

Pulmonary Tuberculosis in Infancy and Childhood

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It must be the common experience of all of us, that more than 50 per cent of children that come under our care, do suffer from some form of tuberculosis or other - viz lungs, glands, bones or joints. In young children, as the lungs are said to be more permeable, the Tubercle Bacilli are more likely to pass through, into the arterial blood - stream and so to infect the distant organs and bones. The general tendency seems to be that tuberculosis in young children, is arrested in the glands, bones or joints. When it occurs in the lungs, it is often of a type of generalised tuberculosis. Miliary and Meningeal forms a rapid and fatal tuberculosis occurring before there is time for the formation of antibodies i.e. before 'Allergy' sets in. This may be called, 'Primary Tuberculosis'. Of these primary tuberculosis cases, according to reports, there is

infection of lungs only in about 15 per cent of cases. Highest mortality occurs in the first three months of life, to the extent of nearly 90 per cent. At the end of the first year, the mortality is about 15 per cent and by the close of the second year, it comes down to 10 per cent. Then a period of lull sets in, till about 10 to 15 years, when the adult type of re-infection tuberculosis with an incidence of nearly 96 per cent in the lungs, commences to occur.

The so called 'Adult Type of Tuberculosis', is commoner in children, than is generally believed and recovery often takes place. Pulmonary tuberculosis is apt to run an acute course, especially in girls, at the age of puberty.

It will be worthwhile to make out a comparison of the two types of tuberculosis, occurring in children—viz

Childhood Type

vs

Adult Type

1. Usually occurs in children, much less frequently in adults. Result of primary infection; may be localised in any part of the lung.

Usually occurs in adults, may also be found in children. Result of continued infection or reinfection. (Exogenous or Endogenous). Localisation is usually in the upper part of the lungs: the first clinical manifestation is usually sub-apical.

2. Associated Tracheobronchial lymph nodes are always involved but may not be demonstrable.

Tracheo-bronchial lymph-nodes not grossly involved by the re-infection except sometimes in the terminal stage.

3. Caseous lesions usually become calcified or even encapsuled, in fibrous tissue Occasionally a lesion progresses to exudation

4. Infiltrated areas commonly resolve leaving trivial or no scar at all except for foci of caseation which usually gets calcified.

5. Prognosis is good.

It is but proper, we explain briefly what we mean by 'Primary or Secondary Tuberculosis'. Tuberculosis may be regarded as primary or secondary according as the body has not been or has been previously infected by the tubercle bacilli. The infected or the Allergic body reacts differently from the so called Non-immune body (which forms the virgin soil) Koch's Phenomenon.

The period of 2 to 3 weeks after infection of the virgin soil, is called the period of Allergy, and is the Primary Phase (which is really the incubation period) of the disease. This primary phase seems not to be of practical importance and is generally overlooked.

The primary infection tends to spread rapidly to the corresponding lymphatic glands without producing any symptoms or any local reaction, anti-bodies being formed and the body becoming allergic at the end of a week or two. Thus a tubercular knee or a Ghon's focus in the lung are not primary lesions, although they follow on a first infection. Because they occur when the body is allergic, it is not unusual, however, to speak of the 'Primary Complex' as a focus in the lung with infected glands and lymphatics. The focus in the lung may be completely healed and even calcified so as to be well

Caseous lesion usually followed by exudation or fibrosis or both.

Infiltrated areas may recede with production of more or less fibrous tissue.

Prognosis in Children is poor.

recognised by a radiographic picture. It is often known as Ghon's focus. Parrot described this condition and spoke of the glands as mirrors of the lungs and it is worthwhile mentioning the law enunciated by him.

"When even a tuberculous mediastinal gland is found, there is always a focus in the lung from which the gland was infected". It is still regarded as true that the lesion in the lung infects the glands and that the disease does not spread to the lung from the glands which can be explained as due probably to the slowing of the circulation in the pulmonary capillaries.

Tuberculin tests prove that the vast majority of the subjects with tuberculous lesions, never develop any clinical manifestations of the disease. In some cases, there may be temporary ill health or the formation of a lesion in the lung progressing to calcification (Ghon's focus) large enough to be seen in an X-ray picture. In others the primary infection may be so large as to lead to caseous tuberculosis or even a rapidly fatal miliary tuberculosis—all stages occurring in a very short time.

A rapid and fatal tuberculosis, occurring before there is time for the formation of anti-bodies, i. e., before allergy sets in—may be called Primary; all the others must be classified as Secondary.

Diagnosis and Prognosis

With a view to diagnosis and prognosis, symptoms of pulmonary tuberculosis in children may very well be considered under two groups—in consideration of the age of the child.

(1.) From birth to 2 years (2) 2 to 10 years. In the young infants up to 2 years, the following conditions require our close observation and investigation.

Anorexia—that is occurrence of digestive disturbances such as Loss of appetite, a sense of fulness after food, diarrhoea, vomiting etc,

Loss of weight or Suspension of growth along with undue fatigue (i. e. getting tired very soon)

Fever. More or less constant elevation of temperature over 100 °F, taken every 4 hrs, after 20 minutes rest in bed.

Colds—constant attacks without fever

Anaemia—with enlargement of Liver and Spleen, must put us on the guard to note for Miliary Tuberculosis, differentiation has to be made from Malaria, Kala-azar and Syphilis

Cough and Expectoration—May be absent entirely Pressure on the mediastinal glands may produce cough Stethoscopic signs may be entirely absent or a few rales may be heard at times Tubercle Bacilli may be found in the sputum if present and if not a laryngeal or a pharyngeal swab may help. If this be negative, faeces examination or examination of the gastric lavage sedi-

ment, after starvation for at least 6 hrs, may give us the clue.

Pleurisy—especially at the mammary region—inter-lobar in position X-ray in the lordosis position is the only confirmative evidence.

Dyspnoea or Stridor—may be due to Enlarged Thymus

Phlyctenular Conjunctivitis and Tuberculous Dactylitis may be present

When one or more of the above symptoms are present, it is our bounden duty,

(1) To trace out the source of infection—from

(a) History of exposure and nature of contact if any, with an open case

(b) Also history of bronchitis, and asthma (Tuberculosis and Asthma: one asthmatic in a 100 gives any incidence of tuberculosis and only one in 200 with active tuberculosis suffers from true asthma).

(2) To do the Tuberculin Tests—The intra-dermic Mantoux's test with suitable dilutions, properly applied, rules out tuberculosis except during or after an attack of exanthemata or in the presence of a far advanced tuberculous disease

N B To avoid the great harm done by the indiscriminate tuberculin tests, we will have to follow a certain definite course in the use of tuberculin reactions. The following course has been suggested by H Behrendt.

On normal children...

- (a) Cutaneous (Pirquet) test with undiluted tuberculin or percutaneous test with diluted tuberculin ointment or intra-cutaneous injection of 0.0001 mg of tuberculin. If this test is negative.
- (b) Either repetition of the aforesaid procedure or Further intra-cutaneous test with increasing doses from 0.001 mg to 0.01 mg.

On children who are likely to be hypersensitive...

- (a) Cutaneous (Pirquet) test with 1 in 10 tuberculin; if no reaction it is to be followed by,
- (b) Cutaneous test with undiluted tuberculin, or by,
Percutaneous test with diluted tuberculin ointment, and finally by,
Intra-cutaneous injection of 0.01 mg. of tuberculin.

Note.—It is a golden rule that no tuberculin test should be done on children known to be tuberculin positive.

It is worth mentioning here, the value of the intra-cutaneous test of Mantoux as well as that of the percutaneous test with tuberculin ointment according to the great workers D. B. Bradshaw and H. P Wright

According to D B. Bradshaw, the value of the Mantoux test is considerably greater than is usually recognised. In 3,010 children tested between 1934 and 1938, there were found 748 positives (that is nearly 25 per cent). The tests were performed with 0.1 c. cm or 0.15 c. cm of 1 in 1000 tuberculin and the skin was examined between the 3rd and the 7th day. Doubtful cases were re-tested with a 1 in 100 dilution of

tuberculin. The Mantoux test excluded the diagnosis of tuberculosis in 3 out of the 4 suspects up-to the age of 8 years and in more than half of the suspects, from the ages 10 to 12 years.

H. P. Wright adopted Hamburger's percutaneous ointment for tuberculin testing which could be rubbed into the skin by general practitioners or nurses, without the aid of a specialist. The ointment consisted of:

- 1 c. cm. of old tuberculin
- 1 gm. of Fuller's earth and
- 78 gm. of lanolin.

A small piece, the size of half a dry pea, was rubbed into an area over the sternum to the size of a florin with 60 revolutions of the finger. The test was carried out in 44 children (aged 23 months to 13 years) known to have tuberculosis and positive Mantoux reactions. Within 12 hours 73 per cent of the tuberculous cases showed pale or pinkish papules, either alone or with surrounding zones of erythema and skin induration; after 24 hours this reaction was present in 94 per cent and after 48 hours in 100 per cent of the cases. The reaction persisted for a week in 79 per cent of the cases. Fifty-seven patients in general medical wards, where all patients were given a Mantoux test as a routine, were treated with the ointment; 3 of them gave a positive result, the same 3 who had a positive Mantoux reaction.

In older children, 2 to 10 years, a good deal of common sense has to be used. Physical examination and history are of very great importance

- (1) Given a definite history of exposure to a source of tuberculosis, any symptoms, local or constitutional, require the most careful

investigation although they may not necessarily be due to tuberculosis, viz,

Loss of weight and strength —

Lack of staying power, that is, getting tired very soon.

Fever over 100° F even after $\frac{1}{2}$ an hour rest in bed

Diseased tonsils and adenoids
Caries in the teeth
Improper feeding
Rickets, Malaria, Kala-azar, Sluggish Liver

All these require investigation, before attributing them to tuberculosis

It is well worth noting here that G. E. King-Turner suggested that the teeth may act in the majority of cases as indicators of past or active tuberculosis. His experience led him to assume that the findings were in the main significantly constant. The balance of the blood reaction is of primary importance to the dental tissues. An acid reaction as measured in the saliva, leads to the withdrawal of calcium ions from the enamel of the teeth, so that the dentine finally becomes exposed and caries sets in. In many cases this appearance of dental caries coincides with activity of the tuberculous lesion.

(2) Physical signs may or may not be present. — Dullness, rales, altered voice and breath sounds, may be present without being due to tuberculosis. On the other hand active tuberculosis may be present without any definite sign in the lungs as judged by Inspection, Palpation, Percussion and Auscultation.

(3) X-rays:—will show and give confirmatory evidence of the focus and the tracheo-bronchial lymph glands. A definite diagnosis of tuberculosis is not justified by mere x-ray examination alone.

(4) Tuberculin Tests:—A positive Mantoux test in children under 5 years may be indicative of tuberculous disease and points to the necessity for further investigation and observation. The diagnostic value of tuberculin test becomes progressively less important as significant of active disease, rather than of infection, in the years 5 to 14.

A definite history of exposure, with a positive tuberculin test accompanied by constitutional signs and symptoms, establishes a diagnosis of tuberculosis, even if the signs in the chest are vague, indefinite or absent.

A similar history of exposure, even with a positive tuberculin reaction but without constitutional signs and symptoms and without signs in the chest, do not justify a diagnosis of tuberculosis, but merely of tubercular infection—except in very young children.

(5) Blood examination is of importance in that it shows the Monocyte, to Lymphocyte ratio 9:1, showing the fight in the system.

An increase in the Monocytes suggests tuberculous activity; a decrease of Lymphocytes or of Eosinophiles, suggest healing; and an increase of Polymorphs indicates suppuration.

The Arneth Index as modified by Von Bonsdorff is the counting of the number of lobes in the nuclei of 100 lobes. Any number below 275 is called a shift to the left and indicates bad prognosis; counts above 275 are called shifts to the right and are of good omen.

R. B. C. Sedimentation Rate—has proved of greater value for estimating the progress of an infective process, than for determining if such a condition is present. A series of tests at regular intervals is of more value than a single test. Such a series provides a reliable record of progress. When a patient is undergoing treatment, a steady improvement in the sedimentation rate is encouraging, whereas, a steady deterioration should cause the physician to reconsider the course of treatment.

- (6) The presence of tuberculosis elsewhere in the body, such as glands, bones, or joints, is not necessarily indicative of tuberculosis in the chest. Nor is it true that these forms of tuberculosis convey immunity against Pulmonary Tuberculosis.

In all cases of doubt, it is better to make a provisional diagnosis of tuberculosis and to give the child the benefit of hygienic measures and prolonged observation, although this does not necessarily mean that the child be definitely stamped as a consumptive.

A correct diagnosis can only be reached by means of common sense, and a careful consideration of a multiplicity of minor signs and symptoms, local

and constitutional. In the age period of 2 to 10 years, it is reported that, 15 per cent of contact cases show active infiltration.

Prognosis is generally good, and a good number of cases recover.

Treatment.

Isolation of the child from the source of infection. This is easier said than done. It is the most difficult problem before us and we have to do the best under the circumstances.

N. B. Nobody with a negative tuberculin test should be admitted into the Tuberculosis Ward.

The following types of institutions for treatment and prevention of tuberculosis will be quite useful and serviceable, in that they provide the essential factor of isolation in the different types of cases.

1. Sanatorium for children with active disease.
2. Preventoria—providing for the susceptible cases, that is to say, for infective but afebrile cases' than can be safely tided over.
3. Open-air Schools—intended for children with no infection of tubercle.
4. Boarding out of children away from their homes to a place with plenty of openair, till the infected people at home are attended to properly. Usually children of 4 to 12 years of age are boarded out; sometimes even children under 3 years. This is a very common system followed in France and is known as the Grancher System, after the person who first instituted it in 1903. It does,

however, deprive the child of the benefit of the home influence, so that if possible, it would be better to remove the infected patient.

Protection of children means, not allowing them to come in contact with a consumptive or his belongings.

Unsuspected cases are a great source of danger to others and it is regrettable that a considerable proportion of cases when first diagnosed, have obviously been suffering from the disease for a long time. Radiological signs are present before symptoms have appeared. Results of repeated serological tests, as suggested by W. Ogden may help to show the presence of contact cases to institute preventive treatment months before diagnosis by X-ray, or physical signs and symptoms, is possible. W. Ogden with nine others outlines a method of tuberculosis control, practised in Toronto Western Hospital Chest Clinic for over 15 years. It consists in.

- (1) A preliminary intra-cutaneous or Mantoux tuberculin test, which if negative is repeated
- (2) All patients giving positive results are subjected to serological tests (the tuberculo-complement fixation test and the Caulfield inhibitive reaction). When positive results are obtained advice is given regarding mode of living, diet, and rest; and these factors are regulated by the results of repeated serological tests

The author states that over a period of 15 yrs a total of 1,300 known contacts and 400 normals have been

under observation, and of those who have followed the prescribed regime, not one has developed tuberculosis. The suggestion is even made, that the entire populace could be controlled in this way, commencing with semi-annual tuberculin tests

Serial X-ray examinations of the whole population are obviously impracticable at present at any rate: But much may be said in favour of periodic serological and radiological examinations of selected groups of individuals, more likely than the average, to contract tuberculosis. Such groups would include.

1. Contacts of open cases.
2. Young children in Elementary Schools
3. Young Nurses.
4. Medical Students.
5. Diabetics.

Vaccination method of prophylactic immunisation by any of the approved methods is said to be efficacious in its prophylactic and sensitising effects. The various vaccination processes are—

1. Subcutaneous (B. C. G. is said to give only relative immunity and does not protect against a large dose of infection)
2. Intra-dermal
3. Multiple punctures of Rosenthal
4. Multiple scarifications.

N. B. Children after vaccination for prevention should be kept away from the source of infection, for at least 6 weeks, preferably in glass houses, wherever it is possible.

Anaemia

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Anaemia is the result of 'systemic oligochromia'—reduction of available haemoglobin in the system. This may be associated either with normocythaemia—normal R B C count, or oligocythaemia—subnormal R B C count. In the former case the condition is brought about by cellular oligochromia—reduced haemoglobin content of each R B C. From the opening remark it will be evident that what matters is total or systemic and not cellular haemoglobin content. For this reason it is suggested that the self-contradictory terminologies, hyper and normochromic anaemias be deleted from the modern text books. This remark applies also to the fallacious term 'Hypochromic anaemia' since there cannot be any anaemia unless associated with hypochromia—systemic.

Modus Erythropoiesis

For the system to put out approximately one trillion R B Cs per diem, which is the normal rate of erythropoiesis, two conditions are essential, viz.,

1. A good supply of erythropoietic factors,

2. Responsive erythrogenetic tissue. A study of these two comprises the study of anaemia.

Erythrogenetic tissue.

The locus genesis of erythrocytes is different at different ages, and whether

this makes any difference in the rate of productivity and responsive power to erythropoietic factors is not quite clear. It is interesting to note that a certain degree of anoxaemia favours erythropoiesis and that the vascular system, especially the capillary, has not only a blood respiratory and conducting function but also a blood forming one, since the R. B Cs develop in the inter-sinusoidal capillaries where a state of anoxaemia and sluggish stream exist.

Locus Erythropoiesis

In the intrauterine life first, area vasculosa of yolk sac, body stalk and placental site; from the third to the sixth month, liver and spleen, and after the fifth month bone marrow, along with liver and spleen function. In the extrauterine life, all the bones of the body function for the first four years, with liver and spleen coming to rescue during stress, and thereafter to the twentieth year bones function exclusively, with the centre of activity receding from the periphery to the centre, and from the twentieth year, the upper ends of femur and humerus and the flat bones of the skull and thorax only function.

Erythropoietic Factors.

There are only three main factors with the principles and functions thereof, as detailed below:—

Factor	Function.	Active Principles.
1. Reticulo-endothelial cell maturation factor (R.E.M.F.)	Makes the R.E. primitive cell mature.	Not known.

2 Megaloblast maturation factor. (M.M.F)	Makes Megaloblast mature to Normoblast.	Formed by a combination of extrinsic factors made of high class proteins and/or Vitamin B, and intrinsic factor which is Haemoprotein of Wilkinson, obtained from pyloro-duodenal glands.
3 Normoblast maturation factor. (M.M.F)	Makes Normoblast mature to R. B. C.	Extrinsic source: Fe, Ca Vitamins B, C, and E, chlorophyll and salt balance of food. Intrinsic source: thyroxin and bile.

Some books have us believe that iron directly helps to form haemoglobin, but the probability is that it helps normoblast maturation as a result of which the cells come to have proper quota of Haemoglobin. Some contend that copper stimulates R. B. C. formation without effect on the Haemoglobin whereas iron has just the opposite effect (Pojonoski and Briskas)

Classification of anaemias and Morbus Erythropoiesis

We have yet to await a satisfactory classification. The following is a modified Wintrobe's and Davidson's classification which is also not claimed to be perfect. Wintrobe's classification is based on morphological basis requiring a microscope for diagnosis and helps in the substitution therapy. Davidson's classification is on an etiological basis, the diagnosis is by a process of elimination and its usefulness in the application of elimination therapy.

Modified Wintrobe's or morphological or microscopy classification

- 1 Macrocytic-megaloblastic
- 2 Macrocytic-non-megaloblastic
- 3 Microcytic.
- 4 Aplastic (Normocytic)

This classification is conspicuous by the dropping out of the terminologies.

Hyper, Hypo, and Normochromias, since as has been pointed out at the very outset, systemic and not cellular Haemoglobin counts. The terms used for the above classification are self-explanatory. Systemic oligochromia, in other words, anaemia, can be produced either by cellular oligochromia with or without normocythaemia or by oligocythaemia with or without cellular oligochromia. In all macrocytic anaemias there will be oligocythaemia (reduced R. B. Cs) since each megaloblast produces four or more erythrocytes and where development is arrested at the megaloblast stage, there will be only one cell as megaloblast or macrocyte in the place of four cells as R. B. Cs. On the contrary, microcytic anaemia can exist either with normocythaemia (normal R. B. C count) where there is cellular oligochromia due to under size of the microcytes, or with oligocythaemia.

Modified Davidson's or Etiological classification

1. Dyserythropoietic anaemia where there is defect in Erythrogenesis

2. Depletory anaemia where there is destruction of fully formed R B C.

A macrocytic anaemia can only be of the first type whereas a microcytic anaemia can be of either type.

Morphologico etiological classification

The following is a combination of the above classifications and is of practical utility:—

- 1 Macrocytic—dyserythropoietic.
- 2 Microcytic—dyserythropoietic.
3. Depletory—which is invariably microcytic.

The following table elaborates these types

I. Macrocytic dyserythropoietic anaemia

A. Deficiency anaemia (deficiency of M M F,) and produces macrocytic megaloblastic anaemia)

Deficiency of**Causes and example**

- | | |
|---|--|
| 1. Intrinsic Factor.
(gastrogenic) | Idiopathic condition eg, Pernicious anaemia |
| 2. Extrinsic Factor
(nutritional) | Food deficiency, Tropical Macrocytic Nutritional and Pseudopernicious anaemias of pregnancy |
| 3. Both I F & E. F
(gastrogenic) | Gastric Carcinoma. |
| 4. Product of combination of I. F and E. F. | |
| a. Defective absorption
(alimentary) | Surgical procedures: Resection of stomach or intestines, short-circuiting of intestines Fatty Diarrhoeas: Coeliac disease, sprue, Idiopathic Steatorrhoea. |
| b. Defective Hepatic
store | Advanced Liver disease like cirrhosis |
| c. Defective mobilisa-
tion from Storage | Achrestic anaemia |

B Inhibitory anaemia (This is a rare type and produces Macrocytic nonmegaloblastic anaemia and the defect is in the erythrogenetic tissue)

Toxins Chemicals Lead and Benzol; Physical: X-ray exposures

Infection. Malaria, (malignant) Dicrocoelium infection.

Infiltration Malignant disease and leukaemia

II Microcytic Dyserythropoietic anaemia

A. Deficiency Anaemia (deficiency of N.M. factor,)

Deficiency of :**Causes and example**

- | | |
|--------------|---|
| 1. Iron | (a) Idiopathic: Chlorosis and Witt's anaemia.
(b) Deficiency: Starvation and food faddism.
(c) Defective absorption: Fatty diarrhoea and surgical operation on intestines (Fe is absorbed only from the first fifteen inches of small intestines in acid medium).
(d) Increased demand: Pregnancy. |
| 2. Thyroxin. | Myxoedema. |
| 3. Vitamin C | Scurvy |

- B Inhibitory anaemia** (this is typically a microcytic nonmegaloblastic anaemia)
 Infection: Tuberculosis, syphilis, nephritis, worms.
 Toxins: Chemical: Lead and Mercury. Physical: X-ray exposures.
 Infiltration: Leukaemic and Malignant.

III. Depletory anaemia. (this can produce only microcytic anaemia)**A. Erythrorrhagia** (extravascular haemorrhage)**Etiological factor****Example**

- | | |
|----------------------|---|
| 1. Visceral diseases | Alimentary: Peptic and malignant ulcers, piles, dysentery.
Respiratory: Haemoptysis.
Urogenital: Haematuria |
| 2. Blood diseases. | Idiopathic: Thrombocytopenia
Congenital: Haemophilia
Parasitic: Ankylostomiasis and Bilharzia. |

B Erythrolysis (intravascular haemorrhage)

- | | |
|--|---|
| 1. R B C states | Abnormal R B C structure: Sickle cell
Abnormal Physical state of R. B C.
Acholic jaundice, |
| 2. Toxins. | Bacterial: Streptococci, B. Welchii
Protozoal: Malaria (malignant)
Organic: Snake venom, Burns
Chemical: N. A. B, Lead, Arseniuretted Hydrogen |
| 3. Overactivity of Erythrolytic tissue | Splenic anaemia (hepato-lineal fibrosis) |

Thus it will be seen that Dyserythropoietic anaemia may be due to either deficiency of erythropoietic factors or non-responsiveness of erythrocytic tissue, and that depletory anaemia may be due to extra or intravascular bleeding

Immature Red Cells of diagnostic significance in an anaemic haemogram.

Megaloblast Shape. Irregular outline, **Cytoplasm:** Basophilic, **Nucleus:** large, lightly stained, patchy or cart-wheel pattern.

Intermediary cells: (between megaloblast and normoblasts) **Shape:** Gets more and more regular and circular (in flat v.ew) **Size:** smaller and smaller till **7u** **Cytoplasm:** Less and less basophilic and more and more eosinophilic passing through polychromasia **Nucleus:** getting gradually smaller more condensed, darker and more uniformly stained

Normoblast: **Shape:** Circular and regular, **Size:** **7u** **Cytoplasm.** Eosinophilic. **Nucleus:** condensed, uniform, dark and small

Intermediary cells (between Normoblast and erythrocyte) The size of the cell gets gradually bigger, the nucleus in the process of division (karyorrhexis) or solution (karyolysis)

Erythrocyte: **7.4u**, no nucleus

There is a tendency to call all large sized nucleated red cells megaloblasts and small sized ones normoblasts. To go by the size is rather fallacious since a large cell in profile may look small and a small cell in the process of making a film may get spread out and appear large. Further I have seen students looking through a No 10 eyepiece and calling all nucleated red cells megaloblasts and non-nucleated red cells macrocytes. The chief differences are in the colour of the cytoplasm and the nature of the nucleus, as pointed out above. This mistake of judging by the size should not be committed since it makes all the difference in treatment. Another common snag for a beginner is mistaking a lymphocyte for a normo-

blast, which mistake again makes all the difference in treatment. Taking a small lymphocyte, if it is remembered that this cell is filled with nucleus with little cytoplasm and that the nucleus is not condensed like that of a normoblast this mistake will not be made. Taking a large lymphocyte; if it is remembered that the cytoplasm is of a skyblue hue and that the nucleus is not condensed whereas in a normoblast the cytoplasm is red or nearly red and the nucleus condensed, this mistake will not be made.

Significance of the various primitive cells.

Megaloblast: This is present typically only in a macrocytic anaemia where deficiency of M M F. is the cause.

Macrocyte. This is present either under conditions where M M F is deficient or even in its presence, when the erythrocytic tissue is non-responsive.

Normoblast: This cell is supposed to be present only when the N M F. is deficient. But actually I have seen more normoblasts in a macrocytic haemogram than in a microcytic one. The only explanation for this seems to me, to be the fact that very seldom one gets M M F deficiency alone there being N M F deficiency as well especially in the tropics. The comparative absence of normoblasts in a microcytic film is, I think, due to the looseness of the nucleus inside the cell the cell being only one step more primitive than the nucleus-free one and consequently loses its nucleus in the process of making the film, and also nature seems to get rid of the nucleus of a normoblast more easily than that of a megaloblast

Microcyte. A normoblast is only **7u** size whereas an erythrocyte is **7.4u**, hence when a normoblast prema-

turely loses its nucleus it becomes a microcyte.

Pure and mixed types of anaemias.

I think that barring the following two types of anaemias all the rest are combined ones

1. Pernicious anaemia: Here the defect is in the intrinsic factor and the anaemia produced is of a pure macrocytic-megaloblastic type.

2 Depletory anaemia: Here a pure microcytic type is produced except probably in very advanced cases.

Even in a pernicious anaemia a microcytic anaemia may develop under the following circumstances

1 Defective absorption of N. M. F due to achylia, acid being necessary for iron absorption.

2 In advanced cases failure of bone marrow to respond even to N.M.F.

3 During treatment when the iron store is insufficient to cope with the regeneration of R B C. A depletory anaemia which is purely microcytic, may in advanced cases become macrocytic as well, due to nonresponse of bone marrow to M. M F as a result of extreme exsanguination

Deficiency and inhibitory anaemias are always mixed since deficiency, especially of alimentary origin is usually multiple and the inhibition is for both the factors Thus it is clear that a mixed type of anaemia with one or the other type predominating is more common than a pure mono-type The phenomena of anisocytosis, that one commonly sees in all haemograms, is not fully accounted for; it may be that it is a combination of micro and macrocytes which means that the anaemia is a mixed one Another condition which is not quite clear is the association of

subacute combined degeneration with pernicious anaemia. Whether, in this anaemia there is an unknown neurotropic deficiency, in addition to M. M. F. deficiency or that the state of blood is such as to produce nervous degeneration is not quite clear It is to be noted that with hepatotherapy of a pernicious anaemia case, the nervous morbidity continues even long after the blood picture has improved, and even afterwards the peripheral nerve lesions improve but not so much, the cord lesions It seems that we are dealing here with neurotropic and haemotropic factors, whether they are combined or separate, and the identity of the former is not known Whether liver contains factors beside haemopoietic is also not clear The theory that the nervous symptoms are due to toxins produced in the stomach due to achylia is not correct, since in other types of achylia such a nervous morbidity does not arise. Whether liver contains factors beside haemopoietic is also not quite clear I have tried injections of liver extract (not the highly purified extracts) in cases of peripheral neuritis unassociated with pernicious anaemia and have found good results, similar to those produced by Vitamin-B injections. Further study on these lines may bring out interesting revelations regarding the factors present in the liver beside the anti-anaemic The claim that crude liver is more potent in cases of subacute combined degeneration lends support to this assumption The fact that massive doses of brain and stomach extracts improve the nervous condition in pernicious anaemia show that these contain some of the active principles Whether Vitamin-A content of these tissues is the potent factor is not known but Mellanby has demonstrated good results with injections of this vitamin.

JOURNAL OF SOUTH INDIAN MEDICINE

OCTOBER, 1940

Indian Medicine

The Madras School of Indian Medicine and the Indigenous beliefs in Medicine have been in the public eye for the last few years. For decades the controversies about the utility of these methods of medical relief have been swinging between two extremes. On the one hand there have been practitioners and politicians strong in the belief that the so called Indian systems contain the last word in Medicine. On the other hand, those who have a little familiarity with methods of medicine as taught in the West, hold out that the indigenous systems are a bundle of antiquated superstitions and unprovable assertions. There is some excuse for the latter, for their opinion is born out of ignorance of what the ancients taught. But we are afraid we cannot say that of the former. While many of the practitioners and politicians are supremely ignorant of both the Western and Eastern knowledge of medicine, a few at least cannot be accused of such ignorance. It is more often a desire to show themselves as uniquely patriotic and intensely national that prompts them to condemn something the utility of which they are personally convinced and to recommend something else while they are thoroughly aware of its defects.

We have seen this controversy enacted in great detail a few months ago in the local Legislative Assembly. Some of the members criticised the Government for its indifference towards the so called Indigenous systems of medicine and the Minister in charge promptly got up and in unmeasured terms condemned the methods adopted in the Indian School of Medicine. One carries the impression from a perusal of the debate that Government would very readily have abolished that school and withdrawn all patronage from the practitioners of Indian Medicine but for the fact such a step would have had an undesirable effect from members of other parties. One is therefore compelled to conclude that all talk about encouraging Indian systems of medicine and the School of Indian Medicine is merely political and that they have no relation to the conviction of most of the politicians.

We are frankly disappointed at this attitude. One should be very ignorant or extremely cynical if one believes that there can be nothing useful elsewhere than in the methods of medicine practised in the West. It is essential that people should have a little history-

cal background before they criticise or condemn medicine as it is practised by others, ancient or modern. The theories and methods of medicine have started from ignorance. The darkness has been from time to time relieved by light, sometimes clear, often blurred. But in the course of centuries many theories have been proposed and many methods have been tried. Often have these been found to be mistaken or insufficient. Some have remained true and useful to this day. In this process of theorizing and offering solutions, the physicians of India have played a great part. There have been a progressive science till about a few hundred years ago. It was only in the last two or three hundred years that medicine in this country has become neglected or allowed to stagnate. It is therefore natural that in the way that medicine was understood and practised in this country till a few centuries ago there should have been theories and solutions for the many ills which are common in this country. An honest and enthusiastic research into these methods of treatment and theories of disease with the help of proved facts and modern theories should indeed be very helpful to students of medicine now. It may be that the methods of practice or classification of diseases may not be similar to the current ones. But the approach of the ancients in the study of disease and their views might certainly help us to understand at least a few of the many diseases which still baffle the students of Medicine.

We therefore think that it is time now, to cry halt to these controversies about the merits of the one or the blemishes of the other systems of medicine. It is also time to drop the common practice of labelling thoughts as different systems of medicine. There can be only one correct solution for each problem that confronts us in the recognition and rectification of disease. Till that correct solution is discovered, there may be many differing ideas and a variety of approaches to solve these problems. It is therefore essential to take advantage of all known facts about particular diseases. The vocabulary of the ancients in their description of diseases might be strange. But it is for us to correlate facts and reconcile when possible, the seeming discrepancies. In this task the School of Indian Medicine can play a great part. But before it can do so, fundamental changes may be necessary in the objects and working of that school. If it is to carry on as a rival institution, charged with the task of turning out "cheap" general practitioners, it is certain to end in failure. On the other hand, its aim should be to supply the background for research into the valuable store of forgotten medicine. We would like to see that school as a research annexe of the Medical College where the best graduates of the college could carry on post graduate work. We hope that the Committee that is enquiring into the work of the School of Indian Medicine will arrive at the right solution.

Association Notes

THE UNION DINNER

The members of the South Indian Medical Union met at dinner on Saturday the 23th September 1940 at the "Modern Cafe", Esplanade, about 70 members were present

After dinner **Dr. C R Krishnasawmy** said he had great pleasure in this task of proposing the toast of the South Indian Medical Union. The Union started about 20 years ago and although at first it included the service men, it was soon realised that there was a clash between the interests of the service men and the large majority of the independent medical profession and so later the service members themselves fell out, excepting for a very few. The Union started in a modest way and has had many ups and downs but on the whole, one could say that it had consolidated its position gradually and today it was stronger than ever. As representing a Union of the independent profession it had a large and a definite sphere of usefulness in bringing them all together. Talks about merging the Union with other associations were futile until our own Union had become sufficiently strong. Especially in this province the ranks of the independent Profession were disorganised and so here, a Union like ours had a definite task of its own.

He appealed to all the members present to help in strengthening the organisation and increasing the membership.

Referring to the pioneer work done by the Office-bearers of the Union during its early days he paid a warm

tribute to the founder of the Union, **Dr. C B. Rama Rao** who is living in retirement at Bangalore, but for whose efforts, the Union would not have seen the light of day. The late **Dr. Rangachari** in his own quiet and unostentatious way was a pillar of strength to the Union. The late **Dr. T. Krishna Menon** was one who had contributed a great amount of energy and enthusiasm towards strengthening the Union and its official organ, the Bulletin which later became the *Journal of South Indian Medicine*. To **Dr. E. V. Srinivasan**, he said, they owed a great deal in his having allowed the use of his premises at all times thus making it possible for the members to meet. For the past few years **Dr. T. Satakopan** had been the main stay of the Union and he also paid a tribute to the support of **Dr. M. Subramania Aiyar**, a past President of the Union.

He said that the Union should increase in strength until one day it should be able to have a building of its own with an up to date library, for the convenience of its members. He referred to one more point the fourth estate of the Union—its *Journal*. He hoped that members would help in running the *Journal* and see that it attained a high status.

Dr. U. L. Narayana Rau, in seconding the toast of the Union which according to him meant the profession as well, said it was not easy to talk of the profession because we have not yet evolved a satisfactory concept of the medical profession in a manner which may be

acceptable to all those who are concerned with it. To his mind medical profession meant medical men, firstly, in relation to themselves; secondly, in relation to people whom they serve; thirdly, in relation to the government under which they live

Judged from this concept, the first aspect of our profession appeared to him far from satisfactory. The important thing we lack, he said, is unity, though there is no doubt we are tending towards it. Many of us have developed some kind of complex or other—the service complex, the practice complex, the honorary complex, the specialist complex, the licentiate complex, the graduate complex, and the like. This indicated that individually and collectively, we have been unable to overcome these self-created prejudices, and to think of ourselves as medical men pure and simple, engaged in the common task of relieving physical suffering. Of course, the erratic history of our medical education, the medical services, medical legislation and administration have contributed not a little to this unsatisfactory state, and our present lack of unity is partly due to these historical factors. To these, has been recently added the economic factor which has victimised a large number of practitioners to a state of continuous struggle for mere existence leaving them no time for study and for social relaxation.

The second aspect of the profession, namely relationship of medical men to the people among whom they practise their profession, is also, he thought, not very satisfactory. The majority of our patients take to scientific medicine as a trial or as a last resort. They are also not in a position to pay for private medical service. Nor can the state hospitals cover fully medical relief to

the whole population. That is why the medical practitioners are not able to make both ends meet by the practice of their profession. All these go to make up a vicious circle, and we really do not know where it begins and where it ends.

The third aspect of the profession—namely the relationship of medical men to the Government and the Local Bodies—is also equally unsatisfactory and inspires in us very little confidence. The Government seem to be unconcerned with the fate of medical men, and have never contributed their share towards the well being of the practitioners, except perhaps in being vigilant to collect the income and the professional taxes. In our province there are about 6000 practitioners. Out of them only about 600 are in service. The rest are mostly in private practice, yet, at no time he knew of, did the Government of our province try to find out the exact state of affairs concerning the welfare of the practitioners, much less, to devise ways and means of helping them.

Such is the state of the profession in brief. He said he was sorry to have given us a dismal picture on a pleasant occasion like this. But he thought it was a true account. Of course, he said we may take it as an experience through which we are passing, an experience which had already begun to teach us to put our house in order. Our future certainly depends on ourselves mostly. There are three pre-requisites needed for our orderly growth. The first is, that each and everyone of us should make himself or herself increasingly efficient in the healing art. There are various ways of doing this and he had no need to dilate upon them at present. The second is, we should give up our tradi-

tional complexes, respect each other, learn from each other and work for each others' good. The third is that we should develop a state of corporate existence and bring about a happy union between ourselves, the people and the government.

If we take good care to make up these three essential needs we would certainly evolve a profession which would play its part well and truly. Even under unfavourable circumstances we will undoubtedly do better. He thought our profession had a great future. Therefore let each one of us contribute his or her best towards this end. Professional efficiency, unity in our ranks, and courageous planning and continuous work is bound to lead us into that bright future.

The President of the Union **Capt V D Nimbkar**, responded to the toast. He said the occasion was unique and he was proud that his was the opportunity to preside at this function. He congratulated the Secretary on his idea of this pleasant dinner. He was glad to find that the Union was growing from strength to strength and he suggested the desirability of affiliating this Union with the Indian Medical Association. After referring to the antiquity and greatness of the medical profession, Dr Nimbkar observed that the members of the profession should not be merely content with earning their living, but should realise that their interests were bound up with those of the community in other ways than relieving their suffering. They should take more interest in the economic, social and national regeneration of the country. He pleaded that among doctors there should be a clear division of labour between consultants and general practitioners as recommended by the committee of the Bombay Medical Union, as a remedy

for the complexes among doctors referred to by Dr Narayana Rau.

In mentioning the gratitude owed to our office bearers, he mentioned the services of Dr Iswariah who was one of the Secretaries of the Union in its early days. Dr T Satakopan must come for a special mention. He was one of the few men who stood solidly behind the Union though thick and thin and he said that the large number of young medical men whom he found here today were a tribute to the work of Dr Satakopan.

Dr. T. Satakopan, felt happy to see such a large and pleasant gathering of members of the Union. The Union had to contend with difficult times. And there were not wanting friends who predicted certain death more than once. This night's gathering was a sure indication that the Union was well set to grow and work for the betterment of the profession and medical relief.

There was an impression in the minds of many members that medical associations in this city were particularly ill managed, and that they just existed without being effective. But this has been the experience of medical associations in many other countries believed to be more advanced in medicine. He just happened to read the history of some of these associations which are now models of influence and activity. These associations have gone through experiences similar to what we find here. All associations owe their origin to a few enthusiastic men. In the course of working, doubts and difficulties arise, imaginary grievances are nourished, and the progress of the association is arrested.

The Irish Medical Union was founded a hundred years ago by a few eminent and enthusiastic medical men of Dublin. It had to go through periods of

inactivity. Then the Medical Charities Act came into force and the Poor Law Medical Service was created by the Government. And as usually happens, the unorganized profession was being exploited. The practitioners of the period found that their interests were ignored. This made them realize the urgent need for organization. They came together, and the Union is now flourishing and authoritative.

We find similar circumstances in our own province. As Dr. Narayana Rau mentioned, our disorganized condition is taken advantage of by the public and the state. With the ostensible object of improving and increasing the Honorary Medical Scheme, the helpless state of the medical practitioners is being exploited by the Government and the public. To fight the Government or educate the public, it is essential that the profession should organize itself better.

Much has been said about the nobility of the profession and ideals have been enunciated. Ideals are essential. Idealism is fine. But if our head is in the clouds, our feet must be on the ground of material reality. And what is the reality? The reality is that all of us earnestly desire to get on. But if we wish to get on, we must get together. And the times are now more propitious for such a coming together of the profession in Madras. Grades and classes in the profession tend to disappear. A licentiate of yesterday is a graduate today. An honorary medical officer of today may cease to be such tomorrow. And it is said that some who were presumed to be consultants the other day were not averse to be known as general practitioners at present. There is therefore less reason now for us to think in groups or classes. He personally felt

confident that before long the various complexes that Dr. Narayana Rau referred to in his speech would disappear.

With reference to the talk of affiliation of the South Indian Medical Union with the Indian Medical Association, he was strongly of opinion that such a step was not desirable. The aims, objects and constitution of the two organizations were very different. The practitioners of South India required a strong local organization which could look after their needs and work for the overcoming of their many difficulties. He took the opportunity to emphasize the need for individual members of the union to carry on the necessary propaganda to strengthen the Union by all possible means.

He said he would be failing in his duty if he did not convey the thanks of the Union to Dr. Govinda Rau for the very successful manner in which he had organized the dinner that night.

COUNCIL OF THE SOUTH INDIAN MEDICAL UNION.

Minutes of the meeting of the Council of the Union held on Monday the 16th September 1940 at Gokhale Hall, Madras

Members present:

- Dr. V. D. Nimbkar
- “ C. R. Krishnaswami
- “ L. V. Srinivasan
- “ B. M. Sundaravadanam
- “ N. Natesan
- “ G. Zachariah
- “ K. B. Bhujanga Rao
- “ S. Thambiah
- “ P. Govinda Rau

- Dr. N Gangadharan
 " T. Satakopan
 " P T. Raghavachari
 " M Krishnamoorthi.

Dr. V. D. Nimbkar was in the chair.

1. The minutes of the last meeting were read and confirmed

2. The financial statement of the month of August was presented and approved.

3. The application for membership from the following gentlemen were considered and approved

1. Dr. Miss A. Kolandavelu
- 2 " G Sriramulu
- 3 " C. L. Charles
4. " Miss E. V. Kalyani
5. " U Maruthi Rao
- 6 " E C. Srinivasan
- 7 " Mrs. Shantasundari
- 8 " P Srinivasa Bhat
9. " B A. Sundaram Pillai
- 10 " M Santosham.

4. With a vote of thanks to the chair the meeting was dissolved

CLINICAL MEETING

Dr L. V. Srinivasan, M.B.B.S read a paper on "Pulmonary Tuberculosis in Infancy and Childhood" on the 8th October 1940, which was followed by an interesting discussion in which many of the members participated

Dr E. V. Srinivasan, M.B.C.M. presided at the meeting

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 THE
 SOUTH INDIAN
 MEDICAL UNION

Jottings

Dr. T. S. S. Rajan while opening an X-Ray Institute at Trichinopoly said that such Institutes cost money and the proprietors cannot afford to render free service. But we remember his saying something to the contrary at a similar function in the City of Madras while he was a Minister. He then expressed the hope that the practitioner who was responsible for the Institute would soon make all the beds available for free treatment. We get a glimpse of wisdom when we pass the peak of folly.

* * *

It was a frank talk that Lt Col. G. R. McRobert gave at the Rotary Club. It was not that of an ostrich with its head buried under the sands. Graft and corruption are inevitable in human organization. He hopes to minimise them in his hospital. But if he waits for patients to bring charges and complainers to him,—well so did his predecessors wait. If he means business he will have to hit it off his own bat.

* * *

There are over forty million people in this Presidency. According to the latest administration report of the Surgeon-General, about twenty million patients have been treated in the various hospitals and dispensaries of this province.

A vast number should have been treated outside the hospitals. That gives a formidable morbidity rate for the presidency. There is here some work for the politicians and professors of economics. What can the poor superintendent of the Government General Hospital do but keep wailing about the overcrowding of his hospital. He should be glad that he has not got to accommodate patients in his office room.

❖ * ❖

The subsidized rural medical practitioners are to change masters. The politician is to make room for the professional. For our part we are generally very nervous about professionals. They are never of one kind. Their supervising technique varies, whereas that of the politician is more or less typed. Any way we are glad that the leaders of the subsidized practitioners have been able to get what they asked for. We hope the practitioners will be happier,

* * *

We had hopes that the war will minimise the visitation of the drug agents. The pest is worse than ever. Not a day passes without some new nostrum being forced on you. Black has become blacker.

Our Members

Dr E V Kalyani, the daughter of the well-known ophthalmic surgeon of the city who qualified for her M D in midwifery at the last university examinations has been entertained as an Honorary Assistant Medical Officer in the Government Hospital for Women and Children for a further period of five years.



Dr. C Chandrasekhara Menon, M B B.S. one of our younger members, who was working as an Honorary Assistant in the Skin department of the General Hospital, Madras has joined the Emergency Commission. We wish him all success in his new sphere of work and expect him back amidst us at the end of the war, ripe with experience.



Dr. J Eapen, M B B.S has been appointed Medical Officer in charge of the Skin department of the General Hospital. He has been working for the past five years in the Government Royapuram Hospital—that training ground of many of the best physicians and surgeons of the city—and as such he is well prepared for his present larger sphere of work.



Dr S Rajagopalan, L M & S, FDS. (Lond) formerly Assistant Medical Officer, Skin Department, Government General Hospital has taken charge as Dermatologist, Government Royapuram

Hospital. Courteous to a degree as he is, and with an ever-present smile, added to which is a thorough knowledge of his speciality, we feel sure that the staff and students of the Government Royapuram Hospital will find him a very welcome addition.



Dr M Rathnavelu M R C S (Eng) L R C P (Lond) F D S (Lond) has been appointed as the Assistant Medical Officer in the Skin Department of the General Hospital. He has formerly been in the Venereal department in the same hospital. We feel sure that he will be very useful both to his patients and to himself in his new speciality.



Dr. M Santhosham, M B B.S. has been appointed as one of the Assistant Medical officers in the Tuberculosis Institute. He was associated with anti-tuberculosis work under the auspices of the King George V Thanks Giving Fund for a period of nearly two years. We are sure this experience will add to his usefulness in his present office.



Dr U Srinivasa Rau, M B B.S who was till recently a scholarship holder under the Indian Research Fund Association has been appointed as Honorary Assistant Medical Officer, Govt Royapuram Hospital. As one of our youngest members he carries the good wishes of the Union in his new appointment.