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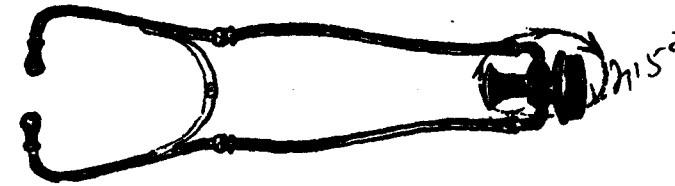


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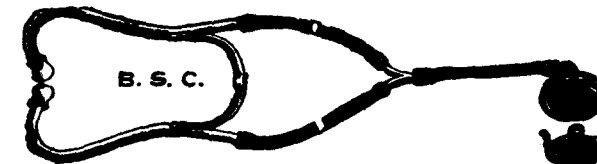


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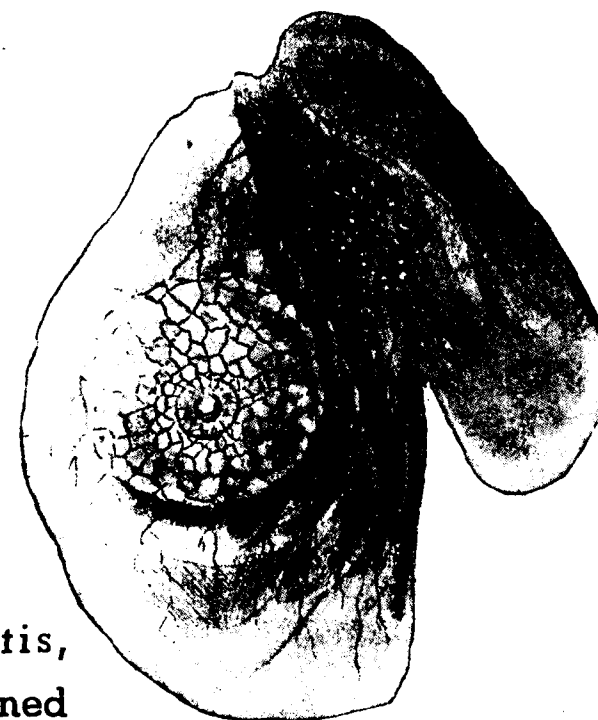
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JULY 1939.

THE MADRAS MEDICAL COLLEGE MAGAZINE

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The Madras Medical College Magazine.

Vol. XVIII.

July 1939

No. 4.

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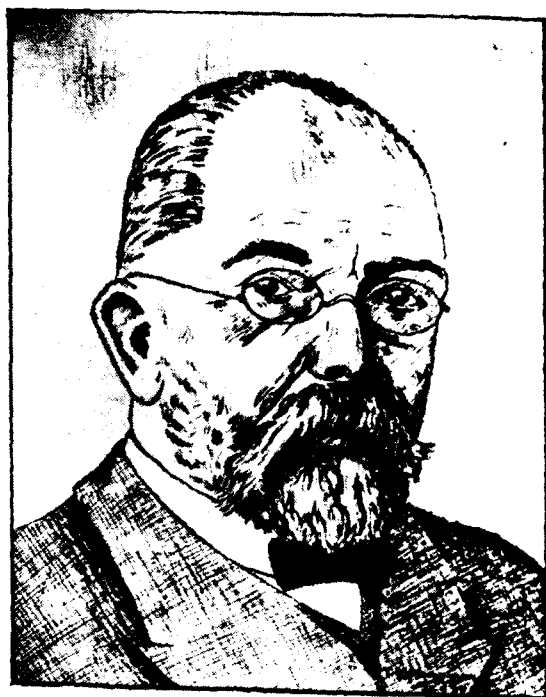


LOUIS PASTEUR
(1822—1895)

The father of microbiology and preventive medicine.

With him originated, in 1880, the modern ideas of vaccine therapy and protective inoculation.

By accident, in the course of his experiments, he found that fowls, inoculated from old cultures of the causative bacillus of poultry diarrhoea, were not killed; and also that these fowls inoculated later with a fresh virus did not succumb, like the other uninoculated ones. He explained this observation by saying that, on keeping, the cultures had become attenuated and inoculation with this attenuated virus had conferred immunity to the fowls against subsequent infection.



ROBERT KOCH
(1843 - 1910)

The father of modern bacteriology.

He discovered, in 1822, the causative organism of tuberculosis, *viz.*, *Mycobacterium Tuberculosis*. He was able to cultivate the organisms from tuberculous material, and to reproduce the disease, by methods of inoculation, in animals.

Koch's Postulates :—

- (1) The particular organism must be constantly found in the lesions, and present in the animal either dead or alive.
- (2) They must always be cultivated in artificial culture media, and isolated in pure culture from those pathogenic lesions.
- (3) When inoculated into susceptible animals, they should be capable of reproducing the disease.
- (4) From the inoculated animal and its lesions, the same micro-organism must be recovered in pure culture.

Healing by First Intention by Lord Moynihan

In speaking of the results of an operation, a surgeon may be a prejudiced witness as to his own efforts and a bad judge of his own merit. When we speak, for example, of 'healing by first intention', what do we mean? What is our standard? Let us take extreme examples. In the one we mean a wound which heals within a few days, leaving a thin, straight, narrow line of palest pink. Around this line and the stitch-marks everything appears "cold". There is no redness, no swelling, no stiffness or induration, and at the line itself the most accurate apposition of skin edges is seen. There is no discharge from the wound. There has been neither local nor constitutional reaction following the operation. In the other we mean a wound which is anything but straight; the edges are jagged, they do not meet accurately at every part, they overlap here and there; the line of healing is broad and irregular, raised and red; a sticky discharge oozes from the unopposed surfaces, and a scab may lie where this discharge has dried. The parts around are raised, tender, doughy or stiff. The stitches seem to sink into the skin. You may see wounds of this kind in some clinics, and hear a complacent comment that the wound has healed by 'first intention'. Such wounds are the clearest evidences either of a bad technique or of a clumsy operator, or perhaps of both. If we had a Dr. Johnson in our profession, and he were asked his opinion of such wounds, what would he thunder in reply? We know what he said when pressed for his opinion of a young lady's verses: "Why? they are very well for a young miss's verses; that is to say, compared with excellence, nothing; but very well for the person who wrote them."

The Madras Medical College Magazine

VOL. XVIII.

JULY 1939

No. 4

Acquired Deformities*

BY N. S. NARASIMHAN, F.R.C.S. (ENG. & IRE.),
Orthopaedic Surgeon, General Hospital, Madras.

"The orthopaedists were examined as to whether they were acquainted with Anatomy and Surgery of Paul of Aegina."
"Legacy of Islam"—Sir Thomas Arnold.

Before beginning this discourse, I wish to emphasize that all the deformities that are acquired are preventable. Although it may not appear to have been adequately dealt with, the problem of prophylaxis of these acquired deformities must always be kept in the forefront when undertaking the treatment of the conditions to be dealt with below.

"Nearly all deformities with the exception of congenital ones are the results, often late results, of gross and detectable disease. They all, therefore, should be looked upon as preventable conditions, and there is no doubt that they are much more easy to prevent than to cure."

This can be classified as follows:—

DEFORMITIES.

I. Due to paralysis of childhood:—

(1) Acute anterior poliomyelitis—the greatest of all physical disorders

that can happen to a healthy child. Study of 118 cases:—

(a) Prevent contractures; immobilisation in supporting type of splints and not circular plasters—hydrotherapy—massage. (b) *No Electricity*. (c) Supporting splints and re-education. (d) Voluntary efforts. (e) Residual paralysis—operations such as stabilisation of foot by triple arthrodesis; supracondyloid osteotomy.

(2) Other types of paralysis where surgery is indicated—Pescavus.

II. Due to disorders of malnutrition:—

A. (1) Rickets.—(a) Acute florid conditions prevalent in Madras (8 cases).—Prophylaxis of deformities. (b) Deformities due to rickets, Genu Valgum (18 cases).

*Lecture delivered under Dr. Elizabeth Mathai Lectures for the University of Madras (1938-39).

(2) Osteomalacia—3 cases in Madras women (1 Muslim and 2 Hindus).

(3) Infantile scurvy.—Resemblance to osteomyelitis—3 cases.

B. Endocrine deficiency or excess.

III. Due to faulty posture:—

(1) Scoliosis.—16 cases—common complaints for which they come.

(2) Foot strain.

(3) Dislocations 161.—Elbow 41—fifteen of which had myositis ossificans.

(4) Post-traumatic conditions.—osteoporosis—traumatic osteoma of internal and external collateral ligament of knee.

(5) Nerve injuries.

(6) Injuries to tendons (cut wrist; cut flexor tendons; tendo-achilis; attrition of extensor pollicis longus).

V. Due to inflammatory conditions:—

(1) Acute:—

(a) Acute infective osteomyelitis (22 cases); staphylococcal and streptococcal entities. (b) Acute osteomyelitis of an adult is a different clinical entity. (c) Acute arthritis in infants; peculiarities and problems in the hip joint. (d) Acute bone and joint conditions of smallpox; Periostitis; Epiphysitis; Arthritis; Destruction of epiphysis.

(2) Chronic:—

(a) Tuberculosis of joints—analysis of 103 cases. (b) Osteochondritis—41 cases; absence of disease of tarsal navicular; presence in upper end humerus,

ileum, pubis; greater preponderance of females in Perthes (hip). (c) Lesions of yaws—osteoporosis; resemblance to neuropathic joints; epiphysis not involved. (d) Chronic infective polyarthritis (Rheumatoid arthritis)—9 cases; report on 6 bilateral lumbar ganglionectomies. (e) Ankylosis of joints—arthroplasty; excision; subtrochanteric-osteotomy. Bilateral bony ankylosis of the hip—a clinical entity. Observations on temporo-mandibular joint ankylosis. (f) Protrusio-acetabuli (adolescent deformities of the acetabulum). Four cases, all in males—this is against the world's recorded data. (g) spondylitis deformans.

VI. Degenerations—osteoarthritis.

VII. Occupational deformities (kyphosis).

VIII. Neoplastic conditions.

Note.—(a) Of the group of Paralysis of childhood, the section on the Anterior polio-myelitis has been published in the *Medical Practitioner*, March 1939.

(b) "Disorders of malnutrition". will be published later on.

(c) The bone and joint lesions in Smallpox require adequate consideration as text-books of Medicine, recent advances in Tropical Medicine and Manson and Barr's tropical diseases do not deal with this problem at all.

(d) The study of tuberculous diseases of joints including spine in Madras is being published in the *Journal of South Indian Medicine*, July 1939.

Other sections are being presented here.

Acquired Deformities

Deformities arise after trauma from

(a) Unreduced dislocations.

(b) Ununited fractures.

(c) Malunited fractures.

(d) Epiphyseal injuries.

(e) Complications coincidental with dislocations and fractures due to the original injury as open fractures or as a result of complications arising during and subsequent to the treatment.

DISLOCATIONS

The following statement gives the common types of dislocation treated in the department. I have noted that the native bone setter does not treat dislocation by reduction but he massages forcibly and brings about laceration of ligaments so as to make the joint lax and more mobile. This treatment produces some complications as myositis ossificans in elbow and they generally bring about a completely extended elbow.

All dislocations must be reduced promptly under an anaesthetic and sufficient rest given to the joint for repair of lacerated structures. This is especially the case in the case of the elbow which must be rested for three weeks; no massage or passive movement is to be permitted; only active movement of the fingers ought to be allowed.

Old unreduced dislocations of metacarpophalangeal joint, and hip joint had to be reduced by open methods and generally a fascia had to be interposed in between; in cases of old unreduced dislocations of the shoulder and wrist treatment depends on the functional capacity present.

Unreduced Elbow dislocations had to be dealt with by modified excision with removal of the excess of osteoid tissue formed in and around the joint.

Dislocations of the internal semilunar cartilage were thought to be rare amongst Indians; this impression is not correct; cases are met with and the cases dealt with by operative removal during the year is recorded here. Bucket-handle injury was not met with during this year. I had one case in 1934.

Dislocations 161.

(1) Sterno-clavicular 2 Males.

(2) Acromio-clavicular 3 (70 Male; 50 Female;—age in one case not known).

(3) (A) Shoulder 20.

Age period.	No. of cases.
1 to 10	...
11 to 20	...
21 to 30	...
31 to 40	...
41 to 50	...
51 to 60	...
Anterior 7	...
Posterior 1	...

(B) Recurrent dislocation shoulder 8 (All adults, age 20 to 30).

(4) Elbow 41 (Males 30; Females 11) Age 20 to 35 in 30.

(a) Both bones forward, 1 (Female).

(b) (i) Both bones backward alone, 1.

(ii) Both bones with supracondylar fracture (male, aged 25) 1.

- (iii) Both bones with fracture of coronoid process (male 40) 1.
- (iv) Both bones with lateral displacement (male 21) 1, (male 70) 1, i.e., 2.
- (v) Both bones with chipping of tip of Olecranon 1 (male).
- (vi) Both bones with fracture of medial condyle, 1 (male 22).
- (vii) Both bones with Osteoarthritis 1 (male 21).
- (viii) Both bones with fracture of Head of radius 2.
- (ix) Both bones with ulnar nerve involvement 2.
- (c) Pulled elbow 1.
- (d) Ulna backward with fracture of head of radius 1 (Female 17);
Ulna backward with loose body in joint 1 (Age 12, Male).
- (e) Head of radius, anterior 2 (14 Female, 8 Male).
- (f) Head of radius with fracture of upper third ulna 2 (11 Female).
- (5) Inferior radio-ulnar 3 (17 Male) with chipping of styloid process of ulna 1 (16 Female).
- (6) Wrist backwards ... 3 }
Wrist forwards ... 1 } 4
- (7) Carpo-metacarpal—2 [of right thumb and arthritis of metacarpophalangeal joint, 1 (12 M.); of right little finger (21 M.)].
- (8) Metacarpophalangeal—4 (Thumb 2; Index 2).
Fracture lower third right ulna with dislocation of metacarpophalangeal joint right thumb (8 Mc.)

Fifteen cases had Myositis Ossificans

- (9) Interphalangeal joint—5
(Fracture dislocation of metacarpophalangeal and interphalangeal joints left thumb—50 M.)
- (10) Hip. (a) Congenital—9. 5 months, Fc. Bilateral; 3 years Fc. Bilateral (2 cases); 10 months, Mc. Left; 3 years Mc. Left; 6 years Fc. Left; 12 years F. Right; 18 days, Mc. Both bilateral contraction knee and Talipes; Equino varus; 6 years. Fc. Right.
- (b) Traumatic—4, Posterior 2 (M. 1, F. 1); Central 1, (35 M.)
- (c) Pathological 6. Aged 55 F., 22 F. Left, 21 F. Right, 35 M., 12 M., 33 M. with travelling acetabulum.
- (d) Acute Suppurative Epiphysitis Hip (Fc. 7 yrs.) 1 (Thomas Smith's Disease).
- (11) Patella 3—Rt. 2; Lt. 1.
(Recurrent 2 Rt. with Genu Valgum 30 F.; Lt. 32 M.)
Upward with rupture of Ligamentum Patella 38 M. (Right).
- (12) (a) Congenital dislocation knee 2.
(b) Dislocation of medial meniscus 6; dislocation of external meniscus 2—(boy of 10, male 15).
(c) Pathological with triple displacement 12.
- (13) Ankle.—Is included under ankle joint injuries.
- (14) (a) Subastragaloid 1 (Male 60).
(b) Tarso-Metatarsal 1.
- (15) Metatarso-phalangeal 4 (20 M. under observation for 5 years; has corns).

Acquired Deformities

(16) Interphalangeal toe 8 (14 M.; 20 M.)

(17) Temporo-Mandibular 6 (Males 4; Females 2).

(a) Dislocations :	No. of cases.
Subluxation	... 1
Left	... 2
Right	... Nil
Bilateral	... 4
Recurrent	... 2
Age Period.	No. of Cases.
10 to 20	1
20 to 30	1
30 to 40	1
Above 50	3

(b) Internal derangements 4:—(20 M. Left; 38 M. Left; 18 F. Left; 30 F. Right.)

The following cases were operated during the year:—

Dislocation Metacarpophalangeal Joint.

Babu 15. H. Thumb. 3rd August 1938.

Manickam 30. M. H. Middle Finger. 16th September 1938.

Arthroplasty Elbow.

Devaki 18. F. H. Ankylosed right elbow. 6th December 1937.

Polamma 15. F. H. Excision lower end humerus and arthroplasty.

Syed Amiruddin 40. M. M. For fracture olecranon and Head of radius with ulnar nerve affection. 4th May 1937, 5th May 1937.

Dislocation Elbow.

Varadarajan 37. M. H. Old dislocation right elbow. 27th May 1937. Excision done.

Srinivasan 26. M. H. Old dislocation right elbow excision. 27th May 1937.

Mannajee Rao 34. M. H. Post-dislocation right elbow with ankylosis. 6th June 1938.

Murugappa Mudaly 30. M. H. Left elbow old dislocation. 24th June 1938.

Thirumaliah 30. M. H. Excision elbow. 6th July 1938.

Yanam Ayyar 50. M. H. Old dislocation right elbow. 1st August 1938.

Operations for Internal Derangement Knee.

Govindaswamy 18. M. H. Degenerated lateral meniscus 3rd December 1938.

Muthukrishnan 20. M. H. Mobile medial meniscus right knee. 4th December, 6th December 1938. 6 months' duration.

Shoulder.

Dr. X 45 M. H. Fracture dislocation left shoulder. 8th August 1938.

B. 35. M. I. Ch. Fracture dislocation. 1937 December.

Kittara Mary 65 F. I. Ch. (Right) 22nd September 1937.

*Paralysis following dislocations and fractures:—*The following conditions may be met with:—

(1) (a) Dislocations of shoulder are complicated sometimes by injuries to the Brachial Plexus.

(b) Attempts at reduction are sometimes accountable for brachial paralysis. Reduction of dislocation should never be attempted by placing the heel in the axilla.

(2) Dislocations of the elbow sometimes involve the ulnar nerve.

(3) In traumatic dislocation of the hip, the great sciatic may be permanently paralysed. This accident has been recorded after reduction of congenital hip dislocation.

(4) Fractures:—

(a) Radial nerve in fractures of the humerus.

(b) Pressure of the lower end of the femur against the popliteal vessels and nerves.

(c) Crutch palsy.

(d) Involvement of a nerve in adhesions or callus.

FRACTURES.

Injuries of the elbow can be grouped into three main varieties:

(1) Supra condylar fractures—complete and incomplete.

(2) Dislocations of elbow.

(3) Other than Nos. 1 and 2.

Eighty-five cases of injuries to lower end of humerus other than (1) and (2) 60 cases of fracture of the upper end of the radius and 101 cases of myositis ossificans have been analysed and studied. There is a preponderance of olecranon fractures in men.

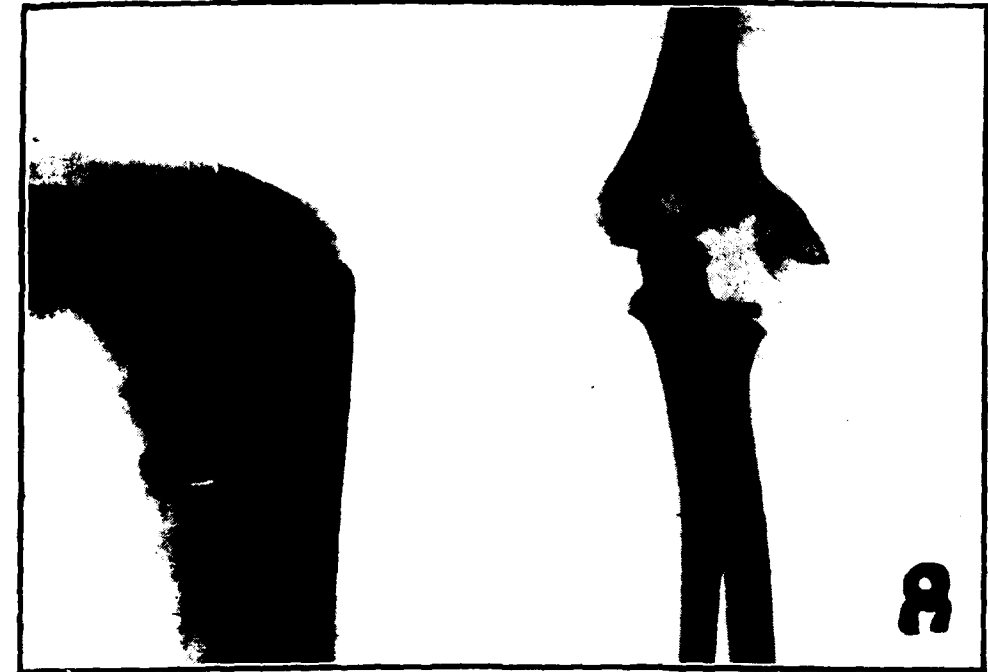
Half of the condylar fractures occur in children. Medial condyle fractures require watching of the ulnar nerve; lateral condyle fractures leave an ugly lump on the lateral side of the elbow if not reduced; the movements of the elbow joint may be quite perfect. (Print I). This produces a late or delayed traumatic ulnar neuritis. A prophylactic anterior transposition of the ulnar nerve is indicated. Fractures of

the head of the Radius require immediate reduction (Print II); when the displacement cannot be reduced open reduction or excision of the head is indicated; even a small fragment may block the joint; dislocation of the fragment from medial condyle into the elbow was seen twice during the year. This requires removal; Myositis ossificans is a complication which has to be dreaded in the elbow. Prophylaxis must be the watchword; gentleness in reduction of the fracture under anæsthesia must be rule.

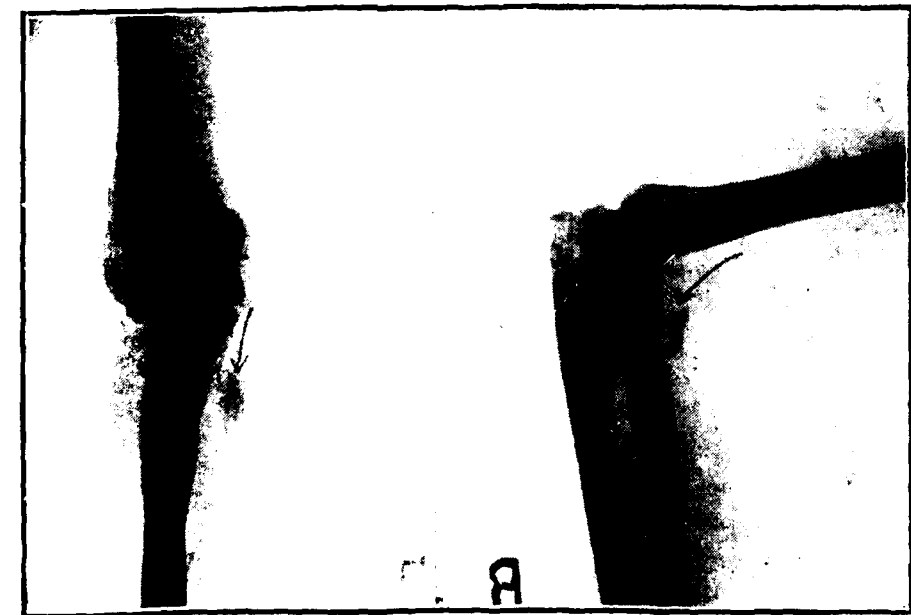
Myositis ossificans is met with in all ages and both sexes. Although most of the cases are due to massage and rubbing, some do arise unexpectedly even in carefully handled cases. When once it arises the joint is rested; after 4 to 6 months when there is no tenderness I remove the excess callus and interpose a fascia; the results are satisfactory and a much greater range of movement is obtained. Excision of the joint is practised in unreduced dislocations of elbow.

Volkman's ischæmic contracture is commoner here than in any other parts of the world. It is a dreaded complication and prophylactic measures ought always to be observed.

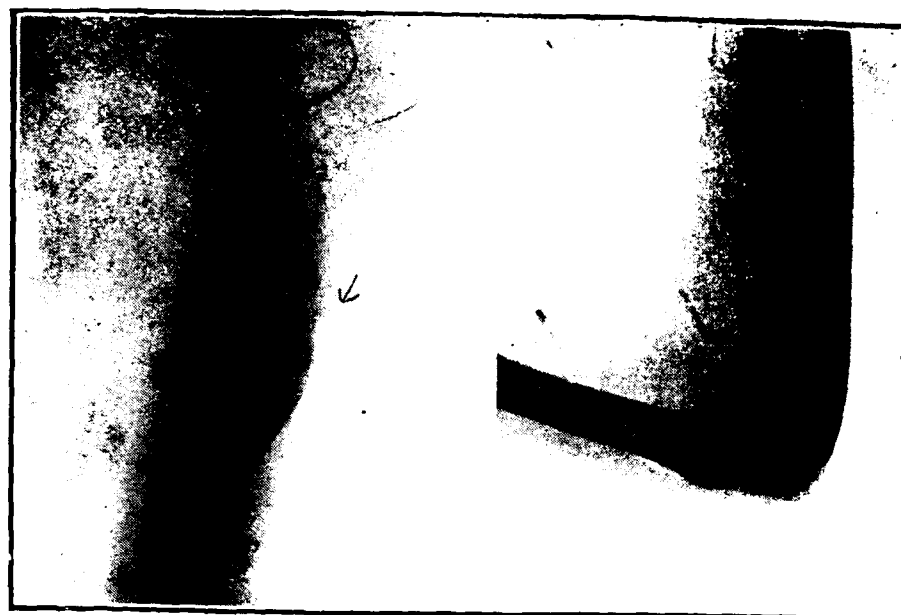
All supracondylar fractures must be reduced early; the limb must not be put up in acute flexion without reduction of the fracture; all cases with œdema must be watched by admitting them into the hospital. If the œdema is not subsiding or if there is severe pain an incision three inches in length must be made on the antero-ulnar border thus dividing the deep fascia and decompressing the fore-arm structures.



I. V. Boy, aged 10—Treated elsewhere. Unreduced. Fracture of the lateral condyle of the humerus. Excellent function is present.



II. Female, V.—Fracture of the head of the radius; and the fragment is displaced downwards. Rare.



III. Of Girl, aged 15.—Loose body in the elbow joint due to fracture of head of the radius producing bony block.



IV. B. Rao.—Result seen at the age of 22—probably from adolescent Coxa Vara. Shortening of limb, and limitation of abduction and internal rotation were present.

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When once the condition has set in, in the early stages the limb is kept elevated, bandages are loosened, incision is made on the antero-ulnar border. Presence of radial pulse is no indication at all; with a good radial pulse contracture may and does arise. The early paralytic stage has been overlooked till the stage of contracture sets in.

The long flexor muscles of the forearm are involved and usually more severely on the ulnar than on the radial side. The paralysis comes on in 24 hours and definite contracture in a few days.

The disability of Volkman's paralysis is far worse than that from a stiff or deformed elbow joint.

Gradual extension by splinting must be continued; an excision of the elbow or muscle sliding operation like Max Page's are both practised.

Max Page's operation must only be regarded as an adjunct to the treatment of splinting. By itself it is useless owing to the masses of scar tissue involving the whole forearm.

After-treatment with encouragement of active movements are essential. Although the outlook is not very good great improvement is obtained. Henderson of the Mayo-clinic does open lengthening of flexor tendons just above the wrist; in 2 cases this gave satisfactory results.

Volkman.

Sukumaran 18. M. H. Right side excision elbow.

Rajamanikam 11. M. H. Max Page-operation 24th June 1938.

Arumugam 4 Mc. H. Decompression forearm. 5th October 1938.

Sanjeeva Raya Rajam 16. M. H. Right side with ulnar nerve paralysis sliding operation. 18th November 1938.

Naina 12. M. H. Left side, sliding operation. 18th November 1938.

G. 9. Fc. H. Max Page and Henderson's Tendon Lengthening.

M. 22 M. H. Max Page and Henderson's Tendon Lengthening.

Loose Body.

Sarojini 14. F. H. Loose body (right elbow)—12th January 1938—due to fracture of head of radius (Print III).

Myositis Ossificans.

Rajagopal 12. M. H. Left arthroplasty after arthrectomy. Date of admission 25th November 1937, and operation 26th November 1937.

Theerthani Chetty 22. M. H. Excision and Horsley's wax for Myositis ossificans right elbow.

Kondiah 20. M. H. 1st February 1938 and 4th February 1938. Excision of ossified tissue.

Operation for *Old unreduced Supracondylar Fracture* of Humerus is indicated 'Treatment is' by osteotomy and correction and was adopted in the following cases:—

Ramamma 9. F. H. Right.

Murugesam 12. M. H. Left. 19th September 1938.

Abdul Subhan 8. M. M. Left Osteotomy with radial palsy 20th June 1938.

Srinivasan 8. M. H. Left Osteotomy with radial palsy, 22nd June 1938.

Elumalai 20. M. H. 19th August 1938.

Vedantham 9. F. H. Left supracondylar with myositis ossificans. Open correction.

Thiruvengadam 8. M. H. Right supracondylar with myositis ossificans. Open correction.

Fracture Olecranon.

Mrs. Thomson 30. F.I.C.h. Left. 17th December 1937. Open operation.

Venkatalakshmi 20. F. H. Right. 4th February 1938. Open operation.

Cubitus Varus.

Subramaniam 12. M.H. Right. Osteotomy. 22nd December 1937.

Cubitus Valgus.

Saraswathi 30. F. H. Left anterior transposition of ulnar nerve.

The study of the fractures treated in the orthopaedic treatment of the General Hospital was published in the *Madras Medical Journal*, July 1938, Vol. XVIII, No. 3. The following is a further study of the various problems met with in our town amongst our populations.

Adolescent Coxa Vara

This term denotes slipping of the upper epiphysis of the femur. The word "Coxa Vara" was first used in 1894 by Hofmeister and Kocher. Later Sprengel (1898) used it. Elmslie opined that slight trauma is sufficient to produce this condition.

Separation at the epiphyseal line occurs usually between the ages of 10 and 19 years. Before the age of 10 the cartilage of the great trochanter and of the epiphysis of the head of the femur is continuous with each other (Irvin). At 10 the epiphyseal line comes to be more vertical with the

result that the shearing force along the line of the growth of the cartilage is increased (Elmslie, 1913).

Casuses of Adolescent Coxa Vara

- (1) Trauma slight and indirect as in a twist of leg.
- (2) Localised Osteo-malacia (Kocher).
- (3) Apparent areas of rarefaction in the metaphyses (Wardle).
- (4) Frolich's Syndrome (a large proportion).

X-ray Findings in Early Stages

(1) Slight areas of rarefaction on the diaphyseal side of the epiphyseal cartilage.

(2) The profile of the upper border of the neck and head of the femur is convex upwards, i.e., slipping has commenced.

X-ray Appearances in a Typical Case.

(1) Head is found to be in the acetabulum; (2) the neck of the femur has arisen by an inch or so, is adducted and is externally rotated as shown by the lesser trochanter being in profile.

One case of adolescent Coxa Vara was diagnosed during the year. He is now 22 and has now considerable pain (Print IV)

Coxa Vara is occasionally a congenital defect. But majority are acquired.

Bilateral cases are due to (a) Pressure of body weight as in Rickets and (b) in older children can be divided as (i) Static, (ii) Traumatic cases.

Coxa Vara is found to be commoner in males in Madras also. Usually

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there is a horizontal or downward inclination of the neck plus increased backward or forward inclination thus causing some external or internal rotation of the limb.

In these cases abduction is abolished; in severe bilateral cases met with in this department there was only adduction or crossing of the limbs.

The subject is dealt with again under trauma to the neck of the femur. No undoubted case of Rickety Coxa Vara was detected during the year.

Coxa Valga.

In these cases some abnormal rotation may be present in addition to the change in the neck, i.e., the neck being more vertical.

Causes. (1) Congenital dislocation of hip.

(2) In conditions where the femur does not bear its due share of the body weight as in A. P. M., and after amputation.

Symptoms. Discomfort about hip in abduction and extension and there is some lengthening as in

(1) early Tub Hip, and

(2) limitation of flexion and adduction.

No case was detected in the year; I particularly studied the radiograms of the hip in all old cases of anterior polio-myelitis and could not detect this change.

Treatment consists of the following:—

- (1) Rest.
- (2) Immobilisation in adduction.
- (3) Operative procedures like Osteotomy.

Fractures of the Neck of the Humerus.

These are classified as follows:—

(1) Contusion crack fracture. Fall on the outer aspect of the shoulder. Crack across the neck with comminuted fracture of tuberosity.

(2) Adduction fracture in children and adults.

Shaft is adducted on the head.

(3) Abduction fracture—
(a) Shaft is abducted in the head.

(b) Shaft driven beneath the head and completely detached from it.

Loosehead externally rotated and abducted.

(4) Through anatomical neck, i.e., through the tuberosities impacted (old age).

(5) Surgical neck below the level of the tuberosities (vigorous adult life).

(6) Fracture of anatomical neck with dislocation of head.

(7) Fracture of great tuberosity with or without dislocation.

Age groups of my cases.

1 to 5, 7 cases:—

Abduction	...	2
Surgical neck with no displacement	...	4

Surgical neck with fracture clavicle	...	1
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6 to 10, 8 cases:—

Surgical neck with no displacement	...	4
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Surgical neck and fracture clavicle ... 1	51 to 60, 13 cases:—	
Surgical neck ... 2	Surgical neck ... 1	
Pathological fracture due to osteomyelitis ... 1	Neck with great tuberosity fracture ... 3	
11 to 20, 18 cases:—	Great tuberosity alone ... 1	
Surgical neck ... 9	Comminuted fracture surgical neck ... 2	
Impacted ... 4	Surgical neck with both tuberosities ... 1	
Abduction ... 1	Anatomical neck ... 1	
Surgical neck and fracture clavicle ... 1	Abduction ... 3	
Adduction ... 1	Adduction ... 1	
Pathological multiple cyst ... 1	61 to 70, 2 cases:—	
Single cyst ... 1	Abduction ... 2	
21 to 30, 8 cases:—	80 years, 1 case:—	
Surgical neck ... 1	Abduction ... 1	
Adduction ... 3	Total No. of cases ... 69	
Surgical neck with great tuberosity ... 2		
Surgical neck with fracture clavicle and with fracture of vertebral border of scapula ... 1	<i>Injuries of the elbow other than supracondylar fractures and dislocations: 85.</i>	
Surgical neck with fracture clavicle ... 1	A. (1) Fracture of the coronoid with dislocation of elbow 1.	
31 to 40, 9 cases:—	(2) Fractures of the coronoid 3	
Fracture dislocation with fracture of great tuberosity ... 2	(3) Supracondylar fracture with fracture of coronoid process 1, Age 57.	
Abduction fracture with comminution of upper end of ulna ... 1	B. Fractures of the olecranon 26.—	
Fracture of great tuberosity ... 3	Males 20;	
Abduction + fracture of great tuberosity ... 1	Females 6.	
Dislocation + fracture of both tuberosities + inferior margin of glenoid cavity + loose body in joint ... 1	Age period	No. of cases
Anatomical neck with great tuberosity ... 1	5 to 10 ... 7	
	11 to 20 ... 4	
	21 to 30 ... 7	
	31 to 40 ... 6	
	41 to 50 ... 1	
	51 to 60 ... 1	
41 to 50, 3 cases:—	Right side 14.	
Abduction with great tuberosity ... 1	Left side 6.	
Surgical neck ... 1	Side not mentioned in 6.	
Do. with dislocation... 1		

C. Fractures of the condyles 58:—

	No. of cases	Right	Left	Not mentioned
Lateral condyle	31	14	10	7
Lateral epicondyle	2		2	
Medial condyle	15	4	7	4
Medial epicondyle	10	3	3	4

Age Distribution in Fractures of Lateral Condyle:

Below 5, six cases. Supracondylar fracture with lateral condyle 1.

6 to 10, 14 cases. With separation of fragments 1; lateral condyle and supracondylar 1.

Of children (below 10 yrs.) Males 17, Females 3.

11 to 15, 3 cases. Calcified area on the lateral condyle 1.

16 to 20, 2 cases. Medial with lateral condyle 1; lateral condyle with olecranon epiphysis 1.

21 to 30, 2 cases. Anterior displacement 1; 'T'-shaped 1.

31 to 40, 3 cases. 'T'-shaped 2; vertical 1.

41 to 50, 1 cases. Vertical involving articular surface.

Medial Condyle Fractures:

Below 5, 1 cases. Supracondylar fracture with medial condyle 1.

6 to 10, 6 cases. With chipping of lateral condyle 1.

11 to 15, 3 cases.

16 to 20, 3 cases.

21 to 30, 1 case. Comminuted fracture of head of radius 1.

30 to 40 Nil.

40 to 50 Nil.

51 to 60, 1 case. Supracondylar fracture with medial condyle and with the fracture of coronoid.

Medial epicondyle with ulnar nerve injury, one in an adult; in a child 1; 10 to 20, 1; adult 2; with olecranon fracture one; with olecranon fracture and shaft of metacarpal one; with displacement down one; with displacement upward one.

D. Fractures of the head of the Radius 60:—

1. Fractures of the head of the radius with dislocation of the elbow 3.

2. Fissured ... 2

Fissured with displacement 12:—

(a) Forward ... 8

(b) Lateral ... 3

(c) Medial ... 1

Through neck ... 3

Comminuted ... 7

Epiphysal separation ... 2

Do. with fracture

of shaft of radius ... 17

Supracondylar fracture of

head of radius with ole-

cranon fracture ... 1

Fracture of head of radius

with upper end of ulna ... 2

Fracture of head of radius

with olecranon fracture

in a child aged 7 ... 1

In a child aged 10 ... 1

In a boy aged 12 fracture

of head of radius with

lower end humerus,

lower end of radius and

navicular bone ... 1

3. Fracture of head of radius with myositis ossificans 8

4. After excision of head of radius in a child of 6, head is concave and mushroom-shaped ... 1

5. Myositis ossificans after excision of head of the radius ... 2

E. *Analysis of cases of myositis ossificans 101:—*

Fracture of shaft of humerus lower end ...	1
Dislocation of elbow ...	14
Fracture head of radius and dislocation of elbow ...	2
Supracondylar fracture ...	33
Fracture medial condyle...	5
Fracture lateral condyle...	5
Fracture head of radius ...	8
Fracture of lower end of humerus and upper end of ulna ...	1
Fracture of coronoid process ...	1
Fracture of olecranon ...	Nil.
Fracture of both bones of fore-arms lower end ...	1
Fracture of both bones fore-arm ...	1
No bony injury ...	29

Age period.	No. of cases
1 to 5	4
6 to 10	14
11 to 20	25
21 to 30	7
31 to 40	20
41 to 50	7
51 to 60	2
61 to 70	1
71 to 80	1

Sex :—
Males 74.
Females 13.
Not stated 14.

N. B.—No case of myositis ossificans has been met with after fracture

of olecranon but cases of myositis are associated with every other type of injury including cases with no bone or joint injury.

It is noteworthy that all the cases of injury to the carpal bones have been in males; there is no explanation.

Fracture Carpal Bones (Wrist)

Scaphoid 19 :—

1. Age:	No. of cases.
Age period.	
1 to 5	Nil
5 to 10	Nil
10 to 15	2 (12th year)
15 to 20	1 (18th year)
20 to 30	12
30 to 40	2
40 to 50	1

Age of one case not given.

2. Sex: All the cases Males.

3. Religion: Hindu 15, Mohame-
dan Nil, Indian Christian 1, European 1.

Data for the rest not given.

4. Side: Right 14, Left 4; data for one not known.

5. Variety of Fracture: Complete 4, Incomplete 3, Transverse 6.

Data for the rest not given.

Through the body: 8 cases:—One un-
united transverse with cavity forma-
tion, another transverse ununited, one
year duration.

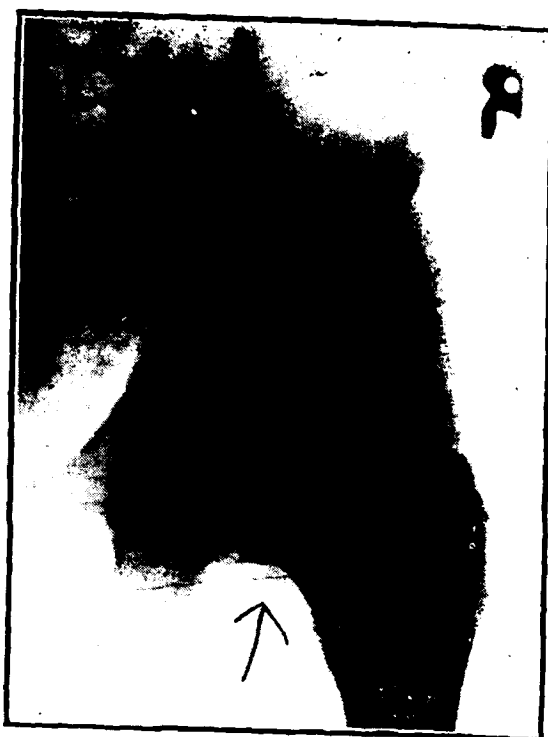
Fracture Scaphoid			
Age	Sex	Caste	Region
18	M.	H.	Left through body.
Above 20	M.	H.	Left incomplete through body.
24	M.	H.	Right incomplete through body.



V. D. Male aged 12.—Fracture through the neck of the femur—no violent injury.



VI. Female 10.—Fracture through the neck of the femur.



VII-A. Fracture through the base of the neck of the femur in a young child.



VII-B. P. Girl, aged 10.—The epiphyseal line has become vertical instead of being horizontal as on the normal side; the upper border of the neck is convex—Epiphyseal Coxa Vara

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|-----------|----|------|---|---|
| 12 | M. | H. | Right incomplete through body. | (1) rupture of the ligament itself; |
| 21 | M. | H. | Right through the body complete. | (2) avulsion of the ulnar styloid at its base; and |
| 22 | M. | H. | Right ununited transverse through body with cavity formation. | (3) severe comminution of the lower end of the radius with the ligament attached to a loose minor medial fragment. Even though the alignment and reduction may be perfect this will lead to trouble in the wrist of involvement of Radio-ulnar joint. |
| 27 | M. | E. | Left Crack through body of scaphoid. | |
| 25 | M. | H. | Left transverse, fracture. | |
| 32 | M. | H. | Right transverse, body. | |
| 26 | M. | H. | Right transverse, body one year ununited. | |
| 22 | M. | H. | Right transverse middle. | |
| 26 | M. | H. | Right transverse middle, back firing. | |
| 23 | M. | H. | Right. | |
| Not known | M. | | Not known. | |
| 24 | M. | | Right transverse. | |
| 30 | M. | H. | Right. | |
| 12 | M. | I.C. | Right. | |
| 27 | M. | H. | Right. | |
| 50 | M. | H. | Left. | |
| | | | <i>Triquetral 1.</i> | |
| 50 | M. | H. | Left. | |
| | | | <i>Unciform 1</i> | |
| 30 | M. | H. | Right with fracture surgical neck of humerus. | |

Colles's fracture is very common in women. They must be reduced properly, otherwise the deformity produced is obvious and interferes with the age-earning capacity; they let slip things easily; the disability even for leisurely household work is great. There is another commonly overlooked factor and that is the importance of triangular fibro cartilage in Colles. The function of the cartilage is to stabilise the inferior radio-ulnar joint. In Colles's fracture with loss of integrity of the radio-ulnar joint, the deformity may be due to—

Treat. Reduction: Extreme flexion and ulnar deviation (Cotton—Loder position).

Fractures of the Neck of the Femur below the Age of 19.

- (1) Male 14—Intertrochanteric left hip.
- (2) Male 14—Intertrochanteric right side 1" shortening; defective *int.* rotation and abduction; 4 months' duration. By pin-traction excellent position was obtained, 26th September 1938.
- (3) Male 16—Intertrochanteric.
- (4) Male 12—Through the base (Print V).
- (5) Female 10—Through the base (Prints VI and VII).

With Coxa Vara.

(6) Bilateral Coxa Vara, F., 12. Came for Genu Valgum.

(7) Bilateral change in metaphysis, F., 8. Old injury with Genu Valgum.

(8) Change in metaphysis Fc., 3. Injury right hip.

(9) Coxa Vara right F., 20. Head normal; neck shortened tilting of the pelvis upward on the affected side.

These patients come walking after slight injury or twist; only radiograms will settle the diagnosis. They ought to be treated with skin traction in the Thomas's splint with enough abduction; otherwise deformities arise; Case No. 3 had to be reduced under anæsthetic and it was possible to do even after four months and pin-traction was maintained. Violent methods are not to be adopted. The deformity is entirely preventible. **Fractures of the neck of the femur in children are commonly met with here.**

Fractures of the Neck of the Femur in Adults.

An analysis of the cases is given; the mortality is not due to treatment but it is due to want of treatment; **the native treatment consists of massage and early use**; these patients come here when the neck is absorbed due to early use and rubbing. These fractures are most difficult to treat; if not treated they produce considerable deformity and disablement. They are reduced and put up in plaster or Smith Peterson Pin is put in or a subtrochanteric osteotomy performed in old ununited fractures.

*Medical College Magazine**Fracture Neck of Femur.*

Total number of cases 126.

Sex: Males 105; Females 21.

Age period.	No. of cases.
1 to 10	3 (Aged 8, 3 and 10)
10 to 20	6 (two aged 12, two 14, one 16, and one 20).
20 to 30	15
30 to 40	15
40 to 50	28
50 to 60	27
60 to 70	21
70 and above	9 (five aged 70, one 80, one 82, one 85, and one 90).

For the rest data not given.

Coxa Vara in two cases—one aged 8, another 14.

Side: Right side 52 cases; Left side 40 cases. For the rest data not provided.

Variety of fracture:

Sub-capital 42 cases (16 cases showed absorption of neck).

Basal 27 cases.

Intertrochanteric 33 cases.

The rest do not have proper data given. Number of cases showing neck being absorbed is 16.

Impacted Variety: 11 cases showed impaction.

Un-united: 4 cases. One case in a man aged 70, X-ray showed Osteo-arthritis changes. Subcapital and some united fractures are treated by closed method of Smith Peterson Pin (Print VIII).

Fractures of the shaft of the femur are treated with skeletal traction with

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Kirschner's wire; this is a great improvement as the shortening is within $\frac{1}{2}$ inch; the movements of the knee are preserved.

one woman aged 40 has not secured complete range of movements.

Fracture Patella.

Total No. of cases: 41.

Pintraction.

Pichu Pillai, 36. M. H. Pertrochanteric fracture.

Chandi, 18. M. I.C. Fracture femur lower end.

Pancharatnam Chetty, 38. M. H. Fracture femur.

Mani, 25. M. H. Fracture femur, 9th March 1938.

Paciriswami, 37. M. H. Fracture femur, 11th April 1938.

Krishnan, 21. M. H. Fracture femur, right.

Abdul, 25. M. M. Fracture femur, left, 9th May 1938.

Manyvannan, 13. M. H. Fracture femur pintraction, 22nd July 1938.

Mohammad, 25. M. M. Fracture shaft of left femur, 26th August 1938.

Kulandaivelu Amma, 65. F. H. 21st November 1938.

Ammani Amma, 65 F.H. Fracture femur (Left shaft, 19th December 1938).

Cases of fracture of patella develop osteo arthritis. If the articular surface of the patella is uneven or on account of the hæmarthrosis or the age, cases operated on by the older method of bringing the fragments together by Kangaroo tendon have developed osteo-arthritis. Excision of the patella is a satisfactory method. Of the five cases of excision of patella,

Aged period	No. of cases.
1 to 10	Nil.
16 to 20	6
20 to 30	2
30 to 40	13
40 to 50	8
50 to 60	8
60 to 70	2
70 and above	1

Age of 1 case not definite but adult.

Sex: Males 24; Females 17.

Side of fracture:

Right 15; Left 15.

Data for the rest not available.

Kind of fracture:

Transverse	... 20 cases.
Comminuted	... 10 "
Fissured	... 3 "
Incomplete	... 2 "

In one case there was fracture of femur in a woman aged 40.

M. 55. Old fracture patella with osteo-arthritis changes seen in X-ray.

M. 30. Fracture patella with early osteo-arthritis change.

M. 32. Complete ossification of ligamentum patella after fracture patella. One case showed elliptical line of fracture.

Cases with displacement: 5

Excision Patella.

Kannirajam, 30. F. H. fracture on 18th March 1938 operation on 31st March, 1938.

Krishna Singh, 35, M. H. For fracture 23rd May 1938.

Kundalamma, 35, F. H. For fracture (right) 10th June 1938.

Narayanaswamy, 30, M. H. For fracture (left) 3rd August 1938.

Thangamma, 35, F. H. For fracture left side, 1st April 1939.

Fractures of the tarsal bones are fairly common. They lead to a good deal of disability and deformity. **The males preponderate**; males 74 to 11 females. **Calcaneus fractures have occurred at the age of 10.** Very few cases at this age are recorded in the literature; 45 cases of fracture calcaneus are analysed.

Ankle Joint Injuries.—It used to be said that ankle joint injuries are rare among Indians on account of their bare-footedness.

The injuries are quite common and all varieties occur.

There were 30 cases—19 males and 11 females.

The age incidence was:—

Age period.	No. of cases.
15 to 20	4
25 to 30	5
31 to 35	8
40 to 45	9
50	3
85	1

In those cases where proper reduction of the dislocation is not obtained, the wage-earning capacity of the individual is lost; an arthrodesis of the ankle joint is required to render the joint painless.

The native bone setter does not know the reduction of this type of injury.

Fracture of the Calcaneus.

Total number of cases since 1936 : 45.

Sex : Males 40, Females 5.

Age : No cases recorded up to 10 years.

Two cases at 10 years.

Age period.	No. of cases.
15 to 20	2 (at 18)
20 to 25	8 (3 at 20; 1 at 22; 4 at 25)
25 to 30	14 (1 at 28; 13 at 30)
30 to 35	3 (1 at 32; 2 at 35)
35 to 40	3 (1 at 38; 2 at 40)
40 to 45	3 (1 at 42; 2 at 45)
45 to 50	6 (1 at 49; 5 at 50)

At 60 One (at 48)

Unilateral 39; Bilateral 1.

Side : Right 23; Left 17.

Right—A crack on dorsal surface of body.

Left—Fissure on the inferior surface.

Nature of fracture.

	No. of cases.
(i) Cracks	2 (both involving superior articular surface)
(ii) Involving superior articular surface	11
(iii) Fissures	4
(iv) Comminuted	3
(v) Crushed	10
(vi) Compressed	7

Acquired Deformities

(vii) **Wedge-shaped** One case, the fracture being on the lateral border of the inferior surface.

(viii) **Associated with fractures of other bones of the foot.** (a) One case with fracture of neck of talus and bases of 3rd and 4th metatarsals. The fracture involved the articular surface.

(b) 2 cases with fracture cuboid.

(ix) **Old fracture** rarefaction of os calcis and tarsal bones.

(x) **Fracture calcaneal spur.**

(xi) **Vertical fracture** one case.

No case of avulsion fracture has been met with.

Fracture of the Talus.

Total No. of cases since 1932 was 10.

Sex : Males 9; Female 1.

Age : No cases up to 10 years.

Age period.	No. of cases.
10 to 15	1 (at 12 involving neck of talus)
15 to 20	3 (2 at 18, and one at 20)
20 to 25	1 (at 24)
25 to 30	2 (one at 26 and the other at 30)
30 to 35	1 (at 35)
35 to 40	1 (at 40)

Side : Bilateral Nil.

Unilateral { Right 8 cases.
Left 2 cases.

3

Nature of fracture :

Body 4 cases :

Complete with fracture of medial malleolus one case. Incomplete fracture body one. Transverse fracture of body of talus one. Fracture of talus involving astragalo-navicular joint one.

Neck of talus 2 cases :

(1) Associated with fracture os calcis.

(2) Fracture neck of talus.

Chipping off of anterior border, one case.

Fracture involving lateral aspect of talus, two cases.

Fracture involving superior surface of talus and navicular, one case.

Navicular.

Total number of cases from 1932 to 1938 : 15 cases.

Sex : Males 14; Female 1.

Age : No cases recorded up to 15 years.

Age period.	No. of cases.
15 to 20	5 (4 at 18; one at 20)
20 to 25	1 (at 22)
25 to 30	3 (2 at 30; one at 26)
30 to 35	1 (at 35)
35 to 40	1 (at 36)
40 to 45	1 (at 44)
45 to 50	1 (at 50)

Side : Right 10; Left 5.

Nature of fracture :

1. **Fracture Superior Surface** of navicular and talus one case.

Chipping off of superior surface one case.

Involving superior surface alone two cases.

2. Involving articular surface one case.

3. Chipping off of tuberosity one case.

4. Associated with fracture first cuneiform one case.

5. Associated with fracture cuboid one case.

There is often shortening of the foot if the fracture is not corrected properly.

Fracture First Cuneiform.

Total number of cases since 1936 : 12.

Sex : Males 8 ; Female 4.

Age : No. cases up to 10 years.

Age period.	No. of cases.
10 to 15	1 (at 12)
15 to 20	4 (1 at 15; 1 at 17; 2 at 18)
20 to 25	1 (at 22)
25 to 30	2 (at 30)
30 to 35	Nil.
35 to 40	1 (at 40)
40 to 45	1 (at 43)
45 to 50	1 (at 48)

Side : Right 2 cases ; Left 9 cases.

Nature of fracture :

Base of 1st cuneiform one case.

Associated with fracture navicular one case.

1st cuneiform associated with fracture of bases of second, third and fourth metatarsals one case.

1st cuneiform with fracture cuboid one case.

Fracture Second and Third Cuneiform

1. Male, Hindu, Left.

Associated with fracture bases of second, third and fourth metatarsals and dislocation of tarso-metatarsal joint great toe.

Fracture of the Cuboid.

Total No. of cases since 1935 : 4.

Sex : All males.

Age : Two cases at 15 years. One case at 59 years.

Side : All left.

Nature of fracture.

(1) Incomplete, one.

(2) Associated with fracture of second and third cuneiforms, bases of second, third and fourth metatarsals and dislocation of tarso-metatarsal joint great toe one case.

(3) Associated with fracture navicular one case.

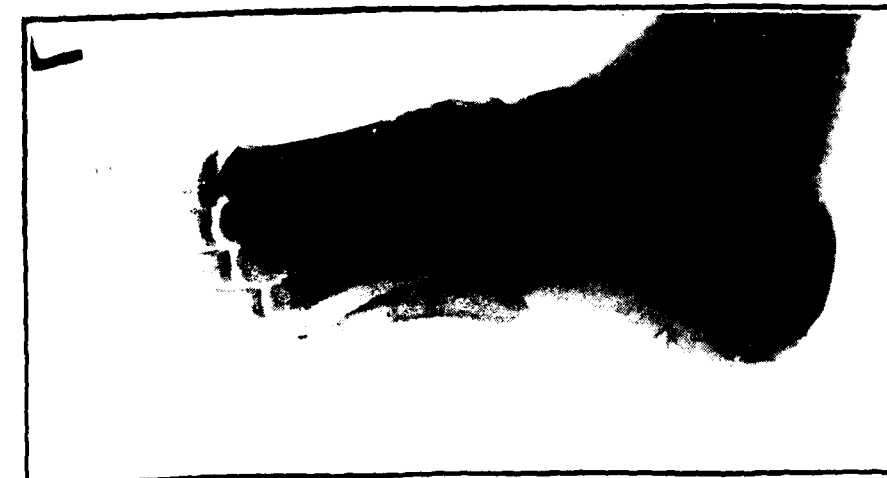
(4) With fracture first cuneiform one case.

Epiphyseal Injuries.

Epiphyseal injuries are not rare : 14 cases were seen during the year ; they are important in that they result in arrest of growth of bones, and they are obvious deformities. They may be clinically suspected and diagnosed ; the final conformation rests on radiograms. The epiphyseal injuries must be corrected as early as possible ; after 48 hours it becomes more difficult to get accurate reduction. After the lapse of a week even open reduction may not be successful at all. Museum specimens demonstrate that the periosteal cuff intervenes between the epiphysis and the diaphysis.



VIII. R., adult male.—Smith Peterson Pin in position for sub-capital fracture of neck of femur.



IX. Fracture of the inferior surface of the calcaneus.



X & XI. H. Baig, aged 12—Forward separation of the lower epiphysis of the left femur—antero-posterior and lateral view.



XII-A. Uncommon variety of fracture of lower end of radius.

Separation of the epiphysis of the lower end of the femur is difficult of recognition unless one has some experience; the four cases seen by me have been seen before by others with radiograms. The radiographic report as well as clinical diagnosis were not correct. The displacement is generally forward. There may or may not be a history of injury; it is strange that the injury may be slight. (Tubercle, syphilis, scurvy, sepsis have been given.) The four cases were in male children aged 10, 7, 12, 15, respectively; if not immediately corrected osteotomy is required. (Prints X and XI).

Case of an Anglo-Indian boy of 12 with backward displacement of the radial epiphysis and ulnar epiphysis and symptoms of median nerve irritation as pain in index finger was admitted 40 days after the injury. Exposure of the median nerve showed that it was being pressed on by the lower end of the upper fragment; the nerve was isolated and then an osteotomy of the lower end of the radius was performed and the backward displacement was corrected; a good position and alignment was obtained.

Epiphyseal Lesions.

Total number of cases 15.

Age period.	No. of cases.
1 to 5	Nil.
5 to 10	6
10 to 15	9

Minimum age 6; Maximum age 15.

Sex: Males 13; Females 2.

Bones:—

- (a) Humerus,—Upper end 2; Lower end 2, one as complication of supracondylar.
- (b) Radius—Lower end 4 cases, one with styloid process of ulna.

- (c) Femur—4, all lower end.
- (d) Tibia—1 lower end.
- (e) 1 case epiphysis of acromion process aged 13, 1 epiphysis of great toe aged 12.

Fracture Scapula.

Total number of cases seen: 7

Sex incidence:

Males 3; Females 4.

Age incidence:—

Adults (age not noted) ...	2 cases.
At 10 years ...	1 case.
At 30 " ...	1 "
At 32 " ...	1 "
At 35 " ...	1 "
At 60 " ...	1 "

Side: Bilateral 1 case; Unilateral 6 cases—Right 3 cases; Left 3 cases.

Site of fracture:

- (1) **Complete fracture** of scapula 2" above the inferior angle with fracture of 3rd, 4th, 7th and 8th ribs, left side, one case.
- (2) **Bilateral: Right, Fracture spine of scapula.**
Left, new bone formation of the coracoid and necrosis of the superior border of the scapula.
- (3) Fracture **outer border** of scapula below glenoid cavity: 3 cases one of which was comminuted and another involved upper part of body also, the right fragment being in position.
- (4) Fracture **coracoid process**, one case.

- (5) Fracture of neck running into vertebral border.

Fracture of the Mandible.

Total number of cases recorded since 1935 is 19.

Sex incidence:

Males 15; Females 4.

Age incidence: No cases up to 5.

Age period	No. of cases.
5 to 10	2 (one at 7; another at 8)
10 to 15	1 (at 12)
15 to 20	1 (at 16)
20 to 25	5 (one at 20; one at 21; two at 22; one at 25)
25 to 30	1 (at 28)
30 to 35	1 (at 35)
35 to 40	2 (one at 37; one at 39)
40 to 45	2 (one at 40; one at 45)
45 to 50	1 (at 50)
50 to 55	Nil
55 to 60	1 (at 60)
65 to 70	1 (at 70)

One case had intracranial injuries.

Site of fracture:

Body: 16 cases.

- (1) *Close to the symphysis menti or mental foramen,* 7 cases.

- (2) *Near the angle,* 3 cases.

- (3) *Comminuted,* 2 cases.

Angle: 3 cases.

Condyle: 2 cases (Rest not classified).

Condyle fractures may end in ankylosis of the temporo-mandibular joint; one case was associated with fracture of body in front of mental foramen and another fracture through neck of condyle with fracture body in front of mental foramen.

Treatment of cases of fracture of mandible:—

The fragments are reduced and held in apposition with the upper jaw by passing wires around adjacent teeth with Bronze wire No. 22 size; Silk-worm gut can be used. Having satisfied oneself that the occlusion is good, the jaw and the head are bandaged with plaster of Paris bandages. This immobilisation is continued for six weeks. The results are satisfactory.

Fracture Condyle of Tibia.

The end results of these cases are unsatisfactory if not properly treated.

Four cases noted.

Sex: Males 3; Female 1.

Age: One case at 32; one at 40; one at 55, and one at 60 years.

Site: Lateral condyles case both—left tibia.

Medial condyle one left.

Associated with fracture fibula one case—aged 60 years.

Depressed condyle must be elevated and pegged in position by a graft.

Ununited Fractures.

Total number of cases 2.

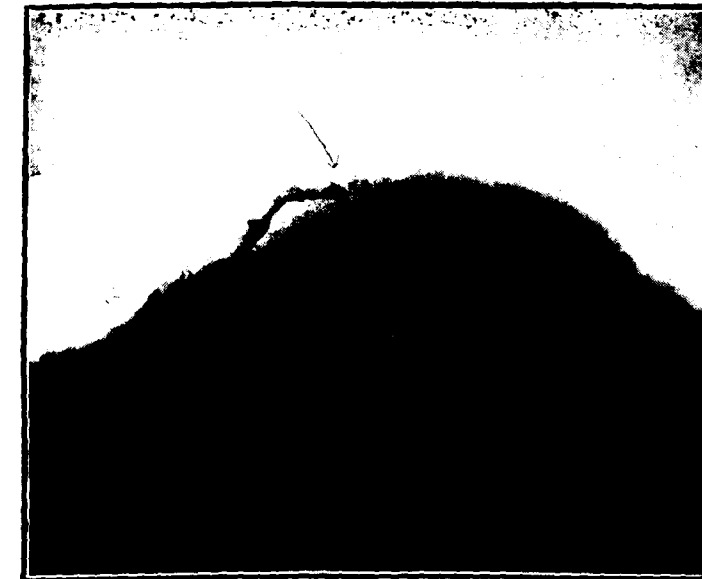
Sex: Both males.

Age: One at 20; another at 25.

Bones involved:

- (1) *Left forearm.* Fracture both bones, both some level, upper third. Radius united. Ulna not united. No callus.

- (2) *Right clavicle.* Middle third, ununited.



XII-B. Fracture of the conyx.



XII-C. V., aged 30.—Fracture of body of sternum. Spine normal. Had severe respiratory distress for a week.



XIII S., Girl, aged 7.—Head of the right femur absent: there is displacement of the trochanter upwards; acetabulum is empty and illformed: the femur is thinner than that on the opposite side. This is the result of acute epiphysitis of the upper end of the femur. Note the abnormality of the fifth lumbar vertebra.



XIV. Sequel of epiphysitis as seen in an adult.

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Post-Traumatic Conditions.

Pallegriani Steida Disease:—It is a post-traumatic disorder of the knee characterised by opacities visible in the X-ray near the internal condyle of the femur; it cannot be demonstrated until 2 or 3 weeks after the injury. It is a local manifestation of post-traumatic changes common to joints. It commonly affects the tibial collateral ligaments and may occur in the tendons of attachment of adductor magnus or vastus medialis muscle. They are akin to traumatic myositis ossificans or opacities in sub-deltoid bursitis; one young man, aged 25, complained of severe pain and after two weeks' rest, the calcified bit was excised from the top of the attachment of the tibial collateral ligament; in the second case of a woman aged 50 it was over the attachment of fibular collateral ligament; as it was painful it was excised under local anaesthetic; the calcified nodule was in the middle of a gelatinous looking fluid. (Print X)II).

Calcification of Semi-Lunar Cartilage. Is not uncommon; can be demonstrated by X-ray. They have to be removed. No case was seen.

Ossification of Tendo-achilis:—Calcified area to be excised and its continuity restored by repairing with fascia lata. This condition is common in Madras beyond the age of 30 both in males and females. Patients come for local pain—Nobody has submitted himself to open operation; the foot is manipulated and hot needle punctures are made. This affords relief.

Post-Traumatic Osteoporosis.

(1) 50. M. M. Generalised rarefaction of all bones of wrist and lower end of radius and ulna. Patient came for arthritis right wrist.

(2) 55, F. M. Generalised rarefaction of all the carpal, metacarpal and forearm bones, left, with old Colles' fracture.

(3) 30, M. M. Generalised rarefaction of all the tarsal and metatarsal bones and lower ends of fibula and tibia, left, came for on old injury of left ankle; no bony lesion.

(4) 45, M. H. Rarefaction of all the tarsal bones and lower ends of tibia and fibula. The calcaneus appears deformed (due to position of the limb during radiography) came for injury right ankle; no bony lesion.

Osteoporosis after minor injuries even without immobilisation is extremely common. They must be encouraged to resume work and activity gradually.

Tuberculosis of Nerve Sheath.

Keen: "the nerves resist infection so strongly that they have been called the aristocrats of the time, often remaining uncontaminated when the surrounding structures are going down in ruin."

A girl of 10 came in with a tumour of the ulnar nerve in the middle of the right arm. It was excised and end to end union of the nerve was done. The tumour was found to be degenerating. Histologically it was reported as tuberculous. Unfortunately no culture or inoculation was done.

There was a difference of opinion if that could not be a degeneration of lepomatous tissue. The child has no indication of the disease. A similar tumour over the ulnar nerve was seen later on but the child was not subject to operation.

The following other operations on nerves were performed:—

Kandaswamy, 30. M. H. Right Brachial plexus lesion. Exposure of the plexus and suturing.

Parker, 16. M. A.I. Ulnar and median nerve paralysis right, 17th August 1938. Exposure and repair.

Teresa Frank, 11 F. A.I. Peroneal nerve exposure and imbedding in muscle (left), 15th October 1938.

Raghuraman 60, M. H. Left ulnar nerve neuroma; due to cut wound—4th November 1938 neurorraphy.

X 14, M. H. Ulnar nerve paralysis with osteomyelitis of radius (left) 9th December 1938.

Removal of bony spur on the anterior aspect of radius and repair of nerve.

Radial nerve paralysis.—Three cases of radial nerve paralysis with unreduced, malunited, supracondylar fractures were released; the lower end of the upper fragment presses upon the nerve and produces a neuroma.

Median Nerve Irritation.—Due to backward displacement of radial epiphysis; nerve exposed and retracted and the fracture was corrected.

Median Nerve Causalgia.—A Volkman's ischæmic contracture in a man of 50 was met with; the median nerve was released from the scar tissue in the ante-cubital fossa. As far as I know median nerve causalgia has not been described in cases of Volkman's ischæmic contracture.

Nerve lesions are met with in cases of both bones of lower third of forearm. There were three cases—all were children aged 11, 13, 9 respectively. In one case there was no displacement of fragments

OSTEOMYELITIS

Ninety-two cases of osteomyelitis have been studied with regional, sex, and age distribution, of which 22 were acute and the rest chronic; 66 were males and 26 females.

Acute osteomyelitis is an emergency; and they are treated most expeditiously; if the mothers do not like to keep the children in the hospital they are sent home after operation.

Disturbance of growth of bone results from osteomyelitis commonly; 4.9 per cent showed increase in length and in 31.5 per cent there was an arrest of growth.

Trauma to the epiphyses must be avoided in osteomyelitis, particularly the periosteum should not be stripped from the cartilage near the epiphysis.

The operation in acute osteomyelitis consists in boring a hole by an awl into the bone above the epiphysis so as to relieve the tension; the chisel and mallet are not to be used so as to minimise the trauma.

Eighteen cases were operated during the year for acute osteomyelitis; culture and swab examination showed staphylococci pyogenes aureus in 13, and 4 showed streptococci, of which Case Nos. 5 and 18 died; but in the fatal cases blood culture on repeated examination was sterile although there were pyæmic manifestations. Sulphanilamide was given in both the streptococci cases by all routes. Case No. 14 is one of scurvy and not osteomyelitis.

Acute Osteomyelitis.

1. Krishna Veni, 1. Fc. H. Acute arthritis right hip with osteomyelitis upper end of femur.

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2. Sundaramma, 7. Fc. H. Lower end of femur.

3. Alamelu, 1 year two months, Fc. H. Lower end; right femur.

4. Rajamani, 1 year 6 months Mc. H. Acute osteomyelitis humerus 13th April 1939.

5. Krishnan, 2. Mc. H. Right hip and lower end of left radius. Had meningitis, convulsions and died. Blood calcium was low, parathyroid tetany set in; had parathormone injections; external table of skull removed; Lumbar puncture. Nil abnormal grown from pus; blood culture sterile. (*Streptococcal*).

6. Muthu, 10 months, Mc. H. Lower end left femur 2nd May 1938.

7. Peddy Sehoratz, 9. Mc. A.I. Femur.

8. Arthur Jackson, 3 years 6 months Mc. A.I. Lower end right femur. 27th May 1933.

9. Anthoniamma, 9 months Fc.I. C. Upper end of right humerus, 17th June 1938. (*Streptococcal*)

10. Vahid Baig, 18. M. M. Lower end femur left, (*Streptococcal*) 20th July 1938.

11. Baby, 3 months, Mc. H. Osteomyelitis lower end, right femur, 12th August 1938.

12. Namy Bai, 3. Fc. H. Osteomyelitis, humerus.

13. Begum, 5. Fc. M. Fibula left, 21st September 1938.

14. Kulasekaran, 2. Mc. H. Right femur lower end (Scurvy) 22nd October 1938.

15. Rajeswari, 6 months Fc. H. Upper end left humerus, 3rd November 1938.

16. Bhoid, 4. Fc. H. Lower end left tibia.

17. Bhoid, 9 months Fc. H. Left hip, 22nd December 1938.

18.—X, 3, Fc. H. Right hip, streptococcal. Developed a week after operation temporo-sphenoidal abscess and hemiplegia. Refused further operation. Child died.

Sex: 10 female children; 7 male children; one male adult.

This does not accord with the usual finding that a greater percentage occurs in male children; in this series, 9 of 18 were in the lower end of femur; upper end femur 4, lower end of fibula one, one of lower end of left tibia one, upper end of humerus 3.

(Generally 50 per cent occur at the lower end of the femur, or the upper end of tibia.) Long bones chiefly, short bones occasionally and flat bones of skull, and Scapula rarely.

Acute osteomyelitis may follow any of the exanthemata or debilitating illness or a pyæmia or enteric fever.

A girl now aged 8 was operated 5 years ago for osteomyelitis of lower end of right femur; she has now 3 inches shortening; the radiogram shows the epiphyses to be normal. The lower third of the diaphysis is thickened, sclerosed and irregular.

A boy of 13 had osteomyelitis of the lower end of right femur in 1934; he had lengthening of bone by one inch in 1935 and this year he has 1½ inches of lengthening of bone.

The sequelæ of osteomyelitis are deformities such as pathological dislocation and ankylosis of joints

wherever the epiphysis is intra-capsular. Nearly a dozen cases are seen every year. In the case of the hip, the head is absorbed and a pathological displacement results. This is a very common condition. The sequel in the hip requires some greater consideration.

Diaphysectomy as an operation for osteomyelitis is not practised. Nature often produce sequestration of the whole shaft of the fibula as was seen in one case during the year. Diaphysectomy is required when the whole bone is diseased as in adults and one case of osteoperiostitis of the left fibula of 4 years' duration in Kandaswamy, aged 35, Male, Hindu, was done on 28th October 1938.

In this case no regeneration of bone is possible.

During adolescence regeneration occurs commonly and a boot with lateral iron is better to prevent valgus deformity; it takes nearly two years for regeneration to be completed as was studied in two cases; a cuff of new bone is laid down in 3 months; these two cases are studied since 1934.

Acute Epiphysitis of the Hip Joint.

It is described as epiphysitis because the infection usually involves the extremities of bones and because the epiphysis is often detached or destroyed. Of 52 cases in which but a single joint was involved the hip was affected in 26. In some instances it is secondary to an infected wound, suppurating ear and the like. It may follow pneumonia of one or the exanthemata.

The influence of age is a vital factor from the standpoint of morbid anatomy and a recognition of this must determine to a large extent the treatment.

In 1874 Thomas Smith of St. Bartholomew Hospital had accurately and exhaustively described as a definite clinical entity, the acute arthritis of infants specifying the main characteristics as follows:—

(1) Age—within the first year, often within the first few weeks or first few days of birth.

(2) Onset—sudden, often preceded by traumatism.

(3) Progress—rapid to suppuration limited to the epiphysis and the joint cavity; the diaphysis always escapes.

(4) Involvement of large joints—hip, shoulder, knee, etc.

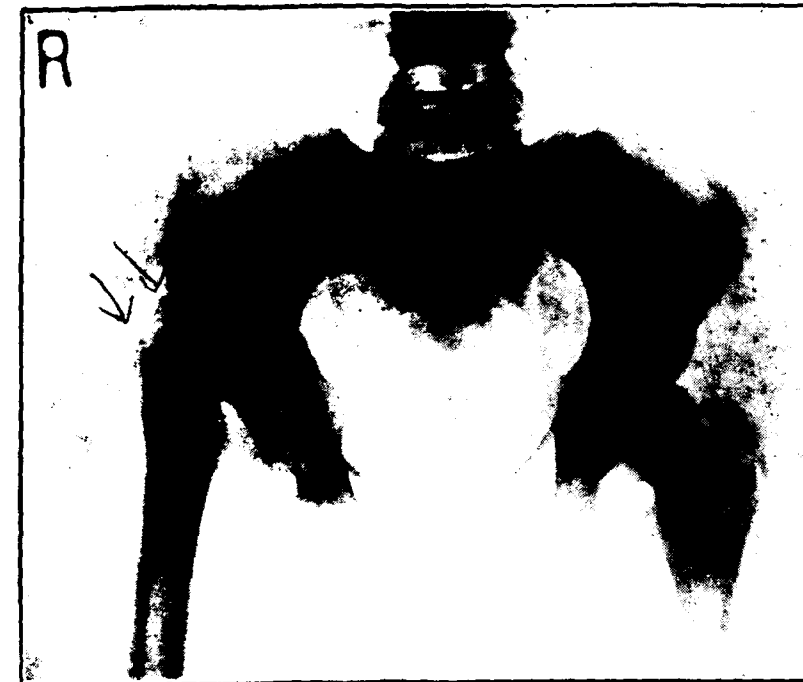
(5) Complete destruction of the whole epiphysis, leading to shortened, mobile or flail joints.

(6) Termination—rapid either favourable or fatal. 13 out of 22 cases in Smith's series were fatal.

(7) Neither syphilis nor tubercle are causal agents.

The morbid anatomy of the upper end of the femur of the infant as disclosed by the X-ray examination affords a clear explanation of these clinical manifestations. The head of the femur, being almost entirely composed of cartilage in infancy, is destroyed by inflammation and suppuration and the epiphysis rapidly disappears.

The nature of infection is either staphylococcal or streptococcal occasionally due to pneumococcus. In this country it follows commonly smallpox. Destruction of joints following smallpox is enormously common; about a dozen cases are seen with multiple epiphysitis and arthritis every year.



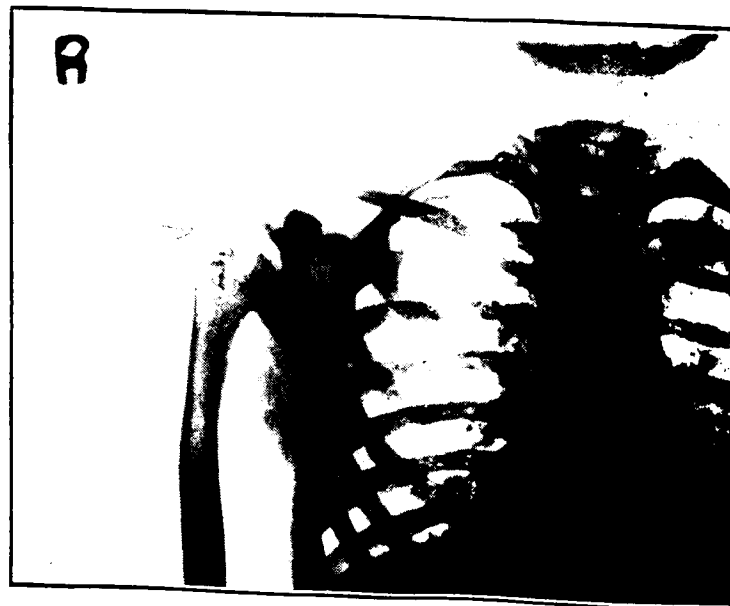
XV-A. N., aged 12.—Stabilisation of the hip by ileal graft on the right side for an unstable pathologically dislocated hip.



XV-B. V. Pillai, aged 44. The displacement of the left hip is due to epiphysitis as a child result at the age of 44. But the hip is unstable.



XVI. V. Girl.—Osteochondritis of upper epiphysis of the humerus.



XVII. V. Girl.—Osteochondritis of the upper epiphysis of the humerus. Head is flattened out although it is not a weight-bearing joint.

A secondary infection is probably the actual cause. The infection is generally through blood stream and the disease is primarily limited to the joint cavity but, as the space in the joint cavity is limited, the head of the bone is bathed in pus. The cases are not diagnosed early especially in the hip.

Treatment is early and free incision and efficient drainage, traction being applied to the limb in a Thomas's bed knee splint. In neglected cases a spontaneous opening forms and suppuration ordinarily persists for several months; the epiphysis is usually destroyed in whole or in part and in consequence the joint becomes somewhat loose and flail-like. After recovery, the joint should be supported for a time in extension and abduction to prevent displacement. If the head of the femur has been destroyed there is usually upward and backward displacement. This induces flexion and adduction of the limb and great disability.

In such cases one should, under anaesthesia, force the femur forward to the neighbourhood of the anterior superior spine and fix it there for a long period by the application of Lorenz Spica bandage applied with the limb in an attitude of abduction and hyperextension. The operation is similar to the Lorenz method of replacing the congenital dislocation.

Acute arthritis of joints treated by this method is quite successful.

The prophylaxis of the troublesome sequelæ of the disease is early efficient treatment.

Sequelæ of the disease in infancy:—

(1) Complete loss of the head of the femur, say, in a child of 15 months of age.

(2) In older children aged five years. At this age the head is mainly osseous but not entirely so; the patient is often seen with a discharging sinus. Separation of the head from the shaft of the femur is found, a considerable portion of the neck having been absorbed. There may be some periostitis in the upper part of the shaft. There is often a breach of continuity, partial or complete, in the femoral neck.

(3) In still older children aged eleven years. There may be history of fever and pain in joints for which the child was bedridden. The child comes with a dislocation of the hip with the usual deformity: flexion, adduction and slight external rotation of the hip. The problem here is a dislocation of the upper end of the femur, the femoral head itself undestroyed so far as stability and mobility are concerned, but associated with it is the absence or softening of the upper lip of the acetabulum.

(4) In an adult. Complicated by a pathological dislocation. (Prints XIV, XV).

Indications for treatment: For (1): No operative interference (a) correct the deformity already present by forcible abduction and encasing in plaster of paris for short time; and (b) fit an appliance which, whilst limiting the tendency of the femur to slip upwards, would allow as much exercise of function as possible.

For (2): The object of treatment is to promote reproduction of bone whilst preventing further shortening. Success in this objective will leave a strut to the shaft, and will eliminate the possibility of the greater trochanter slipping upwards upon the ilium and extension in an abduction frame. There is still a risk of the trochanter

slipping upwards and an ankylosis in good position will be the ultimate result:

For (3): Subcutaneous tenotomy of adductors with reposition of the head in plaster in slight abduction. The patient will get a painless, stable, mobile hip.

For (4) Some operation may be required if the limb is to become painless and capable of the functions of support and progression. In the adult the femoral head is still more resistant to the influence of inflammation and infection and except in those cases in which inflammation begins as a definite osteitis, very little destruction of the head follows, the brunt of the disease falls upon the acetabulum, whose upper lip yields and allows the head to escape upon the dorsum ilii. By the time healing has occurred there has usually been so much shortening of the ligaments and capsule of the joint and so much inflammatory material filling up the acetabulum as to make reposition and replacement impossible.

The following cases were seen during the year.

CASE No. 1.—"R." 16 years. F.C. This child was known to me when it had acute arthritis in 1924 in another Hospital. It was incised and the joint was freely drained and kept under extension. The parents got the child discharged from the hospital in 1924 and the child subsequently was admitted into the General Hospital. The head of the femur is absorbed and is dislocated upwards. Many operations had been done and there was a pathological fracture of the upper third of the femur. The fracture united. At present the joint is ankylosed; the acetabulum is very shallow and there is new bone formation on the inner side of the ace-

tabulum. There was a shortening of 2½ inches, which was corrected at present by boots. The child is poor and cannot afford frequent renewal of boots. No operative procedure could be contemplated in this case.

CASE No. 2—"S." aged 8, F.C. Was admitted as a case of tuberculous disease of the hip joint. But the child was moving about and playing without any pain. No history of any infectious fever; but the child had an acute swelling of the hip with fever, which gradually got well without any treatment. At present the head is absorbed (right hip), the neck is projecting as a stump horizontally for half an inch. There is no dislocation of the bone in this case as this horizontal projection of the neck is hitching against the acetabulum. Why that portion of the neck alone remains unabsorbed cannot be explained by any anatomical peculiarity of the structure of the neck or of its blood supply. The structure of the neck is thicker below than above. This projection is seen in another case also mentioned below.

Certain peculiarities in the upper part of the neck as some thickening are said to be due to the habitual squatting posture of Indians. Examination of a large number of our dry specimens do not reveal this fact.

CASE No. 3—"N." 8 years M.C. Case Nos. 3 and 4 were under treatment in two other hospitals. They both came with a sinus in the anterior aspect of the groin due to operative interference. An incision for drainage of the hip joint must be a lateral or posterior incision. An anterior incision in the middle of the groin does not drain the joint efficiently. The head of the femur has disappeared. The neck is stumpy, half-inch in length. Epiphysis of the great trochanter is smaller than usual. Bone

is dislocated upwards; but an acetabular cavity is formed. The sinus was opened and the joint drained. Attempts were made to bring the stump into the acetabulum and fixed in plaster of paris. The sinus healed up after six months' treatment. The stump has not entered into the acetabular cavity but no operative measures are indicated at present.

CASE No. 4—"N." F. 14 years, I.C. Was admitted for flexion of right hip. There was a scar on the anterior aspect of the groin. It was operated four years ago in district hospital, where she remained for a year. X-ray now shows absorption of the head of the right femur. Arrest of development of the shaft of the bone with upward dislocation is present. There is distortion of the pelvis with Scoliosis. The neck is projecting as a stump at its upper part for half-an-inch. As the flexion deformity was being corrected by extension, the original scar showed signs of inflammation and an abscess was formed, which was opened and drained. The wound healed up and the child was fitted with a boot to correct the shortening. Treatment of a case of this type becomes difficult, as the original infection has become recrudescence after four years.

CASE No. 5.—Was that of a boy aged 8, who had acute arthritis of the left hip and osteomyelitis of the lower end of the right femur. There were several sinuses present over both the

regions. The left hip was flexed and adducted and the right knee was flexed to a right ankle. Several sequestra were removed; the right knee was extended; but the left hip did not improve under extension. The child was originally treated for five months outside the hospital by others.

CASE No. 6. Was that of a young man aged 20 admitted into the medical wards (another hospital) and was being treated for an unclassified fever. There was swelling over the right hip which was not recognised and when he was transferred to the surgical side there was dorsal dislocation of the hip. The joint was drained. Streptococcus was isolated from the culture and he developed abscesses in other situations. After a prolonged illness he recovered. He is able to do his work efficiently and is a good boxer. He belongs to Group 4; there was no necrosis of the head of the femur.

There were two other cases in children aged two to three years, where the limb was completely flail. Similar cases occur in other joints also. Shoulder and elbow are the next common types especially in smallpox; but there were two cases in children of about five years where all the joints were affected.

The characters of the staphylococcal and streptococcal varieties differ and are studied. Cases of osteomyelitis in adults have their own characteristics.

Osteomyelitis of the Long Bones and Typhoid Fever.—In a large number of cases staphylococci have been obtained from clinical specimens, instead of Bacillus typhosus.

Differential Diagnosis :—

Staphylococcus.	Typhoid
1. More extensive, osseous, hypertrophy.	1. Less acute—local symptoms.
	2. Detachment of periosteum.
	3. Lamellar sequestra.
2. Destruction of bone.	4. Cured usually by simple surgical intervention.

One case of typhoid abscess in the centre of the shaft of the left radius was seen; patient was convalescing from typhoid fever. In *Tub.* perichondritis and periostitis of ribs, destruction begins in the periphery and extends inwards; In Typhoid chondromyelitis—the cartilage and marrow are primarily affected.

Osteomyelitis.

<i>Streptococcal</i> , 13.3 p.c. septicaemia No necrosis of bone No sequestra Common in children under 2 Simple drainage and immobilisation Lock after dehydration	<i>Staphylococcal</i> , children above 2 22.4 p.c. septicaemia Necrosis Sequestra The blood of all patients with chronic or healed staphylococcal osteomyelitis should be frequently investigated and toxoid should be administered if less than 3 units of anti-toxin is present.
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Osteomyelitis (92 cases).

BONES OF THE UPPER EXTREMITY.

Humerus.

Total number of cases noted 20.

Acute 5; Chronic 15.

Sex: Females 11; Males 9.

Age period.	No. of cases.
1 to 5	9 (3 at 1½; 2 at 3; 3 at 4; 1 at 5)
5 to 10	1 (at 7)
15 to 20	Nil
20 to 25	2 (1 at 20; 1 at 25)
25 to 30	5 (3 at 26; 1 at 27; 1 at 30)
30 to 35	1 at 35.

Remarks:

Osteomyelitis neighbouring joints:
With arthritis shoulder 2: one associated with osteomyelitis left tibia, and one with arthritis elbow.

Periostitis.—8 cases. One case of bilateral periostitis of lower end

of humerus, osteomyelitis of upper end of radius and ulna.

In a male child 1½ yrs. old, after smallpox 3 months before

Radius.

Total number of cases: 7.

Sex incidence: Males 5; Females 2.

Age period	No. of cases.
1 to 5	1 (at 1½)
10 to 15	1 (at 15)
20 to 25	1 (at 23)
25 to 30	3 (at 27 and 2 at 30)
50 to 55	1 (at 51)

Remarks:

1. Post-traumatic rarefaction—left radius, age 51, Male.

2. Osteomyelitis whole shaft, left radius 1 case, 15, Male. Hindu.

Ulna.

Total numbers of cases: 4.

Sex: Males 2; Females—2.

Acquired Deformities

Age:—

10 to 15	1 (at 15)
25 to 30	2 (one at 27 and the other at 30)

Clavicle:

Chronic Osteomyelitis. Age 26. Male. Hindu.

Meta Carpals:—No cases.

Phalanges:—6 cases.

(1) Necrosis terminal phalanx right thumb 2 cases. Both males. One aged 20 years, the other aged 35 years.

(2) Necrosis terminal phalanx left middle finger after whitlow 30 years. Male. Hindu.

(3) Acute periostitis: 27 years. Male. Hindu.

(4) Chronic: osteomyelitis 50 years. Male. Muhammedan.

(5) Chronic: Proximal phalanx right middle finger. 15 years. Male. Hindu.

BONES OF THE LOWER EXTREMITY.

1. *Chronic Osteomyelitis Hip Bones.*—One case, Female, aged 7, associated with similar involvement of femur.

2. *Femur.*—Total number of cases 20. Acute 5; Chronic 15.

Sex incidence.—Males 13; Females 7.

Age period.	No. of cases.
Up to 1	2 (1 at 5 months; 1 at 9 months)
1 to 5	7 (1 at 1; 1 at 2; 2 at 1½; 1 at 2½; 1 at 3; 2 at 5)

Remarks:

(1) Left femur and tibia.—Chronic osteomyelitis with peroneal nerve palsy also.

(2) Chronic osteomyelitis of femur and hip bones—one case.

(3) Chronic periosteomyelitis whole of diaphysis femur—one case.

(4) Osteomyelitis of upper end of right femur. Periosteal new bone formation. Head of femur not affected. Clinically suspected T.B. Age 2½ years. Male. Hindu.

(5) Upper end of right femur Clinically T.B., right hip Age 3 years. Male. Hindu

(6) Brodies abscess. Neck of left femur (clinically T.B.) Age 8 years. Female. Hindu.

3. *Tibia.*—Total number of cases 16. Acute 8; Chronic 8.

Sex.—Males 14; Females 2.

Age period.	No. of cases
Up to 1	Nil.
1 to 5	2 (1 at 1½; 1 at 1 year)
5 to 10	5 (1 at 6; 2 at 7; 1 at 8; 1 at 10)
10 to 15	3 (1 at 13; 2 at 15)
15 to 20	2 (1 at 17; 1 at 20)
20 to 25	1 (at 25)
25 to 30	1 (at 28)
30 to 35	Nil.
35 to 40	Nil.
40 to 45	1 (at 45)
45 to 50	1 (at 50)

Remarks:—

(1) Periostitis acute one case.

(2) Chronic periostitis one case of bones of knee.

(3) With peroneal nerve palsy and osteomyelitis femur one case.

- (4) Brodies abscess lower end right tibia 15 years. Male. Hindu.

4. *Fibula*.—Total No. of cases 8. Acute 2; Chronic 6.

Sex: Males 5; Females 3.

Age: One case at 1½ years.

Remarks:—

- (1) In three cases Diaphysectomy right fibula was performed: 1½ Mc. H.; 18 M. H.; 24 M. H.
- (2) Periostitis lower end left fibula Female A.I. 24 years.
3. Osteomyelitis of both bones. Right leg. Result of compound fracture with sequestra and involvement of ankle joint.
- (4) Osteomyelitis of both bones left leg and os calcis. Result of compound fracture.
5. *The Tarsus*.—Total number of cases 3.
 - (1) *Calcaneus* Chronic osteomyelitis of both bones. Left leg and os calcis. Result of compound fracture.
 - (2) *Cuboid* Osteomyelitis of left cuboid and fifth metatarsal. 42 years. Male. Hindu.
 - (3) Chronic osteomyelitis—tarsal bones, 30 years. Male. Hindu.
6. *The Metatarsal*.—One mid-metatarsal right—10 years. Male. Hindu.
7. *The Phalanges*.—One Necrosis Phalanx. 2nd right toe. 50 years. Male. Hindu.

Acute osteomyelitis of long bones in the adult occurs once in a way. The following cases were seen:—

(1) A young man of 25 was seen first for streptococcal cellulitis of the foot which was relieved by multiple incisions. Two months after he developed a synovitis of the knee of the same side; two years after he developed a number of pyæmic abscesses involving joints and skull bone and chest wall. Culture and smear examination showed staphylococci. He died after two years of prolonged illness.

(2) A man of 40 developed a staphylococcal abscess of the scapular region 3 years ago; since then he has had number of abscesses involving the shaft of long bones; there is not much periosteal involvement; the medulla is affected; the process has not subsided in spite of vaccines, sulphanilamides.

(3) A police constable aged 35 got a primary periosteomyelitis of the right femur; the lesion is confined to one bone; after three years' illness this has quietened down at the moment.

(4) An adult male of 40 came in with staphylococcal osteomyelitis of lower end left femur; the bone has been saucerised and after Winnet Orr's method of treatment **the raw area has been skin-grafted**. He has an anterior curvature of the right tibia with scars; the Wassermann reaction is negative. Radiographic examination shows osteoporosis lesions resembling those of yaws.

(5) The condition is rarely met with in adult women.

Osteomyelitis occur in the aged also.

Primary Osteomyelitis in the adult runs a different course. There is often

an acute infection years before the occurrence of osteomyelitis. Then there may be an infectious incident, followed by the gradual development of osteomyelitis.

A review by Zudex (1938) of 9 cases (7 men and 2 women) of acute osteomyelitis of the long bones of adults is included here. Compound fractures and the sclerosing osteomyelitis of Savre are not included. As in children the preponderance is in males.

Etiology:—History of slight trauma in 3 cases, and none in 6 cases.

No preceding infection or illness in 6 cases.

History of sore throat in one case.

Mammary abscess after lactation one case.

Phlebitis following parturition in one case.

In adults, unlike in children, the progress of the disease is slow and insidious but of gradually increasing intensity (occasionally the pattern is that seen in children). A positive blood culture is not an additional complication since the lesion is metastatic; it is a feature at some stage of the disease.

Pathology:—The pathologic changes are principally central and periosteal. The involved portion of central canal is filled with granulation tissue and pus.

If the lesion has existed for a long time this central granulation tissue becomes more fibrous. The disease has its origin more in the shaft (but may occur in the former metaphyseal region) since there is a more evenly distributed supply of blood to the bone in adults than in children. The route of spread in the long bones of the

adult is through the central canal, and the changes are more evident in the marrow cavity than in the osseous substance.

The development of subperiosteal abscess in the adult bone is unlikely though pus may be localised about an area in which there is periosteal involvement. This is due to the more firm adherence of the periosteum to the cortex in fully grown bone and the accepted theory of spread advanced by Choyce (1912-15) and modified by Starr does not apply.

When the involvement is near the end of the bone in the cancellous substance there is a tendency to invasion of the neighbouring joint. When the new periosteal bone is produced it is light in texture and may be peeled off the outer part of the cortex readily; no involucrum is seen. They may be pus formed about this area of periostitis. Eventually after operation, the bone is restored to a relatively normal appearance, there being little gross distortion other than that incidental to operation.

The disease may be localised in the medullary cavity without the usual diffuse involvement seen in childhood.

There may be a local area of periosteal bone production with pus formation intimately associated with bar-like thickening on the surface of the shaft. There may seem to be but little evidence of further disease. The reaction would be so slight and one could not convince oneself that they should be opened. On opening it will be found that the medullary cavity is filled with pus and granulation tissue for a considerable distance.

Sequestrum formation is rare.

Commonly involved bone is the femur.

The organisms are the same (Staph. P. A. in 7 and Strepto Hæmolytic 1).

The difference in location and spread of the disease is influenced by the difference in the architecture of the bones of adults and children.

Symptoms:—Pain is the most constant symptom; there may be no fever. No high leucocytosis.

An increase in this intense boring pain entails the patient to an exploratory operation.

Treat:—Removal of a window of cortex 1 inch long and $\frac{1}{2}$ or $\frac{3}{4}$ inch wide; Winnett Orr treatment.

Extensive sauceration is not usually indicated.

There is no tendency to metastatic involvement.

Roentgen Examination:—

- (1) Early stages—nil.
- (2) Changes seen after several weeks or months.
- (3) Lesion localised.
- (4) Spotty atrophy of the cortex over an area of several inches.
- (5) Associated production of periosteal light bone over the same area.
- (6) Local erosion.
- (7) Spotty atrophy over the ends of the bones.
- (8) New periosteal bone may be laminated in appearance and be confused with Endothelioma.
- (9) No extensive involvement.

Pyogenic Arthritis:—

"At any time from almost immediately after birth to the end of the

period of childhood, pyogenic infection of joints may occur."

I. (1) Gonococcus from ophthalmia or vagina in older children.

(2) Pneumococcal Knee.

(3) Otitis media.

(4) Pyæmia.

(5) Single joint—primary (Tonsil, skin, teeth) (in infants and children a single acute arthritis is often found to be due to streptococcus).

This may occur during convalescence from one of the specific fevers.

II. Penetrating wound.

III. Neighbouring focus.

Involvement of hip joint from osteomyelitis head of femur.

Repeated aspiration of joints with immobilisation of joints with skin traction for the lower extremity joints and immobilisation in plaster in the optimum position in the upper extremity joints are required.

Streptococcal cases require drainage. Sulphonamides are freely used. No case ended in amputation during the year. Orthopædic principles will prevent ankylosis of joints and obtain useful joints in the optimum position; lateral and backward dislocation of the tibia at the knee is extremely common and most difficult to correct.

Winnett Orr's method is extensively practised and is very useful.

The profession has not yet realised that an early surgical intervention is as essential in osteomyelitis as in strangulated hernia, or acute mastoiditis, or obstructive appendicitis.

Acquired Deformities

The term *Osteochondritis* is a misnomer. The term "Osteochondropathy" is better.

Osteochondritis.

Total number of cases 44.

Distribution:—

Perthes	20
Osgood	8
Schlatter	6
Patella	1
Upper end of humerus	2
Lower end of humerus	2
Kohlers	0
Kein Boch	1
Freiburg	1
Spine	1
Pubis	1
Ileum	1

Perthes.

Total number of cases 20.

Sex.—Males 6; Females 14.

Side.—Right 12; Left 6; Bilateral 2.

Age period	No. of cases.
5	1
5 to 10	8
10 to 20	5
20 to 30	5
At 35	1

N.B.—It is recorded that males are more often affected in other countries. Here there is a preponderance of females.

Site: Acetabulum 5; Head of Femur 15; Changes noted:—Fragmentation of the head 3; Shortening of the neck 3; Typical Mushrooming of the head 2.

In one case of Osteochondritis of the right hip in which the acetabulum was the site of the disease (there was a suggestion of *protrusio acetabuli*,

Associated lesions.—In one case of bilateral Osteochondritis of the hips in a girl of 6 years, both the iliac crests presented osteochondritic changes.

One case of perthes left hip in a 13-year-old girl was associated with sacralisation of the fifth lumbar vertebra.

Clinical Characters of Perthe's Disease.

- (1) No abscess occurs.
- (2) The hip joint does not become stiff.
- (3) Motion usually improves until the patient is not conscious of any limitation.

(4) The leg does not become shortened as in tuberculosis; but our experience in Madras shows that the disease leaves an inch of shortening. This shortening has been noticed even in the upper extremity.

(5) There is no danger to life.

CASES:—

Female 10. Right side; acetabulum rarefied; neck is short, head is flattened and left side neck is broad-ended.

Female 7. Right head is flattened shorter, ilial portion of acetabulum also irregular. Index of deformity was:—

Normal side 3 : $1 \times 100 = 37\frac{1}{2}$.

Right side $\frac{1}{4}$: $1\frac{1}{2} \times 100 = 27$.

30 Male. Arthritis right hip. Old Perthes. Head wide. Neck broad and short. Osteophytic changes in acetabulum and head at its inferior part.

Male 10. Right side early; complete sacralisation of L. V. is also seen. Sclerosis of the acetabular margin is present.

Male 8. Neck is enormously broad.

Right—Female below 8; Head is flat; neck is rarefied.

Female child 6. Left, head is sclerosed and flattened. No change in neck.

Male child 4. On the left side there is posterior dislocation of left hip with changes in the acetabulum. Right head is flattened. When one hip is affected; the second hip is likely to be affected.

Female 30. Right femur adducted; thin. Head is mushroom-shaped and sclerosed; acetabulum looks like travelling acetabulum.

Female, Hindu, 8. Dorsal dislocation of the right hip. Areas of rarefaction in the pubic bone.

Female child, Hindu, 8. Head of the left femur is small; the lower part of the acetabulum is rarefied.

Male Hindu, 35. Right hip; head mushroom-shaped. Neck shortened; buttressing on the superior and inferior lip of the acetabulum. Left hip is normal. No osteoarthritic changes. The upper part of the acetabulum shows irregular sclerosis above and rarefaction together with slight new bone formation. Is this old perthes becoming tuberculous, or osteoarthritic?

Female, Hindu, 18. Right hip. Neck is short; lower portion of the neck is absent; the lower part of the acetabulum is diseased; complains of pain now.

Osgood (Osteitis)

Total number of cases 8.

Sex.—Males 6; Females 2.

Side.—Right 6; Left 1; Bilateral 1—
Male of 11 years.

Age period	No. of cases.
1 to 10	3
10 to 20	4
20 to 30	1

Of these, three cases came for injury to the heel. One case was associated with fracture of the tibia. In one case a male of 15 years who came with a history of injury, there was an Osteochondritis of the right calcaneus with *Fretberg disease* of the fourth metatarsal.

Schlatters.

May occur in boys and girls.

Total number of cases 6.

Sex.—Males 4; Females 2.

Side.—Right 3; Left 3.

Age period	No. of cases.
1 to 10	1
10 to 20	5

Of these, five cases gave a definite history of injury to the knee. In one case there was traumatic synovitis.

One case came for an arthritic condition of the knee joint. One case developed an arthritis of the interphalangeal joint two years later.

Patella.—One case.

Osteochondritis of the Upper End of the Humerus.—I am not able to trace, in the literature, cases of osteochondritis of the upper end of the humerus. Three cases in boys of 12 to 16 years have been seen during the past six months. One of the cases was shown

before the Madras General Hospital Clinical Meeting. The accompanying prints show the actual conditions. Montoux test and serum reaction are negative. The general health is good. There is no other abnormality. The patients came with painful shoulders and attributed them to injuries which were slight in nature. In both instances there was marked shortening of three-quarter of an inch. This is not expected as it is not a weight-bearing joint. This may be explained by the fact that the growth in length takes place at the upper end of the humerus. Osteochondritis changes in the upper end of the humerus has been described after Erb's paralysis.

The following are the notes of the three cases:

(a) Male, Indian, Christian 13. Head of left humerus is half-gone. There is a rectangular depression in the humerus on to which the glenoid rests. The glenoid cavity is irregular. There is a bend in the middle of the shaft of the humerus. Rest of the shaft of the humerus is normal. (Print XVI).

(b) Male child, Hindu, 7, Right shoulder; limitation of movements.

The head of the humerus is shaped like an arc with a handle. The glenoid cavity is irregular at the top; the humerus is very thin. (Print XVII).

(c) Male, Hindu, 16. Head of the left humerus is broad and deformed; shaft is short; there is absorption of the capitellum, part of the lower end of humerus; there is destruction of the upper epiphysis of the radius.

Blood calcium and phosphorus normal.

Osteochondritis of the Lower End of the Humerus.—Was met with in two instances.

Kohler's Disease.

It is remarkable that I could not find one single case of Kohler's disease of the tarsal navicular; it may not be even painful.

Kein Boch.

Osteochondritis of the Carpal Bones was seen in a man aged 18 who came with pain in the wrist after a slight injury about six months previously. Skiagram revealed the true nature of the condition.

Freiburg.—One case, 15 years. Male. Right.

Fourth metatarsal was associated with Osgood's disease. Came for injury of the foot.

Spine.

A case of adolescent Kyphosis was seen in an Anglo-Indian boy aged 15; he has been under observation for two years and is better now.

Ischio-Pubic Dystrophy

Juxta-epiphyseal lesion is seen in general infections or a metaphyseal dystrophy as in rickets (Renal coeliac or Avitaminosis). In well-treated rickets it must become normal; in all osteochondritis the synostosis should show broadening and shortening.

Osteochondritis of Pubic bone.

No epiphysis in the body is immune to the disease.

Female Child. Age less than 8. Upward dislocation of right hip and osteochondritic changes of the pubic bone.

Osteochondritis of the Os Pubis.—A girl aged 16 came for a left iliac abscess. A routine skiagraphic examination revealed osteochondritis of the pubis, on the right side. There

are no symptoms referable to this region. Left iliac abscess was staphylococcal in nature. The accompanying print shows the conditions of the pubic bone (Print XVIII).

Osteochondritis Juvenalis was described by Perthes (1910).

Vascular disturbance associated with trauma of the epiphyseal artilage is the main factor.

Index of the degree of deformity is the ratio of the maximum height of the head to its maximum width along the epiphyseal line multiplied by 100. In children the normal figure may approach 50, in a severe case of pseudo-coxalgia under 25 (Burns and Ellis).

Bony Ankylosis of the Hip Joint.

Male, Hindu, 35. Bony ankylosis of left hip joint; the head is dislocated up by $1\frac{1}{2}$ " and is in a cavity; neck almost vertical; femur adducted and internally rotated; sound union.

Flexion deformity 55° ; shortening $1\frac{1}{2}$ "; Gait-Equinus Static. Hallux Valgus. Lumbar Scoliosis convexity to right.

Bilateral Bony Ankylosis of the Hip Joint.—Is also a common clinical entity; two cases recently—both young males aged 25—were admitted with considerable flexion deformity of both hips; progression was almost in the quadrupedal way; in both cases the condition started with fever and in a short time it progressed rapidly in 3 to 6 months. A subtrochanteric osteotomy has been performed. This will give him an erect position, relieve the backache; this patient has been seen recently and is walking erect; he cannot squat in the Indian way.

Bony ankylosis in a faulty position in the elbow and knee.—Is treated by excision with satisfactory results.

Triple displacement at the knee joint is extremely common. It is a great deformity and disability. One is not able to correct this even by pin traction in a vertical direction. It is better to prevent this deformity by skin traction, and weight extension in all acute inflammatory conditions of the knee joint. If the knee joint gets ankylosed with triple displacement, there is an obvious deformity and disability.

Bony ankylosis in wrist does not produce much disability; one may be deceived unless a careful examination is made.

Ankylosis of the finger interphalangeal joints.—Is extremely commonly met with; they result from minor injuries, after tendon suppuration and after fractures. After fractures one is not able to anticipate which cases will get this complication. It is better to rest the joints completely for three weeks with active movements at the metacarpophalangeal and wrist joints.

Ankylosis of the temporo-mandibular joint is common; it results from fractures of the condyles, inflammatory conditions of the mouth as mercurial stomatitis, cancrum oris, suppurative arthritis of the joint after suppurative parotitis; sometimes the cause is unknown; it may result as a sequel of smallpox, gonorrhoea, puerperal arthritis. These patients readily consent for operation as there is great difficulty in eating their food.

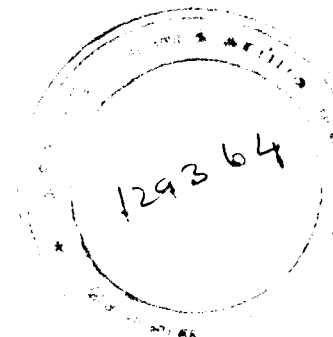
How to know which side is ankylosed, is important.



XVIII. Osteochondritis of the pubic bone.



XVIII-B Bilateral perthes with considerable difficulty in progression at the age of 30.



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XIX. M. Male, aged 22.—Protrusion of the acetabulum (Otto pelvis).



XX. S. Rao.—Variety of loose body.

Acquired Deformities

Murphy's rules for this are:—

(1) There is *flattening of the jaw* on the *unaffected* side, most pronounced near the tip of the chin.

(2) When the patient attempts to open his mouth the teeth move from 1/60 to 1/100 of an inch downwards and deviate a little in the direction of the ankylosed side, because of a slight sliding forwards of the mandibular articulation on the unaffected side.

(3) A sliding motion on the unaffected side can be felt by the palpating fingers, and the muscular activity on that side is much greater on attempted opening of the mouth than on the ankylosed side.

(4) The muscles on the ankylosed side are *more atrophied than those* on the unaffected side.

Excision of the condyle followed by interposition of temporal fascia must be done.

Three cases were done during the year, one female child and two males 15.

The results are satisfactory; after-treatment consists in keeping the mouth open by means of a wooden block until healing is complete.

The following cases of **Ankylosis of Joints** were seen during the year:—

(1) Fibrous ankylosis of shoulders is extremely common in both sexes; this is discussed under painful shoulders separately.

(2) Elbow. Bony ankylosis. Males 6; Females 2. Age 12 to 27.

(3) Wrist. Males 4; Female 1 (bony).

(4) Radio-carpal and Carpo-metacarpal one case, Male, 15 years.

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Carpo-metacarpal, one case, Male 30 years.

Carpal Female, one case, 25 years.

(5) Metacarpo-phalangeal joint, four cases (20 to 30 years) Males 3, Female 1; with involvement of extensor tendon.

(4) Interphalangeal joint 12 cases (after minor injuries 4; after suppurations 6; after fracture 2).

(7) Spine (Spondylitis deformans six cases (Males 4; Females 2).

(8) Both Sacro-iliac joints one case, Male 38 years.

(9) Hips 7 cases Males, 5 cases; one case 60 years.

Hip with spondylitis deformans two cases (Male 1; Female 1).

(10) Knee—Males 7; Females 4 (generally with triple displacement).

(11) Ankle 2 cases.

(12) Tarso-metatarsal three cases, Males 3, 30 to 35 years.

(13) Temporo-mandibular joints five cases, Female Children 2; Male 18 years; 1 Male 50 years: 1 Female 30 years.

Spondylitis deformans is recognised in much larger numbers than is recorded here. In view of the fact that fluorine intoxication cases are suspected in other districts in addition to Nellore, a careful study is being pursued.

Adolescent Deformity of the Acetabulum.

(“Protrusio acetabuli” “Otto pelvis” or “Arthrosatadysis”).

Four cases in males have been noted this year for the first time in Madras; one of which was published in the *Madras Medical College Magazine* (1938). One was secondary to Tuberculosis (in a male). Three others were primary—but all were in males. This is against the recorded literature that there is a greater preponderance in females (22 to 30) (John Gilmour 1936). The youngest age was 15½. Inter-tubercular diameter is much less and intercrystal is larger than normal. Following complications are met with:—(a) Trauma; (b) superimposed infection after confinement; (c) Osteoarthritis; (d) bony ankylosis; (e) slipped femoral epiphysis.

Treatment is traction and recumbency.

X-ray.—Floor of acetabulum ballooned in. Head of femur is completely within the acetabular cavity. The joint is thinner than usual. Head of femur is normal in shape and density.

Local softening of bone with continuous weight bearing and an error of growth conduce to this condition. More cannot be said. It may be simulated to a minor degree by osteoarthritis of the hip.

Usually bilateral—commoner in females. Discovered clinically in middle life although probably in every case dates from childhood.

Symptoms.—Stiffening of the hips and pain. Symptoms draw attention usually about the period of adolescence. Limit of movement at the hip joint gets progressively greater.

A Case of Protrusio acetabuli.

Annamalai (2622/2nd July 1938), aged 20, was admitted for flexion contraction right hip.

Duration.—He had no injury, he was quite well six months ago; the trouble started as swelling of the hip followed by fever and contracture.

Souttar's fasciotomy was performed and the limb brought to normal level. After a time the boy was discharged and he came back with flexion right hip. The radiograph showed the true condition (Print XIX).

Right side the head is smaller; there is deepening of acetabulum with projection of the floor into the pelvic cavity. Mantoux's test is negative. There are no visible signs of tuberculosis in other parts of the body. Protrusio-acetabuli occurs in healed cases of Tubercle hip joint. A case of Tubercle of left hip under observation for the past six years now healed shows protrusion of the acetabulum into pelvic cavity. The boy is now 12 years of age. Two other radiograms have been obtained. Both of them are young adolescent males.

Interest is taken in America on this subject for the past few years. Prior to that references to the condition are restricted entirely to German literature.

Fifty-one true cases are described in 110 cases since Otto's original article in 1824.

In a Rheumatic clinic out of a survey of 298 radiographs of pathological hip joints, 15 cases of Otto pelvis were found, i.e., 5 per cent in this type of patients.

There is no agreement on the subject of Etiology.

Is protrusion a disease-process or an entity?

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A classification based on radiographic findings:—

GROUP I.

(1) A group confirming to the hypothesis of Eppinger or some theory of growth disturbance (Non-inflammatory origin in early life).

(2) The rheumatic group—

- (a) Specific infection gonococcal;
- (b) Non-specific infection;
- (c) Metabolic arthritis.

(3) A group including many varieties due to destructive disease.

Eppinger considered that the cases he described were due to a disturbance of the tri-radiate cartilage, possibly a process resembling osteochondritis. There is no evidence to support or disprove this theory.

On the evidence of history and radiographic findings Eppinger's theory may be correct.

The radiograph of this type shows a joint with an intact cartilage and no evidence of infective changes in articular bone.

The acetabulum protrudes to a varying extent, and on this depends the degree of limitation of movement which may be so slight that the patient is not aware of the defect, or alternatively the loss of full range of movements, especially abduction, which the patient notices, is insufficient to make the patient seek treatment. At a later stage owing no doubt to the mechanical disadvantage at which the joint is working, osteoarthritic and infective changes are often superimposed, and the patient now complains of definite pain; or, by

reason of these changes which produce osteophytes and loss of cartilage, or both, the patient is aware, for the first time, that movement is restricted.

(1) Female aged 62—Bilateral pain in left hip only. Unable to separate her legs during swimming at the age of 15.

(2) Female aged 40—Bilateral pain in both hips. Inability to cross her legs at 15.

The protrusion having formed does not increase in size. In view of the presence of an intact cartilage in the early stages, and the absence of sclerosis of bone, or other signs of infective change, the term 'arthrokata-dysis' of Verrall is very suitable for this group. Later the combination of trauma and superimposed infection destroy the characteristic features and is not possible to differentiate this group from other groups.

GROUP II—RHEUMATIC GROUP.

There is some evidence which favoured the gonococcal origin of some of these cases.

Coincidence of arthritis with venereal infection in these male patients suggests that the latter may have had some causal relationship to joint lesions.

In another male patient there was association with "Marie Strumpell" type.

In the case of the female it is associated with polyarthritis and menopause.

The etiology of this group is the etiology of rheumatic infections in general.

In the rheumatic group the cartilage is absent or thin, and this thinning is generalised over the circumference of the femur head; not at the point of maximum pressure only, as in early senile osteoarthritis. The head of the bone is often heavily sclerosed, with minor irregularity in outline, and occasionally somewhat pointed. New bone is laid down as a compensatory process over the bulging acetabulum, a feature which is absent from Group I except in the later stages. The wall is therefore more marked and dense in Group II than in Group I.

(1) The degree of protrusion depends to some extent on the virulence of the infective organism.

(2) Infective changes in the acetabulum must be necessarily in advance of any destruction which may take place in the femoral head.

(3) A virulent infection need not necessarily produce marked protrusion.

(4) Osteophytes develop at the base of the femoral head; the head may show cavitation as in osteoarthritis.

GROUP III.

In any disease involving the acetabulum, protrusion can occur as in neoplasms, hydatid, syphilis, tubercle, and pyogenic infections.

Deformities due to Contractures from Burns

Are extremely common; they are most common in the axillæ, opposite the groins, in the popliteal space, opposite the anterior aspect of the elbow, and in the hands.

They are all preventible if adequate attention is paid during the treatment of burns. The modern treatment

with Tannic acid has diminished the incidence of these scar contractures.

Before deciding on a plastic operation it is better to wait for a year; many scars get stretched and supple and the fundamental results are good. In the elbow the function is good; in the axilla opposite the groins and in the popliteal space and palmar aspects of the hands whole skin grafts in the form of tube flaps are good. In a girl of 14 who had bilateral contractures of the knees and who was moving about on her gluteal region only, an arthrodesis of one knee was done giving her a stiff knee so that she may be able to go about with a stick; plastic operations with whole skin grafts on hand give good useful hands though not nice to look at.

Rheumatoid Arthritis.

This is an intensely disabling and crippling disease; it is not a lethal disease, and public and profession are not alive to the dangers; if not early and properly treated with sustained efforts, it leads to permanent disablement.

Rheumatoid Arthritis is divided into

- (a) Primary of undetermined causation; and
- (b) Secondary of ascertained local infection.

Primary disease is extraordinarily frequent among women as compared with men; the proportion given varies (9 to 12 women to 1 male). The proportion in this series in Madras is 7 women and 4 men; the disease is prevalent in all classes and castes of people. What is the explanation?

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Probably it is as follows:—

- (a) Due to disorders of internal secretion in the female, or
- (b) habits and environment as emotional, instability as sedentary lives, poor circulation, defective nutrition.

Etiology.

(Bacteræmia, Bacterial Toxæmia.)

"As a clinical investigator, the cause is unknown, and the evidence for infection, though very impressive, is incomplete. As a practising physician, I have committed myself to the microbic theory"—Hench of the Mayo Clinic. Other theories, exciting or contributing, of Rheumatoid arthritis, are:

(a) Metabolic abnormalities, from deranged carbohydrate, protein or sulphur metabolism; or from food allergy or vitamin deficiency.

(b) Circulating deficiency, leading to "joint hunger" and consequent arthritis.

(c) Endocrine disturbances of sympathetic nervous system.

Hench (1936) states: "The last two or three theories often combined to explain the pathogenesis of Rheumatoid arthritis are as follows: the endocrine imbalance affects the sympathetics, thereby impairing the articular and general circulation.

"General and articular metabolic abnormalities are fostered, and arthritis develops with or without the aggravating influence of infections."

Pathological Histology.

Lymphocytic infiltration of joint tissues is regarded as specific to

Rheumatoid arthritis, contrasting with the polymorphocytic infiltration that occurs in frankly pyogenic infection. Fischer (1937) draws attention to the close resemblance in the microscopical appearances of the tissues in Rheumatic fever and Rheumatoid arthritis, both showing lymphocytes, histocytes, and giant cells but no leucocytes unless pyogenic organisms were present.

Bio-chemistry.

Sedimentation rate is increased in Rheumatoid arthritis, **both primary and secondary, in contradistinction to uncomplicated cases of Osteoarthritis and this is an aid in diagnosis.** If the sedimentation is raised in the absence of other causes tending to increase it—as intercurrent febrile disorder, anæmia—suspicion is at once aroused of the presence of infection. It is of value to determine the progress in response to treatment. Clinical improvement is followed by the diminution of sedimentation rate, but the treatment must be continued till it becomes normal. Until the sedimentation rate is normal, the disease cannot be regarded as arrested; an infective process is still at work. **In cases of apparent recovery a subsequent rise in sedimentation rate is one of the first signs of impending relapse.**

Gastric Juice.—The incidence of achlorhydria or hypochlorhydria in arthritis is five times higher than in normal subjects but only slightly higher than in certain other diseases. **This has not been found so here in Madras in this series.**

Metabolism.—No constant metabolic changes are found in Rheumatoid arthritis—primary or secondary. Carbohydrate metabolism shows a lowered sugar tolerance ascribed to diminished utilisation of sugar by the

tissues, resulting presumably from defective circulation. In specific infective arthritis such as that following typhoid, dysentery or pneumonia, metabolic changes are observed—rise of temperature, loss of weight, anæmia, increased sedimentation rate, diminished glucose tolerance—which are the result of reaction to the infective organism. In Secondary Rheumatoid arthritis due to focal sepsis the same applies.

Endocrine Disturbances.—There are no direct proofs; in climacteric arthritis there is underlying ovarian deficiency. Ovarian substitution therapy can be used in Primary Rheumatoid arthritis. Amenorrhœa is common.

There is marked osteoporosis in the bones with loss of calcium salts in the urine; but there is no proof of parathyroid involvement.

Radiology.

The changes seen in Primary and Secondary Rheumatoid arthritis are alike—

- (1) generalised osteoporosis;
- (2) followed later by destruction of cartilage and articular bone; and
- (3) in its final stage by subluxation and ankylosis.

SUMMARY.

X-ray shows no destruction.

Anæmia, pallor, lymph nodes enlargement, spleen enlargement, florid middle-aged women, plethoric, stout, thyroid deficiency.

History of the Disease from Childhood.

Heredity 50 per cent.

Endocrine disturbances present.

Gastro-intestinal disturbances—achlorhydria, gall bladder diseased—constipation and stasis.

To prove infection: Culture of deep inguinal glands and vaccine prepared from the fluid from joints.

Arthritics suffer from coldness and blueness of hand and feet, *i.e.*, disturbed blood circulation.

Raynaud's Syndrome is associated with Rheumatoid arthritis.

Treatment.—Early diagnosis is essential. There is paramount need for early and sustained treatment. The sooner the treatment is begun the greater are the chances for arrest or recovery from the disease. General treatment in an institution is important.

Rest, fresh air, warmth and sunlight, generous feeding, treatment to the joints by physical methods—dry or moist heat, massage, passive movements, splinting when necessary, diathermy, X-rays, orthopædic measures—together with specific drug treatment, as by vaccine or gold therapy. Vaccine therapy is disappointing.

The affected joints must be rested by temporary fixation in plaster; after a period of complete rest, daily passive movements of the joint through its normal range are given. Fixation in faulty positions must be prevented. Gold therapy represents the greatest advance in the drug treatment of arthritis during the last 30 years. All observers are agreed that it is of no value in true Osteoarthritis and non-articular rheumatic diseases.

Small dosage, test for idiosyncrasy of the drug, preliminary blood count and sedimentation test before embarking on a course, prevent complications. The drug must be withdrawn on the

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first symptom of intolerance. Development of the respiratory capacity is fundamental in the general treatment of the disease.

Keep a record chart in Rheumatoid arthritis—for recording activity of the disease, joint positions, ranges of movement.

Deformity of the knee is one of the most common and serious problems. It should be corrected under anaesthesia very slowly and put in plaster so that the patient can get out of bed. Mobilisation and correction, retention and re-education of the quadriceps and the fullest development of active movements are to be achieved.

There is only a limited scope for Synovectomy. Patellectomy is indicated if the patella is ankylosed to the femur; Osteotomy for ankylosis with deformity of the wrist, hip, knee and foot joints is valuable. Arthroplasty is efficient for temporo-mandibular and elbow joints.

Triple arthrodesis or sub-astragaloid arthrodesis is required for painful fibrous ankylosis of the foot with or without deformity. For multiple claw toe deformities, Lambrimudi's method of interphalangeal arthrodesis gives remarkable results.

Effects of spontaneous or induced jaundice on Rheumatoid (atrophic) arthritis (Philip, S. Hench, Mayo-clinic):—When patients with Rheumatoid arthritis or with Primary Fibrositis become definitely jaundiced their rheumatic symptoms are rapidly, markedly, and generally completely alleviated for some weeks or months. It was casually noted by Still in 1897.

With the onset of any one of several types of jaundice, rather dramatic remissions in rheumatic symptoms,

lasting from 3 to 4 weeks occurred in 19 cases of Rheumatoid arthritis, in 9 Primary Intramuscular or Periarticular Fibrositis, in 2 of lumbosacral and sciatic pain and in one of Secondary arthritis of the hips. Remissions averaged (roughly) from two to three times the average duration of the jaundice and the symptoms of active disease; residual articular thickening and disability from deformity were unaffected. The production of artificial jaundice and induced hyperbilirubinæmia are used in an attempt to reproduce the phenomenon.

There is no case in this series to confirm or disprove this observation.

Young reported in the International Surgical Congress in Cairo on Lumbar Ganglionectomy: "The most striking result of all was achieved in six cases of profoundly disabling polyarthritis, of a rheumatoid type, the completely bed-ridden and crippled patients being relieved from pain and restored to possibility of a useful life."

Adson's first case was reported in 1928 in the "Proceedings of the Staff Meetings of the Mayo-clinic". A bilateral lumbar ganglionectomy was performed in June 1926 by Adson. It was thought that, on account of a high vaso-motor index, the ganglionectomy procedure, by inducing favourable vaso-dilatation, might beneficially affect the condition of the disabled joints. There was a definite improvement and relief from pain.

In view of the favourable result, other cases were submitted to the same procedure and in 1929 Rowntree and Adson were able to report their sixth case.

Fraser in 1931 recorded one case in a girl of 23, who had pronounced polyarthritis of the upper extremities,

A cervico-thoracic ganglionectomy was carried out on the left side, with a tolerably favourable result as regards relief of pain. In the report of Paterson Ross to the Association of Surgeons of Great Britain and Ireland, it is stated that sympathetic ganglionectomy was performed in five cases of chronic arthritis associated with excessive sweating and vasomotor disorders in the affected limb. What the exact rationale of the therapeutic process is, it is not possible to say with any degree of certainty.

As the result of lumbar ganglionectomy operation (in each case bilateral) all the patients were at once relieved of pain, and obtained relief almost immediately from the adductor and flexor spasm; the results in Young's cases have not deteriorated.

Difficulties in the Technique of the Operation:—

(1) Enlarged lymph glands especially on the right side; if the nodes are cleared away, there is no difficulty in the recognition of the ganglionic chains.

(2) Venous oozing especially on the right side.

(3) Adhesions in the region of the cæcum.

(4) A very short mesosigmoid.

There is always associated improvement in the joint condition of the upper limbs and temporo-mandibular joints and lower joints of the spine. A noteworthy feature, too, was the fact that the patient himself draws attention, within the first 24 hours, to the substantial improvement which has taken place in the upper limbs as well as in the lower limbs.

Complications after Operation:—

(1) Retention of urine.

(2) Some abdominal distension and discomfort.

These require the usual attention and treatment.

Case Reports of Rheumatoid Arthritis.

Seven cases of Rheumatoid arthritis are described on five of whom bilateral lumbar ganglionectomy has been performed:

1. VARADAMMA, 30. Female. All joints affected with contractures; Stools—no patho-genic organism grown on culture. Bilateral ganglionectomy done, 11th September 1938. Sedimentation rate 3.8 cc. in 1 hour (Zuklva and Gowa). (Considerable fall—poor resistance). Pathology report 27th August 1938 (1798). Ganglion cells seen; 27th September 1938. Blood calcium 10.2 mgm per cent; Local orthopaedic measures of extending the knee, and application of plaster of paris supports were done. Patient's pain was relieved and she was able to get out of bed.

2. RANGAMMA, 45. Female. Both upper extremity and lower extremity joints affected. No focal sepsis; all other investigations were negative; there was effusion in the knee joints. Patient improved considerably. Culture from the effusion in the knee joint was sterile. Bilateral ganglionectomy done, 21st March 1938. Tissue showed Ganglionic tissue surrounded by fibro fatty connective tissue.

3. SUBBAMMA, 25. Female. Admitted 17th June 1938. Elgin Ward.

Complaint.—Pain and ankylosis of the joints of upper and lower extre-

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mities—both sides—and inability to walk.

Duration.—One year.

History.—Present complaint started one year ago with pain in all the joints. No fever or swelling of the joints were noticed. Has been progressive up to the present condition.

Family History.—Married 10 years; had one child six years ago. No abortions. No history of venereal disease.

Clinical Condition.—Upper extremities.

Right:—

(a) *Shoulder.*—Free.

(b) *Elbow.*—Fixed in a position of partial flexion 105° with pronation of the fore-arm. No further movements possible.

(c) *Wrist.*—Palmar flexed, flexion at the metacarpophalangeal joints. Adduction deformity of the index finger.

Left:—

(a) *Shoulder.*—Rotation movement lost.

(b) *Elbow.*—Limited amount of flexion possible.

(c) *Wrist and fingers.*—Same as on the right side.

Lower Extremities:—

Right:—

Hip.—Flexion and rotation possible. Extension limited.

Knee.—Flexor contracture.

Foot.—Stiffness of the toes and ankle and corn present opposite the interphalangeal joint of the great toe.

Left:—Hip and knee.—Flexor contracture.

Spinal Movements.—Possible. No pain.

Joints are not swollen or warm except both the knee joints which presented slight swelling and warmth.

Heart.—Nil abnormal (no enlargement or murmurs).

Investigations:—

X-rays.—Osteoporosis of all bones.

Blood.—Calcium. }
Phosphatase. } Normal
Cholestrol. }
Sedimentation rate. }

Urine.—Nil abnormal. Culture sterile.

F.T.M.—Within normal limits, 11th September 1938.

Motion.—No pathogenic organisms grown.

Cervical Smear.—Negative for gonococcus.

X-ray of sinuses and teeth.—Nothing abnormal.

Glucose tolerance test:—

(1) 0.1% urine—no sugar.

(2) 0.18% do.

(3) 0.22% do.

(4) 0.2% urine not obtained.

(5) 0.167% do.

Diagnosis.—Rheumatoid arthritis.

Treatment:—

27th June 1938. Bilateral lumbar ganglionectomy done.

30th June 1938. Pain in the joints, both upper and lower extremities better. Can stretch the knees.

20th July 1938. Both knees stretched to slight extent under anaesthesia and plaster casing done. Patient encouraged to walk with plaster casing.

20th August 1938. Plaster casing removed. Patient walks with crutches.

31st August 1938. Movements under anaesthesia given.

15th September 1938. Patient having deep X-ray therapy for the joints.

4. KAMALAM. 25. Female. Admitted 1. th July 1938. Elgin Ward.

Complaint.—Pain in all the joints.

Duration.—Two months.

History.—Married and has children. Insidious onset. No fever. Has burning sensation in the limbs and eyes.

Clinical condition.—Joints not swollen. Movements of both the knee joints painful and limited. Prematurely grey-haired and has hair on the upper lip. Amenorrhoea now.

Investigations:—

X-ray:—Osteoarthritic changes, seen in both the knee joints. Lipping of both sides. Intra-articular space clear except on the right side.

Blood.—B.P. 100/60:

(a) R.B.C. count, 4.56 millions.

(b) Hb. 80%.

Glucose tolerance test:—

(1) 0.057%

(2) 0.122%

(3) 0.135%

(4) 0.143%

(5) 0.155%

F.T.M.—High curve.

Urine.—Nil abnormal; culture sterile.

Motion.—Culture. No pathogenic organisms grown.

Kahn—Negative.

Cervical smear.—Negative.

X-ray of sinuses and teeth.—Normal.

Diagnosis.—Polyarthrititis.

Treatment.—27th July 1938. Bilateral lumbar ganglionectomy was done under general anaesthetic.

Pathological Report:—

Ganglionic cells and nerve fibres "present."

30th July 1938. Pain much better.

15th September 1938. Patient is having deep X-ray therapy for the joints.

Patient had a course of gold injections. She was recently seen in June 1939; the improvement is maintained.

5. OOSMAN SHERIFF, 25. Male. Muhammadan. Poly arthrititis. All investigations for focal sepsis, negative.

9th July 1938. Sedimentation test. R. B. C. occupying 7.8 c.c. (Zuklva and Giddall).

Patient refused operation.

6. ARUMUGAM. 22. Male Hindu.

Admitted for pain and swelling of both knee joints, both ankles, elbow, wrist and small joints of the left hand.

Duration.—Five months.

Family history.—Unmarried. Brother had the same sort of complaint for 10 years and is a cripple now.

History.—Gonorrhoea six months back. Had native treatment. Discharge stopped. The present complaint started with high fever and pain in the knees. Subsequently other joints became involved. Since then the patient has swelling of large joints. Patient is unable to walk without the aid of crutches. Does not give history of sore.

Condition on admission.—Patient is an ill-nourished young man of about 20 years. Anaemic. Teeth clean. Respiratory and cardiovascular and central nervous systems, nil abnormal.

Local condition.—Patient keeps his legs in semi-flexed condition. Swelling of large joints (both knees and both ankles). Wasting of muscles of both thighs. Joints are not warm. Effusion into both knee joints.

Movements.—Active movements. He is able to flex and extend only very little. Complains of intense pain in the joints.

Passive movements.—Possible but resented. Inguinal glands enlarged on left side.

Investigations:—

Kahn.—Negative.

Wassermann.—Negative. No evidence of gonorrhoea on repeated examination.

Treatment.—In the special department one course of Dmelcos therapy; no improvement. Antisyphilitic treatment with mapharside and Bismuth; no improvement. One course of sulphamylamide 9 tablets (5 grs.) for 6 days; no improvement.

On 21st November 1938, under C₂E₃. Right paramedian incision. Lumbar sympathetic ganglionectomy done on both sides. Wound closed in layers. Pathological report of the material removed showed ganglionic tissue with evidence of inflammatory change. Patient was able to move his joints without pain. After the operation the swelling subsided.

Patient has pain on extending the knee joints and the left elbow joint; patient had a course of diathermy and deep X-ray therapy to the joints.

7. KAMALA. 10. Female child. Hindu. Admitted on 27th October 1938, transferred to Orthopaedic Department on 9th November 1938.

Admitted for fever and inability to use her limbs, and deformity of all the joints of the body with considerable crippling.

Duration.—Three months.

Previous illness.—Had fever lasting for 3 days 3 months ago.

Family history.—Nothing particular.

History of present illness.—Three months ago patient had fever which lasted for 3 days. Since then the patient is unable to use her limbs,

General condition.—Poorly nourished girl; anaemic; teeth clean. Tongue pale. Both knees are kept flexed; elbows also kept flexed; submental and sub-maxillary glands enlarged.

Cardiovascular System.—Apex beat seen outside nipple line.

Boundaries:—

Third-Rib.

One finger breadth external to right lateralsternal line.	One finger breadth external to left mid-clavicular line.
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Heart sounds.—Feeble systolic murmur heard in all the areas. Pulse regular. Volume and tension good.

Respiratory and C. N. S. Alimentary.—Nil abnormal.

Local condition on admission:—Patient keeps her legs flexed upon the thighs. Thighs flexed and adducted. Patient can only lie on her sides. The fore-arms and hands are kept flexed. The finger kept at extension at metacarpophalangeal joints and flexed at terminal interphalangeal joints. The arms are kept adducted. Wasting of muscles seen on both sides of joints.

Movements.—All joint movements are possible but very painful and resented.

Investigations:

Urine.—Acid sp. gr. 1014—no sugar, no albumin.

W. B. C. count 13,750 per c.mm.

Differential count: Polymorphs 71%
Lymphos 18%
Monocytes 4%
Eosinophiles 6%
Basophils 1%

Wassermann.—Negative.

Kahn.—Positive.

E. N. T. Examination.—Sinuses clear.

30th November 1938.

Blood.—Calcium 8.5 mg. %
Urea 23 mg. %
Sugar 0.08 %

Osteoarthritis.

Has afflicted not only mankind but the lower animals from remote period.

A study by Elliot Smith, Wood-jones, of the anatomy of mummies show that Osteoarthritis was very common amongst the ancient Egyptians. The majority of these lesions appear to have been the common osteoarthritis, which involved not only the men, but many of the pet animals kept in the temples. In a much higher proportion, than in modern days, the spinal column was involved. It is interesting to note that the determinative of old age in hieroglyphic writing is the picture of a man affected with arthritis deformans.

Ankylosis of one joint may bring strain in some adjacent joint, as arthrodesis of the hip may be followed by chronic sacro-iliac or lumbosacral strain.

In certain occupations (A. Lane) and trades it is common; so correct posture is essential and preventive.

Osteoarthritis follows (a) non-reduction of congenital dislocation of hip, and (b) Perthes disease at about 25 to 30.

The blood vessels never show arterio-sclerotic changes when the

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earliest signs of degeneration of articular cartilage first become manifest.

The onset of symptoms does not present any definite relation to the degree of osseous change but depends rather upon the state of the connective tissue elements of the joint. There is no definite relation between the degrees of the changes and the symptoms. In Osteo-arthritis of the hip joint pains are referred along the sciatic or anterior crural nerves. X-ray of the hip joint should always be taken in every case of Sciatica.

The following statement shows the age and site distribution in 100 cases.

Cases of Osteoarthritis.

Total number of cases : 100.

Sex: Males 78 ; Females 22.

Religion: Hindus 60 ; Indian Christians 3 ; Mahomedans 8 ; Anglo-Indian 1 ; for the rest data not available.

Age period.	No. of cases.
10 to 20	3 (2 at 19 ; 1 at 16)
20 to 30	7
30 to 40	14
40 to 50	29
50 to 60	23
60 and above	14 (between 60 and 70) ; 3 (at 70 and above).

Joints affected:—

Shoulder: 11 cases: Right side 5; Left side 6.

Elbow: 3 cases: Right side 3 ; Left side nil.

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Hips: 5 cases : Bilateral 1 ; Left side 1 ; Right side 3.

Knee: 67 cases: Right side 20 ; Left side 21 ; Bilateral 10. For the rest data not given.

Ankle: 3 cases.

Wrist: 4 cases: One case with Volkmann's contracture with ankylosis of Carpal bones; one case of interphalangeal joint; one case of cervical spine; one case showed spondylitic changes in the lumbar spine. Patient came for pain in the hips.

Local sepsis is treated; diathermy and manipulations under anaesthetic are given; manipulations are of great value; hip joint cases require subtrochanteric osteotomy which gives good results; early knee joint cases are benefited by excision of patella; novocaine injection or injection of im-metal gives good relief especially in knee cases; lumbar ganglionectomy is of value; loose bodies require removal.

Young records unilateral lumbar ganglionectomy in a case of advanced grossly disabling Osteoarthritis of the left hip joint in a woman aged 62 with great benefit. Improvement was maintained.

Loose bodies in joints are common; only one case was operated.

Osteoarthritis of spine will be considered separately under "Back-ache."

Loose Bodies in Joints.

Total number of cases 17.

Sex:—Males 15 ; Females 2.

Age period.	No. of cases.	
1 to 10	1 (Aged 7)	17. M. H. Giant celled tumour right radius.
10 to 20	5	25. M. H. giant celled tumour Third left metacarpal.
20 to 30	5	
30 to 50	1	23 M. Giant celled, tumour left ulna, excised.
40 to 50	1	
50 and above	4	28. M. giant celled tumour Right femur left end (2 cases).

Site:—

Knee 8 cases. One case behind ligamentum patellæ. (Print XX).

Elbow 5 cases. One case wrist with ulnar styloid rounded off.

Tumours of Bone.

It would be noted that exostosis of the phalanx of the great toe is a very uncommon condition; so also chondromas of fingers and metacarpals. The following is a list of a few of the cases met with in the department:—

A Non-malignant Tumours of Bone.

40. M. H. Exostosis femur lower end.

20. M. Fibula upper end.

30. M. H. Osteoma terminal phalanx right second toe.

15. M. H. Periostitis or new growth left end right humerus.

8. Mc. H. Exostosis upper end left tibia.

30. M. H. Exostosis of second phalanx right leg toe.

25. M. H. Giant celled tumour (white variety lower end right radius).

35. M. H. Giant celled tumour lower end right tibia.

Female. Right femur lower end.

12 M. H. Right humerus upper end and separation of epiphysis.

They are treated by local excision followed by deep X-ray. One case of lower end tibia and one of radius were treated by excision of bone, followed by an autogenous bone graft in the former case from lower end tibia. The man is not fit for work still after two years as he is not bearing weight. One case of osteoclastoma lower end of femur was treated by Putti's operation (described in "Robert Jone's Birthday" Volume. The lower third of femur was excised; the upper third of tibia was split into two halves so that the anterior portion of tibia was tilted upwards so that the two cartilage covered articular surfaces will be in apposition. The patient died of shock.

It would have been better to amputate in these cases.

Malignant.

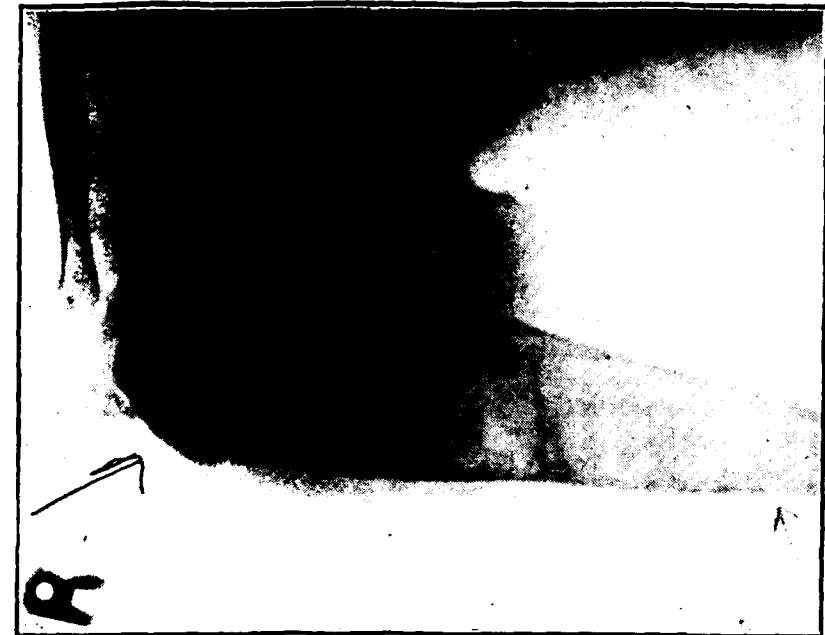
40. F. H. Secondary in right humerus shaft.

30. M. I.Ch. Sarcoma left femur left end.

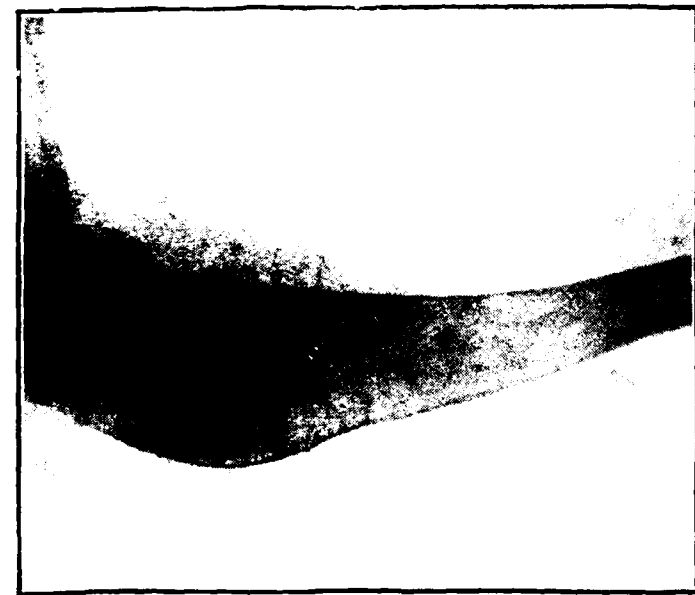
Osteogenic Sarcoma.

10. M. H. Upper end of tibia.

25. M. H. Left femur lower end.



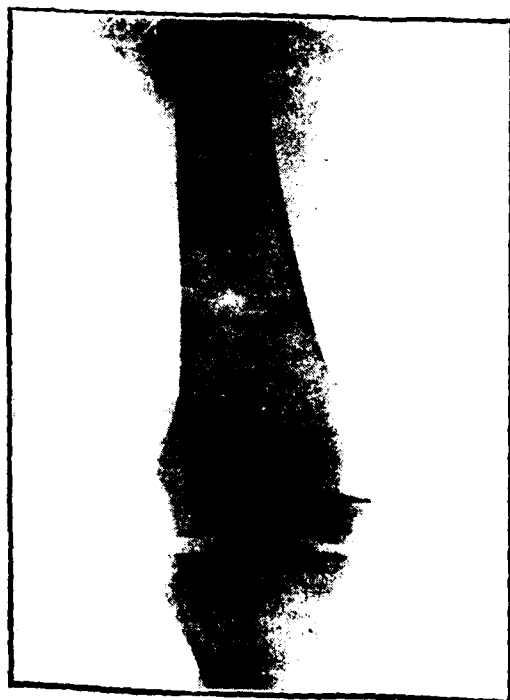
XXI-B. Large cyst of the right humerus affecting the upper epiphysis also.



XXI-A. Male, aged 18.—Bone cyst of right humerus involving the epiphysis also; the cyst was multilocular and contained clear fluid—an autogenous bone graft was laid in. Blood calcium normal—all other bones normal.



XXII. Ankylosis of the radio carpal joint.



XIII. Mrs. W., aged 50.—Calcification of the upper end of the fibular collateral ligament: the calcified material was in the midst of gelatinous fluid



S—Superior hip of acetabulum fragmentary—symmetrical.

This case was undergoing repeated courses of deep X-ray treatment for over a year and a half. The pain disappeared and he was in good health. Recently it has begun to grow considerably; patient refused amputation. In the case of the young boy the growth began to grow very rapidly after deep X-ray.

B. Cystic Disease of Bone.

- 50. M. Head of right humerus.
 - 28. M. Lower end of right ulna.
 - 30. M. Upper end of right ulna.
 - 50. M. Middle toe right foot proximal phalanx.
 - 19. F. Talus left.
 - 26. M. Right femur neck cyst.
 - 2½. Mc. H. Right shaft pathological fracture.
 - 12. Mc. H. Left femoral neck cyst. Had fracture in 1930 and again in 1933; good union.
- They generally come with fracture and then only they are spotted.
- 3. Mc. H. Lower end left humerus; cyst at the end of diaphysis; no periosteal thickness; no reactionary wall.
 - 22. M. H. With pathological fracture at its middle.
 - 19. M. H. Large cyst of right humerus affecting the epiphysis also right down to below the insertion of Deltoid; cyst curetted and a large autogenous bone graft is put in from tibia. (Print XXI).

Conclusions

1. A study of the various groups of common conditions seen in Madras as

(a) dislocations, (b) fractures, (c) myositis ossificans, (d) nerve injuries, (e) osteomyelitis and acute epiphyseitis of the hip joint, (f) osteoarthritis, (g) osteochondritis, and (h) tumours of bones, is attempted.

2. The following conditions hitherto unrecognised in Madras are described:—

- (a) Post-traumatic calcifications of ligaments;
- (b) osteomalacia in women of Madras;
- (c) large number of acute cases of rickets;
- (d) presence of adolescent deformities of acetabulum—all in males;
- (e) greater preponderance of osteochondritis of the hip in females; presence of osteochondritis of the upper end of the humerus;
- (f) absence of fractures in carpal navicular in females;
- (g) fracture of calcaneus in children;
- (h) tuberculosis of nerve sheath;
- (i) preponderance of acute osteomyelitis in female children than in male children; and
- (j) acute osteomyelitis of the long bones in adults.

3. No case of Kohler's disease of tarsal navicular has been recognised.

4. Parts of the lecture dealing with anterior polio-myelitis, surgery of other paralyses of childhood, tuberculosis of joints and spine are published separately.

5. Bone and joint lesions in yaws, smallpox and disorders of malnutrition as scurvy, rickets and incorrect posture will be published separately.

6. Treatment of rheumatoid arthritis by abdominal bilateral lumbar ganglionectomy and use of Smith Patterson pin in subcapital fractures of the neck of femur are practised for the first time in Madras and seven cases of the former are described.

I am indebted to Drs. N. Ramathan, M.B., B.S., Rangavadivelu, M.B., B.S., Srinivasaraghavan, B.A., M.B., B.S., House Surgeons, for the invaluable help in going through the enormous amount of material together with me. Thanks are also due to the Professors of Biochemistry and Bacteriology, the staff of the Barnard Institute of Radiology and the Librarian of the Madras University for their co-operation and help.

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The Use and Abuse of Cardiac Stimulants.

BY CAPT. S. SHONE, M.D., M.R.C.P. (Lond.), I.M.S.

It used to be fashionable, even amongst the greatest exponents of the art of Medicine, to spend a considerable time discussing the morbid anatomy, symptomatology and differential diagnosis of a case and then to gloss over the treatment as an unimportant trifle. Ambroise Pare said of a patient "I treated him and God cured him". Admirable as was the sentiment so expressed, it implied not only a belief that life was sustained by a divine power, but that the remedies available were utterly inadequate to assist Nature. "Therapeutic nihilism" is descriptive of the attitude, so common once, which scorns the use of drugs. It was probably justified, at one time, by the embryonic stage of the science of pharmacology, which was then emerging from its cocoon of mediæval entanglements. Now, however, such a viewpoint merely indicates a failure to keep up with modern advances. In spite of this, one still encounters physicians who deny the value of any but a limited number of drugs with which they made acquaintance many years ago.

The pendulum would seem, however, to have swung in the opposite direction and the extraordinary gullibility of the medical profession is manifested by the rampant activities of the commercial drug houses. New products are turned out by the hundred. Doctors no longer need the British Pharmacopœia or a like testament of their profession, but are provided with booklets which not only give the products of the parti-

cular firm, but an alphabetical list of diseases and the corresponding proprietary drug to employ. The virtues of each remedy, based upon some obscure and theoretical activity, are supported by copious references to medical literature, at the sight of which the practitioner promptly capitulates. He is unable to assess the value of this basic research and his semi-scientific upbringing makes him an easy target for the commercial propagandist, whose tacit implication that the doctor is, of course, fully aware of the tremendous activities on the research front, is the last word in "Sales' Psychology".

Medicine cannot be—at least for many decades to come—an exact science, but it should be the aim of every practitioner to use the weapons which ancillary sciences have placed in his hands, with some degree of scientific exactitude. Drugs which the chemist elaborates are first subjected to rigid animal experimentation by the pharmacologist and the biochemist. When therapeutic activity and lack of toxicity have been confirmed in the animal, the clinician is justified in testing the value of the drug on the human being. It is at this stage that the average drug firms become anxious to recoup themselves for the cost of the antecedent research and for the intensive advertising campaign to come. They put the nostrum upon the market, having secured a mildly confirmatory report from some worker, whose sole intention is to call attention to the claims of the drug.

with a view to stimulating agreement or opposition to his tentative findings. The average doctor, whose sole interest, at first, is whether he is going to find a useful piece of blotting paper in the communication which has reached him, gradually succumbs to the spell of intensive propaganda. (That the drug firms regard the whole business as pure propaganda is shown by the fact that some introduce their representatives as "propagandists".) The longer the medical man is in practice the less likely is he to maintain contact with progress in his profession through the medium of journals and the more does he come to rely upon the drug houses for his information. The less ethical firms, it is obvious, will not hesitate to turn this to commercial advantage.

One of the reasons for the fervour with which certain remedies have been accepted in the past, only to be repudiated within a few months, is that the limitations of practical medicine make true control experiments almost impossible. An example of topical interest may not be out of place. The substance M. & B. 693, following the animal experiments of Whitby, has been extensively tried in England upon cases of lobar pneumonia. The results appear to have been extraordinarily and uniformly good. Now, in America, treatment of this disease has advanced upon the rational lines of attempting to neutralise the effects of the disease by antisera. It was some time before American observers could obtain sufficient quantities of the new drug and reports of its action are, if not wholly condemnatory, at any rate by no means as eulogistic as they might be expected to be. Without wishing to imply that the experiences of American authorities are coloured by prejudice in favour of their own

particular line of treatment, one can readily imagine that the very inexactness of the practice of medicine makes differences upon even such a comparatively simple problem inevitable. Here we have vast experiments, conducted under good conditions in two countries, giving rise to seemingly conflicting results. How then, can the practitioner, within his own little sphere, circumscribed by paucity of cases and the demands of daily routine, be a capable judge of the efficacy of a less renowned drug than the above?

There is no field of therapeutics in which more optimism and credulity, coupled with an ignorance of the true uses of the remedies employed, is displayed than in the administration of the so-called "cardiac stimulants". As has been pointed out, it would probably be true to say that no patient under the care of a duly certificated medical practitioner, is permitted to quit this world without an injection of some cardiac stimulant. Two things are considered the perquisite of the dying—oxygen and an injection of some kind. Of the manner in which oxygen is used in general by the profession, it need only be said that it is coupled in the mind of the layman, with the customary religious rites, in its inability to prevent the patient's onward progress. The same foreknowledge of an early demise is manifest in the use of the hypodermic syringe.

Let us consider the manner in which the profession copes with circulatory failure. We use the term "circulatory failure" to include two varieties of cardio-vascular breakdown—the cardiac and the peripheral. The former is customarily divided into "right-sided" failure and "left-sided" failure, although the distinction, apart from dogmatic hospital

teaching is somewhat artificial. Failure of the right heart we are all accustomed to seeing as a terminal result of mitral stenosis and of chronic pulmonary conditions. Left-sided failure occurs as a result of constant and unendurable peripheral resistance, as for example in hyperpiesia. Peripheral failure occurs mainly in the course of an acute toxæmia, of which two typical examples are diphtheria and pneumonia. It is due to a paralytic effect of the toxins upon the walls of the capillaries. Normally not all the capillaries of a tissue or organ are patent: if they were, these extra capillaries could accommodate the major quantity of the circulating blood. When, however, they are paralysed by, say, the diphtheria toxin, they lose their tone and do act as a reservoir for a vast quantity of blood. In this way they are responsible for inducing a condition very similar to that obtaining in secondary shock.

In order to make perfectly clear what it is that we are dealing with when we encounter a case of circulatory failure, we may summarise the features of each variety of failure.

Right-sided failure is associated with dyspnoea, cyanosis, oedema and, very frequently, a cardiac arrhythmia—notably auricular fibrillation.

Left-sided failure may manifest itself by dyspnoea, often of the type known as "cardiac asthma", by anginal pain, by coronary thrombosis and by acute pulmonary oedema. (Coronary thrombosis is included because it is a pathological variant of angina pectoris, which is a physiological response to ischaemia.) Probably we should also include in this list ventricular fibrillation and cardiac arrest during anaesthesia.

Peripheral failure is characterised by a profound fall in blood pressure, by a running and thready pulse and by all the features associated with shock.

Here, then, are the main conditions one is called upon to treat. Let us now consider the armamentarium at our disposal. The drugs, which practitioners believe capable of stimulating the heart, are:—

Digitalis and its allies—strophanthus and squills.

Camphor, now largely replaced by coramine and cardiazol.

Adrenalin.

Strychnine.

Caffeine.

Of all these, digitalis has pride of place as a cardiac drug and it is universally employed in the treatment of auricular fibrillation. It will be remembered that it does not cure the arrhythmia, but by virtue of its property of depressing conductivity in the junctional tissues, it diminishes the number of impulses which pass down the bundle of His from the tormented auricle. Nobody will dispute the dramatic effect of digitalising a patient with congestive failure, associated with fibrillation, but whether digitalis will prove of value in a case of failure with normal rhythm is a matter by no means clearly established.

Digitalis stimulates the vagus and thus it should slow the heart. This effect, however, is only manifest in children to any marked degree. By a direct action on the heart muscle, the drug increases the strength of systole, but, whether an exhausted heart muscle is benefited by this flogging effect, is open to serious questioning. Nobody will deny that the results of

administering digitalis in cases of heart failure with normal rhythm are unreliable and inconstant. It would appear that the best effects are obtained in patients with oedema. To sum up a difficult situation, it would be best to state that, in case of fibrillation with rapid rate, digitalis should be used, and that in patients with failure and normal rhythm it may be tried. In this connection, it may be advisable to stress that each practitioner should make himself thoroughly familiar with one of the digitalis products and, as far as possible, use that one only. A drug of such potency as digitalis merits an intimate acquaintance with its peculiarities and dangers and this can only be acquired by an intensive study of one product.

Camphor in oil was formerly extensively used in Germany as a cardiac stimulant. It may be stated categorically that camphor has no stimulant effect on the heart. When injected subcutaneously its only effect is to stimulate the respiratory centre through a local irritative action.

The use of coramine, cardiozol and veritol (another allied substance) is widespread for the resuscitation of patients who are in extremis. In what type of failure can these drugs logically be expected to act? They are powerful stimulants of the respiratory centre. They may raise the blood pressure when carried by the blood to the medulla, but, unfortunately, when the blood pressure is lowered as in peripheral failure, by the effect of circulating toxins on the capillaries they very often have no influence upon it. The drugs have very definitely no local action upon the heart, other than a harmful one. Thus, in all forms of circulatory failure proper, they are of no value. Even when

circulatory failure is associated with, or preceded by, respiratory collapse, as in the mishaps of anaesthesia, coramine has been recently shown to be a danger rather than a help.

Adrenalin, by reason of its sympathomimetic action, raises the blood pressure and hence it would appear to be of value in peripheral failure. But its action is transient only, and it affects the sympathetic nerve endings of the muscle of the arterioles without acting on the capillaries. There is, nevertheless, some theoretical sanction for its use in this condition.

In cardiac failure, adrenalin merely increases the load on the heart and is contra-indicated. It finds some use, however, in the treatment of cardiac arrest, especially in the Stokes Adams syndrome and in anaesthesia. In the latter condition, when the heart stops, adrenalin is customarily injected into the cardiac muscle direct. Whether the occasional successful result follows from absorption of the drug is extremely doubtful, since the intense vasoconstriction produced militates against a sufficiently rapid absorption. It is probable that the stimulation of the needle is the deciding factor.

Strychnine, the use of which in England rivalled that of camphor in Germany, has no direct effect on the heart. By means of a stimulating effect on the medullary centres, it produces a generalised vaso-constriction, which is particularly marked in the splanchnic area. The vaso-motor centre does not control the capillaries and hence strychnine has no place in the treatment of peripheral vascular failure, although many still use it on the supposition that a general stimulation of the nervous system may help to combat toxæmia and the effect of

histamine-like bodies, which are presumed to be present.

In cardiac failure with its associated stagnation of blood, it is theoretically possible for a larger flow to be returned to the heart and thus improve the coronary circulation, if big doses (1/10th gr.) of strychnine are used, but on the whole it may be said that the hope of reviving a patient in extremis is very remote.

Caffeine is not extensively employed as an emergent drug. It produces dilatation of the coronary vessels and may thus benefit the heart, but, by an action on the sino-auricular node, it also produces an increased rate which is a distinct disadvantage.

We have now considered the conditions we are called upon to treat and the drugs most of us use. The analysis shows that, apart from the superlative value of digitalis in cardiac failure with fibrillation, there is no remedy mentioned which is effective to overcome the mechanical disabilities occurring in the various forms of failure of the circulation. If we aim at breaking a vicious circle by a localised effect on medullary centres, pump or periphery, we fail. If we consider that it is possible to whip a tired or poisoned myocardium into increased activity by a direct stimulating effect on the heart muscle, we shall be disillusioned, because we shall thereby accelerate the patient's death.

What, then, is rational treatment of these conditions? To those who still retain illusions concerning the miracle working activities of the modern doctor, it will be very disappointing to be told that a broken-down piece of machinery will inevitably stop functioning. One must distinguish between the emergency failure, which is more likely to occur in left-sided conditions, and the failure of more gradual onset, as in congestive

failure or the peripheral failure of toxæmias.

The heart may stop beating during the administration of an anaesthetic, especially chloroform. Early arrest in chloroform anaesthesia means ventricular fibrillation and is invariably fatal. Later arrest means overdosage and this reflects upon the anaesthetist.

Angina pectoris is probably always due to an insufficient coronary flow and is probably to be explained as on a par with the pain arising in the intermittent claudication of thrombo-angeitis obliterans. If the attack is uncomplicated, vaso-dilators such as amyl nitrite will relieve it and the future treatment of the patient is an exhortation to live within much restricted limits of activity.

Acute pulmonary oedema may be the terminal event of cardiac defeat from left ventricular overloading. The essential treatment is a large dose of morphia, perhaps combined with atropine. With recovery, the progress of the causative condition, whether primary hypertension or that from secondary to nephrosclerosis, may be stayed by the adoption of restrictive measures. But, in any case the patient will soon succumb. In this connection, it may be mentioned that the practitioner should always be on the watch for two extremely unfavourable signs in the course of left ventricular failure, namely, gallop rhythm and pulsus alternans.

Coronary thrombosis should nowadays be always in the mind of the physician. Slight attacks, so often mistaken for "indigestion", may, if missed, be responsible for precipitating the patient into a condition of failure, from which he might have been spared for some time to come. In the treatment of the condition, morphia again plays a large part.

In the case of a right-sided failure, whether with or without arrhythmia, morphia at the onset is of immense value. Here it may be emphasised that, used judiciously, morphia is an invaluable asset in the treatment of cardiac failure. It provides rest for the patient and may tide him over a critical period, which has often been induced by an unwise activity. The effect of a single dose of morphia upon a patient in extremis is often remarkable.

If the case is one of fibrillation, an attempt will be made to ensure digitalisation as soon as possible, usually by the massive dose method recommended by Eggleston. (Enquiry should always be made as to recent administration of digitalis.) Intravenous medication is best effected with digitalin or digoxin as strophanthin is not without danger. Its toxic dose is very close to the therapeutic one and accidents of injection are liable to occur.

When congestive failure exists with normal rhythm, digitalis may be tried, but reliance should rather be placed upon the accessory methods of treatment such as morphia and venesection. With regard to the latter, it is apparently not sufficiently appreciated that the blood must be withdrawn rapidly and from a vein as near to the heart as possible. The application of leeches to the liver area is a measure not to be sneered at, as a relic of the past.

A word about the value of oxygen may not be out of place. In the ordinary case of cardiac failure, oxygen has very little, if any, value. If the failure arises from some chronic pulmonary condition which has ultimately proved too much of a burden for the heart, it may be employed with benefit. Similarly, if there is congestion of the lungs, oxygen will be valuable.

Finally, for the cases of peripheral failure, about which it may be said immediately that, in them, very little good can be done. We have seen that coramine, strychnine and adrenalin cannot be expected to help. Pituitrin also is of no great value, although it acts on capillaries as well as arterioles. Where peripheral failure is due to excessive loss of fluid, intravenous injection of fluids, such as hypertonic glucose solutions, 6 per cent gum saline or even blood, may be useful. Where capillary tone is lost from toxæmia, such as in pneumonia or diphtheria, adding more fluid to a stagnant circulation cannot be expected to help materially. The ideal treatment in such poisonings should be as rational as science can devise and should consist in the neutralisation of the toxins. It has not been shown that digitalis is of the slightest use in the routine treatment of pneumonia nor is it of any value in the management of peripheral failure in general.

The keynote of the above remarks is that reliance cannot be placed upon the specious claims made for certain drugs which have been acclaimed as 'cardiac stimulants'. Rational therapy consists in prevention of failure by intelligent anticipation and attention to detail. When failure occurs it should be met with commonsense weapons. Should the patient's death be inevitable, the only question which the doctor has to ask himself is "Did I prevent the onset of failure for as long as was humanly possible?" If the answer is in the affirmative, the death of the patient cannot be a matter of reproach, since all men must die. It is far better that the patient should die in a dignified way, than that the doctor who tended him in life should act the charlatan at his death, irrespective of the moral effect of the syringe upon the relatives.

Gastric Analysis.

THE ANATOMY AND PHYSIOLOGY OF STOMACH.

BY DR. A. S. MANNADI NAIR, M.B., B.S., Ph.D. (Edin.).

The stomach should be considered only as a dilated portion of the alimentary canal required for the chymification of the food before further digestion takes place in the small intestine. The fundus of the stomach may be considered more or less of the nature of a reservoir, while the antrum as the motor of the stomach. The stomach wall has four coats: (i) the mucous, (ii) the sub-mucous, (iii) the muscular, and (iv) the serous. The mucous coat corrugated by many folds, called rugæ, is thinner at the cardiac end and thicker and firmer at the pyloric region. The cells lining the glands at the fundus are of three types:—(i) chief cells producing the enzyme pepsin, (ii) parietal or acid cells producing the hydrochloric acid, and (iii) goblet or intermediary cells producing the mucus. At the pyloric end the parietal cells are absent and only the other two are present. The blood supply of the stomach is from the arteries of the coeliac plexus and the nerve supply from the two vagi and the solar plexus of the sympathetic. Gastric peristalsis appears to begin in the fundus, moves down towards the pylorus, reaches the incisura angularis, marks the antrum, and proceeds therefrom steadily on to the pylorus. The form of the contraction waves apparently depends on the thickness and strength of the musculature. In a hypertonic steer horn stomach the waves are generally deep and short, while, in an atonic low stomach, they are usually longer and shallow. As the muscle increases in strength, generally towards the pylorus, the contraction waves appear to become deeper as they approach the pylorus. We may say that the main function of the stomach is reduction of the food to chyme. The acid secretion is of value in promoting the maceration of the food. The chemical digestion of the food is rather limited in the stomach. It is true that peptic digestion of proteins to peptone stage takes place in the stomach and for about half-an-hour ptyalin digestion of carbo-hydrates goes on in the fundus. The action of gastric lipase is very limited, only on emulsified fat.

Gastric Analysis.

It has been claimed that fractional gastric analysis reveals the function of the stomach, both (i) the secretory function of the mucous layer, and (ii) the motor function of the stomach which depends on the efficiency of the gastric walls and that of the sphincters. The gastric secretion in normal health varies widely in its chemical composition as it depends on various factors which may be classified as:—

A. External Factors.

(1) The composition of the testmeal itself which may be (i) oatmeal congee, (ii) two slices of bread and 200 c.c. of water, (iii) two slices of bread and 200 c.c. of plain weak tea without milk, or (iv) 50 c.c. of 7 per cent alcohol.

(2) *Individual Factor*.—The chemical composition of the gastric contents varies with different individuals and even with the same individual from day to day.

(3) *Age*.—The secretion decreases with age.

(4) *Sex*.—The acidity in women is less than that in men except at the old age, over 60 years, when it is practically equal in both sexes.

B. Internal Factors.

(1) The stomach content is composed of (i) food taken, (ii) gastric secretion, (iii) salivary secretion swallowed, and (iv) duodenal contents regurgitated through the pylorus.

(2) *Psychic Factor*.—It has been known that in nervous individuals the very act of swallowing the tube inhibits the secretion of the stomach.

(3) The stomach contents are not homogenous. The contents of the pyloric end differs in its acidity from that at the fundus. In practice the tip is kept at the lowest pole of the stomach and the contents therefrom are collected.

Technique—Varieties of Tubes.—Several varieties of tubes have been used for gastric analysis. We have the large Evald's tube used for one-hour method of the testmeal, the much narrower Ryle's tube used for fractional gastric analysis and a still narrower tube used for histamine testmeal introduced through the nose to avoid the contamination with saliva.

Preparation of the Patient.—After a light supper in the previous night, preferably with one or two charcoal biscuits, the patient comes to the laboratory in an empty stomach with no food, nor drink in the morning.

Introduction of the Tube.—The tube is sterilised by boiling water and then lubricated with glycerine. The patient is first assured that it is very easy to swallow the tube. He sits up and opens the mouth wide. The doctor holding the tip of the tube between the index finger and thumb of right hand, while holding the loops of the tube in the open left hand, places it at the root of the tongue and encourages the patient to swallow the tube which is led slowly on. He may be asked to take deep breath while swallowing, thereby concentrating his attention on breathing. In the majority of cases no difficulty is experienced. In some cases when the swallowing becomes difficult after placing the tip at the root of the tongue, a measured amount of water may be given to drink and with the drinking of the water the tube is swallowed. In a small number of nervous individuals the throat may have to be cocaineised.

It may be mentioned at this stage that there are several contra-indications to the passage of the tube in certain pathological conditions. They are:—

- (i) Acute gastric conditions with severe nausea and vomiting.
- (ii) Progressive anæmia with debility and prostration.
- (iii) Recent gastric hæmorrhage.
- (iv) Pulmonary œdema and severe pulmonary infections.
- (v) Cordiac muscle degeneration, angina and advance heart disease
- (vi) Thoracic aneurysm.
- (vii) Marked prostration after acute infectious diseases.

After the introduction of the tube all the gastric juice in the fasting stomach is aspirated by a 20 c.c. record syringe. The volume and character of the testing juice are noted and it is analysed with other samples. Then with the tube in position in the stomach the testmeal is drunk. This varies with various workers. It may be as stated before—bread and water or bread and plain tea or oatmeal congee or 7 per cent alcohol. We use as a routine oatmeal congee.

It is prepared by boiling one quart of water with two spoons of fine oatmeal to one pint, straining through cheese cloth and cooling it. The patient takes rest reading a book or a journal while 10 c.c. of the stomach contents are withdrawn every 15 minutes for 2 to 2½ hours. Free hydrochloric acid, total acidity and, when necessary, total chlorides are estimated in each sample. Presence of mucus and bile is observed and presence of starch and occult blood detected. For estimation of free HCl, 1 c.c. of the sample is titrated with N/100 NaOH using 0.5 per cent alcoholic solution of paradimethyl aminoazobenzene (a few drops) as indicator, otherwise called Topfer's reagent. You may add a few c.c. of distilled water to the sample before titration. The acidity may be expressed as c.c. of N/10 NaOH or c.c. of N/10 HCl per 100 c.c. This is obtained by multiplying the actual titration figure by ten. Similarly total acidity is estimated by titrating 1 c.c. of each sample with N/100 NaOH using phenolphthaleine as indicator. Total chlorides are estimated by digesting the neutralized total acidity tubes with nitric acid in a water bath, cooling and adding a definite amount of standard silver nitrate and titrating the excess of silver nitrate left over after combining with all the

chlorides, with standard ammonium thiocyanate using ferric alum as indicator. Presence of lactic acid may be detected in resting juice by any modified ferric chloride method or with Uffelmann's reagent. Its presence, however, indicates only fermentation and is not pathognomonic of cancer as claimed by some. Estimation of pepsin is not done as a routine. Occult blood is detected by benzidine method and starch by iodine. Bile is usually noted by the colour of the specimen, yellow or green and mucus by the ropy shiny consistency of the sample.

Normal Gastric Analysis.

The Resting Juice.—The average volume of the resting juice is about 50 c.c. varying from 20 to 100 c.c. in normal health. It may be colourless or stained yellow or green with bile. Its total acidity varies between 2 c.c. per cent NaOH—50 c.c. per cent NaOH, the average being about 30 c.c. per cent, while the free HCl varies between 0 to 40 c.c. NaOH per cent the average being 20 c.c. per cent. Thus in normal health the difference between total acidity and free HCl is about 10 c.c.

The Acidity Curves.

If you draw a graph of total acidity and free HCl in normal health you find there are in general three types of curves:—

- (1) Isosecretory.
- (2) Hypersecretory.
- (3) Hyposecretory.

(1) The Isosecretory type shows a steady rise, the peak-point is about 60 c.c. NaOH per cent and then a gradual fall. The stomach is emptied in 2 to 2½ hours.

(2) The Hypersecretory type shows a rapid response to stimulus, often a rapid rise in acidity from 70 to 100 c.c. either sustained or a slow decline. The stomach, however, empties in normal time 2 to 2½ hours.

(3) The Hyposecretory type is similar in form to the second but the highest point is only 20 to 30 c.c. per cent and digestion is completed in usual time 2 to 2½ hours. In normal health, it is found that the emptying time is remarkably constant (it varies about 2 to 2½ hours) and the types met with are: (i) about 80 per cent are isosecretory and (ii) 8 per cent are hypersecretory and (iii) 8 per cent are hyposecretory and (iv) a smaller per cent, i.e., 4 per cent have an acidity.

Normally the factors that reduce acidity are: (i) Diluting and neu-

tralising effect of saliva, (ii) the alkaline secretion of the pyloric mucosa, and (iii) the neutralizing effect of the duodenal contents regurgitated besides (iv) the buffering effect of the testmeal proteins. The factors for hyperacidity are therefore: (i) Increased secretion of normal juice (ii) increased tonus of the pylorus preventing duodenal regurgitation; hence the importance of total chlorides estimation in hyperacidity and achlorhydria. In hyperacidity the chloride estimation distinguishes between positive hypersecretion and a failure of neutralisation while in achlorhydria, chloride estimations distinguish between excessive neutralisation and a failure of secretion.

(To be continued)

X-Ray Study and Eletrocardiographic Tracings of a Few Patients with "Infantile Liver" (Infantile Hepatic Cirrhosis).

BY A. V. S. SARMA, M.B. B.S., D.C.H. (Lond.).

X-Ray Study

I. X-Ray chest (1st November 1937). Prakasa Rao, male, 5½ years old at the time picture was taken. A. Antero-posterior view. B. Right lateral view.

Observations.—Hila show infiltrative changes of the active type. Right cardio-phrenic angle is encroached upon. The right supra-clavicular glands appear involved.

Case notes.—Resident of Triplicane, Madras. Family history and investigations:—Father obese, and suffered from migraine while young, and now (March to June 1939) having petit mal, rise of blood pressure and glycosuria. Wassermann and Kahn of both the parents on two different occasions negative. Middle class Brahmin, Vegetarian. First child of the parents died of infantile liver; and the patient is the second child. Another child (female) died of cirrhosis liver at one year of age. There are now (June 1939) three other children who are healthy and free from cirrhosis of liver.

The patient had summer diarrhoea in his first year, and later on developed irregular action of the bowels. Constipation was the symptom for which advice was sought. The patient was getting irregular fever, and later (in the second year) developed ascites and jaundice. Liver and spleen both enlarged and rather hard—three fingers

size below the costal margins. Urine reduced Benedict's solution, and a trace of albumin was found on some occasions.

All over the precordium a systolic murmur was heard (most marked at the apex) till January 1937. In the first week of December 1937, I could hear the same only very feebly. Does it mean that as the liver decreases in size, the myocardium also regains from damage?

During 1934 and 1935 the patient was under my observation and in 1933 the condition of the patient appeared normal. In June 1937 the patient developed an irregular fever with a rise in the temperature towards the evening. There was an increased dullness over both hilar regions of the lungs. The supra-clavicular lymph glands on the right side of the neck were large and rather painful. The whole condition (early tuberculosis of lungs supervening on a previously injured part (?) responded to colloidal calcium with ostelin D (½ c.c. on alternate days—10 injections in total). In December 1937, the liver and spleen were hard and just palpable below the costal margins.

On 20th June 1939 the patient was examined and found fit. Height 4 ft. 2 in. and weight 46 lbs.

II. X-Ray chest (2nd November 1937). Alimelu, Female, 5 years (at

the time the X-ray was taken). A. Antero-posterior view. B. Right lateral view.

Observations.—Hila show considerable infiltrative changes and extension to the upper lobes and to the region of the cardio-phrenic angles on either side, more marked on the right. There is extension into the inter-lobar area between the right middle and the lower lobes. Right diaphragm appears to be limited in its movements. The whole seems to be a sub-acute condition.

Case notes.—The child was treated for infantile hepatic cirrhosis for nearly two years (2nd and 3rd years of age). When the patient was brought to me for irregular fever and constipation in her fourth year the liver was hard and enlarged to about $\frac{1}{2}$ " below the costal margin. The X-Ray picture of the chest speaks of certain damage and hence calcium was given in large doses and in two months the child improved very well.

March 1939. The patient was examined and found well and happy.

III. X-Ray chest (2nd November 1937). Narasimha Reddi 2 years 8 months (at the time the picture was taken). A. Antero-posterior view. B. Right lateral view.

Observations.—There is some tendency to infiltrative changes in the region of the right cardio-phrenic angle which appears to limit the movement of the right cupola of the diaphragm. The supra-clavicular glands show early changes. No definite active condition is noticed; but the X-Ray picture was taken to note the very early changes, if any, in a cirrhosis-liver-patient.

Case notes.—The child suffered from severe constipation and is sensitive to castor oil. When castor oil is given the child has generally a few motions by the afternoon, and by the evening develops a bloated abdomen, respiratory distress (asthma-like) and fever (about 100° F).

27th October 1937. Liver two fingers breadth enlargement. Supra-clavicular lymph glands on the right side were enlarged and the skin over them was hyperæsthetic.

Between 27th October 1937 and 1st December 1937, the child had three tablets of Redoxon Roche (Vitamin C) in addition to my usual routine treatment for liver cases. In January 1938 the patient was discharged as completely cured.

Electrocardiographic Tracings.

I. Baby Narasimha Reddi. Male, 2 years 8 months, 4th December 1937.

Notes.—Simple tachycardia. Right ventricular preponderance. Deep Q wave in lead III. T + + +

II. Baby Gopal, Male 3 years, 22nd November 1937.

Notes.—Simple tachycardia. T wave marked. QRS notched in lead II. T + + + (I have learnt from the patient's father that this child died of pneumonia some time in March 1939).

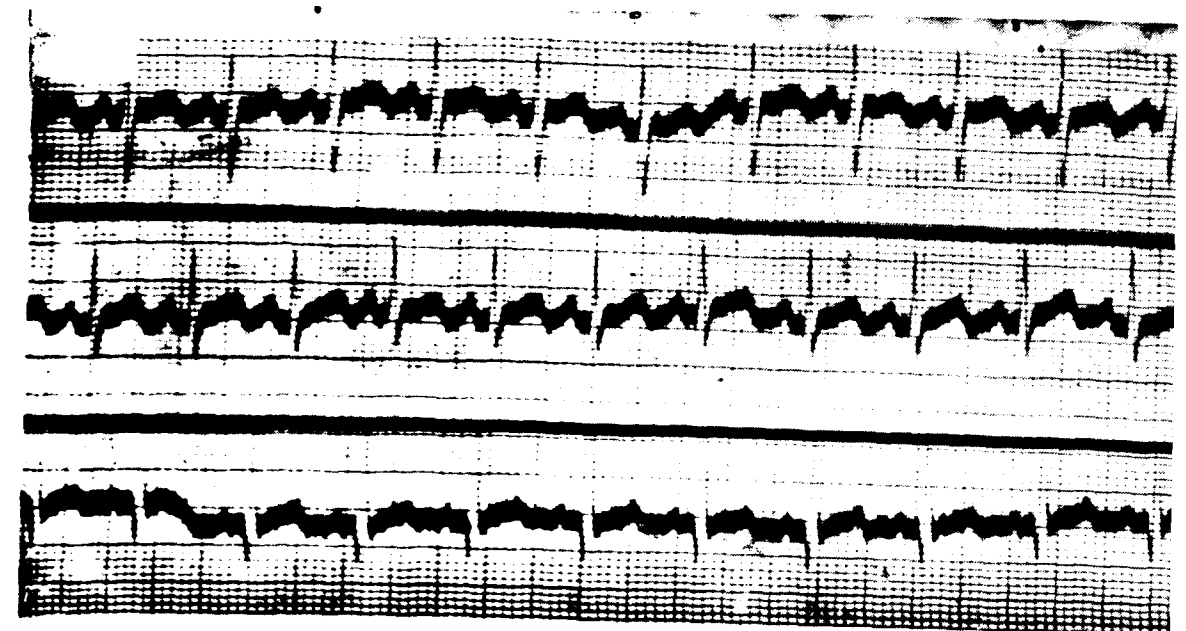
III Baby Mani. Male, 3 years.

Notes.—Simple tachycardia. Deep Q in lead III. QRS of varying voltage in lead III. T + + + Tendency to flutter (?)

Comments.

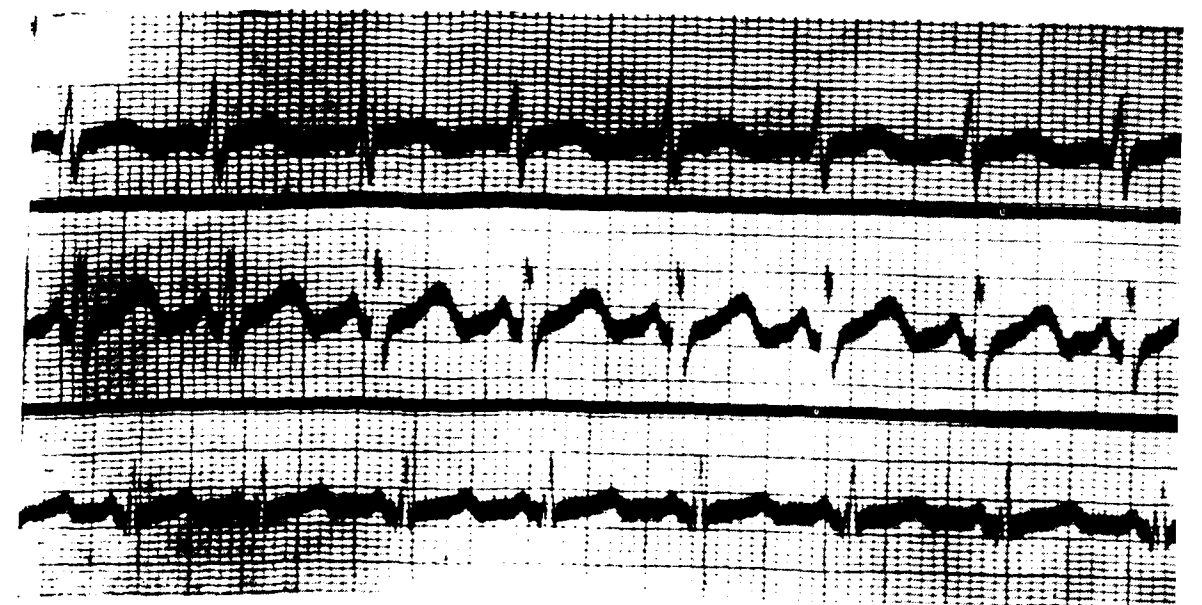
It has struck me that children suffering from infantile liver easily catch

Infantile Liver—By Dr. A. V. S. Sarma.
ELECTROCARDIOGRAM OF BABY NARASIMHA REDDY.



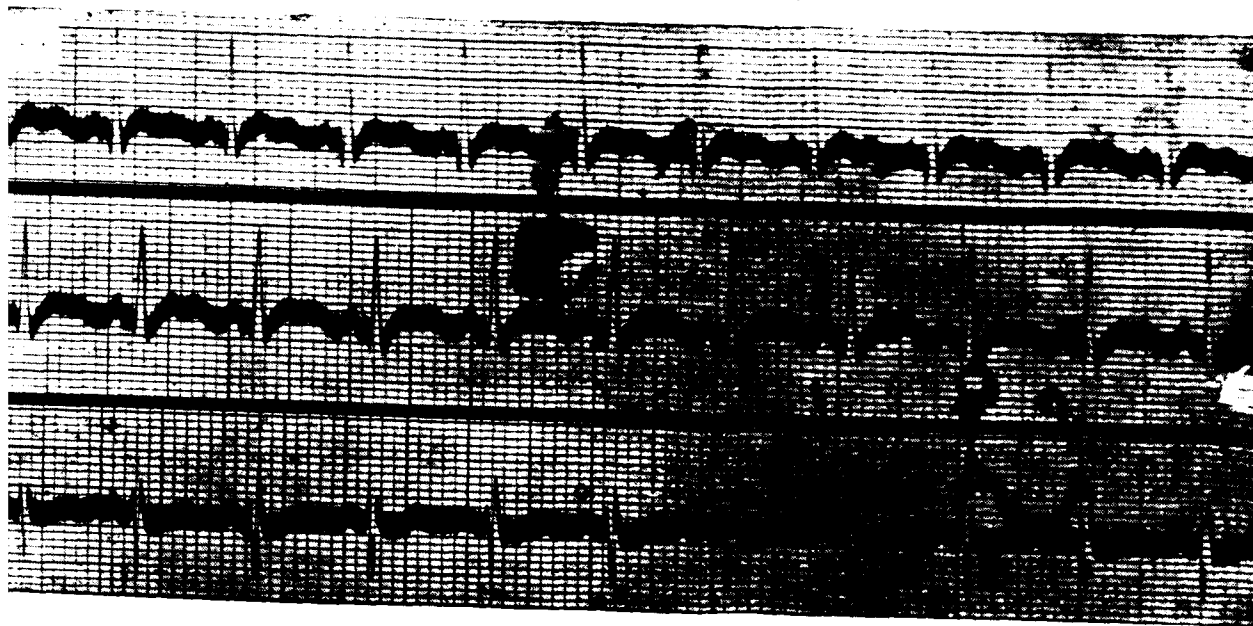
Simple Tachycardia.
Right ventricular preponderance.
Deep Q wave L₃.
T + + +

ELECTROCARDIOGRAM OF BABY GOPAL.



Simple Tachycardia.
T wave marked.
QRS notched L₂.
T + + +

Infantile Liver—By Dr. A. V. S. Sarma.
ELECTROCARDIOGRAM OF BABY MANI



Simple Tachycardia.
Deep Q in L_{a1}
Q R S of varying voltage L_{a1}
T
? Tendency to flutter.

—By courtesy of the "Antiseptic"

respiratory infections which very often prove fatal. The pulmonary tissue appears to be easily predisposed to infections probably because of (1) a general debility, being the outcome of avitaminoses, and (2) a toxic influence damaging the lung tissue and thus paving the way for future infections. It is useful to remember in this connection that the cirrhogenic agent spreading via the general circulation after the decompensated state has set in, can easily injure the entire body cells. The analogy between silicosis and pulmonary tuberculosis may also be recalled to mind at this juncture.

That the myocardium is also frequently involved in infantile hepatic cirrhosis is apparent in all severe

cases; and to arrive at something substantial the electrocardiograms have been taken and they speak for themselves.

These findings are published as the subject of infantile hepatic cirrhosis is receiving renewed attention from various workers.

My thanks are due to Drs. M. J. Santhanakrishna Pillai and C. Todadri who attended to my little patients at the X-ray Institute, General Hospital, Madras. The latter particularly helped me in my work seeing that we have to deal with irritable children with liver disease.

(1) A. V. S. Sarma, *The Antiseptic*, March 1939

Foreign Body in the Respiratory Tract.

By S. V. T. CHARY, M.B.B.S.

Foreign body of different sizes, shapes and consistency may find its way into the respiratory tract. This is very common in children. It is generally seen to rest in one of the bronchi, particularly the right lower one due to its large size and its being directly in the line of trachea.

The effects produced, vary depending on the nature of the foreign body, whether soft or hard, septic or clean. Local inflammation at the site of obstruction followed by accumulation of secretions may proceed and may result in an ulceration of the bronchus or abscess formation. Bronchopneumonia, empyema and bronchiectasis are usually expected in these cases.

Spontaneous expulsion of the foreign body may occur in some lucky individuals. Attempts at removal by bronchoscopy and other surgical measures are made.

Patric, aged six, was admitted on the 17th April for fever with cough of 10 days' duration. The fever was stated to have been continuous.

Physical examination revealed signs of consolidation of the right base. Pleural rub was heard in the 7th space in midaxillary line. Respiration rate was 48, and pulse rate 120. Cardio-vascular system was normal. Abdomen was distended, liver was

palpable about 1" below the costal margin, and the spleen just palpable.

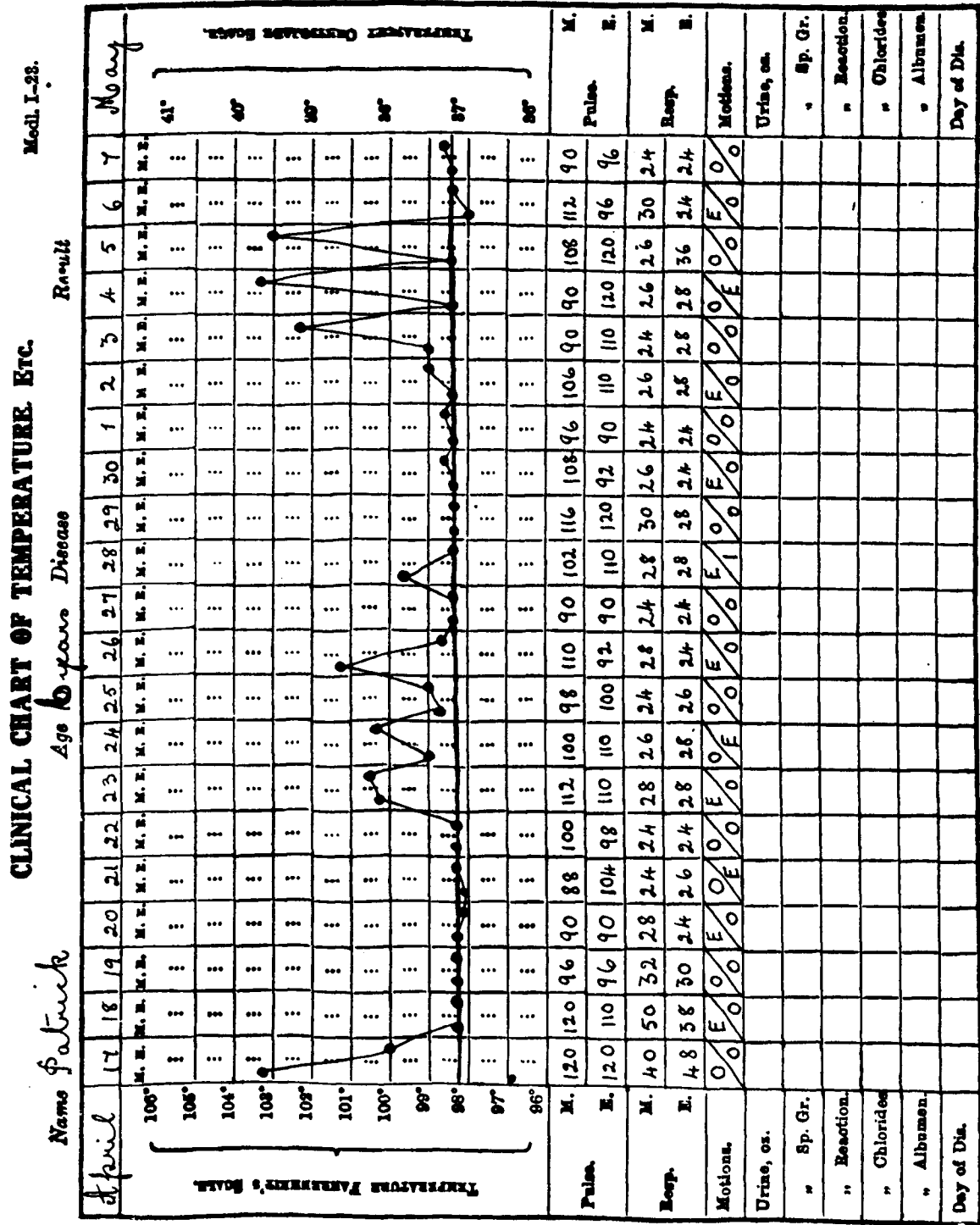
The patient was subjected to various investigations. His urine was normal. Blood showed slight leucocytosis with a polymorph increase. Sputum was seen to contain streptococci staphylococci but no acid fast bacilli.

The patient was treated with M. & B. 693 tablets thrice a day and diaphoretic mixture. The temperature dropped to normal a day after the admission and kept so for a period of a week after which it shot up to 101°.

Physical examination revealed dullness at the right base. A few crepitations with tubular breathing were heard over the same area.

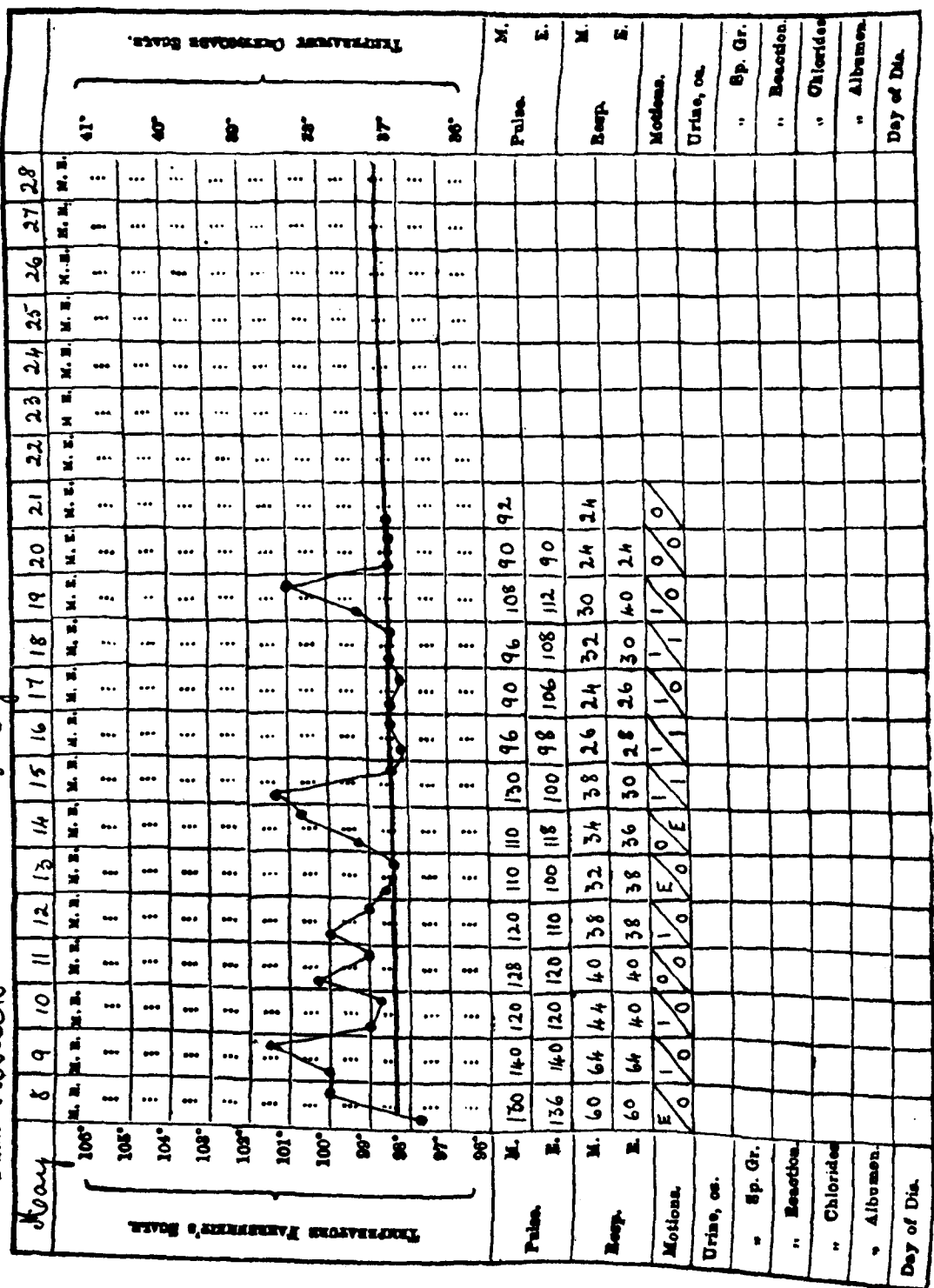
As the patient did not respond to M. & B. 693, he was X-rayed. X-ray revealed a nail in the right lower bronchus just at the bifurcation of the main bronchus and was about 1" long. The patient when questioned gave no history of having swallowed a nail nor the parents could supplement the answer.

On 6th May the patient was subjected to Bronchoscopy under general anaesthesia. Right bronchus was seen to contain pus. The nail could not be visualised and as such attempt at its removal had to be postponed.



REPRODUCED FROM THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

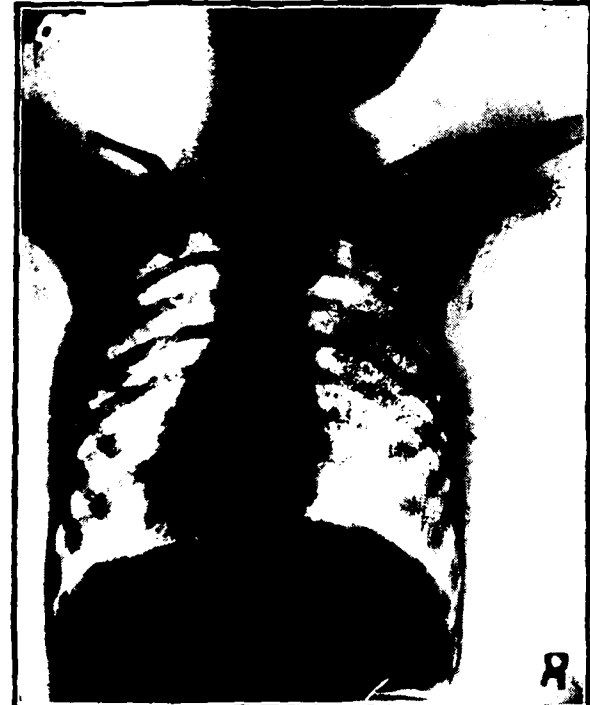
CLINICAL CHART OF TEMPERATURE, ETC. Med. I-23.
Name Patrick Age 10 years Disease Result



Patrick—Foreign body in the right bronchus.



Case No. II,



Case No. III,

About 8 hours after this, the patient's respiratory rate mounted up to 64 per minute, pulse rate 140 and general condition low. Continuous oxygen and 2nd hourly coramine with atropine helped to tide over the crisis which lasted for three days.

The temperature was still varying (as seen in the charts). The foot of the bed was raised and the patient was again treated with M. & B. 693 and expectorant mixture.

On 21st May, the patient had a fit of coughing and brought out the nail (in rusted state) with a fairly large

quantity of pus. The temperature and respiration settled down and his lungs cleared up with postural treatment.

The interesting fact of the case was that the patient was apparently normal in spite of the pressure of a nail in the right lower bronchus and was not aware of the fact of his having swallowed it. More than this when bronchoscopy failed, nature helped the patient to cough it out.

I thank Dr. A. Srinivasan, Honorary Physician, for his guidance in publishing this case.

The Madras Medical College Magazine.

"POST-OPERATIVE INFECTION OF WOUND."



THE modern medical students and the past generation are not aware of the ravages of sepsis of wounds.

The Great War, 1914 to 1919, led to many researches on the use of antiseptics and the treatment of wounds.

Although it is nearly 75 years since the epoch-making discoveries of Lord Lister revolutionised surgery, wound infection is still with us. A good deal of work is being done to prevent wound infection in civil practice and in war under the changed modern conditions of warfare.

Experimental work was done by C. G. Paine on the use of masks in puerperal infection, with special reference to droplet infection. Paine makes the statement (*B. M. J.* 1935, 1, p. 243) that one in 4 in an ordinary urban population have a streptococcus in the throat.

Experiments showed that there are two danger points in surgery. One is at a distance of 15 inches from the mouth, which is the situation of the operation wound, and the other is the surgeon's hands and gloves and overall which are immediately below his mouth.

A mask made of very fine dental gauze of a particular thickness and so made as to cover the nose, mouth and chin is efficient.

It is important to reduce talking to an absolute minimum, and all forms of hilarity are to be prohibited in the operating theatre or anteroom.

Probably 15 to 30 per cent of the so-called clean cases show some infection.

The Leader of the *British Medical Journal* of April 8, 1939, on the sterilisation of dressings and syringes makes the following statement:—

"It has always appeared somewhat strange that we should accept dressings as bacteriologically sterile merely because they have been treated in a high-pressure steriliser. Under the present methods in vogue there is no proof whatever that such dressings are sterile."

Correct temperature must be maintained for thirty minutes for efficient sterilisation. If penetration is poor even streptococci may survive in the centre of the bundles. Letters have appeared in the *British Medical Journal*, April 15, 1939, p. 793, indicating that the "dry sterilisation of

Editorial

rubber gloves and their powder does not bear bacteriological criticism so far as spore bearing micro-organisms are concerned". The glove-powder, talc, is difficult to be sterilised owing to its low conductivity of heat and its dense, closely lying character. It is suggested that this substance must be separately sterilised at high temperature or by incineration.

Antiseptic sterilisation of knives and scissors and tubes of catgut for 15 minutes in 70 per cent alcohol is quite unsatisfactory. Certain organisms can live in spirit for a great number of years.

The *British Medical Journal* of April 8, 1939, discusses the methods of treating skin, syringes. The ordinary procedure rubbing the site of inoculation with spirit followed by a dab of of tincture of iodine is reasonably effective. "The high risk in washing out a syringe with alcohol before use and storing it during use in a bowl of boiled water or saline is well-known. It is reasonably clear that the medical man must begin with autoclaved or heat sterilised syringes and needles, and must boil syringe and needle in weak carbolic or alkaline solution—ideally between each injection."

Other factors as the type of catgut, cleansing of the hands of the operator and the staff, the method of preparation of the skin of the patient in a tropical climate, spread of infection by air contamination as from Burns cases, and the susceptibility of the patient have all to be carefully studied and evaluated.

Careless surgery as allowing hæmorrhage to occur, inclusion of large masses of tissue in ligatures, putting in stitches under great tension and drains of various sorts unnecessarily render a patient more liable to infection.

The doctor must "think bacteriologically" and adopt safe methods of sterilisation and store age of dressings in his private work in his clinic or at the patient's house. "The ordinary drum affords no protection against dust and germs and even more obvious living creatures."

The following rules are adopted in most operation theatres. "Face masks must be put on immediately on entering the theatre ante-room by spectators, all members of theatre staff, as well as members of operating unit. No person with an acute infection of the respiratory tract will be allowed in theatres."

Personal.

Dr. V. Sankaramba, qualified from the College in 1925, got F.R.C.S. (England) in May 1939. This is the second Lady Doctor of the College to get the F.R.C.S. (England).

Dr. U. Mohan Rao got his F.R.C.S. (England) in May 1939.

Dr. P. T. Madhaviammal, M.R.C.P. (Lond.), and Dr. N. Vaidyanathan passed the M.D. (Mad.) in April 1939.

Major F. M. Collins, M.A., M.Ch., F.R.C.S., is the Surgeon and Professor of Operative Surgery.

Dr. S. K. Sundaram, M.D., proceeded on leave for higher studies to England and Dr. Anantachari was transferred.

Dr. S. T. Achar, M.D., and Dr. N. Vaidyanathan, M.D., are Assistants in Medicine.

Dr. K. C. Jacob is Assistant to Professor of Pathology *vice* Dr. R. E. S. Muthayya transferred to Government Ophthalmic Hospital.

Dr. R. K. K. Thamban, M.B., F.R.C.S. D.G.O. (Mad.), M.R.C.O.G., is Tutor in Midwifery, and Dr. M. Balakrishna Prabhu, is the Lecturer in Antenatal Care, *vice* Dr. A. P. Kurriappan, M.D., transferred.

Dr. C. Vareed and Dr. G. W. Roberts, B. A., M. B. B. S., were appointed as Assistant Professors of Physiology.

Dr. D. Sivasubramaniya Mudaliar, M.R.C.S., L.R.C.P., and Dr. K. Govinda Menon, B.A., M.B.B.S., were appointed as Assistant Professors of Anatomy.

This Examination Bogey.

SOME PRE-REGISTRATION REMINISCENCES

BY K. SHAKUNTALA, 1st Year M.B.

Months before the fatal days commenced we students burned the mid-night oil and with eyelids heavy and dull browsed upon the inadhesive elements of Pre-Registration Physics, Chemistry or Biology. Coffee hotels welcomed us throughout the night. In fact, the more inert amongst us discovered that ice was tonic quite efficient (refer Isotonic Coefficient) to keep the wiles of drowsiness at a safe distance. The majority of candidates wrote home fuming for rupees, annas and pies and enclosing stamps to a Calcutta firm applying for free samples of the modern 'Keep-Awake' Balm discovered by an unsuccessful B.Sc. of the Madras University.

Already the symptoms of examination fever (is a very malignant form) furrowed the brows and tormented the brains of the saner candidates. The less sane enrolled themselves as members of the Triplet Club either as *Cooks*, *Crows* or *Mugs*. This rule of three was definitely better flavoured than that of nasty Mathematics. Examination fever has two consistent and remarkably decisive symptoms and features. The pre-fatal one is fears, and the post-fatal is tears. This is merely a psychological application of Newton's third law of motion where tears are the reaction to fears after the fatal period of nervous tension where the impact between candidate and examiner is not often very soothing.

Passing by fluke is the silvered lining of hope cherished by the fatalist who believes in eleventh hour preparations. He doesn't let examination fear stand between yawns and sleep but switches off his lamp at 10-30 p. m. to be aroused from a blissful state of repose by the buzz of activity

at 7-30 a.m. perhaps. He leaves no dogs-ears upon the pages of literary books for his retina has never received the sensation of any extra book. *Sleepomania* conquers him in class, for he is practically a *knowledge phobe*. It is when he is faced by the problem of tackling a nosey oral examiner with a dog's skull that he realises that his is but an earthworm's brain with neither cerebellum nor medulla oblongata. Elevation of the boiling point of frenzy mounts higher still and unless the tongue tied chap is a man without fear who could handle his examiner, there is every danger of his being electrocuted by the gong. I have heard of a candid candidate—a very up-to-date fellow—who gave his man 'a bit of his mind', very nearly fusing the patience of the gentleman concerned . . . It is very doubtful as to whether his safety valve was properly regulated . . .

There is the *cook* who spoils the broth, the black sheep of a *crow* and the *mug* who dreams of Hans Anderson over his theory papers. Fruits and flowers are never more detestable than when served up on the table before the oral examiner. Strangely enough, the flowers wither the hopes where the fruits cause a loss of appetite to the flustered student. The very same hosteller who headed a deputation to the hostel contractor emphasising the vitamin content of fresh fruits and the crying need for an insertion of that item on the menu at least on Sundays, now is nauseated by the sight of the nosypome or the golden yellow hesperidium of an orange. Papi-lionatæ flowers bloom even in the winter of December for the sake of the examiner's benevolent smiles. The jokkey's of Wheetstone's Bridge reappear in the guise of the insect riders

of Botany whose graceful mounting and pilfering visitation of flowers forms one of the dramatic sequences in the subject devoted to their excursions. *Plasmodium fulci-parum* has a crude knack of muddling up the nerve plexuses and the dewpoint is reached much earlier in the case of the ladies when simple harmonic motion inspired by pendulating earrings, forms a questionnaire from the examiner.

I have known the blood pressure of certain anonymous persons mount to such an extent in the cranial regions that the more distal appendages fell to a temperature rather below the freezing point of impure water. It sometimes so chances that by freak of luck, some of these trembling persons unknown are rescued from the confusing jumble of centimetres and millimetres by the kind hearted whisper of a hinting supervisor or reminded of the presence of a collimator while fidgeting with an exasperating spectrometer. These have been occasions when the obstinate image of a slit refused to budge and when matters refused to convert minutes into degrees or *vice versa* but insisted on seconds and hours. This is the most trying time for the inertia of the brain becomes so great that thinking clearly becomes a problem in itself. Inspiration! Where hast thou fled, fickle one? . . . The sensory apparatus functions superbly but the motor nerves are parted from the peptising action of thought by an elusive apathy. Such is the static state of delirium caused by examination fever in which the temperature of the patient exceeds the short range of the clinical thermometer and rises to a maximum unrecorded in the files of medical practitioners. It is but justice to congratulate the candidate concerned on keeping within the limits of drastic endurance in spite of the tremendous strain brought to bear on his delicately poised mental state. If fainting was

recognised by society as a masculine as well as a feminine faint I do not doubt the possibility of a special ambulance unit being stationed in the vicinity of the examination hall for emergency cases.

The ensuing holidays are days spent in weighing the possibilities of a pass against that of a failure. If the balance tips to the wrong side we still cherish the hope that five marks here or there would certainly not stand in the way of the examiner. We pray that ours might be that auspicious paper he corrects after winning a tennis championship or after being the distinguished guest of the evening of some social bigwig. But there is always the danger of his being pestered by a prodigal son-in-law or distracted by the screams of a baby grand-daughter while turning over the sheets of an unfortunate one's answer book. Some people call it luck, others pluck. But it all depends on the person plucked in the examination. Unless the plug is applied at the right moment and pluck appears only when auspicious, luck cannot be assured by all the Professors Hiskeys and Sowhiskeys. When our pinnae reddened between the fingers of a village tyrant school master and no amount of bluff would operate on his deaf ears, pluck fled miles of—only luck remained to decide whether that unfortunate organ would be treated impudently or contorted out of shape beyond human redemption.

After all is said and done, true steel (so far as I remember) is procured only by perfect welding and a stouter type of candidate will be procured by this electrical furnace method when a step up is made in the range of marks by the action of such super-heated occasions. This examination bogey is only to be deplored. It is just an obstacle race meant for the shrewd, wary and intelligent.

Extracts.

F. R. C. S. SUPPLEMENT

The Lahore Examination

For the first time in the history of our College the Primary Examination of Fellowship of the Royal College of Surgeons of England was held in the first week of January this year. It gave a good opportunity to our teachers to watch the examination and to come in contact with renowned professors from England.

Moreover it was a golden opportunity for candidates from the Punjab to take the examination.

The Primary F. R. C. S. Examinator

By LIEUT.-COL. H. S. ANAND, I.M.S.,

Assessor in Physiology

The fellowship examination consists of two parts, and formerly examination for both the parts was held in London. For the last four years the Primary Examination is held in January of each year at different centres in India, provided an adequate number of candidates apply for it. Both the qualified medical graduates as well as those who have passed their First M.B., B.S. examination are eligible.

The object of holding the examination every year in India is to provide facilities for the students whose pecuniary condition did not permit them to proceed to Europe for study. And it must be admitted that there is a large percentage of our students who, given an opportunity, would do well at any university. For such

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students this is a golden opportunity for they are now in a position to secure a coveted diploma at a comparatively small cost.

The holding of examination at Lahore this year has been beneficial in several ways. It has brought us in contact with two of the well-known teachers in England. Prof. McDowall is the well-known editor of the famous Halliburton's *Handbook of Physiology*—a work of international reputation. Prof. Bremble Green is the Head of Department of Anatomy in the University of Durham and Dean of the Faculty of Medicine. They paid us a great compliment by coming and talking to us. Their lectures were interesting and instructive. It also gave us an opportunity to watch the conduct of the examination and to study the standard required of the candidates. I have no doubt that the experience gained at this examination will be of great benefit to us in future. I sincerely hope that the examiners also benefited by their visit to India. It gave them an opportunity to see our Educational Institutions and to feel that they were adequately equipped. They also came in contact with the University authorities, with teachers and with members of independent medical profession. I hope this visit has widened their outlook with regard to India.

The examination consists of two parts—written and oral. There is no practical test. It is a thoroughly searching examination and demands a deep insight into the subject. However I feel perfectly certain that for a good student it is decidedly not a

difficult task. I wish particularly to drive the belief out of the student's mind that it is a test which requires super-human effort. It is an examination which any honest and diligent student with a little more than average intelligence might well undertake. In the paper there are six questions out of which only four have to be answered. This is an admirable arrangement because it gives the student an opportunity to show the best side of his knowledge, and at the same time enables the examiners to expect a really good standard of answers. I think this example may well be followed by the Punjab University. The *viva voce* consists of description and identification of three slides, identification of some typical apparatus and oral question covering a wide field of the subject.

I found the examiners extremely sympathetic. As Prof. McDowall said, "I am out to find out what the student knows and not what he or she did not know." They treated the candidates kindly and encouraged them at every step. The examination is not a competitive one though one must admit that a certain element of competition creeps in because the standard is set by the best student and this "best" varies at different examinations. Of course a certain irreducible minimum is maintained.

I have no doubt in my mind (and I am glad to say that Major B. S. Nat agrees with me) that the best time to take the Primary Examination is soon after finishing the first professional examination. The most suitable candidates would be the topmost ten who have passed the first professional examination in their first attempt. If such students put in extra effort from June to January one has little doubt that majority of them would pass the Primary Exa-

mination with credit. The examiners have before them a record to show whether a particular candidate who is before them for the *viva* is qualified or is still an undergraduate and they (I believe) modify their questions accordingly. Perhaps it would be well for the candidates to study their examiners and find out the subjects they are particularly interested in (I must, however, say that Prof. McDowall kept scrupulously away from his pet subject—circulation). Another piece of good advice that I would like to offer is that the students should study the Primary F.R.C.S. question papers for the last few years. These I believe could be got from publishers in London.

The Primary Fellowship Examination

BY

MAJOR B. S. NAT, I.M.S.,

Professor of Anatomy.

The Primary Fellowship Examination of the Royal College of Surgeons of England held this year at Lahore has left certain definite impression on my mind that may be helpful to candidates intending to go up for it in future.

I think it is best to take this examination soon after passing the First M.B., B.S. The standard required is, not to my mind, beyond the reach of a good student who has recently passed his First M.B., B.S., and has devoted six extra months to an intensive study of Anatomy and Physiology. At this stage the knowledge of Anatomy in one's mind is based on one's recent work in the dissection room. It is imperative for such candidates, however, to continue and develop their contact with actual dissection during this preparatory

period. I saw many instances during the course of examination where anatomical knowledge that had been hurriedly acquired without this work on actual dissection suffered almost complete eclipse during the mental stress of the *viva voce* test. Familiarity with anatomical tests should in a candidate's mind reach the stage of almost an instinct. I think the knowledge of morphology expected is of a very elementary nature and does not require any very special effort. Deep study and knowledge of obtruse and advanced morphological theories is quite unnecessary. No amount of wide and superficial knowledge of this nature will succeed in covering the lack of depth of the ordinary anatomical foundation from the scrutiny of the examiners. The candidate must know the pure anatomical facts in precise and very definite way. It was this want of definiteness that struck me most in many candidates. I feel sure that with adequate appreciation of this fact success in this examination is possible for quite a good number of our under-graduates who have just completed their course in Anatomy and Physiology.

Those taking it after graduation must similarly work in the dissection room for some months to renew their knowledge on the actual parts.

As regards the written parts of the examination (although I had no opportunity to see the written answers in the last examination) it is necessary to remember that Anatomy is essentially a descriptive science and therefore it is important to cultivate one's descriptive faculties.

Perhaps the best way for learning this art would be to practise answering old question papers for the Primary Fellowship Examination.

The examination has been as much an experience for us teachers as for the candidates. It has, besides enabling us to establish contact with distinguished teachers from England, helped to correct many a wrong notion in our minds.

In view of the experience gained I feel justified in encouraging many of our good students to take this examination next time.

EXAMINATION PAPERS

Royal College of Surgeons of England

DIPLOMA OF FELLOW

Primary Examination in Anatomy and Physiology

ANATOMY

Monday, January 2, 1939

from 10 a.m. to 1 p.m.

Questions 1, 2 and 3, and either 4 or 5, i.e., four questions in all, must be answered.

1. Describe the arterial supply and the venous and lymphatic drainage of the stomach.

2. Give an account of the middle-ear (tympanic cavity) excluding the auditory ossicles. How does this cavity develop?

3. Give a detailed account of the distribution of the ulnar and median nerves in the hand.

and either

4. Discuss the growth changes which occur in the vertebral column after birth.

or

5. Discuss the theory of nerve components. Illustrate answer by reference to the glosso-pharyngeal nerve.

PHYSIOLOGY

Tuesday, January 3, 1939,
from 10 a.m. to 1 p.m.

Candidates must answer four questions and no more.

Answers should be illustrated with diagrams where possible.

1. How may changes in the diet affect the constituents in the urine?
2. Describe the factors which affect the flow of blood through the coronary vessels.

3. What experiments indicate the site of the action of carbon dioxide in the body?

4. How do complete sections of the central nervous system throw light on its function?

5. Describe the formation, the function and flow of lymph.

6. What is hamolysis? By what methods can it be produced and what information is obtained from their study?

—K. E. M. College Magazine,
Jan. and Feb. 1939.

'BETAXIN'

Betaxin in the Treatment of Leprosy.

Very promising results are being obtained with 'Betaxin' in many etiologically diverse forms of polyneuritic and polynuralgic disorders. The neurotoxic and infective types appear to respond equally well. The usual dosage used by different workers was 1 mgrm. and the total amount administered over some 9 weeks was 45 mgrm. Of late, in the light of further experience, the single dose up to 10 mgrm. was reached by some while others state that the rapid cessation of pain and regression of the nerve swellings was most striking. Even advanced bilateral peroneus paralysis improved in a relatively short time so much that practically complete function could be restored.

In conclusion it should be stated that treatment with 'Betaxin' injections has proved of great service in leprosy neuralgia occurring as an isolated symptom and in the course of a general reaction to the disease; the response is equally good in the usually intractable neurotic vasodilatory-symptoms in the hands and feet, which as a rule are associated with severe pain and paresthesia. The action appears to be highly selective, since the treatment leaves both the general and the arthritic symptom of leprosy wholly unaffected.—*Leprosy Review*, X, 109, 39.

Extracts

THE VIEW OF THE LEAGUE OF NATIONS

on Malaria Treatment and Prophylaxis.

(Abstracted from the Fourth General Report of the Malaria Commission.)

The Malaria Commission of the League of Nations regards as its main task to help physicians to distinguish what is clearly proved from what is still doubtful. Moreover, where truth is not plainly revealed, the Commission endeavours to ascertain on its own account, by arranging experiments according to a specific programme, as it has recently done the true value of the procedures or measures advocated.

think, however, that it is part of the Commission to instruct medical practitioners in 'standard' methods of treating the disease". However the advantages and disadvantages of every method and of every drug now in use in the fight against malaria are described and much is added to the knowledge about the synthetic drugs 'Atebrin' and 'Plasmoquine' which are well known in this country. The report ends by saying:

In this country, the wrong idea is widespread that the Malaria Commission recommends a special way of treatment or a special preparation to be used. The statement "The short Quinine Treatment as recommended in the Malaria Commission" is frequently met with in newspaper articles. A study of the fourth report, however, reveals that no such 'standard' method of treatment is recommended, as the Commission does not deem it advisable to do so. It is stated in the beginning of the report: "We do not

"As regards the synthetic products, which have only been used in therapeutics for ten years, the Commission hopes that it has discharged the duty which devolved upon it by giving in this Fourth General Report an account of the present state of our knowledge regarding the possible use of 'atebrin' and 'plasmoquine' in the treatment and prophylaxis of malaria. In certain circumstances, as has been shown above, these drugs—representing a notable scientific advance—possesses a very special value."

Action of Quinine and the Synthetic Drugs on Malaria.
(From 4th General Report of League of Nations Malaria Commission.)

Action on Trophozoites.			Action on Gametocytes.		Action on Acute Symptoms.		Action on Frequency of Relapse.	Action on Splenomegaly.	Effect on General Condition of Patient.
B.T. + Q.	M.T.	B.T. + Q.	M.T.	B.T. + Q.	M.T.				
QUININE.	Daily dose of 1 g. (15 grs.) causes disappearance, 5 to 7 days.	Daily dose of 0.3 g. causes disappearance after 3 days. Effects last to 7 days.	Affects pre-gametocytes and gametocytes slightly.	Marked action from 3rd day (2nd paroxysm).	Variable action from 3rd or 4th paroxysm.	Acts on all species but in B.T. and Q relapse rate may reach 50%.	Acts on all species but effect is transient where infection or relapses are frequent.	No effect if treatment is limited to number of days essential.	
ATEBRIN.	Daily dose of 0.3 g. causes disappearance after 3 days. Effects last longer than quinine.	Daily dose of 0.3 g. causes disappearance after 4 days in 90% of cases.	Similar to quinine but slightly more marked.	Similar to quinine.	Very marked action. Fever falls by 2nd paroxysm.	Marked action. Fever usually falls by 3rd paroxysm (but with some strains effect is less than quinine.)	Effect somewhat slower than quinine but seems to last longer.	Sometimes yellow coloration of skin.	
PLASMOQUINE.	Slight action only.	Practically no action.	Definite action in both species.	Marked action in minimum doses of 0.02 g.	No indications for using plasmoquine alone for treatment of acute attack.	Definite effect in B.T. & Q. In association with quinine and atebrin it has a marked effect in reducing relapses in all 3 species.	Insufficient data.	In the doses now used (e.g. 0.02 g.) it seems to have no depressing effect.	

NOTES.

A.—Action of Combinations of Drugs.

1. There is no advantage in combining quinine and 'atebrin' in treatment.
2. Quinine + 'plasmoquine' simultaneously produce less frequent and less intense toxic symptoms than 'atebrin' + 'plasmoquine', but are best given consecutively where possible. Quinine (15 to 20 grains daily, 7 days) + 'plasmoquine' (0.02 g. daily, 5 days) are probably the best treatment for B.T. and Q. malaria.
3. Simultaneous administration of 'atebrin' and 'plasmoquine' aggravates the toxicity of each and is not recommended. Consecutive treatment with 'atebrin' (0.3 g. daily 5 to 7 days) and 'plasmoquine' (0.02 g. daily, 5 days) has no advantage in the primary attack, but acts on gametocytes and relapses in the same manner as quinine and 'plasmoquine' treatment.

B.—Practical Suggestions for Treatment.

1. *Individual treatment.*—Quinine (15 to 20 grains or 'atebrin' (0.3 g.) 5 to 7 days, followed by 'plasmoquine' (0.02 g.) 5 days, or quinine + 'plasmoquine' simultaneously.
2. *Treatment in Field.*—Quinine (15 to 20 grains) or 'atebrin' (0.3 g.) 5 to 7 days, followed by 'plasmoquine' (0.02 g.) 5 days if funds and medical supervision are available. But if, as is usual, this is not so, short treatments with the cinchona alkaloids are more suitable.
3. *Mass Drug Prophylaxis.*—Daily doses of quinine (0.4 g. or 6 grains), or bi-weekly doses of 'atebrin' (0.2 g.)

* For gametocidal purposes alone, however, one dose of 0.02 g. 'plasmoquine' followed by a second dose, if necessary, on the 5th day is equally effective. It may be noted also that in one mass treatment experiment (in Sardinia), the daily administration of 0.02 g. 'plasmoquine' had to be stopped after 3 days on account of toxic symptoms.

LEPROSY RELIEF IN MADRAS.

New Approach to Problem.

The meeting was convened by Lady Marjorie Erskine and was held on 20th March evening at the Banqueting Hall, Government House, Mount Road.

DR. COCHRANE'S ADDRESS.

Dr. Cochrane, speaking, expressed the gratitude of those whose privilege it was to be active workers in leprosy relief to Dr. Rajan for his help and assistance.

Leprosy work in India, Dr. Cochrane said, was started in the first instance, from a desire to help a needy section of the community, but with no thought of eradicating the disease. In Europe, in the middle ages, the Church undertook the task of segregation and control and established lazaret houses outside many large towns. But in India leprosy work was firstly merely a work of compassion; very gradually as this scourge received recognition as a vital question of public health, there grew up the belief that institutions would ultimately bring it under control. Government partly because it was their duty to look after destitute persons suffering from leprosy, and partly in the hope of controlling the disease, encouraged the formation of Settlements throughout India and gave grants towards their support.

Conditions in India

Dr. Cochrane said that it was his conviction that one of the main factors in the eradication of leprosy from European countries was the fact that segregation was not central. Each town or village either had lazaret houses run by the Church, or the authorities enforced rigid rules governing the return of the afflicted one to his 'cabin

at night', forbidding him to associate himself with members of the public, especially children. The population was small and the total number of persons suffering from leprosy was correspondingly small. Thus, the method of compulsion, combined with the gradual development of a public health conscience succeeded in bringing the disease under control. In India the disease was so widespread, and the cases so numerous, that measures of forcible segregation could not even be considered. The Madras Presidency, Dr. Cochrane continued, had ever been in the forefront of active public health measures in the matter of leprosy relief, and still maintained this high reputation. If this Presidency was to continue to give India the lead, new measures must be devised and their schemes must be in line with the recent developments in their knowledge of this disease. Unfortunately, though the Association had been in existence for well nigh 15 years, their knowledge of prevention was still rudimentary. That was largely because curative measures tended to be placed before the preventive, and because it was hoped that the remedies discovered would prove to be relatively quick and stem the tide of the disease before further damage was done. After referring to the results of modern treatment of the disease, Dr. Cochrane said that one of the main policies of the British Empire Leprosy Relief Association (Madras Provincial Branch), was to encourage investigation into childhood leprosy in order to ascertain the relative importance of the types of the disease in children, and the conditions under which a child developed serious leprosy. It was their belief that much leprosy in

Extracts

children was not serious, but those types which were serious were indeed of grave significance, and such children could not come under observation and treatment too soon. Investigations were being actively pursued at Saidapet, and with the assistance of Mrs. Todd and the Salem District Leprosy Relief Council, further intensive investigation into the control of childhood leprosy would be undertaken.

Importance of Investigation.

The Association, Dr. Cochrane said, with the active co-operation of the Madras City Leprosy Relief Council was about to undertake an intensive investigation into the methods of urban control. The Executive Committee of the British Empire Leprosy Relief Association had decided that instead of dissipating its activities over a large area, their energies should be concentrated along the lines already indicated, and they hoped that the result would be the discovery of more efficient methods of control in urban and rural areas. Members of the general public still tended to think in terms of treatment; the need of investigation seemed only dimly to enter their minds. With a limited sum at their disposal, it was imperative that their money should be spent along such lines, so that at the end of 5 or 10 years they should be able to outline a plan which was most likely to lead to the ultimate control of this disease. The whole work of the Provincial Branch of the British Empire Leprosy Relief Association had now become co-ordinated and they could claim that there was no overlapping. The Association felt that they had a right to appeal to the public and State

that given the necessary financial resources they could now undertake a unified direction of the anti-leprosy measures, and that if they had the continued confidence of the public they should, in a comparatively short time, begin so to add to their knowledge that the day would not be too far distant when they should be able to lay down lines, which, if followed, would result in the control of leprosy in this presidency. He, therefore, appealed to the public to join the Association.

With regard to the crippled and mutilated case, Dr. Cochrane emphasised, that provision for such cases, if certified as harmless and non-infectious should be made in some institution, for the care of those who were destitute. Present-day measures for the control of leprosy were directed towards making it less possible for the sufferers from leprosy to go on to the mutilated stage, but there would always be a large number of crippled cases no longer dangerous but needing care, and to this aspect of the pauper problem he would call their attention. The full development of a nation could not but be hampered if the crippled, the blind and the deformed, no matter whether as a result of leprosy, or from some other cause, could not find shelter in institutions organised for the reception of such persons. He was fully aware that the Government were doing everything humanly possible to bring leprosy under control, but let them in their search for scientific measures not forget that those who were crippled by this disease, still needed care and attention.—*The Hindu*, 21-3-1939.

PREVENTION OF CHOLERA.

Importance of Using Genuine Vaccine.

WARNING BY PUBLIC HEALTH COMMISSIONER.

The Public Health Commissioner with the Government of India has issued a statement emphasising the necessity for using genuine vaccine for inoculation against cholera.

The following are extracts from the statement:—

In 1938, the attacks and deaths from cholera in British India, as recorded in the office of the Public Health Commissioner, totalled approximately 323,243 and 158,010 respectively. The worst affected provinces were the United Provinces with 70,000 cases and 34,000 deaths, the Central Provinces with 94,000 cases and 43,000 deaths and Bengal with 86,000 cases and 45,000 deaths. The Punjab reported 86,001 cases and 4,600 deaths during the same period.

This grave incidence of cholera has been a matter of serious concern to the country and the subject came under exhaustive discussion at the Medical Research Conference held in Delhi in December and at the second meeting of the Central Advisory Board of Health in Madras in January.

New Light on Cholera Organism.

Recent research work under the Indian Research Fund Association has thrown new light on the nature of the cholera organism. It has been shown that there are in nature many organisms which resemble the cholera organism but do not cause the disease. The value of inoculation against cholera is now generally recognised

and the number of inoculations carried out in India shows a large regular increase over the last few years. It is, therefore, of the greatest importance, that the vaccine used for protection against cholera should be prepared from the genuine cholera organism.

The Cholera Advisory Committee of the Indian Research Fund Association considered the question of the sources of supply and the nature of anti-cholera vaccines used in the several provinces in India. Examinations carried out on cholera vaccines available in the market in India during the last 18 months have indicated that in certain cases these vaccines were not prepared from the strains of the true organism. The view of the Cholera Advisory Committee, which was accepted by the Medical Research Conference, is that no protection against cholera can be expected from the use of such vaccines.

For the purpose of ensuring that the vaccine is made from correct strains, it is recommended that those employed in the manufacture of the vaccine in India should be strains tested and issued by certain specified laboratories which have been continuously engaged in the study of the cholera vibrio. The Directors of the Central Research Institute, Kasauli, the Calcutta School of Tropical Medicine and the King Institute, Guindy, have expressed their willingness to issue suitable strains to all laboratories, including those of commercial firms, for this purpose.—*The Hindu* 30-3-1939.

FLUOROSIS IN NELLORE.

Analysis of Water Sources.

WIDER INCIDENCE OF DISEASE SUSPECTED.

The earliest manifestation of this disease is a certain peculiarity of colour and shape discernible in the teeth even of children. It has been a well-known fact in these parts that all people born in Podili and the surrounding areas have got peculiar teeth. In its more developed stages the disease brings about such symptoms as stiffening of the joints, the spinal column, the neck or the chest. In these parts the people have almost reconciled themselves to these pathological phenomena as acts of God. Almost every man expects to have some such symptoms between the ages of 40 and 60.

The Director of Public Health and party pay periodical visits to this area to check and correlate the data that are being gathered by the permanent research staff employed on this work there by the Government by house-to-house and village-to-village investigation. It has been found, during the investigation, that a very large percentage of children are found to have this symptom of peculiar teeth in Podili, Kanigiri, Darsi and other taluks. Dr. T. S. S. Rajan, Minister for Public Health, paid a visit to this area last September to acquaint himself with the nature of the investigations and the incidence of the disease in this area.

Fluorine in Wells.

The Public Health Department started on the investigation of the causes and incidence of these symptoms after a study of some of the advanced cases in Madras. They first set out to analyse the water-sources of this area. By now the water of every well in Podili has been analysed. A study of

the symptoms of some advanced cases revealed that these symptoms looked very much like the symptoms of a common disease known to be prevalent among the workers employed in Fluorine factories in Denmark. It was on this basis practically that the wide and large-scale analysis of water sources was carried out here. This analysis revealed the presence of Fluorine in every water source in this area without exception. Fluorine is manufactured in factories in Denmark for use in the fruit-preserving industry. The symptoms of the disease, which is known to be common among the industrial workers there tallied so closely with the symptoms of sufferers in the Podili area, and the vigorous investigations subsequently carried on revealed such abundant data, that it has now been fairly established that the cause of this endemic Fluorosis is the presence of Fluorine in the water sources. The area where Fluorine occurs in the water supply is so widespread in these parts that even when many villagers left their homestead and constructed their houses in different places the symptoms of the disease persisted among them; so much so, people in these parts have come to regard it as the working of destiny.

Incidence in other Districts.

Recent observations by the staff of the Public Health Department have revealed that this disease is prevalent in vast areas of the Ceded Districts and parts of Salem and Trichinopoly Districts. It is apprehended that further observation may reveal a yet wider incidence of these symptoms in

many other parts of the Presidency. The public have till now been utterly in the dark about the ravages of this disease; but the Public Health Department, thanks to the liberal grants of the Government, have been carrying on intensive research, which may help to bring relief to thousands of sufferers throughout the Presidency.

The prevalence of endemic fluorosis, a disease caused by the presence of Fluorine in water, in Podili and Kanigiri taluks in this district has been causing concern to the Government and investigations have been undertaken to ascertain the conditions responsible for the prevalence of the disease among men and cattle.

As already reported an experimental borewell is being constructed at Podili. The water at each strata is subjected to chemical analysis at the King Institute. So far, the borewell has reached a depth of about 250 feet and the rocky soil has not yet been thoroughly penetrated. The water obtained even at this depth is found to contain a high percentage of Fluorine. It is expected that soon a depth of about 300 feet will be reached. After analysing the water then obtained, the Government will decide on the future course of the investigation.

THE RELATIONSHIP OF BEJEL TO SYPHILIS AND YAWS.

It was Ellis H. Hudson who first in 1937 described the newly identified condition known as Bejel which resembles syphilis in some respects and yaws in others. It is a non-venereal spirochaetosis which is endemic among the Arab population of part of the Syrian Desert on the middle Euphrates. The

Along with this investigation, the Government have directed an enquiry into the condition of some villages along the Makeru river, which takes its rise in the Podili hills and flows through Kanigiri taluk. The object is to study whether with the Fluorine condition of the water being practically uniform, the villages show any difference in the incidence of the disease and to find out the reasons for it.

The villages in which enquiries were made are: Darisivantha, Gulugavaripalle, Kammararipalle, Kothapalli, Pugodu, Karivendala, Yedavalli and four other villages. The investigation included the analysis of water obtainable in wells and other water sources in each village, examination of its Fluorine content and a study of the social and economic conditions of the villagers which, it is felt, may have some bearing on the incidence of fluorosis attacks in particular villages, families or communities.

It is stated that while it is too early to lay down the conditions in which fluorosis either thrives or disappears, the researches that are being carried on will certainly aid the authorities in making a scientific approach to the problem of the prevention and treatment of fluorosis, which is responsible for great economic loss to the ryot. —*The Hindu* 30-3-1939.

important features of this condition are that it is essentially a disease of childhood and has nothing to do with sexual intercourse. The infection is carried by direct contact as a result of dirt and unhygienic social habits. No primary lesion is noticeable and the disease usually commences as desqua-

mating patches in the mouth which swarm with spirochaetes resembling *treponema pallidum*. Papules appear on the skin in moist situations. These early lesions disappear in the course of a few months and after a long time they give place to ulcerations of the soft tissues at the back of the mouth and the skin and bones. The chief characteristic of the disease is general adenopathy. Very often alopecia is present and very rarely the cardiovascular system is affected. Quite rarely is a small number of cases mild changes in the cerebro-spinal fluid have been observed. Wassermann and Kahn's serum reactions are positive for a very, very long time. Regional glands are enlarged and shotty, though painless. No constitutional symptoms are generally seen but in children the vulva and perianal regions are affected. As regards treatment Hudson suggests that the main object should be the eradication of the disease from the community by the prevention of new infections and the treatment of the already infected and the drug greatly favoured at present is Bismuth.

The most difficult problem is to differentiate this condition from syphilis on the one hand and yaws on the other. Various workers have expressed different and conflicting opinions.

Hudson writing in the Transactions of the Royal Society of Tropical Medicine and Hygiene states that syphilis, yaws and bejel are all caused by the

same spirochaete, with this difference that bejel is a primitive form of syphilis in which the spirochaete has free access from person to person taking a non-venereal form; but Stannus and Hanschell believe that this condition is not in any way allied to syphilis or yaws because of the differences in the skin lesions which these conditions produce stressing emphasis on the fact that bejel neither affects the central nervous system nor passes on to the foetus.

Chesterman is inclined to believe that bejel resembles yaws rather than syphilis except in the matter that yaws does not show alopecia and the mucous membrane involvement.

Recently V. Iswariah and V. G. Nair have reported some cases from a village near Vizagapatam in the Journal of Indian Medical Association, No. XII, 1938. Their view is that bejel seems to occupy an intermediate position between syphilis and yaws but they disagree with Hudson's view that the spirochaetes causing these three different conditions are identical.

Before a universal agreement is reached a good amount of further research, has to be carried out and with our present imperfect knowledge of the life processes of the spirochaetes it will be rather difficult to decide as to whether the spirochaetes of these three conditions are identical or different—*The Burma Medical Times*, May 1939.

TRANSACTIONS OF THE CALCUTTA MEDICAL COLLEGE RE-UNION, TENTH SESSION (1938-39).

It might be recalled that this Re-Union was formed by the past and present students of the Calcutta Medical College with the object of giving the *alma mater* an opportunity to study the various improvements of the Hospital and College so that the past students may keep their knowledge abreast of the times and at the same time give chance to the past and present students to mix with each other socially. The Re-Union was started in the year 1929 and their proceedings were first published in the "Calcutta Medical College Magazine". Since last year they are publishing the scientific articles read at their annual session in the form of a bulletin under the caption "Transactions of the Medical College Re-Union." The second volume of this issue which is just to hand shows a vast improvement over the previous one. As usual the articles are divided into three sections—one on medicine, the second on surgery and the third on midwifery—excluding the students'

section which is devoted to students' activity in sports, etc. The articles in the main three sections are on varied current subjects and are highly illuminating. The function was presided over by Rai Bahadur Dr. Surendra Nath Gosh whose address is highly interesting and instructive, throwing a flood of light on the present day medical problems of India. In the opinion of the editorial committee the usefulness of the Re-Union can be greatly increased if the members of the Re-Union take up a greater interest in study and research and place the results before the scientific session. We wholeheartedly endorse this view and we hope the next volume will appear with more articles on medical ethics and surgical cases, health insurance and other subjects coming under the sphere of the medical profession and thus make the name of the Calcutta Medical College worthy of the earliest Medical College in India—*The Burma Medical Times, 1939*

NEEDED FOR HUNDRED MILLION SUFFERERS—A SEVEN-YEAR SCHEME—I. C. A. R. INVESTIGATION REPORT.

"India contains enough first class land for an early resumption of cinchona growing", observes Mr. A. Wilson, Deputy Director of Agriculture, Cinchona, Madras, in the Imperial Council of Agricultural Research "Miscellaneous Bulletin No. 29".

India produces only 70,000 lbs. of quinine but consumes 210,000 lbs. and therefore import 140,000 lbs. mainly from Java. India's real need of quinine, however, has been estimated at 600,000 lbs., hence the importance

of extending cinchona cultivation in India.

The Royal Commission on Agriculture emphasised the importance of cheap quinine. On the advice of the Indian Research Fund Association, the Central Advisory Board of Health in July 1937 resolved that an officer experienced in cinchona cultivation should investigate areas most suited to its cultivation and the cost of production. The Imperial Council of Agricultural Research arranged and financed this investigation.

Extracts

A VICERINE CURED

Cinchona is indigenous to the wilds of Andes in South America. It was named after the wife of a Spanish Viceroy of Peru, the Countess of Cinchon, the classic patient who was cured of an attack of fever about 1639 by the Cinchona tree bark employed as a decoction. In 1820 French chemists isolated quinine as the main alkaloid of cinchona bark.

Tracing the history of cinchona cultivation in India starting from 1835, Mr. Wilson mentions that, within a short period of thirty years, the plantation industry had been abandoned by private enterprise by 1890, following overproduction and a catastrophic drop in prices. All that remained in India were the Cinchona Plantation belonging to the Governments of Madras and Bengal. These were the pioneers in the work of establishing the plant in India from seed obtained from South America. They continue to exist besides plantations of private growers who supply the Government quinine factories with cinchona bark. Simultaneously Java by unremitting scientific work, aided by optimum conditions for growing cinchona, gradually obtained a complete command of the world's quinine market which it now dominates to the extent of about 97 per cent.

COMMERCIAL POTENTIALITIES.

The two most important species utilized by cinchona plantations in India are known as *Cinchona Ledgeriana* which predominates in Bengal, and *Cinchona Succirubra*, the red bark variety. The latter presents certain advantages for certain soils and elevations but the former, the principal variety in Bengal, has much greater commercial potentialities especially on

account of its high content of the invaluable alkaloid. It is on this variety that Mr. Wilson recommends that future attention should be concentrated.

In cinchona growing, elevation aspect and soil are also of primary importance. Most important is the definite finding that cinchona is a comparatively delicate crop and one requiring good plantation management comparable with orchard cultivation. No slipshod methods will serve. If cinchona is to succeed, there must be properly organised nurseries putting out healthy seedlings which will grow into vigorous trees. Given a proper organisation of nurseries and a steady offtake of bark at guaranteed prices, the cinchona plant would not be unsuitable for small growers but any idea that it could profitably be grown as a forest tree can be dismissed.

The investigation included a survey of likely areas and a study of the cinchona soils, including potential cinchona soils, formed an important part of the investigation. The bulletin states in what areas efforts to extend cinchona cultivation are most likely to be successful.

COST OF PRODUCTION.

The report contains estimates of the cost of cinchona bark and consequent prices of medicinal preparations from it, of converting bark into quinine and into the mixed alkaloids, a cheaper preparation, commonly called Totiquina. Details are given of a seven-year planting scheme which would bring Indian production up to the present level of consumption. While no great reduction in the cost of quinine is foreshadowed, the figures show that in suitable areas quinine could be produced in India at world market prices.

Mr. Wilson emphasises the need for research and experiments in a number of directions. Any area selected for development should be tested in the first place by small properly organised experiments to determine the yields of bark, the difficulties to be overcome and the cost of production. The need for more fundamental research is also emphasised. Amongst the stock of cinchona plants at present existing in the country there are undoubtedly strains of superior plantation performance and containing a much higher percentage of quinine than the commercial mixed crop. By suitable methods these could be isolated and multiplied. Further experimental work is also required on the improvement of cultivation methods and in

the reduction of the cost of extraction and distribution of the quinine.

HUNDRED MILLION SUFFERS!

There are one hundred million sufferers from Malaria in India calling for an annual supply of some 600,000 lbs of quinine sulphate—or its equivalent in other forms. Immediately 38,000 acres of first class cinchona land is available, and this is distributed in Bengal, Assam, Orissa, Bhutan, Sikkim, Madras, Travancore, Cochin, Mysore, and Coorg. Much of the hill land which is not yet fully explored showed promise and will require further investigation in the future.—*Journal of South Indian Medicine.*

MINERAL SPRINGS IN INDIA—GEOLOGICAL INVESTIGATION CONTEMPLATED NEED OF MEDICAL COLLABORATION.

Occurrence of two sulphurous springs in Riasi district, Kashmir, is reported by the Geological Survey of India.

The one, which is situated about a quarter of a mile above Khar along the Tawi river, discharges hot water only during winter. It precipitates a good deal of milk of sulphur.

The other spring is, of course, the well known thermal spring at Tattapani. Its water is apparently possessed of certain therapeutic properties for curing skin diseases and gouty affections. This spring is visited by a large number of people from far and near. The water gives a strong sulphurous odour and maintains a constant high temperature of 70 to 80° C.

The name Tattapani is familiar in various parts of India—as in the

Sutlej valley, North of Simla, in the coalfield of this name on the northern border of Sirgula, in the Kopili valley in Assam etc.—at places where thermal mineral springs occur. There are, however, numerous other localities, many well-known places of pilgrimage, where hot springs are among the chief attractions because the waters have been found efficacious in the treatment of disease.

CATALOGUE OF HOT SPRINGS.

Several years ago the Geological Survey of India compiled a catalogue of the hot springs in this country, but this information is in need of additional information both with regard to the radio-active and mineral character of the waters from a geological aspect and the medicinal properties of the water from a medical point of view.

Extracts

Just before the Italian occupation of Abyssinia an officer of the Geological Survey of India made a special investigation of several hot springs in that country on behalf of the Emperor of Ethiopia who then contemplated establishing a health resort in his territory. The special apparatus for ascertaining the radio-active property of spring waters in the field employed in Abyssinia is now in the possession of the Geological Survey. This department has, besides, even more delicate laboratory apparatus for the same kind of work and at least three officers who are already familiar with this class of investigation.

It is understood that an exhaustive examination of the mineral springs of India is under consideration and it is hoped that the Geological Survey of

India will shortly be able to arrange a programme. But the determination of the physical and chemical constitution of the mineral waters must be supplemented by an investigation of the cures which are said to have been effected by the various waters and for this purpose medical collaboration is necessary to complete the investigation to give the final report its greatest value.

Though mineral springs have till now attracted little public attention in India, spas and hydros in Europe which have grown up at numerous places where mineral springs occur and the therapeutic properties of the waters are beyond dispute are highly popular resorts with those who seek health and holiday.—*Journal of South Indian Medicine.*

SHOULD PILGRIMS BE COMPULSORILY INOCULATED? THE CHOLERA DANGER IN INDIA—MELAS AND THE SPREAD OF CHOLERA—COMMITTEE TO INVESTIGATE THE PROBLEM.

Since every large gathering of pilgrims appears to hold out a threat of the spread of cholera, the Central Advisory Board of Health at its meeting in Madras last January decided that the time had come to consider whether the authorities responsible for the health of the people should be armed with powers to enforce preventive inoculation. In order to investigate the question the Board appointed a committee consisting of the Hon'ble Dr. T. S. S. Rajan, Minister in charge of the Public Health Department, Madras, the Hon'ble Dr. M. D. D. Gilder, Minister in charge of Health, Bombay, the Public Health Commissioner with the Government of India and the Directors of Public Health of the Punjab, Bengal and the United Provinces.

At Pandharpur, in Bombay Presidency, where an important festival attracting over a lakh and a half of pilgrims takes place at this time of the year, the Provincial Government has been able to carry out inoculations of the great majority of pilgrims in recent years. The Committee appointed by the Central Advisory Board of Health will meet at Pandharpur on June 26, in order to see for themselves the procedure adopted by the authorities there. The Committee will reassemble in Poona on June 28, in order to consider its report.

The important part played in the spread of Cholera by large gatherings of pilgrims at festival centres has long been recognised by public health authorities in this country. Provincial

public health departments are now taking elaborate precaution in respect of such gatherings by special attention to the sanitation of the festival area, medical inspection of the pilgrims, arrangements for the segregation and treatment of persons suffering from infectious diseases and intensive propaganda for carrying out mass anti-cholera inoculation among intending pilgrims. However, the most efficient sanitation of the festival area will not suffice to ward off the danger of cholera outbreaks when large numbers of pilgrims may arrive from or pass through cholera-infected areas on their way to and from the place of festival.

The explosive outburst of cholera that followed the Hardwar festival in April, 1938, and produced a large in-

crease in the incidence of the disease in a number of Provinces and States, brought prominently to public notice the necessity for the application of all available methods to ward off the danger. The value of inoculation with cholera vaccine in conferring protection against the disease is now generally recognised and it is true that, within recent years, the willingness of the people in this country to accept inoculation has undoubtedly grown. Education of the people through the propaganda carried out by Provincial health authorities and voluntary organisations has been largely responsible for this result and educative efforts must no doubt continue in order to provide a background of public opinion in support of this measure.—*Journal of South Indian Medicine*.

THE MEDICAL ASPECT OF FLYING

P. ASTLEY COOPER, M.R.C.S., C.P.L.R.

In flying the human body meets with a variety of changes, stresses and strains which are not normally experienced otherwise. The main effects may be regarded from physiological and psychological aspects. Under the former heading fall the effects of altitude and the effects of motion, especially acceleration.

ALTITUDE.

With increasing height from the earth both atmospheric pressure and temperature fall. The pressure falls to about half that at sea-level at 17,500 ft. ($3\frac{1}{2}$ miles), and the temperature to freezing point somewhere between 15,000 and 25,000 feet ($2\frac{1}{2}$ to $4\frac{1}{2}$ miles) above sea level*; there are

* All altitude in this paper give the height above sea level.

however wide variations in the latter, depending on the latitude and the time of year.

When an aeroplane climbs, as a result of the decreasing pressure, any enclosed air or gas in the body tends to expand. Such air or gas in the body tends to expand. Such air or gas is found in the intestine. To compensate for expansion in the middle ears the Eustachian tubes must be patent, and the pressure is readjusted when necessary by swallowing. If the openings of the nasal sinuses are blocked, changes in pressure cause headache or facial pain. Gas in the intestines, if plentiful, causes pain and even fainting from stretching of the intestinal wall.

An important effect of altitude is the decrease of oxygen pressure. At

sea level the blood is 90 per cent saturated with oxygen; the slight deficiency is due to the fall of oxygen tension in the alveoli of the lungs, and to the dilution of the inspired air by the residual air in the lungs.

At a height of 25,000 feet (about $4\frac{1}{2}$ miles) the blood of a person at absolute rest is about 90 per cent saturated, thereafter with increasing altitude the oxygen saturation of the blood falls very rapidly.

Experience shows that a man can perform light work without oxygen-shortage at 15,000 feet. At 19,000 feet he can remain at rest without any symptoms of oxygen-want except an increased respiratory excursion; but the slightest exertion at this height will cause panting and even fainting from anoxæmia.

The symptoms of oxygen-want are an excessive and unjustified feeling of self-confidence followed by a gradual and insidious loss of consciousness. The insidious nature of this process is very important, as the pilot of an aircraft may faint from anoxæmia without having realised that there was anything abnormal in his condition.

In connection with this question of oxygen-supply at high altitudes it is worth noting that the pilot should be adequately clad; otherwise the attempts of his body to combat the cold will increase his oxygen consumption.

It is evident that for heights above 15,000 feet the occupants of aircraft should be supplied with extra oxygen. Normally oxygen is supplied from a cylinder through a tube or special mask at atmospheric pressure. This method is satisfactory for heights up to 40,000 feet or just over 7 miles.

Above this height oxygen must be given under pressure to supply the body's needs adequately. For all present day flying purposes this is sufficient, but for higher flying and in passenger-carrying aircraft such methods are unsatisfactory.

Above 40,000 feet there begins a layer of the atmosphere known as the stratosphere. This region is free from clouds and the air-currents are constant; on account of these factors the stratosphere is well suited for long distance flying, and, it is surmised, will be largely used in the future. To this end experiments are being conducted with "pressure cabins" which are gas-tight and in which the occupants are given oxygen under pressure. Experiment has shown that oxygen at a pressure of $2\frac{1}{2}$ lbs. per square inch (130 mm. Hg.) is sufficient for flying at all heights.

MOTION.

There is no physiological limit to the constant speed in a straight line at which a human body can travel, but strains are imposed upon a body during acceleration, deceleration and circular or turning movements. In the latter the force known as centrifugal force occurs; this is of course due to the tendency of any body in motion to travel in a straight line and to resist efforts made to change its direction of movement. This change of direction that occurs in all circular movement is really an acceleration, and is measured as such. In considering these accelerations we shall express them as multiples of 'g', the acceleration or force due to the tendency of gravity, which is approximately 32 feet per second per second. Thus an acceleration of 2g is equal to 64 feet per second per second, and of 0.5g. to 16 feet per second per second.

The main circular movements occur in steep turns (i.e., turns of small radius), recovery from dives and in looping. In the latter manoeuvre, the machine gathers speed by diving and then describes an upward circle, at the top of which it is upside down.

In all of these centrifugal force acts towards the seat and legs and the apparent weight of all parts of the body is increased. The most mobile part of the body is the blood and consequently this is affected most. Its increase in weight impedes circulation, and the centrifugal force draws the blood towards the feet. It collects largely in the splanchnic area and probably also in the veins of the thighs.

If the movements that have been described are very abrupt, the sudden drainage of blood from the head will cause fainting from cerebral anæmia. A somewhat less violent movement may cause the interesting condition known as "blacking out." The pilot finds himself suddenly blind, though he does not lose consciousness. After a few seconds sight returns. This condition is a possible source of accident. Its exact cause is not known, but it is probably due to a localised anæmia either in the retina or some other part of the visual apparatus.

These adverse effects are minimal in pilots of sound physique with well toned muscles, especially those of the abdominal wall.

In certain "aerobatics" the pilot is on the outside of the turn, so that centrifugal force causes the blood to "rush" to the head. The pilot feels as though his head were bursting and his eyes bulging. There is also engorgement of the retinal vessels which cause him literally to "see red." These manoeuvres, however, are sel-

dom done, and no harmful results have been recorded.

A type of movement with which all pilots have to be familiar is spinning. During a spin the aeroplane falls towards the ground nose first rotating about its longitudinal axis. The pilot is rotated accordingly. It is therefore necessary to ascertain that a pilot can undergo rotation without undue giddiness, nausea, or upset of ocular and muscular co-ordination.

THE PSYCHOLOGICAL ASPECT.

The psychological aspect of flying is largely centred around the one word "anxiety".

The pilot while flying is subjected to a continuous strain, conscious or unconscious, of a varying intensity. He often has to fly in bad weather conditions, and at times when there is little or no visibility. He may also have to fly and make landings at night. And at all times there is a possibility of engine failure necessitating a forced landing, possibly on unsuitable ground. Moreover with the increase of speed in aeroplanes, the strain on the pilot is likely to grow too. The symptoms of anxiety, and the reaction to danger are too well known to need description here.

Should symptoms occur, rest or limited work may be sufficient to restore the pilot's confidence. The onset of an anxiety neurosis or a hysterical state will require specialised treatment or a total change of occupation.

THE MEDICAL EXAMINATION OF PILOTS.*

The examination of pilots consists of a strict physical examination.

* These remarks apply mainly to pilots engaged in commercial flying and similar enterprises. The medical examination for private flying is not so strict.

Special attention is paid to the eyes, as normal binocular vision is required for the operation of landing when distances have to be judged accurately. The presence of a concealed squint or defective eyesight may lead to bad or even disastrous landings.

Certain tests are also carried out to measure the physical efficiency of the

pilot. These tests are exceedingly useful, as any disturbance of health, either bodily or mental, causes an immediate decrease in the physical efficiency of the pilot. Examination of all pilots is, naturally, carried out at regular intervals.—*The Sind Medical Journal*, Vol. XI, No. 4.

Annual Report of the 'A' Coy., Medical 5 M.U.T.C., 1938-39.

The College Contingent of the University Training Corps commenced its activities in July 1938. Finding from previous records that the contingent could well manage to impart efficient training to more cadets, the strength was increased from seventy-seven to eighty-five including officers. This increase in the accommodation together with the grant of discharges, from the Corps, of senior cadets and outgoing students, created a few vacancies which were filled up in no time. There was enhanced enthusiasm among the students, and after a strict selection, twenty-eight were enrolled. This made up to more than the sanctioned strength. A few of the recruits were compelled to remain in the waiting list till vacancies arose as a result of further discharges.

The contingent did company parades on Tuesdays and Thursdays every week and attended Battalion Parade on all Penultimate Saturdays. Parades were conducted according to the time-table drawn up for the year. On Tuesdays Non-Commissioned Officers were given special parades by the officer. Lt. Viswanathan, who is the permanent officer commanding the contingent, returned from America and immediately took charge of it in August 1938. Until then the contingent was under the guidance of Lt. Chandrasekhar. Lt. Viswanathan is also the Medical Officer of the Battalion over and above his duties as the contingent commander.

The College contingent took part in the Guard of Honour that was given

to His Excellency the Governor of Madras on the Convocation day at the Government House on 5th August 1938. Our contingent also took part in the celebrations on the Armistice Day Parade at the War Memorial on 11th November.

The contingent left for Pallavaram on 8th December 1938 to attend the annual camp of fourteen days. Twenty students were exempted from camp as they had to appear for Pre-Registration Examination which came off during camp period. The remaining sixty-eight were present on Parade on the day of departure for camp. As Lt. Dr. Viswanathan had to discharge his duties as the Medical Officer of the Battalion, the Company was kept in direct charge of Lt. Chandrasekhar, the former making use of all available moments to come into contact with the men of his College both during Parade as well as in his leisure hours. The officers, Non-Commissioned Officers and cadets exhibited their spirit of co-operation to a notable degree during camp. The team spirit was kept up and they combined well with the Engineers who formed the other contingent of the 'A' Coy. Special classes and parades were held for senior cadets (those who had the benefit of having attended two camps already). Considering its strength the medical contingent contributed a good proportion of senior cadets in the role of Non-Commissioned Officers and cadets to these special parades.

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Our achievements in camp were quite satisfactory, though not outstanding as in previous years. The contingent was unlucky in that a few senior Non-Commissioned Officers were sick during camp period and could not do their maximum towards the success of the unit. The medical unit consisted of a medical corporal, a malarial and a medical orderly all three being senior students of the College. They were in charge of the medical tent and, under the command of the Medical Officer Lt. Viswanathan, discharged their duties efficiently and to the entire satisfaction of the Battalion. They stood the test of the General's inspection creditably well. The medicals found no difficulty in winning the

'Tug of-War' for the third time in succession.

The regular parades were temporarily suspended during Christmas vacation after which they were resumed on January 1939 to go on till March 1939. During this term the contingent under the command of Lt. Viswanathan furnished a Guard of Honour to His Excellency, the Governor, on 3rd February 1939 in connection with His Excellency opening the new Medical College Hostel at Kilpauk.

The contingent is proud to record the selection of one of its members, 4770, Sgt. K. Sundaram, to the Indian Military Academy, Dehra Dun.

Report of the Athletic Club.

Track and Field Events.—It is very gratifying to note how the College is maintaining our high standard in this department. We have won the Inter-Collegiate (Travancore) Shield for the fourth year in succession.

Much praise is due to Ralston who won all the events, and to Pereira.

Madras Olympic Sports.—It is a pity some of our best men did not compete. Ralston won the 400 and 200 meters and was second in the 100 meters. Bird won the 16 lb. hammer throw and came second in the discus throw. Pereira won the 400 meter hurdles.

College Sports.—This winding-up event showed keen contests. It is sad that Ralston lost the championship because of a pulled muscle. He has now been our best Athlete for the last three years with many records in the Inter-Collegiate and Olympic sports and it is a pity that he should be leaving the College without ever winning the championship.

My congratulations are especially due to Bird, our captain. He has shown what a lot can be achieved by careful and painstaking practice.

Cricket.—We had a very successful year in cricket. After the lapse of three years we have won the Inter-Collegiate League Championship again and were runners-up in the intra-divisional tournaments.

We started with a poor bowling side but were able to do great feats. Much of the credit for this is due to

Padmanabhan who time and again proved himself unplayable. Mention must also be made of A. V. Rajagopalan who showed himself a great all-rounder.

Let me congratulate our captain Mahadevan, on the splendid achievements of his team. I am glad that real team spirit was always in evidence and there never was such keen, unselfish co-operation as was manifest this year. It was due entirely to the merit and efforts of the captain, who in every way proved that he was worthy of his responsible position.

Football.—When we started, everybody thought that the side was quite a depleted one, but events soon proved that the fight was still in our blood. We won the intra-divisional tournament and were runners-up in the Inter-Collegiate League and Wilson Cup Tournament. Special mention must be made of Shritharan and Stephens who were our tower of defence. The former as back and the latter as goalier were so good that our team was almost unbeatable in spite of our chronic inability to marshal our full strength in the matches. Our losses are attributable to our poor forward line. In fact that only 16 goals were scored against us in 17 matches vouches for the solidarity of our defence.

My thanks are due to Stephens as captain. He has been invaluable in ferretting out raw material, and teeming that to good account. He has made the way easier for his successor.

Hockey.—As in football, we started with a side that was enfeebled by the departures of the mighty names of last year. Praise is due to O'Neill, who set himself to make up as far as possible by constant practice. We are proud that we were able to win the Inter-Collegiate League and the 'varsity championships. I wish them all success in the ensuing tournaments.

Boxing.—Due to the want of proper boxing ring for practice and many of our men being unable to appear because of examinations, we had to send in a limited number, our teams consist-

ing of only ten men. But we were able to win three fights and were runners-up in three men.

Tennis.—Mohanrangam won for us the Inter-Collegiate singles, with a well-earned victory over Moses in the finals, and defeating Bobgee in the semifinals. As luck would have it, we lost the doubles.

It is unfortunate that our Tennis Club is so poorly patronised. I hope that soon the state of affairs will be changed and a keener interest will be in evidence.

A. K. HARIDOSS,
Sports Secretary.



The Sports Casuarie.

BY "SENEX"

Cricket.

Always to be looking at and for the sun and moon and the attendant planets, though an enchanting and ever-green prospect, is not as fascinating, thought provoking and bewildering as a study of the heavens on star-lit nights. The multitude of stars in their confusing groupings, present to-day and disappearing the next day changing and flitting like the waves of the sea, has in it a charm and a witchery, that appeals but to the persevering.

The inter-class matches fall to the latter category. With players of note distributed in all the five years, it is a question of the proportion of them, that decides the issue. The fourth year had six members of the College eleven in their side, and naturally they won the championship but certainly, not as easily, as one expected. After an anxious time with the final years and a nerve-wracking and trying time with the second years, they won the championship.

The matches were all through interesting to watch and speculate, real

holiday cricket, cricket of a type, fast disappearing. The matches would be more interesting and well contested if the regular eleven keep down from the event. Of course it is a bit unfair to them! After all what is there in a game? With Burns I can say,

"The game is a game for all that and for all that"

The result is but the guinea stamp"

1. Pre-Registration 41 (Cherian 24; Rangaraj 5 for 14)
Second year, 57 for 2 declared.
2. Staff and House Surgeons 47.
Fourth year 50 for 2 (B. Mahadevan 35.*)
3. Third year 47 (Atma Rao 6 for 21).
Final year 55 for 3 (Atma Rao 26).
5. Final Year 85 (Shambu Shetty 33*)
Fourth year 89 for 6 (Hogg 44*).
6. Fourth year (1st innings) 202 (Hogg 63).

* Not out.



P. V. Krishnamurthy, Hockey Captain. Eric O'Neill, The All-Madras Player and outgoing Captain

Second year (1st innings) 74
(Suri 26; V. Rao 23).

Second year (2nd innings) 114
(V. Rao 23; Ramesh Pai 24).

Hockey.

It is said "Practice makes perfect". Nowhere has it been better exemplified than in our College Hockey. Eric O'Neill deserves all our congratulations for the thoroughness and fairness with which he built an eleven—an eleven that shows very great promise of regaining our place as a force in Madras Hockey—starting from a depleted and illknit side. 'It is the game that matters and not the result', that is said to be the spirit of sport. It was this that prompted us to enter the league, knowing full well that we could not field the regular eleven throughout.

In the M.C.C. tournament we beat the Hornets full and square but the St. Joseph's of Bangalore—the Travancore Cup-holders and Runners-up in the tourney—beat us by the odd goal of the day.

Dwarfing everything O'Neill has stood out as a player of merit, and day by day his form has improved, so that ultimately he was selected to represent All Madras against Bhopal as right full back. His clever anticipations, sure interceptions and forceful clearances earned for him a chorus of tribute from the sport loving public. He reminds us of Tapsell of the Olympic Team and, 'Rock of Gibraltar' as he is in defence, one would be surprised, if he is not selected, in the next Olympic eleven. For years Madras has not seen such a brilliant display, as his, in his position. We are proud of him and the College is proud of him. Wish him fresh laurels and pastures anew!

MADRAS HOCKEY LEAGUE.

Madras Medical College vs.

G.E.C. Sports Club	... W.O.
A.I.C. Club	... 7-3
Telegraph Recreation Club	... 1-2
Ever Merry Sports Club	... 2-1
Shivaji Memorial Club	... 1-0

After these matches, with the exception of O'Neill, Krishnamoorthy and Ralston, the others well made up from the second eleven.

Madras Medical College vs.

Rangers	... 2-4
Hornets	... 3-3
M.U.C.	... 0-2
Binny's Recreation Club	... 5-0
M. & S. M. 'A'	... 1-3
M. & S. M. 'B'	... 2-2

Unable to raise even an eleven we gave a walk over to Madras Eastern Club and Mambalam Hockets.

S. I. A. A. Tournament:

M. M. C. vs. Hornets,	0 1
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M. C. C. Tournament:

M. M. C. vs. Hornets,	3 0
" vs. St. Joseph's	0 1

REPORT FROM THE CAPTAIN Foot-Ball

It has been said that "once going downhill always gowing downhill". It is a matter of no small congratulation that we were able to dig our heels into slippery earth and work towards the top once again.

Save for a few non-co-operators, the members of the team stood admirably together even when it came to a bout of fistcuffs with a section of our none-too-polite hosts in an Inter-Collegiate fixture.

It was a good season and even though we have no cheap silverware to show as token of our exploits the morale remains and should carry us through a good few years.

The team behaved wonderfully as a whole and though I will admit that a certain spirit of resentfulness against unfair referees still prevails amongst the more hot-headed members of the side, it does not undo the cohesion that has been patiently built up.

Winners of the Inter-Divisional League, Runners-up in the Inter-Collegiate League and Wilson Cup Tournament and semi-finalists (although we only played a single match) in the Jabbar Tournament—something that should take some of the moisture out of the wet rags of our College who croak about our low standard of football, but who are ready to gush like cut arteries at the mere odour of a threatened success.

Thanks awful you fellows, I have thoroughly enjoyed doing things for you—and to the new skipper the very best of good Luck.

BOXING.

Due to want of a proper boxing ring for practice, and due to the inability of many of our men to contest because of examinations, we had to send in a limited number of entrants. We won three fights and were runners-up in three others.

One must sympathise with A. J. Ralston, the runner with funny muscles. They let him down badly. One is very sorry that he leaves the College without at least once becoming the champion sportsman. His

fine record in the Inter-Collegiate and Olympic sports for the past three years should be an object lesson to enterprising and enthusiastic athletes.

(For results see the table given.)

TENNIS

With the passing out of C. Mohanarangam, our College has lost a player of merit and the university, a player of spirit. With good practice, one sees no reason why we should not maintain the same high standard as before in Inter-Collegiate Tennis.

Our Lady students—or shall I call them our sisters—have won for us the Inter-Collegiate Ladies' Tennis Doubles League Championship for the second year in succession. Our congratulations to Miss Leelavati Bal and Miss N. Thuraisingam for their splendid performance.

As one who has been following the College teams in action as far as possible one cannot but help feeling that we are sadly neglecting our College sportsmen. We, students, for various reasons, rarely turn up to see them in action, encourage them and fillip them to further success. They deserve better encouragement from our hands and, if, but we wish, we could do it.

I hope that when facilities for sports are provided in the College hostel—hope it will be done in another year at least—more students will play games, more students will become interested in games and, consequently, more encouragement will be given to the courageous few who every year at great inconvenience keep up our prestige in Inter-Collegiate and Madras Sports.

INTER-CLASS TOURNAMENTS.

CRICKET

Rolling Cup presented by	Dr. N. Mangesh Rao	} Winners: III year
Best Batsman of the year—		
Cup presented by	Gordon & Co., Ltd., Printers	} A. K. Haridoss
Best bowler of the year	... V. Padmanaban	

FOOTBALL

Rolling Cup presented by	Dr. S. Ramakrishnan	} Winners: V year

HOCKEY

Rolling Cup presented by	Dr. R. K. Chettur	} Winners: IV year

TENNIS

Singles (Gents)	} Winner: C. Mohanarangam (V year) Runner-up: Vincent D'Bayliss (V year)
Singles (Ladies)	
Doubles (Gents)—Cup presented by Sharman & Co.	} Winner: Miss L. Bal Runner-up: Miss N. Thorasingam Winners: C. Mohanarangam and Thomas Kuruvilla (V year) Runners-up Mr. Ranganatham and Mr. J. Williams (staff)
Doubles (Ladies)—Cup presented by Kota Alwar Chetty	
Mixed Doubles	} Winners: Miss N. Thorasingam and Miss A. Sarada Runners-up: Miss L. Bal and Miss S. Sarada Winners: Miss Bunyan and Mr. C. Mohanarangam Runners up: Miss J. Asirvadam and Vincent D. Bayliss
Tenikoit	
	} Winners: M. Thangam and Miss L. Colacco Runners up: Miss Bultjens and Miss Damayanti.

U. T. C. PRIZES.

(Awarded by Lt. K. S. Visvanathan and 2/Lt. Chandrasekharan).

Best Shot among Recruits	... Cadet Lobo.
Best Shot among Trained Men	... Lance-Corporal Jayaram. Lance-Corporal Shamsuddin.
Attendance Prize among Recruits	... Recruit Ramachandran. Recruit Kothari Anandlal.
Attendance Prize among Trained Men...	Cadet Durga Prasada Rao.
Best Turnout among Trained Men	... Cadet Sivaprakasam.

PRIZE WINNERS.

EVENTS.	FIRST.	SECOND.	THIRD.	FOURTH.	TIME, HEIGHT OR DISTANCE.
1 400 Meters Hurdles	A. J. Ralston	B. J. Pereira	D. S. B. Stephens	B. D. L. Carvalho	62.4 secs.
2 Long Jump	D. S. B. Stephens.	A. J. Ralston	K. Shambu Shetty	...	19' 9 1/4"
3 Cricket Ball Throw	J. Marshall	E. P. O'Neill	L. M. Hogg	E. F. G. Harben	92 yards
4 800 Meters Race	A. J. Ralston	B. J. Pereira	M. A. Gidney	...	2 min. 16.8 secs.
5 16 lbs. Shot Put	J. A. Muthiah	E. P. O'Neill	G. W. Bird	B. Mahadevan	31' 11 1/2"
6 High Jump	Bhaskar Mahadevan	L. M. Hogg	R. S. Bower	T. J. Cherian	5' 2"
7 200 Meters Hurdles	B. J. Pereira	D. S. B. Stephens	K. Shambu Shetty	A. J. Nicholas	28.8 secs.
8 Javelin Throw	J. Marshall	E. P. O'Neill	J. A. Muthiah	E. S. Linton	125' 4"
9 Tug-of-War (Inter-class)	Pre-Registration	...	...	...	...
10 110 Meters Hurdles	B. J. Pereira	D. S. B. Stephens	B. D. L. Carvalho	...	17.4 secs.
11 Discus Throw	A. J. Brafield	G. W. Bird	T. McCullagh	B. D'lanoy Carvalho	92' 8"
12 Pole Vault	Herbert Gnanaolivu.	D. S. B. Stephens	T. J. Cherian	K. N. Kothanath	9' 5"
13 Servants Race	John Samuel	Marimuthu	Krishnan	...	...
14 100 Meters Race	B. J. Pereira	Charles Alexander	B. D. L. Carvalho	L. M. Hogg	12 secs.
15 16 lbs. Hammer Throw	G. W. Bird	E. P. O'Neill	J. A. Muthiah	...	77 feet
16 Hop, Step and Jump	L. M. Hogg	R. S. Bower	D. S. B. Stephens	K. Sambhu Shetty	45 min. 9 1/2 secs.
17 Ladies 100 Meters Race	...	...	...	...	...
(College and Hospital)	...	...	...	...	...
18 200 Meters Race	Miss Hargreaves	Miss O. Hughes	Miss Adams	...	14.6 secs.
19 U.T.C. Race	B. J. Pereira	Charles Alexander	G. K. Sri Hari	...	25 secs.
20 Old Students Race (Handicap).	Cdt. Abraham	Cdt. Arunagiri	...	...	...
21 400 Meters Race	Dr. C. Raghavachari.	Dr. M. Santhosham	Dr. Sundara Babu	...	...
22 Ladies Slow Cycle Race	B. J. Pereira	G. K. Sri Hari	K. Shambu Shetty	D. S. B. Stephens	57.6 secs.
23 8 x 50 Meters Relay Race (Inter-class)	Miss N. Hughes	Miss O. Hughes	...	...	...
24 Fast Cycle Race 1600 Meters	Final Year	Fourth Year	...	...	...
25 Students' Mixed Race	A. J. Brafield	B. D. L. Carvalho	T. K. Jaya Ram	T. J. Cherian	...
...	Miss M. Hughes and Partner.	Miss Welch and Partner	Miss Mathias and Partner (Prize awarded by Lt. Col. V. Mahadevan, I.M.S.)	...	...
26 4 x 200 Meters Relay (Open).	Y. M. C. A. College, Madras.	Medical College, Madras.	...	...	1 min. 41 secs.
27 Staff Mixed Race	Miss Hodgson and Partner.	Miss Osborne and Partner.	...	...	...
28 Sack Fight	E. P. O'Neill	B. D. L. Carvalho	G. Paulie	...	...
29 Tug-of-War (Professors, etc.)	Asst. Professors, etc.	...	...	...	...
30 1,500 Meters Race	M. A. Gidney	R. A. Jansen	G. K. Sri Hari	Herbert Gnanaolivu.	4 min. 53.3 secs.
31 Disguise Competition	Tirupathi Pilgrim (Prize awarded by Md. Saif & Sons.)	Beads Woman	Male Nurse	...	...

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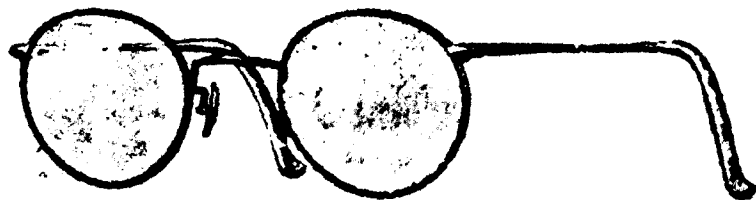
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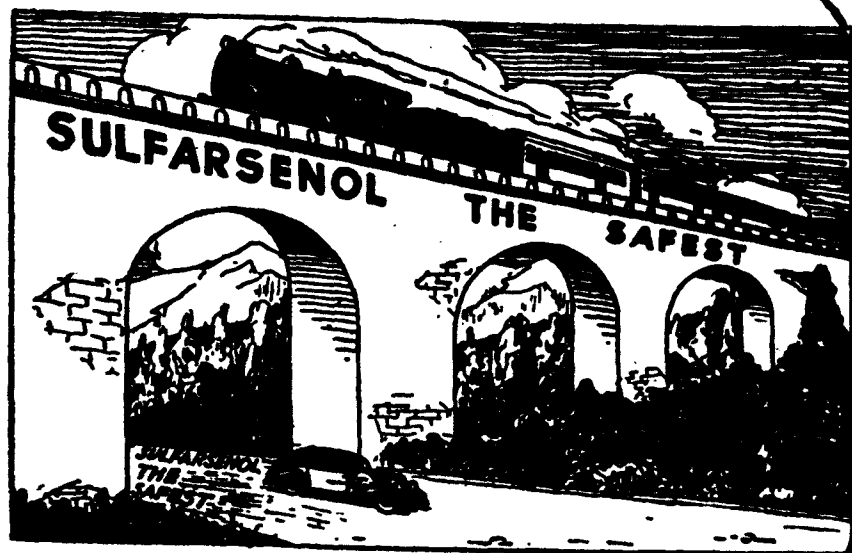
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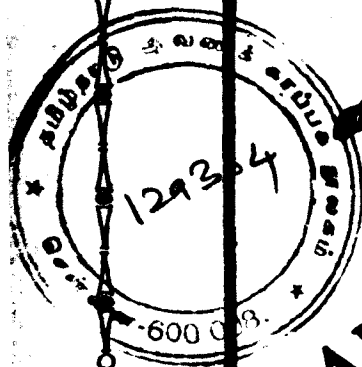


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