PhD. Notes on Idiopathic Anaemia as occurring in young girls, its probable cause, its pathology, symptoms, and treatment.

"Etiology"


Definition.

By Idiopathic Anaemia, I mean that peculiar condition of ill-health occurring in young girls between the ages of thirteen and twenty five, characterized by symptoms, referable to the alimentary, nervous, circulatory, respiratory, integumentary, and reproductive systems, occurring more frequently in those who are brought up in large towns, than in those who live a rural life, growing on independency of any Bermine lesion or specific
Anaemia. According to Dr. Robert of Manchester, we find.
Anaemia defined as:- Deficiency of the blood in quantity; alterations in quality as:- Deficiency of red corpuscles, of the Albumen, of Eucus.
Dr. William Wither in his treatise in Medicine defines Anaemia as:- A special morbid state in which there is either a relative diminution of the mass of blood, with the general composition of the blood differing from the normal standard, Again in James's Med. Vol I. we get a similar definition viz. Deficiency of blood in quantity, either general or local, deficiency of the most important constituents of the blood, particularly Albuminous substance, and red corpuscles, but all of these definitions are purely pathological. Wustrow in his treatise of Medicine defines Anaemia as the name applied to a condition in which there is diminution of the solid constituents of the blood and in particular of the red and white corpuscles, attended with pallor of the general surface.
And of the mucous membranes, palpitation, feebleness, and rapidity of pulse, panting respiration, lightness of.

Gardening, headache, delirium, functional disturbance of the organs of sight and hearing, tendency to faint and general debility. Some writers attempt to distinguish between the terms Chlorosis and Anaemia. But after some years' personal observation I am inclined to believe they are one and the same, there being only a difference of degree, viz. that I look upon Chlorosis as a mild form of Anaemia. Some writers distinguish Icteric Anaemia from Chlorosis by saying that Icteric Anaemia is characterised by the diminution in equal proportions of all the solid constituents of the blood, whereas in Chlorosis it is the corpuscular elements which are deficient; but this definition will not hold good, as it is well known that when Anaemia is caused by loss of blood, the corpuscles and other organic principles being removed in equal
proportions, the albumenous and other such matters are far more speedily restored than the corpuscles, and hence whatever may have been, the patient's condition at first; a time speedily arrives, in which the blood presents the typical character of chlorotic blood. It has again been supposed that a chemical change takes place in the blood pigment, but as far as my own experience and personal observation goes I have not been able to prove this.

Probable Causes.

A great many causes have been assigned for anaemia. It may readily be admitted that some of these conditions may be predisposing causes; it is certain that some of these may be consequence of it. But it has not yet been clearly demonstrated that any of these can lay claim to being an exciting cause. From my own observations and close examination of a number of cases, I am inclined to believe
That it is a poisoning of the blood, due to the absorption of unknown bodies, lefts during the process of digestion, or from the walls of the intestinal canal, after that process is complete.

And let us consider in detail some of the more important causes, and firstly in my opinion comes Constipation, and the absorption of certain poisons derived from the putrefaction and decomposition of faecal matter in the intestinal canal. This I am strongly inclined to believe is a very frequent cause of the Idiopathic Anaemia in young girls.

Up to a certain age girls are accustomed to run about and take plenty of healthy outdoor exercise. But after that age, it is considered very improper for girls to run and romp about as they did when younger.

It is at this period of life, that Constipation sets in, and with it comes Anaemia. Again females are very careless in regard to the daily evacuation of the bowels.
And if the calls of Nature are not pressing they are very apt to neglect. Doing so, as everyone should after the first meal in the morning (Parker said before the medical Society of London by Sir Andrew Clarke Nov. 14 1874).

And does this Constipation and the retention of the products of Digestion bring about Anaemia? It is supposed by some writers that certain poisons are formed due to the decomposition of the albuminous constiuents of the retained faecal matter, and that these poisons becoming absorbed produce the characteristic changes found in the blood.

"It is probable that poisons alkaloids are continually being formed in healthy men and animals by the decomposition of albumen in the intestinal canal during the process of digestion, or in the blood and tissues generally by the metabolism which occurs during the functional activities of life."
Probability destroyed in the body, according to some they are burnt up, during the process of Oxygenation, some are said to be excreted in the urine; and faeces, from both of which powerful poisons have been entailed. (Disorders of Digestion, J.S. Lauder Brunton loc. cit. page 263).

Is it not probable that during the retention of these faeces in the intestinal canal, that these poisonous bodies become absorbed, enter the blood and produce the characteristic changes found in Anaemic blood and also acting on the Respiratory and Vascular centres cause the various symptoms referable to the above systems.

We all know very well that if the secretion of the urine becomes suppressed, certain very dangerous symptoms immediately make their appearance, from this it appears that there is some poison circulating in the blood which ought to have been eliminated by the urine.
According to Dr. Lauder Brunton in his "Pharmacology and Therapeutics 3rd Edition" page 107: "A considerable production of Alkaloids takes place in the intestine, both when the digestive processes are normal and more especially when they are disordered, were all the Alkaloids to be retained in the body, poisoning would undoubtedly occur. Bouchardeau considers that the Alkaloids formed in the intestine of a healthy man in twenty-four hours, would be sufficient to kill him, if they were all absorbed and secretion stopped. He finds that the poisonous activity of even healthy human faces is very great, and a substance obtained from these produces violent convulsions in rabbits.

Sir William Aitken in his "Science and Practice of Medicine" 7th Edition Vol I page 629. Says that the healthy living organism may become poisoned by the accumulation with in itself of deleterious substances, normally elaborated but imperfectly or.
Deficiency eliminated hence.
The cold and insidious onset
Of much ill-health.
We know that Anaemia develops
Very insidiously and slowly.
And moreover is correspondingly slow in recovery.
Again there are certain symptoms for which
It is extremely difficult
to account, unless we assume
That they are due to a poison
Circulating in the blood, and
This poison I believe either to
Be some of the unknown bodies
Called Extracts in the Sickeness
Which are said to be produced
During the decomposition
Of effete matters.
D. Lauder Bruntout
In cit. page 351. points out:
The resemblance between the
Languor and weakness
Which occur in many cases
Of digestion, and the
Symptoms of poisoning by
Curare, and drew attention
to the probability, that the
Languor was due to the
Effect of poisonous substances.
Absorbed from the Intestine and there be considered to be Peptones.

Hence languor and weakness are sometimes the earliest symptoms of Anaemia, therefore it seems very probable that they are due to poisons absorbed from the Intestinal Canal, of the nature of Extractives or Leucamines.

Again we know that certain poisons circulating in the blood can change its character, i.e. either destroy or partially destroy some of the constituents entering into its composition.

In Anaemia there are very well marked changes in the blood, for which it is very difficult to assign any cause. Unless we put these down as due to the effects of an unknown poison circulating in the blood, and lately it has been conclusively proved that Leucamines &c. are produced during the Decomposition of
effect matters in the Intestinal Canal.

Dr. Congreve in a paper lately read before the medical section of the Royal Academy of Medicine in Ireland says he cannot view leave lack upon Constipation as even an important cause of Anaemia. He says that Constipation and Anaemia are often associated, but very often the constipation is not greater than would be expected from the general sluggishness of the functions, and is similar in significance to the copious pale urine of low specific gravity, and deficient in urate, so generally associated with this Anaemia.

That the Constipation is accompanied not only by impotency, but also by loss of power is shown by the failure of Belladonna and inis Vom. to relieve it.

Another argument
Against Constipation being the cause of the disease, is that care often follows the use of iron in the form of Griffith's mineral or Blaude pills without any purgative being administered.

I have generally found that by slightly modifying Blaude pills by adding to them Aloes and Dynamite I have obtained better results in treatment and this I attribute to the action of the last named drugs on the intestinal canal and especially to the emptying of the lower bowel.

After some years personal observation of cases of Anaemia, I am strongly inclined to believe, that the majority of cases are due to Constipation and its effects.

Other factors which have to be considered in the 

Etiology of Idiopathic Anaemia
I. Unhealthy Surroundings and Late Hours.
As examples let us take Dressmakers and Milliners. These form a great part of our Anæmic patients. From one week's end to another these poor girls are compelled to sit in the workroom and shop, perhaps closely packed, all inhaling the same atmosphere, perhaps the rooms are placed at the back of the premises in close proximity to the ash-pits and closets of the neighbouring houses. Here these girls have to sit all day long, the only breath of fresh air they get being obtained on their walk. To business in the morning and on the wall. home again in the evening. Moreover in some large establishments, the girls stay in the house, and are only allowed out at the end of the week for a few hours.
We can not wonder then why it is so many of them suffer from Anaemia. Another such class are the pupil-teachers and governesses of our large public schools. We well know they have to work in an atmosphere vitiated by the breath of a number of children who come as a rule from not the sweetest parts of our large towns. I have found Anaemia much more frequent amongst the latter class of girls than amongst the shop girls and this I put down to the more sedentary occupation of the former. The shop girls have not so much sitting to do, and they get a certain amount of exercise in walking about the shop.

The next factor I mentioned was late hours. Here I mean those who are compelled
to sit up late sewing a
frightening goods for large
establishments, after perhaps
having worked hard all
day at service or some other
such occupation.

A unsuitable food and not
sufficient time to take
it in. Here again is another
factor, which I think has
not a little to do in
the production of anaemia.
in our dressmakers, tailors,
shop girls and pupil-teachers.

First let us con-
sider the food. If such a
class. In a great many
establishments, the girls
are fed on the premises, and
for economical reasons, they
get anything that is to buy
made-up dishes from
tinned meats &c. Again
a great many living
at home or in lodgings
are not in the position to
provide themselves with
nourishing food, and are
compelled to live on tea as
a substitute.
Here I would like to point out, that in a good number of Anaemic patients, the symptoms referable to the nervous and vascular systems, are not due so much to the Anaemia, as to the excessive use of tea. Another thing to be considered is the time allowed for meals in such a class of girls. In many establishments, the girls are allowed about twenty-five minutes for dinner and perhaps fifteen minutes for tea. Here, there is a very probable cause of Anaemia, as it is well known that food, taken in such a manner, can not be properly digested. Many have to take their food standing, perhaps behind the counter, or in one of the back premises, and are several times obliged to have to serve customers.
III. Sedentary Habits and want of Muscular Exercise.

Having treated of the above in an earlier part of the paper, it is perhaps hardly fair to mention it again, but I wish here to bring in another class of Anemic patients, viz., the girls of the better classes. Many of these are not allowed to take active exercise, like the children of the poorer classes, for fear of injuring their health. They do not rise till very late in the day, the rest of the day being spent, perhaps, reading novels, or doing fancy work. Compare such a girl with a country farm servant, the latter spends most of her time out of doors, working hard and exercising her muscles, hence such girls very rarely suffer from
Anaemia.

Emotional Affections or Affairs of the Heart. This is rather a delicate point to deal with, but one which must not be passed over lightly, as I have seen a good many cases of Anaemia, whose etiology, I could clearly trace to the above cause.

By the above I mean certain affairs of the heart or disappointment in love. Young girls as a rule expect to be engaged at a certain age, and this age as far as I have been able to ascertain, is about twenty or twenty one. After reaching this age, and not being engaged, they begin to think they are on the shelf, and pine and fret, and lose all interest in the affairs of life. And in the time an anxious brother will consult you about her daughter's health, believing...
her to be in Consumption or some other such disease. It requires a great deal of tact to discern such a case, but with a little patience, you will in the end, in the great majority of cases satisfy yourself that the above cause to which I have drawn your attention, has a great deal to do with the symptoms of your fair patient; as I have often seen a complete and permanent cure, which all the medical men had failed to effect, result from the young lady going to another part of the country and their becoming engaged. The other class who come under the above cause are the disappointed, or jilted, I mean those who have been engaged, but had to break it off either with the parents not consenting to the Alliance, or on some
Quarrel on the part of the young people is very curious as well as interesting to watch. Such cases, how soon they become anaemic and on the other hand how soon they recover when the parents give their consent to the match, or they make it up again among themselves.

Another class are the silent lovers. That is, some girls let their affection on one of the opposite sex, but he may be totally unconscious of it, or does not wish to return them. These girls go on loving in silence, rapidly become anaemic. Such cases I have been treated by medical men, and the poor girls doted with medicines without any relief to health.

In the above cases a good deal of fact is
required to obtain the confidence of your
fair patient, without
which treatment is of
no avail. I am of
opinion that the anaemia
of such patients is purely
fearless in origin.

I Excuse Delays and
Masturbation.
The ill effects of the
first in producing
Anaemia, are only noticed
among the class of girls
who are called Prostitutes.

I have often noticed young
girls coming from
the country to some
business in the town, who
perhaps, from a love
of fine clothes and money
take to a life of prostitution
and have been struck
with the rapidity with
which girls become anaemic.
Perhaps the late hours, gas
night air, the insufficient
and unsuitable food, along
with the unhealthy sur-
roundings, have a good
deal to do with such cases of Anaemia. I do not think all these have a share in the cause of the Anaemia, but I do incline to think, that the undue demands made on the system to supply the parts with blood, by the excessive venery play, the principal part in the production of the Anaemia I have often seen.

a species of Anaemia in young married females due to I think the above cause.

Masturbation, Here we have an extremely delicate point to deal with, and at the same time a very difficult one, as there are very few medical men who would care to investigate such a point. But never the less it is I am sorry to say, more often practised among young girls than is generally supposed, and more frequently in the
Upper class of girls especially in those who go to large boarding schools. At first I was inclined to put the Anaemia of such girls down to the close confinement, the unsuitable and sometimes disagreeable food, but on a closer examination of such establishments, I found that the girls got plenty of outdoor exercise and good nourishing food. I generally found that the Anaemia was most frequent among the girls who occupied a common bedroom, that is to say, where a number slept together.

It is very well known that Masturbation is practiced to a great extent among boys, but principally at those establishments where the lads have a common bedroom. It was the occurrence
Anaemia among boys, that first led me to investigate masturbation as a probable cause of anaemia in young girls. After a great many difficulties, I have at last satisfied myself that such is the case. I have often been struck with the similarity of some of the symptoms complained of by an anaemic girl, as compared with the symptoms of a boy who has been guilty of masturbation.

One of the most prominent, in my opinion, is a peculiar sensation referred to the head. They never can describe the exact character of such a symptom, but always tell you they have a peculiar sensation in the head.

Another symptom is palpitation of the heart. Such a symptom when examined young men's...
hearts, has always led me to ask about self-solution, and I have often been struck with the frequency of its occurrence. Other symptoms are: genitae pains in various parts of the body, boys generally complain of pain in the testicle, girls again refer the pain either to the Mamme or ovaries. And I don’t want to say that Masturbation is a very frequent cause of Anaemia, I merely want to draw attention to it as one of the probable causes.

II. Displacement of the Uterus. Some writers put the above as a cause of Anaemia.

III. Functional Ovarian and Uterine disturbances.

IV. Congenital defects, such as narrowness of the aorta, irregularities in the origin of arteries (Virchow).

V. Seaton, (according to Dr. J. Moore of Scotland) exercises an influence in
The occurrence of Anaemia in young adult life, for instance, leads to a greater prevalence of the disease in winter than in Summer.

*Shock to the Nervous System*

Beneke has shown that the annual increase in the heat and blood-flow in girls up to puberty is up to 8 per cent per annum, whilst during the establishment of menstruation it is 50—100 per cent, so that if puberty is established in a single year an extra growth from 70—90 per cent weight in addition to ordinary growth is entailed and that at the end of puberty, the lungs have arrived at the fullest development, and the excretion of Carbonic Acid gas has reached its highest; there is no such rapid change in the male. (Zur Ueber das Volumen des Herzens und die Weite der...
Artura in den Verschiedenen Nebensätzen." 1879).

Bowditch says that up to

eleven or twelve, boys are

on the average taller and

heavier than girls, for the

next two or three years girls

have the advantage, whilst

after fourteen or fifteen

boys again excel in strength

and height (The Growth of

Children 1879).

11
Pathology.

Before entering into the Pathology, let us consider the normal Histology and Chemical Analysis of the blood, as it has not a little to do with the Pathology.

Blood, when examined under the microscope, is seen to consist of an enormous number of corpuscles, the coloured and colourless floating in a transparent fluid - the liquor sanguinis and bodies called the granules of the blood.

The coloured corpuscles are biconcave circular discs about 7.7 x 8 microns in diameter and 1.4 microns in thickness, according to Heideraud. The number exceeds 5,000,000 per cubic millimeter in the male and 4,500,000 in the female; so that in 100 c.c. of blood, there are 25,000,000 corpuscles.

They can be estimated either by the method of
Wallace, or by the
Haemacytometer. G. Green,
When observed singly, they
bear a yellow colour
with a slight tinge of
green, are non-nucleated
appear to be homogeneous
throughout. Each corpuscle
consists of a framework
-the Stroma, and a red
pigment called Haemoglobin
which fills the meshes.
G. the Stroma, they are
derived from the Mesoblast.
These corpuscles are developed
in the foetal during the
first days of embryonic
life. They appear in
groups within the large
branching cells of the
Mesoblast, in the vascular
area G. the Blastoderm
outside the developing
body. G. the Chick, when
they form the blood-
island G. Pander. The
brother cells form a network
by the union of processes
of adjoining cells, and
meantime the central
Masses split up, and the nuclei multiply.

The small-nucleated masses of protoplasm, which represent the blood-corpuscles acquire a reddish hue, while the surrounding protoplasm, and also that of the processes, becomes vacuolated or hollowed out, constituting a branching system of canals; the outer part of the cells remaining with their nuclei to form the walls of the future blood-vessels.

A fluid appears within this system of canals in which the corpuscles lie, and gradually a communication is established with the blood-vessels developed in connection with the heart. At first the corpuscles are devoid of pigment, nucleated, globular, larger, and more irregular than the permanent corpuscles, and they also exhibit amoeboid movements. They become coloured, retain their nucleus and are capable...
of undergoing multiplication by division. Such there is a brief sketch of the development of the red corpuscles during embryonic life. During post embryonic life they are formed from Vaso-formative cells which lie in the "Saches. Lacteals" (Rauvin as seen in young rabbits). They arise in the protoplasm of these cells in the same manner as grains of starch arise within the cells of plants. According to Kölliker and others, they are derived from the colourless corpuscles. Heumann and Rössy re say they come from peculiar corpuscles, occurring in the red marrow of bones. The colourless corpuscles are more or less spherical masses of protoplasm, which is sticky, highly refractile, soft and capable of movement, and devoid of an envelope.
They contain nuclei and one or more nucleoli; in size they vary from 4-13 micra.

According to Max Schultze, there are three different forms in human blood: 1. The small round form. 2. The round form the same size as the coloured. 3. The large ameboid corpuscles.

The so-called bodies or granules of the blood (Laudois Physiology Vol I 1st Ed.).

Chemical Composition and Analysis of the Blood.

I Red-Colourles, the red colour is due to a pigment called Hæmoglobin, its composition is C₆4H₄N₂FeS₄ and C. It is a colourless substance, but if crystallizes into rhombic plates or prisms. You can estimate the amount either from the amount of iron, by the colorimetric method, by the Spectroscope or the Hæmoglobinometer of Lowe. The amount in
Iron is 12-15 per cent, in the woman 12-14 per cent. According to Leichtentraut Hb. is in greatest amount in the blood of the newly-born infant, but after the first weeks the excess disappears. Between six months and five years, it becomes least in amount, reaches its second highest maximum between twenty-one and forty-five, and then sinks again. From the tenth year onwards the blood of the female is poorer in Hb.

The Proteins of the Serum.
The Hb. of serum is Globulin which is combined with a body resembling Nuclein and traces of a diastatic ferment.

Other constituents are Leithin. This is regarded as a Glycerophosphate of leucin, in which the radical of glycerophosphoric acid, two atoms of hydrogen

are replaced by two $2$ of the radical of stearic acid.

Cholesterol, Water, and Salts, which are chiefly compounds of Potash and Phosphoric acid.

Analysis of Blood.

1000 parts, by weight, contain 344.18 blood corpuscles (containing 128 per cent. of solids.
659.8 plasma (contains about 19% solids.
1000 parts, by weight, of moist corpus.
Sols 367.9 (kg. 400.1 (Or).
Walu 632.1 " 599.9 "

The solids are:

- Haemoglobin 261.5 3805
- Albumin 86.7 117
- Leithin, Cholesterol
- Other organic bodies 12.0 95
- Organic Salts 8.9 120
- Potash 5.543 0.747
- Magnesia 0.158 0.017
- Chlorella 1.504 1.635
- Phosphoric Acid 2.087 0.783
- Iron 8 2.078

Chemical Composition of Colorless Corpuscles.

They contain several proteins Alkalii Albuminates, and another
ressembling Albumin, and a coagulating factor, fibrin, Lecithin, Glycogen, and extracts.

Chemical Composition of the Plasma and Serum.

Proteids occur to the amount of 8–10 per cent. in the plasma only 0.2 per cent. of these go to form fibrin. The S.G. of human serum is 1.027 to 1.029. It contains several proteids.

According to Scharzwald, human serum contains 7.2076 per cent. of solids — of these 3.103 = Serum globulin. And 4.104 = Serum albumin i.e. in the ratio of 1:1.311.

(a) Serum-Globulin
(b) Serum-Albumin
(c) Fat
(d) Trace of Glauc-Sugar.

(1) Extractives:
   (1) Kreatin
   (2) Urea
   (3) Hippuric Acid
   (4) Succinic Acid
   (5) Uric Acid
   (6) Hydroxanthin
1. Yellow-pigment
2. Lactic acid and lactic acid salts.

The most abundant is sodium chloride, next to it is sodium carbonate. There is a small amount of potassium chloride and also sulphuric acid and phosphoric acid, lime and magnesia salts in human blood-serum (Hoppe-Seyler).

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration</th>
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<tbody>
<tr>
<td>Sodium chloride</td>
<td>0.92 per cent</td>
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<tr>
<td>Sulphate</td>
<td>0.44</td>
</tr>
<tr>
<td>Carbonate</td>
<td>0.21</td>
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<tr>
<td>Phosphate</td>
<td>0.15</td>
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<tr>
<td>Calcium phosphate</td>
<td>0.73</td>
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<tr>
<td>Magnesia</td>
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(c) Water 90 per cent. (Lundegardh, Physiology Vol I 1st Edition. Pathology. According to Troussseau it is a febrility, the blood changes being secondary (Clinical Med. Vol. I page 101. 1872. Niemeyer says it is the result of premature sexual activity. Text book of Practical Medicine Vol II Sec. 100 chap. 1)
He says “According to my observations, Obstinate Anaemia attacks all young girls without exception in whom the menses have appeared in the twelfth or thirteenth year before the development of the breasts and pubes.”

Mitchell Bruce believes the disease lies in a peculiar condition of the blood and blood-vessels which is believed to be congenital and perhaps hereditary (Lucain Dictionary of Medicine art: Anaemia).

Sir William Aitken considers it as one of the functional diseases of the female organs of generation in the unimpregnated state.

Sir Andrew Clarke says it is the result of jaundice retention (paper by Sir Andrew Clarke Nov 14th 1887).

She says it is the inability of the organism to meet the demands made upon it by the simultaneous
Advent of Inflammation and of rapid growth of the tissues.

D. Hosgrace in a paper read before the Medical Section of the Royal Academy of Medicine in Ireland March 9th, 1884. "points out three varieties of anaemia:"

1. Fat Anaemia where there is a well-marked deposit of adipose tissue.
2. Anaemia of Thrigrowth, where there has been well-marked general increase without much deposit of fat.
3. Anaemia of general malnutrition.

The part most affected in the rapid growth are the various tissues derived from the mesoderm. The white cells and blood corpuscles, the heart and blood vessels, the reproductive organs and the supporting and connecting tissues are chiefly affected. During puberty the mesoderm is largely called upon by the rapid
Growth of the organs concerned in generation.

If the system is unable to meet the demands made upon it, Anaemia results.

If badly nourished, the system is almost certain to fail to meet the extra demands made upon it; Anaemia results, i.e., Anaemia of general malnutrition.

If, at the time the rapid growth of the organs of circulation and reproduction is set up, there is active growth of the bones, muscles, and other tissues, the system may be overtaxed by the further demand, and the Anaemia of overgrowth gradually appear.

In a third class of cases the mesodermal energy is misdirected, and instead of the demand being supplied, an excessive amount of reserve tissue (possibly resulting in part from deficient oxidation) is formed and fat Anaemia develops.
The blood suffers three principal changes in chronic anaemia: 1. Oligoemia = deficiency in amount. 2. Oligocythaemia. Aglobulinism = deficiency in red corpuscles or haemoglobin. 3. Hypoalbuminosis = deficiency in albuminous constituents.

Of these Oligoemia is the simplest, and perhaps never occurs alone; it is speedily complicated with Aglobulinism which is a very early and common, as well as the most obstinate, change in the blood. Hypoalbuminosis is the most advanced and perhaps the most serious alteration of the three.

Oligocythaemia a diminution of the red corpuscles. Microscopically the number of red cells in a given visible area of blood is diminished and chemically the amount of haemoglobin in a given volume of blood may fall from 15 even as low as 5 per cent.
Deficiency of the red corpuscles in haemoglobin, also called Oligochromatemia, one of the essential changes in Anaemia. Here the red-corpuscles present a pale appearance to the eye. A more trustworthy method of determining the richness of the red-blood corpuscles is by means of the Haemoglobinometer, or we may compare the amount of Haemoglobin in a given weight of blood, with the number of red corpuscles in a given microscopic area. When the former is small in proportion to the latter, the defect must lie in the individual corpuscles; and this may be so great that the proportion of Haemoglobin falls as in some cases, to 25 per cent. of the normal. Lack of the oxygenating substance of the organism gives rise to symptoms at once entirely various, and of the most serious import. Every vital func- 
ction, whether developmental, plastic, secretory, dynamic, or nutritive, is absolutely dependent on a
free and immediate supply of oxygen. All these processes therefore will suffer in Asphyxia. The respiratory and circulatory movements are accelerated. The complex process of elimination and secretion are performed imperfectly and the results are Dyspepsia, Constipation, and disorders of Quaerification, which intensify the normal blood state. Muscular contraction is feeble and cannot be sustained. Physical force is weak, and dulness, sleepiness, pains and other symptoms indicate imperfect exhalation within the nervous system. Bodily growth and development as of the sexual organs for example—remain incomplete, and puberty is deferred. Nutrition everywhere suffers, the materials being insufficiently oxidized and substances intermediate to albumen on the one hand, and carbonic acid, water and urea on the other hand are formed, especially oils. Thus the organs and the connecting
Tissues become loaded with fat and enlarged, instead of suffering atrophy, as they do when the blood-plasma is deficient (Theeis of the Blood J. Mitchell Bruce. Lewis's Diet. of med. Vol I).
The blood in Anaemia is scanty and pale, has a diminished pH, reaction- less, alkaline than normal blood (Lépine). Coagulates slowly and loosely (or in aggravated cases not at all) settling into thin layers -- consisting respectively of red corpuscles while and plasma.
Fibrin is proportionally high and the blood has a tendency to coagulate in the veins (Herry and Practice of Medicine Roberts Vol IV. 3rd edition).
That there is not necessarily a deficiency in the red-blood corpuscle (Maclean, Lancel. Vol IV 1880 page 286). From my own observations on the blood of anaemic patients I find that in a good number of cases, there is not a visible deficiency in the number of
the red-blood corpuscles. As to deficiency of haemoglobin in the red-blood corpuscles, in nearly every case I have examined I have found this to be the case, whereas there is a diminution of the corpuscles themselves.

I have also noticed that the individual corpuscles presented a peculiar felloe when compared with a drop of healthy blood. I have never been able to find the curious changes in shape described by some writers (Quincke, Medical Times and Gazette Vol II 1876, page 429) no doubt a good many of the supposed changes in shape were produced by the pressure of the cover-glass in the examination of the blood.

In some cases, I have noticed a perceptible diminution in the size of the red-blood corpuscle. I have also found a diminution of the white blood corpuscles, but this is not constant.
A great many morbid conditions have been found in the bodies of people who have died of anaemia, and these have a good deal of importance attached to them.

(i) The so-called form of anaemic fatty heart, in which there is a fatty degeneration of the muscular wall of the heart, especially of the Carinæ Columnæ and Musculi papillares (Brislow's theory. and Practice of Medicine, Ed. 5 to 1884).

Dilatation of the cavities of the heart, and a fatty change in the lining membrane of the arteries.

There has also been found a narrowing of the Aorta and large vessels and a thinning of their coats (Lectures in Medicine 1876. J. Granger Stewart).

Sometimes there is no pathological change except the anaemic condition of the organs in general.

The ovaries and uterus have been carefully examined.
and found to vary extremely. In some the generative organs have been described as infantile, while in others they are either inordinately developed, or perfectly normal in every respect. It is natural to refer the diminution of the corpuscular elements of the blood, to some functional disturbance, or organic lesion of the lymphatic tissues, but unfortunately nothing has been detected in their condition to justify this view. I am strongly inclined to believe, it is a poisoning of the blood, that is to say, there are certain poisons circulating in the blood, these poisons I believe destroy the red blood cells and haemoglobin.

We know that there are a great many diseases due to poisons circulating in the blood, and in a good many of these diseases certain changes are produced...
in the blood, i.e., for example, pyaemia. It is now believed that pyaemia is due to the entrance into the blood stream of a specific poison developed in unhealthy & decomposing pus.

It is said that in almost all cases, the blood contains a considerable excess of white corpuscles with a deficiency of red. The red corpuscles are usually unchanged, but occasionally they have been observed to join together, into irregular masses, microscopic organisms have also been found. Gaullier has shown that in dead animal tissues, processes of putrefaction, by which certain alkaloids are elaborated from the proteic substances, called by the late Lelmi of Bologna Plomaines. He has further shown that in the living animal tissues and their by virtue of their vitality
Certain other alkaloids are elaborated which are analogous to the Phormaines and these he has named Leucomaines. He has further demonstrated that in the living animal economy there are elaborated certain azotised uncrystallizable substances, as yet undetermined called "Entactines" or "Entraactive matters." The nature of these bodies has still to be discovered, but we know that they are more toxic or poisonous than either the Leucomaines or Phormaines. Take, for example the urine; we know that by or through it we eliminate chlorides, phosphates, urea, glucose, albumen, and "Intactines" in variable amounts; we know further the chemical composition and the danger of all of these, when found in too abundance or when not eliminated except as regards the unknown and
and mysterious "extractive" (Animal Alkaloids Sir W. Aitken 1887) we also know that we eliminate a good many substances by a through the faces.
The faces contain (1) The unchanged residue of Animal or Vegetable tissue, used as food, hairs, horny and elastic tissues, most of the cellulose, woody fibres, spiral vessels.
(2) Vegetable cells, gum, portions of digestible substances, especially when there have been a loss large amounts of when not sufficiently broken up.
by chewing, portions of muscular fibres, tendon, cartilage, particles of fat, coagulated albumen—vegetable cells from potatoes and vegetables, and starch etc.
The decomposition products from the bile-precipitates, as well as the allied bile-acids, unchanged mucin and mucine, crystalline needles of lime combined with fatty acids, chalk-soaps, unchanged masses.
If casein and fat, micrococci, and microbacteria
how we can exactly understand if by any means,
the elimination of the above substances does not
take place, some may undergo putrefaction and during
that process certain bodies
may be elaborated, called
by modern science leucoides,
and also unknown bodies
called extractives.
We are now also completely
alive to the important
results produced by the
absorption from the intestinal
canal of poisonous matters,
introduced from without, but
we are not yet sufficiently
alive to the important results
produced by the absorption
from the intestinal canal
of substances generated in it
by fermentation or imperfect
digestion. We recognize the
danger of breathing gas
from a sewer, but probably
we do not sufficiently realize
that noxious gases may be
produced in the intestines, and, being absorbed from it into the circulation, may produce symptoms of poisoning.

In many persons the mere omission to evacuate the contents of the bowels at the usual time will lead to a headache in the course of the day, which it is quite possible may be due to the absorption of some of the elements of the fecal matter itself. (Animal Alkaloids, Sir W. Aitken).

If this omission to evacuate the bowels goes on from day to day, for a considerable time, is it not possible that a tolerance is set up to the poison or poisons absorbed so that they do not produce their full toxic effect but merely impoverish the blood and its constituent to such an extent that it is not capable of nourishing the organism.
Symptoms.
The appearance of an anaemic girl is as a rule sufficiently characteristic. The pallor of such a patient at once strikes you; it is of a peculiarly waxy look. The skin is clear and transparent.

How white is this pallor most pronounced?
In some cases it is the pallor of the countenance that attracts your attention; you are struck with the colour of the lips which may vary from a somewhat pale hue to an almost blanched condition, so that there seems no line of demarcation between the mucous membrane and the skin. On opening the mouth the same condition is noticed, the gums and soft palate are pale and flabby.

But these are not the
only mucous membrane which exhibit this pallor. On turning down the lower eyelid, you notice here again the same absence of colour, in some cases this is very marked, but in others there is seen a line of demarcation, that is to say, the pallor gradually passes into the healthy colour of the normal mucous membrane.

Another sign noticed in the eye is the pearly blue colour of the sclerotic, as compared with the normal colour of that of a healthy patient. Again the eye have a peculiar glassy appearance, dark rings under the eyelids is another sign to be noticed in the examination of an anaemic patient. On looking at the hands, you are at once struck with the clear.
Transparent condition of the skin. You notice that the veins are very prominent, and in a good number of cases have a peculiar pinkish tint; the nails also show a bloodless condition. Sometimes there is to be noticed a brownish stain on the back of the hands; this is also occasionally seen on the eyelids. Another sign often seen in anemic girls is a puffiness of the lower eyelid.

The above are the appearance of a well-marked case of anemia. But in practice there are a good many gradations from this. Thus in some cases, the countenance maintains its natural colour, whereas the mucous membranes are blanched. Again, you will notice the lips of a perfectly good colour, but
the gums and buccal mucous membrane. Blanched
in some cases the feel of the skin is peculiar: it resembles a piece of velvet to the touch, and seems to be loose. This I am inclined to believe is due to a decrease in the amount of the subcutaneous fat, and also to a small extent to the atrophy of the muscles. Altogether the general appearance and air of the anaemic girl is one of loss of vigour and diminution of bodily strength. She looks dull, sleepy, melancholy, and depressed in spirits; seems to have no life in her. In other words, she wants backbone.
How what are the symptoms which cause a young girl to ask your advice in Anaemia? If these there are many
The most prominent and frequent in my experience, is what they term a feeling of fatigue and weariness. They will tell you that they are always tired. They rise from bed in the morning feeling as tired as if they had not rested at all. Once they sit down, they will tell you that they would like to sit still all day. And what is the probable pathology of this symptom? I am strongly inclined to believe it is due to a poisoning of the blood, by the absorption of unknown poisonous bodies from the intestinal canal. It might be put down as due to the dyspepsia which accompanies the anaemia, but I have often noticed it before the patient apparently suffered from
Dyspepsia.

Another symptom is a feeling of chilliness. They are always cold and never feel warm. They complain most of the extremities. They are always warming the hands and feet, but never with any good effect; again some will complain of a peculiar creeping sensation under the skin along with this chilliness. Extra clothing does not seem to have any effect. What is the pathology of the above symptom? I believe a poisoning of the blood. A chilly feeling is one of the first symptoms of general fever, and in some cases of anaemia I have got a slight rise of temperature. This is also noticed in (Larue, Vol. I, 1881, pages 534-570) Larue, Vol. II, 1891, page 14). Again, some patients will complain
of flushings of heat, Arthur in his work on the Leucorrheas and Romain mentions that poisoning by Extractio causes Hypothermia.

Infra-Nervous pain is another prominent symptom upon which Anaemic girls say great stress they always refer this symptom to the heart and imagine they have heart disease. The pain is sometimes constant but varies in its severity. In others again it is intermittent, it is worst in the persons Anaemic patient.

Let us consider its probable pathology. In a great number of cases it is due no doubt to the Gastralgia set up by the Anaemia or it might be a pure Bryaalgia. In may be also due to Gastric ulcers which is often found in Anaemic
Girls, I may give a good account of the above symptom in "British and Foreign Medical Gazette" Vol. 4 page 329. 

Strangulation of the circulatory system are often to blame for it. I am strongly inclined to believe it is of neurasthenic origin.

Another prominent symptom is pain in the head accompanied generally by vertigo and dizziness in the ears. Some patients will complain of a steady pain, while others will tell you that they feel a pushing in the head. Others again compare the pain to a feeling of dullness and heaviness.

Clumping in another symptom. See "British Medical Gazette" Vol. 1853 page 894 and Vol. 1876 page 461. Some suffer from this symptom only.
At night, while others have it more or less during the day, symptoms referable to the reproductive system are those that often bring an anxious mother to consult you in regard to her daughter's health, they will tell you that the girl has not been poorly for months, and when they have that there was what they term merely a show. This Amenorrhoea I have found to be one of the commonest symptoms with the exception of Leucorrhoea. Others again will complain of great pain preceding the periods, but on the appearance of the flow the pain ceases. Again, others will tell you that their period never leave them, but this symptom is not so common as the former two. The most frequent symptom
Complained of a white or semi-white discharge, with well-marked pain in the left side and lower part of the back.

Others tell you that they are perfectly regular, but the discharge is very scanty. In a good number of cases the reproductive functions are normal in time and amount of discharge.

Some writers point out that the sexual appetite is increased, but here I agree with Soucreau, who says that it is decreased.

It is much more natural to believe that it should be decreased, seeing that the general vitality of the system is lowered.

Such then are some of the most important premonitory symptoms. Now let us examine the systems in order, and firstly let us take the alimentary
Gastric System.
The digestive organs are generally at fault in Anaemia. Appetite is impained or depauperate in some cases it is excessive, or vice versa. There is absolute disgust for food, and especially flesh meat.

There is generally uneasiness, weight after food, flatulence, pain here or there severe and varies in character, generally referred to the epigastric region, between the shoulders or the left hypochondrium and in others varying in position. The above symptoms should lead you to be careful in the treatment of such cases as they are often due to irritation of the stomach. The bowels are usually constipated though occasionally Diarrhoea is present.

Stomatalomeisis and Melanosis
and sometimes vomiting sickness. This latter symptom I have noticed more in domestic servants and shop girls, than in girls of the better class; they generally complain of nausea after breakfast. In a good number of cases the digestive functions are normal. It is in these patients that we obtain the best results from treatment.

In examining this system we notice that the lips become cyanotic. Fauces et. al. are very pale and blanched, also the tongue presents the same characteristics in some cases. You find it flabby and indented by the teeth.

Stenopoeitic System. This brings us to the microscopic examination of the blood. Now what do we really observe as particular in examining a drop of blood from
An anaemic patient? The first thing that strikes you is the local of colour in the red corpuscles. Secondly in a good number of cases there seems to be a diminution in size. Thirdly there is a marked decline in the number of the red blood corpuscles as compared with a drop of healthy blood, there is also a deficiency in the number of the white corpuscles, on examining with the haemacytometer and stama-Johnimeter you find the same.

Circulatory System
Subjective Symptoms, an anaemic girl will always complain of faintness, and are very apt to faint on the slightest exertion. This might be due to organic lesion of the heart, but in the majority of cases, it is due to the heart being
fed with Anaemic Blood. Therefore it is not able to perform its duty and so a deficient supply is sent to the brain. This symptom is not always present in Anaemic girls, I have often found it absent.

Another symptom complained of is an excruciating and irregular action of the heart, this is a very constant symptom. The patient will tell you that if she runs up stairs or even walks fast up a hill, or as some have told me even playing the Piano has given them an attack of palpitation. Along with the above there is always more or less Dyspnoea. Pain in the Precordial region is another great symptom complained of. This pain always lead a girl to think she has some lesion of the
In some cases they say the pain is always there, but again only complain of it on exertion. In a great number of cases, it is due to dyspepsia. In one or two cases, I found gastric ulcer, often it is a nervous pain, or it may be due to true organic disease of the heart. Dyspepsia is frequently complained of by anaemic girls. I have often noted that in such cases there was always well-marked functional disease of the heart.

What are the physical signs observed in anaemia in regard to the circulatory system?

First of all there is the so-called anaemic murmur, heard over the base of the heart and also over the great veins. A great deal has been written in regard to the pathlogy of this murmur.
Some have considered it due to the characters and composition of the blood itself, others have put it down to congenital defects of the vessels; others again attribute this murmure to dilatation of the chambers of the heart, causing vibratation, with this view I am inclined to agree, as it is very easy to see how a heart badly fed that is a heart fed by blood deficient or partially deficient of some of its most important constituents, has become unable to perform its duty; dilate to a certain extent, and with this dilatation there must be some stretching of the auricular-senticular orifices. How white is this murmure best heard? In the great majority of cases, over the pulmonic area, or a little to the
left. It has been supposed to be the result of dilatation of the left cavities, and really to be formed in a large left auricle, and not in the Pulmonary Artery. It is said to have its maximum of intensity further to the left than a murmur really generated in the Pulmonary Artery would have.

In cases of Mitral Stenosis, a murmur of Mitral regurgitation does occur in the region referred to but the conditions are very different ("Physical Signs of Cardiac Disease" by Graham Steel).

In regard to my own experience, I have generally found the murmur rather lower down and to the left of the Pulmonary Artery.

What are the characters of the so-called Haemis murmur? First of all...
It is systolic in rhythm although under the influence of pressure a diastolic murmur may exist as a rule it is soft and blowing, but is said to be altered by pressure, it is seldom harsh and never permanent to, and generally accompanied by a venous hum in the neck. The pulse in Anaemia is generally weak, soft and compressible it is usually quickened. On examining the great veins at the root of the neck we are struck by the humming sound produced by the venous current. A great deal has been said and written about this noise or Bruit de Diable, in the great majority of cases it is produced by the pressure of the stethoscope, a good rule to follow in listening for such a murmur is after gently
Using the stethoscope at the post of the neck is to auscultate the great venous sinuses of the skull, where pressure has no effect. It is best heard above the clavicles in the furrow between the two heads of the sternocleidomastoid muscle frequently on the right side.

It is either a continuous or rhythmic occurrence occurring during the diastole of the heart or during inspiration. It has a whistling or rushing character, or even a musical quality and arises within the bulb of the common jugular vein, sometimes a thrill of the vascular wall can be felt. It is generally present in 30 per cent of all persons examined, and if pressure be exerted and if, at the same time, the head is turned to the opposite side...
the sound is heard in nearly all cases (Weil). It is said to be due to the vibration of the blood flowing in from the relatively narrow part of the Common Jugular Vein into the wide balloons portion of the vessel, and ceases to occur chiefly when the walls of a thin part of the vein lie close to each other so that the current must part through a (Notes on Medicine, Prof. Stewart, Session 1876). A similar sound is sometimes though rarely heard in the Subclavian, Axillary, Thyroid, Facial, Innominate, and Cephalic Veins and superior Cava. Dr. Causing your patient to walk up and down the room it disappears. The first symptom referable to this system is breathlessness on exertion, they will tell you that if they go up stairs they are out of breath.
or some even in taking an ordinary walk will complain of shortness of breath.

The respirations in Anaemia are more rapid and shallower than in health, it is very important that we should be very careful in treating these symptoms as it often happens that we are dealing with tubercular disease as well as Anaemia. Integumentary System

The skin in Anaemia has a peculiar soft, satiny feel to the touch and appears to hang loose; the colour has a waxy, transparent look, and the superficial veins are very well marked and in some cases have a peculiar pinkish tinge. I have often been struck by the occurrence of eruptions of the skin in Anaemia. One of the most frequent is acne vulgaris, this occurs on the forehead
and on the back, another troublesome eruption is Urticaria. Many patients complain of the appearance of patches of Erythema especially in the evening. There is often a slight puffiness of the skin under the lower eyelid. You also get a similar condition in the legs and ankles, another symptom is a falling off of the hair. The hair is dull in colour and harsh to the touch.

Urinary System.
The principal character of Anaemic urine, are first it is usually abundant, but varies greatly, pale and cloudy in colour. Sp. G. lower than normal deficient in acidity and a marked decrease in the amount of pigment.

Reproductive System.
Amenorrhoea is a very frequent symptom in Anaemia, the menses may be either altogether absent.
or infrequent or irregular.
Dysmenorrhea is often complained of especially before the flow comes or after it has appeared. The pain ceases sometimes.
Menorrhagia is a troublesome symptom, but one of the most frequent and troublesome is Leiomyoma.
Neuropsychosis. The phenomena which are
apt to attend are nervous and various, they are.
Nervousness, inability of application to any
pursuit or even train of thought, loss of spirits
and irritability of temper; usually. Complain of
Neuralgic pains, sometimes in the face and head,
sometimes in the intercostal muscles, sometimes in the
internal organs and extremities. They are not ungenerally
hysterical, have depressed appetite or suffer from
paralysis or convulsions or even become maniacal.
Treatment.
It is all important before commencing to treat a case of Anaemia to discover the cause, once having traced this our greatest difficulty is removed.
One of the main points is to locate all possible causes of illhealth. If the patient is shut up all day in close confined room, let her endeavour to obtain some more suitable occupation, if however this is impossible she should try to take a short walk in the middle of the day gradually extending it as she gains strength. Try and get her change of scene and fresh air by leading her into the country, seaside, or watering place.
Let her get into the habit of keeping good hours, in retiring to bed and rising in the morning.
Another important point is the use of the baths
not so much the cold bath, as the tepid soap bath.

There is a very prevalent idea among the girls of the better classes, that the use of warm water and soap spoils the skin. Therefore they avoid the bath as much as possible. In the use of the cold bath, let her be guided by the reaction after it: if this is healthy, causing her whole person to glow with heat, then let her use the cold bath by all means. But if on getting out of the bath she feels chillie, and her skin looks pale, she should use the tepid soap bath as the persistent use of the cold will do more harm than good. It is a good plan if the bath is contraindicated or else impossible to procure, to have a good rubbing down with a rough towel the first thing in the morning.
A very good rule to follow is to drink a glassful of warm or cold water on first rising. By this the liver and intestinal glands are stimulated, and it conduces to the healthy evacuation of the bowels, which in any opinion is of the first importance in the treatment of Anaemia. Let her diet be as nourishing a character as it is possible to procure, preferably, to consist of flesh meat, get her to drink milk instead of tea. Be sure that the diet is nonconstipating in character, that is does not consist of the finer breads, let her eat whole-meal bread, in addition to the above. Have a certain amount of fruit—especially cooked fruit such as apples, pears, prunes, figs, etc. In regard to alcoholic liquors, I do not advise their administration, unless the pulse and heart demand.
them, except perhaps a small quantity of good bitter ale to be drank with the dinner, if this does not agree a little good claret.

Medicinal Treatment.
Iron is the most important drug in the treatment of anaemia, as it there are many forms and preparations, some seem to suit certain cases better than others. It is very important before prescribe iron, to enquire into the state of the patient's prime bine, if this is unsatisfactory, commence by giving a saline and tonic purgative for the first two or three days.

How as to the preparation to use. I generally begin with a pill slightly modified from Blund's by the addition of extract. Ailis, Vom, and Indi. Extract. Ailis, aquos, and if this combination proves useful, expect to see signs of improvement in one.
patient is from 4-6 weeks. I occasionally find it advisable to give at the same time, one of the saline preparations of iron.

When the heart is weak, the *Liquor Arsenicalis* in 2-3 ells in warm wine is of great use.

If the patient is striduous in breathing, I generally find one of the syrups, such as the *Liq. Ferris* Lot. or the *Liq. Ferri Phosph. Co.* or the *Liq. Ferris e Latta Phosph.* prove of great benefit.

If there is great nervousness *Phosphorus* functions very well.

Where there is a tendency to discharge, the *Per Salts* combined with *Pet Wilts* answers the purpose, the *Liq. Ferris Perch.* is apt to disagree, but the addition of an equal quantity of spirits of vitriol either present a dilution (S. Cameron-Huddersfield).

Urine Complaints demand special attention. In these the *Bromides* are very useful.
also Mysoreunes and
ind, Canabite, Ind.
A great many other drugs
have been advocated, such
as the "Alkali" (Nicholson
in Practitioner Vol I 1880, p. 26)
Kipps' Times and Gazette Vol II
p. 371 1866) advises the use of
Saltic Acid
Pollock points out the
advantage of adding Rheo-
barb to the Iron. (Lancet Vol II
1876, p. 202).
Blythwood recommends the
hypodermic injection of Iron
(Practitioner Vol I 1878, p. 12)
Ballocks blood is advised by
Moultouns (Times Vol II 1856, p. 699)
What are we to do in the
cases which derive no benefit
from drugs and general
treatment?
I am of opinion that these
are the cases in which
transfusion should be tried.
What fluid are we to inject or
transfuse?
Some advocate milk, others
saline fluids. Prof. von
Riemerscheil in the
Subcutaneous injection of blood, his method is as follows.

The blood taken from the donor's arm (with due regard to antiseptics precaution) is whipped as it flows, and the defibrinated blood placed in a beaker, kept by a water bath at a temperature of 37° 6-46° C until required.

The patient is then prepared and only part of the thigh being selected for the injections and if necessary the arms also.

Therfore must be administered owing to the painful massage that has to be practiced to facilitate the injection.

The syringe has a capacity of 24 gms and is furnished with a long, but not too fine cannula.

The injection is made slowly, the limb being subjected to vigorous massage while it proceeds.

A fresh spot is selected for each injection, of which,
There may be several at one sitting.

Ice bags are applied afterward and although ecchymosis often follows, inflammation seldom occurs. With small quantities the pain is very slight, but after the injection of large amounts there is considerable pain, which may last some time. The effect of the injections is to cause an immediate but temporary increase in the haemoglobin, followed by a decrease, but not to be lost a point as before the injections.

By repeating the injections after an interval of some days the amount of iron in the haemoglobin may be gradually increased.

Prof. von Grimm also advocates the subcutaneous injection of salt solutions, Säure chlor.


Sir Tye. Duckworth regards
Iron as the Specific for Academia, and attributes failures to the improper administration or insufficient usage of the drug, he also believes that some cases may be cured by Alcon albus, Salmi Aperienti, good diet, with 4 to 6 ounces of Burgundy daily. Are flags of value.

He prefers the Chloride and Sulphate, and also points to the advantages of Chalybeate Spas.

He insists on the value of rest, and on the importance of continuing treatment until the obvious eruptions disappear. (British Medical Journal Vol 1 p. 562. 1887. According to Prof. Rottmanegel, Iron stands in the front as a means of ameliorating the condition.

In milder cases it suffices to improve digestion by resort to the open air, the mountains or the seaside, whereby such patients
are enabled to assimilate sufficient iron from the food they take.
Bathing should at first be prohibited, and when
commenced should be
most cautiously pursued.
Of the various preparations of iron, he likes the least
the "Compound Ones" as the
Sulphate of Iron, Cyp. Ferr.
The Sulphate and the
perchloride have their special
properties, due to their
combination, but are not
always well borne, and
then the Lactate or Reduced
Iron are preferable.
He protests against the
use of Arsenic (Allg.,
Med. Zeit. 32 and 33 1887; and
Maragaliaud advocates the
use of Spleen pulp, it consists
in the pulp of the Spleen ZII,
given in emulsion. Better
Almond Z x and Brandy Z x
with meals. (Deutsch, Ins.
Zeit. Jan 1887).
In those cases in which iron fails to do good, Dr. Hugo Schultz, and Paul. Strübing, recommend sulphur (Deutsch. med. Woch. 9. 2 1884). Oxygen, Enemata are fairly well spoken of by S. H. Kellogg. (Therap. Gazelle. Sept. 1884).
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