a	...	316	ef	...
250	b	...	317	def	Ophthalmology.
255	a	...	318	c	...
257	a b	...	322	absent	...
258	a b	...	328	ef	Hygiene and Ophthalmology.
260	a b	...	329	ef	Ophthalmology.
263	b	...	333	f	Hygiene.
264	a b	...	334	ef	Hygiene and Ophthalmology.
269	b	...	337	ef	Ophthalmology
271	b	...	339	fgh	Hygiene.
290	a b	...	341	absent	...
293	absent	...	342	ef	Ophthalmology.
294	ef	Hygiene and Ophthalmology.	343	ef	Hygiene and Ophthalmology.
295	e	Do.	346	cef	Ophthalmology.
296	ef	Ophthalmology.	354	h	Pathology.
298	abefgh	Hygiene.	359	ef	Ophthalmology.
299	cdef	Ophthalmology.	360	cd	Pathology and Ophthalmology.
300	ae	Hygiene.	361	f	Hygiene.
301	abefgh	Do.	365	h	Hygiene and Pathology.
303	cde	Ophthalmology.	370	e	Hygiene and Ophthalmology.
305	ef	Hygiene and Ophthalmology.	371	f	Do.
307	ef	Do.			
308	ef	Do.			
310	e	Do.			
312	e	Do.			
314	def	Ophthalmology.			

FINAL M.B. & B.S. DEGREE EXAMINATION, APRIL 1937.

Forensic Medicine (written)	...	a	Surgery (clinical)	...	f
Do. (oral)	...	b	Do. (oral and operative surgery)	...	g
Medicine (written)	...	c	Obstetrics and Gynaecology (written)	...	h
Do. (clinical and oral)	...	d	Do. (clinical, oral and practical)	...	i
Surgery (written)	...	e			

Regr. No.	Subjects failed in.	Exemption earned in.	Regr. No.	Subjects failed in.	Exemption earned in.
381	a b	...	430	cdefgi	...
385	absent	...	431	cdefg	Midwifery.
386	a b	...	432	cdefg	Do.
395	a b	...	433	absent for Part I.	(Not permitted to sit for Part II.)
413	a b	...	434	cdegh	...
417	cdefg	Midwifery.	435	Not permitted to sit for Part II.	...
418	cdefg	Do.	436	efg	Medicine & Midwifery.
419	cdefg	Do.	437	cdefg	Midwifery.
420	cdefg	Do.	438	cdefg	Do.
421	cdefbl	...	439	cdefgh	...
422	Not permitted to sit for Part II.	...	441	cdefgi	...
423	cdefghi	...	443	cd	Surgery and Midwifery.
424	cdefgi	...	444	cd	Do.
425	cdefgi	...	445	cdefghi	...
426	cdefgi	...	446	absent	...
427	cdefg	Midwifery.	448	cdefg	Midwifery.
428	cdef	Do.	449	cd	Surgery and Midwifery.
429	cdefgi	...			

FINAL M.B. & B.S. DEGREE EXAMINATION, APRIL 1937—(Contd.)

Regr. No.	Subjects failed in.	Exemption earned in.	Regr. No.	Subjects failed in.	Exemptions earned in.
450	cd	Surgery and Midwifery.	513	cdefg	...
452	cdefg	...	514	d	Surgery.
453	cdeg	...	515	cdf	Midwifery.
454	cdefg	Midwifery.	521	absent	...
455	cd	Surgery and Midwifery.	522	d	Surgery and Midwifery.
456	cdefgi	...	523	d fg	...
458	cdefg	...	524	cd	Surgery and Midwifery.
459	cd	...	525	d	...
460	cd	...	526	cdf	...
461	d	Surgery.	527	cdefg	Midwifery.
464	d	...	529	absent	...
465	fg	Medicine & Midwifery.	530	cd	Midwifery.
466	d f g	Midwifery.	532	efg	Medicine & Midwifery.
468	cd	...	534	df	Midwifery.
470	def	Midwifery.	535	absent	...
471	cdefg	Do.	536	cefg	...
476	cd	Surgery and Midwifery.	538	cdefi	...
478	cd	Surgery.	539	cdefg	Midwifery.
483	cdefg	...	542	cdefg	...
485	cdefg	Midwifery.	543	cefg	Midwifery.
486	def	...	544	d	...
489	d f g	...	545	d f g	Midwifery.
490	c d f g	Midwifery.	546	cd	Surgery and Midwifery.
491	d f g	Do.	547	d	Do.
493	efg	Medicine.	549	cdefg	Midwifery.
494	d	Surgery.	550	cdefg	Do.
495	cdefg	Midwifery.	553	cef	Do.
497	cdefg	Do.	554	d	...
498	c d f g	Do.	560	df	Midwifery.
499	c d f g	Do.	562	absent	...
505	cdefg	Do.	563	cd	...
506	efg	Medicine.	564	cd	...
508	h	Medicine and Surgery.	565	cd	Surgery and Midwifery.
511	cdefg	Midwifery.			

FINAL L.M. & S. DEGREE EXAMINATION.

Note.—List of abbreviations same as shown above for the Final M.B. & B.S. Degree examination.

Regr. No.	Subjects failed in.	Exemption earned in.
480	absent	...

M.D. DEGREE EXAMINATION, APRIL 1937.

The following candidates were declared to have qualified for the M.D. Degree:—

Register number and name of candidate.

Branch I—Medicine.

569	Kanakaprasada Rao, C.	571	Sanjiva Rao, S.
570	Narayana Pisharoti, K.		

Branch IV—Tropical Medicine.

573	Narayanamurti, K.	574	Satyanarayanamurti, G. V.
-----	-------------------	-----	---------------------------

All other candidates (Register Nos. 567 and 568—Branch I—Medicine and 572—Branch II—Midwifery) failed in the examination.

M.S. DEGREE EXAMINATION, APRIL 1937.

The following candidate was declared to have qualified for the M.S. Degree:—

Register number and name of candidate.

575 Gopalan, E. S.

The other two candidates (Register Nos. 576 and 577) failed in the examination.

EXAMINATION FOR THE DIPLOMA IN GYNAECOLOGY
AND OBSTETRICS, APRIL 1937.

(DIPLOMA IN MIDWIFERY.)

The following candidates were declared to have passed in the examination:—

Register number and name of candidate.

580 Noronha, Teresa

581 Venkatalakshmma, K.

LIST OF FAILURES.

Midwifery (written)	... a	Midwifery and Gynaecology (clinical and	
Gynaecology, etc. (written)	... b	oral)	... c

Register number and name of candidate.

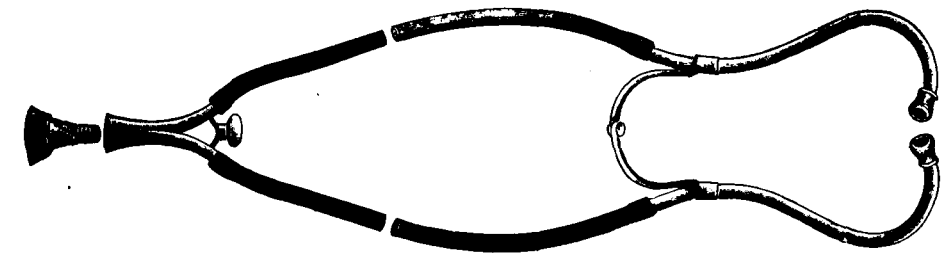
578 b c
579 b c

THE SURGICAL INSTRUMENT CO.

Asutosh Building (Cal. University)

KOLUTOLLA STREET

CALCUTTA.



DOWN BROS.' Folding STETHOSCOPES, all metal, with Skinner's Chest piece complete with 3 ft. Down Bros.' Grey Tubing **Rs. 13/4** each.

(Price **Rs. 14/4** if fitted with Bowle's Diaphragm Chest piece instead of Skinner's),

OUR OWN MAKE "S.I. CO." Folding STETHOSCOPES, all, metal, with Skinner's Chest piece complete with 3 ft. Down Bros.' Grey Tubing **Rs. 8** each.

LONG CHEST PIECE for examining Female patients etc., **As. 12** each.

PERCUSSION HAMMERS, to elicit knee jerk etc., with a pin in the handle.

Circular pattern **Rs. 1/8** Triangular pattern **Rs. 2.**

OPHTHALMOSCOPES (English make)

May's, luminous, (with battery in handle) complete in case **Rs. 42.**

Universal, luminous, (can also be used as a luminous Retinoscope) **Rs. 65.** Morton's Non-luminous **Rs. 45.**

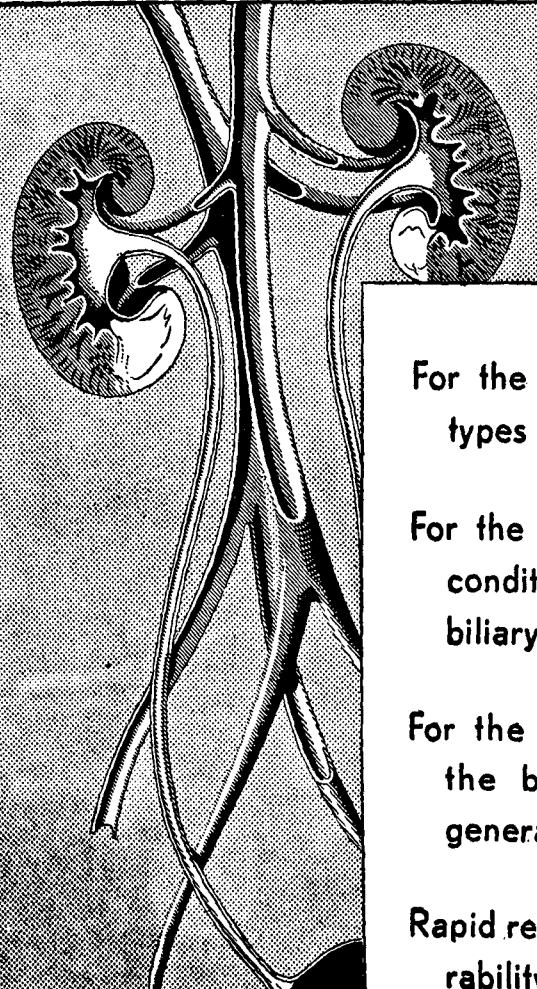
CONDENSING LENS, 13 D in Leather Pouch

English make **Rs. 1/14.**

Quotations will be gladly furnished for all kinds of

**MEDICAL AND SURGICAL INSTRUMENTS, SURGICAL AND
HYGIENIC RUBBER GOODS, ASEPTIC FURNITURE,
HOSPITAL EQUIPMENT, ETC. ETC.**

When writing to advertisers, please mention this Magazine.




For the internal treatment of all types of gonorrhœa.

For the therapy of inflammatory conditions of the urinary and biliary tracts.

For the internal disinfection of the body in infections and general affections.

Rapid relief of pain and good tolerability even in prolonged use.

'HELMITOL'
TABLETS
perorally

'AMPHOTROPIN'
SOLUTION
intravenously

Literature and full particulars on application to:
HAVERO TRADING CO., LTD.

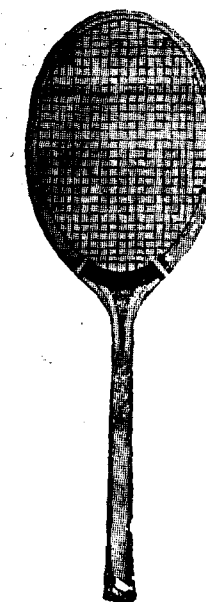
Sole Importers for
"Bayer"
I. G. Farbenindustrie Aktiengesellschaft
LEVERKUSEN

Branch: Head Office; Branch:
P. O. Box 2122, P. O. Box 642, P. O. Box 76,
CALCUTTA BOMBAY MADRAS

When writing to advertisers, please mention this Magazine.

"SHARMAN"

THE SIGN OF SPORTS SERVICE



The House for ideal and economical sports Goods on the market at the present day. Like the Rock of Gibraltar, our materials stand for much permanence and dependability.

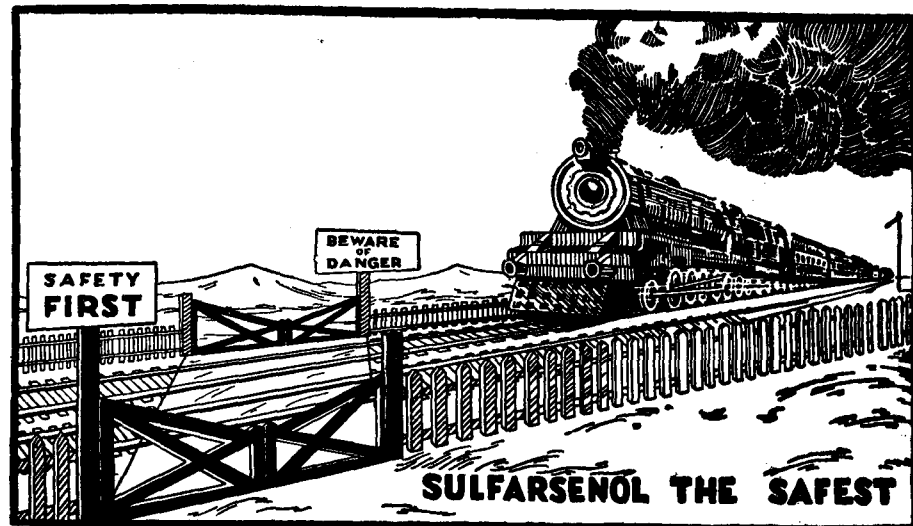
SHARMAN & CO.,

SPORTS SPECIALISTS,

MOUNT ROAD, MADRAS & COIMBATORE.

PHONE: 3544

When writing to advertisers, please mention this Magazine.



ANGLO-FRENCH DRUG COMPANY



When writing to advertisers, please, mention this Magazine.



A significant advance
in Oral Antiseptic and
Specific for Pyorrhea

- STOPS PAIN IMMEDIATELY
- CURES PYORRHEA
- PREVENTS CARIES
- REDUCES INFLAMMATION & BLEEDING GUMS.

Distributors:—

SACHI & CO.,
Mylapore, Madras.

TO LET

When writing to advertisers, please mention this Magazine.

SUPER D COD LIVER OIL

Assayed by the U. S. P. Method of Vitamin A potency approximately 30,000 A. D. M. A. units (42,000 International units) per oz. and Vitamin D potency of not less than 10,000 A. D. M. A. units (3,100 International units) per oz. Vitamins are in natural condition.

SUPER D CONCENTRATE. An assayed solution of Vitamins A and D concentrated from Cod Liver Oil. Two minims (6 drops) are approximately equivalent to one teaspoonful of Super D. It may be administered in small quantities of orange juice or by dropping the dose directly on the tongue.

SUPER D PERLES. Each perle contains a quantity of concentrate equivalent in Vitamin potency to not less than three teaspoonfuls of Standard Cod Liver Oil.

SUPER D WITH MALT. A palatable preparation of malt with 25% by volume of Super D Cod Liver Oil (Upjohn). Each ounce of Super D with Malt presents not less than 775 International units of Vitamin D and 10,500 units of Vitamin A and provides a caloric value of 150 calories per ounce.

Manufactured by:—

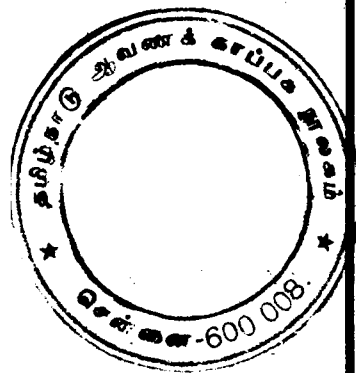
THE UPJOHN COMPANY,
U. S. A.

Sole Agents:—**T. M. THAKORE & CO.,**

5, SUNKURAMA CHETTY STREET, S. T., MADRAS.

Head Office:—Fort, BOMBAY.

TO LET



JL

Lyt, m211 mm, 51
N27 16.2



When writing to advertisers, please mention, this Magazine.

=====

5 STANDARD INSTRUMENTS - - for DIAGNOSIS

=====

- ZEISS MICROSCOPE
- ZEISS IKON BLOOD-SUGAR COLORIMETER
- ZEISS IKON HAEMOMETER
- ZEISS HAEMACYTOMETER
- BRAUN SPHYGMOMANOMETER

Full Particulars on request.



Sole Distributors:

=====

ADAIR, DUTT & CO., LTD.,
Mount Road, Madras.
CALCUTTA + BOMBAY

=====

129 362