On Purpura.

With special reference to its
Pathogenesis.

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Purpura.

Purpura (from Purpura, a purple dye) was first described by Westhof, towards the end of the last century, and cases are recorded by him in his "Opera Medica" 1785.

His name is still associated with the disease, and the Germans give it the name of Morbus Maculosus Westhoffii.

Shortly after Westhof's writings, Præfe wrote a Thesis on the subject (Reference a) and Robertson and Adam have given careful records of cases, studied by them in the year 1789. (Ref. b)

William describes Purpura in his "Cutaneous Diseases" 1808, and classes the disease among the Haemorrhata, and since this time till within the last few years, very little advance

(a) Dr. Pelichius Eine Lebh.
(b) Dr. Horst, Maculosus demonstration 1789.
has been made in our knowledge of the subject.

In the present day it is still the cause of much controversy and is well worthy of study.

Definition.

Purpura is best considered generally as a "diseased condition," characterized by the occurrence of circumscribed effusions of blood into the thin and other tissues of the body, and sometimes by hemorrhage from mucous membranes, and into serous cavities, occurring either idiopathically, or in the course of various diseases, with or without certain constitutional symptoms, often of spontaneous origin and without evident cause.

It is impossible to give more than a general definition of Purpura as it occurs under so many conditions and is not attended by any constant symptoms.

Its one distinguishing feature, is the existence of an acquired and transient hemorhagic eruption in some, whereby the
Blood escapes from its vessels, and may appear as a rash-like extravasation into the skin, or be effused into other tissues and organs, or flow from the various mucous membranes of the body.

It has been a matter of much dispute as to what to include and what not to include under the name of Purpura.

It is intended in the present treatise to make passing allusion to three forms of Purpuraic eruption that occur as it were symptomatically in the course of other disease, and to pay special attention to the more independent forms of Purpura, where no evident causal condition is present.

It will be well however at this outset, to refer to an opinion that is just gaining ground among recent observers, (and which will be supported here), that Purpura so-called may eventually
be proved the symptomatic.
"A set of phenomena due to widely different influences acting upon the Blood and Blood Vessels, and that the term will disappear from our nomenclature as indicating a Disease, but will be preserved as denoting a symptom of various morbid states." (Atkinson, Physical Atlas of Med. Vol. 2.)

The African Diseases of Scurvy and Hemophilia will not be considered. They are etiologically and clinically distinct. In the former, there is a history of privation, and the impoverished state of the Blood, thereby induced, leads to marked anæmia and debility previous to the occurrence of hemorrhagic effusions, which are different in their Character to those which are seen in Pyemia or Hemophilia. The condition has been constant, and has existed throughout the life of the individual, and has been handed down from his forefathers. Its clinical
characteristics moreover are different.

Etiology. 

As regard the Etiology of Plum-pox, there are many points to consider.

There is no evidence whatever that hereditary predisposition plays any part, though individual pre-disposition undoubtedly exists as the disease has recurred in the same individual. Some man thinks this may possibly be accounted for by some congenital peculiarity, though in many cases it remains is doubtless of nervous origin.

Dr. Doyle has recently mentioned a case in which a gentleman, having been an intimate friend immediately after his death from Plum-pox, had himself ever since been liable to annual attacks of the same disease, (these occurring always in the spring.) Ref. a.

This however is not transmitted

The offspring and the person so affected is in good health prior to and after its occurrence.

Purpuric eruptions may occur in those who are apparently in perfect health.

No special constitution can be associated with the disease (see note below). Strong, healthy, and robust persons are liable to suffer as well as the weak and debilitated though it is more often seen in the latter.

It may occur at any period of life, but is more common between the ages of sixteen and twenty. It has been observed in infants at birth; and Dr. E. S. Brown reports a case (Brit Med Jour., 86) where a child was born covered with petechiae and shortly after suffered from severe hemorrhage from the stomach, bowels, and umbilical vessels, dying on the third day.

Note. For the sake of convenience in description, the word "disease" is used throughout the paper, in reference to Purpura, as it will be seen better to be an inappropriate term.
The disease is also seen occasionally in aged people. (Amphora Sphilo).
It affects both sexes but according to Currans, has been more often observed in females.
It frequently occurs, especially in the milder forms, in personsconvalescent from acute disease, and also during chronic illnesses.
Hemorrhagic petechiae, sometimes precede the eruption of smallpox, and are commonly seen in the course of other diseases, in typhus and typhoid fever, measles, cholera, diphtheria, pneumonia, scarlet fever, phthisis, acute rheumatism, anthrax of the liver, leucocytozemia, intermittent fever, and in forms ofBright's disease.
It also occurs in septic disease and during the course of whooping cough, in some neuralgia, locomotor ataxia and in tabes.
Spinal Fever.
Acute or hemorrhagic eruptions have also followed the administration of various drugs, locoide of Nitric,
Chloral, quinine, phosphorus, mercury and also after the entrance into the blood of certain make poisons.

A case is reported of a child dying with symptoms of Pneumonia after taking 2½ dr of lodquick of Potash.

As to inciting causes, severe mental shocks and fright have sometimes been followed by Pneumonia. It is not the case that poverty and want of food are essential factors in its production, though Bouchut (ref a) maintains that ill ventilation, insufficient food and bad surroundings have much to do with the development of the disease, and Loosfelt closely allied to Slurry.

Bogner (ref b.) describes a case where Slurry and severe Pneumonia Hemorrhagica were well marked in the same patient.

It has doubtless occurred under

(a) Parke Vid. 20th. Nov. 79.
(b) Arch. of Dermat. Oct. 79.
conditions of poverty and malnutrition but also in those who have been well fed and cared for.

It never affects a community who have lived under faulty hygienic conditions as Sydney does. It is not endemic nor epidemic.

The rarity of the disease compared with the prevalence of poverty and want of hygiene in our large cities, prevent our associating the two conditions and establishing any causal relationship between the two.

Within a recent date, Dr. Watson Cheyne has reported two cases where the disease was attributed to its infection with the blood of specific forms, and a third case illustrating the condition is noted in appendicis, Case IV, numerous micronuclei being found in the blood, and tissues. The consideration of this subject will be undertaken further on, (see Pathogenesis).

In the majority of cases
of typical Purpura, no cause has been discovered.
It has occurred spontaneously
and neither the pre-existing nor
co-existing condition of the patient
has been sufficient to account
for its development.

Classification.

Purpura, we have seen,
since it occurs under a variety
of circumstances and with varying
symptoms, must necessarily be
expanded as a general term.
It is therefore desirable to subdivide
the subject and consider the disease
under separate headings.

Bearing in mind that the
etiological conditions are doubtless
very different in different forms
of Purpura, a classification
based on its etiology would be
the more preferable and scientific
one but for the purposes of
description it is better to adhere to
the old classification based on
clinical types.
It will be well to put aside all forms of Purpura Eruption that occur secondarily in the course of other diseases, and to consider them generally under the term, Symptomatic Purpura, and to subdivide the more independent forms of the disease according to their clinical manifestations.

Thus we have three main varieties:

Purpura Simplex,

answer for the disease in its simplest type, in which there is development of petechiae in the skin and no extensive extravasation or hemorrhage.

Purpura Symptomatica,

includes those cases in which there is extensive extravasation into the skin and mucous membranes, and more or less external hemorrhage.

Purpura Rheumatica,

in which, along with the extravasations, symptoms resembling Rheumatism are present, with pain and swelling in the joints.
This form has been described by Schonlein (1829) and others as a separate disease under the names of Peliosis Rheumatica, and Rheumatica Petechialis, but Schöflisch has shown the existence of transitional cases between the so-called Peliosis Rheumatica and True Purpura Hemorrhagica and the subsequent history and results do not bear out its rheumatic origin. (Ref a).

There is no doubt it should be considered a form of Purpura, and Immnerman calls it, Purpura Rheumatica.

Here are the chief clinical types of the disease though several other forms have been heedlessly isolated as separate varieties by different writers.

Immnerman subdivides into, Purpura Petechiata, and Purpura hemorrhagica according to the existence or not of fever. (Ref b)

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(a) Deutschen Archiv für Klin Med. 1874, S. 446.
(b) Prussian Cyclopes. 1877, S. 46.
Hancock and Conty describe a form occurring mostly in children, where severe gastro-intestinal symptoms predominate, and Conty consid-
ersing it due to derangement of the sympathetic nervous system calls it, Purpura Reticulosa (Ref. a).

Another form, where in addition to the ordinary appearances, there is an eruption of wheals resembling urticaria, has received the name Purpura Urticans. It may be noted that Purpura Papulososa (Chicken hives, hives) implies a variety where short papules appear in the midst of the petechia.

These conditions, though they are not seen in ordinary cases, are not of sufficient importance to be considered as separate varieties but are better regarded as unusual symptoms of one or other type.

(b) Gaz. Rist. 36, 828. 1876.
General Features of the Disease.

Its commencement.

In a clinically typical case of "synovial" arthritis, there are no Premonitory Symptoms.

The disease is noticed in sudden and unexpectedly by the occurrence of petechiae in the skin or by some internal hemorrhage such as bleeding from the nose.

In some cases however the development of the hemorrhagic spots is preceded by slight general malaise, some fever, headache and gastric disturbance. These are not severe and last only a few days.

In other cases again, the earliest symptoms are referable to the joints; there is pain and sometimes swelling of some joint or joints, usually of the lower leg. Tenosynovitis, and this is often attendant by slight peltic disturbance, which as a rule subsides as the petechiae appear.

Its characteristic onset then
is marked by the sudden appearance of hemorrhagic spots, and these usually at first upon the skin, generally in the form of maculae. Their occurrence is unattended with pain or itching and there is no previous congestion of the part affected.

The seat of the eruption is very frequently the lower extremities, then in the first instance and it may be confined to these, but in some cases there is no part of the cutaneous surface exempt, it may cover the whole body.

After the lower extremities the trunk is most commonly affected, then the upper limbs, the face being more frequently free than other parts. In Rheumatic Cases the neighborhood of the painful joints is often first affected, and from them it spreads to other parts.

These cutaneous hemorrhages vary in size from a pin head to a nut or larger.
The smaller, called petechiae, are the more common and more generally distributed. The larger spots, or ecchymoses, are present in most well marked cases but are fewer in number and more scattered.

When the ecchymoses occur in line or stripes, they are called ridges. Their shape varies; they are more frequently rounded though often irregular or star shaped and may assume any form. Their edge is generally uneven and is sharply outlined. They are flat with the surface or may be slightly raised.

Besides the more common macule, vesicles, and sometimes blebs containing blood are seen on the skin. These are produced by break down blood into the reti endothelial from the capillary loops of the papille of the skin.

Sometimes also as my the
petechiae are minute brownish papules (Rhipicephalus appendiculatus) and in rare instances an eruption of wheals resembling urticaria; (Rhipicephalus hirricane)

The Colour of the spots varies from bright red to a livid or dark purplish red, the colour depending on the depth of the thin at which the blood is extravasated. It is permanent and cannot be effaced by pressure.

The extravasated blood undergoes change in colour with age as the disease advances, from alteration in the haematin during the process of absorption. They change from red to brown, to green, then yellow, and finally fade away, leaving as a rule no pigmentation behind them and are not followed by any chrysematous ulceration of the cuticle. Each spot lasts from one to two weeks. They remain discrete and do not increase in size
after the first effusion.

Frequently, such extravasations occur at various intervals, producing a strange variety of colors on the skin, and often a slight petechial attack precedes each outbreak of spots, occasionally also arthritic pains.

These petechial attacks are sometimes occasioned by some mechanical injury or sudden emotion.

In some cases, noticeable soft, elastic swellings have been observed previous to the hemorrhagic eruption and frequently some cutaneous adenitis consists.

Enlargement of the lymphatic glands throughout the body, had been observed in some instances.

Besides cutaneous hemorrhage, which occur alone in the simpler forms of the disease, (P. Simplex), we find the mucous membrane also participate in the marked process.

In the mucous membrane of
The mouth, palms, and pharynx, extravasations of blood occur and are plainly visible as the slightly raised purplish spots and patches.

In the conjunctiva also interstitial hemorrhages occur.

These extravasations may be present only as small petechial spots or may be more extensive.

Again in the more serious cases (Renal Purpura Hemorrhagica) the different mucous membranes, bladder, infiltration of blood into their interstices, allow of copious hemorrhage from their surface.

The mucous membrane of the gums, mouth, nose, bronchi, stomach, intestines, rectum, bladder, urinaries, passage, vagina, are all liable to copious and repeated hemorrhage, recurring without any exciting cause.

The gums though frequently bleeding, do not present the same spongy, swollen, discolored appearance as we find
in Saxony: nor are they tender.

They retain their natural appearance though they often look white and bloodless.

In some cases, they are covered with black sanguineous spots.

Hemorrhage also occurs though not so frequently into the pleura, pericardium, and peritoneum.

Occasionally extravasations take place into the brain and membranes, producing symptoms depending on their position and extent. Rarely extravasation hemorrhage occurs in the subcutaneous connective tissue and more rarely into the substance of muscles.

The general condition of persons suffering from Purpura in the majority of cases, depends on the extent of the extravasations and their locality and on the severity of the sectional hemorrhage, and on the patient's
previus state of health.

In Petechiae, the general health is as a rule but little impaired: the patient often feels quite well and may have discovered the eruption only by accident. He presents no other indication of illness and is well at the close of a few days.

In other cases, where some febrile symptoms have existed with the eruption, the patient is confined to his bed and feels indisposed. He has lost his appetite, complains of headache and general uneasiness for some days, but in the majority of cases, is soon restored to health.

In Petechiae, in addition to petechial disturbance there is acute pain in certain joints, especially the ankles and knees. There is some effusion into them and often some cutaneous edema. In a few days patches appear, at first in the neighborhood of the painful joints, and on their
appearance the pain is lessened.

Frequently however patients will suffer a recurrence of pain in the joints and this is again relieved after a fresh outbreak of chills.

This may go on for some time, even for months, without the general health suffering to any great extent. Here is seldom any hemorrhage from the mucous membranes; Cæradie tumours are frequently observed but are probably hæmorrhagic, and in some cases albuminuria has existed.

In nearly all cases after a longer or shorter period, recovery ensues. (See Case Appendix II.)

In rare instances besides the Rheumatoid symptoms, severe gastro-intestinal symptoms are present, with bilious vomiting acute colic and abdominal tenderness, these often recurring several times during the course of the illness. It is more common in children and is frequently associated with cutaneous oedema.
The patient is seriously ill, is liable to collapse and much danger is apprehended.

it was thought that cases and the dissociate the disease from Peripera and consider it distinct. (Ref. a)

Scheby Bock maintains that these symptoms are due to the digestive juices being involved in the hemorrhagic process, by the occurrence of hemorrhage into the serous coats of the stomach and intestines.

Costy thinks these symptoms due to derangement of the sympathetic nerves. Hence his designation, Peripera nervosa. (Ref. b)

In a few reported cases, purpura and persistent diarrhea has existed, entirely uncontrolled by treatment, and leading to rapid exhaustion and a fatal issue.

Its cause has been ascribed to extensive hemorrhagic infiltration into the intestinal mucous membrane.

(Ref. b) Gaz. Hebdt. 36. 1876.
Death has rarely resulted from sudden inelecine extravasation of blood into the Brain, the patient dying with symptoms of apoplexy.

In Purpura hemorrhagica, where in addition to interstitial extravasation there has been internal hemorrhage, the patient's general condition will depend solely on the amount of blood he has lost. In all cases there is some anemia and consequent debility. This may be all and on the cessation of hemorrhage he quickly regains strength.

In several cases where hemorrhage is unchecked, he becomes rapidly anemic. Here is increasing pallor and weakness and often chills. The pulse is rapid and fluttering and can hardly be felt. The breathing is hurried and sighing. The heart palpitate, on the slightest emotion and he is subject to recurring attacks of syncope.
The mental faculties previously clear, gradually fail; delirium often supervenes and death ensues from insensibility (see appendix, Case II). It must be borne in mind however, that alarming and repeated hemorrhage may occur punctuating the patient, without ending fatally, and once the hemorrhagic tendency is in evidence, he quickly rallies and regains strength.

Duration of Illness.
The average duration of moderate and favorable cases of Petpura is two to four weeks.
The hemorrhagic tendency may only last for a period of five to fourteen days and in the milder cases for even a shorter time, but the resulting anemia which occurs in most instances, prolongs the illness and prevents a speedy recovery.

Sometimes however the condition may last for several months.
Either from the occurrence of
shock, or from severe external
or internal hemorrhage and
from the intensity of the resulting
anemia.

Some cases again, happily
rare, are very rapid in their
onset and may end fatally
in a few days.

Termination.

The great majority of cases
of Perfora, taking all forms
together, end in Recovery.

A small proportion are fatal
either from acute anemia from
repeated hemorrhage, or from
internal bleeding or cerebral edema.

Of 73 cases of Perfora hemorrhage
observed in Hamburg, 10 died.
and of 14 cases observed in St.
Peterburg, 4 died. This seems
to imply a high rate of mortality
but the cases included only those
of the severe type and do not include
the simple and more common forms
of Perfora.
Complications

1. Gibert asserts that Periphere is a common complication of Periphere though it has not been generally observed or referred to in the literature of the subject. (Ref. a.)

2. Periphere rarely occurs with pregnancy. When it does so it is extremely fatal.

Dr. Phillips has recently recorded a series of cases. (Ref. b.)

He attributes the rarity of Periphere during pregnancy to the highly fibrinous state of the blood which exists in the latter condition and asserts that the disease has a decided action on the gravid uterus, being almost certainly productive of abortion.

He propagates an internal cure and death frequently results from intrauterine or post-partum haemorrhage.

The disease does not affect the offspring.

3. The development of arteritis, (Arteritis arteriosa) has been frequently observed in Purpura, and has been chiefly seen in cases complicated with severe gastric symptoms. Its occurrence has been ascribed by Schob, Bach, and others to the gastric condition than the Purpura.

4. Mortification and ulceration of the mucous membrane of the intestines, rarely occurs from extensive hemorrhagic infiltration. The ulcers show no tendency to heal and lead to profuse and exhausting haemorrhage which has invariably proved fatal.

The Pathogenesis of Purpura, will be considered further on and will receive special consideration.

Prognosis.
In simple cases the prognosis may be said as a rule to be favorable but an opinion must always be given with caution.
There is a great tendency to Relapse and the Simplest Case may at any time develop severe symptoms.

Purpura Rheumatica almost always ends in Recovery.

In the severer forms, the prognosis depends in a great measure on the extent of the hemorrhage, the existence or not of complications, and on the constitution of the patient, and the conditions under which Purpura has been developed.

Bonchut asserts that in the chronic diseases of children, the development of Purpura is an invariably fatal symptom. (Ref. a)

The correctness of Perny and the one Union doubt on the patient's chances of recovery.

It must be borne in mind however, that the severest case may at any time suddenly lose its hemorrhagic character and end favorably.
Anatomical Characters and Post Mortem Appearances.

The chief seat of Hæmorrhage is Pericarae is the zeta Cornell, and the papillary layer of the Cutis.

The blood escapes from the capillary vessels, and becomes diffused into the interstices of the connective tissue, its serum becomes absorbed, and the hæmatin liberated from the red corpuscles, undergoes change passing through the various tints of purple, green, brown, yellow, and is finally absorbed.

In rare cases, permanent pigmentation has resulted from the formation of hæmatoidin.

The same occurs in the extravasation that take place in other parts of the body.

Post Mortem Appearances.

Death has probably resulted from the severity and continuance of the hæmorrhage.

The body appears fairly nourished.
in most cases excepting where the disease has been of long standing. It is white and anemic and often adenomatous. The skin presents numerous petechiae of all sizes and of different colors depending on the date of extravasation. The various orifices of the body, nose, mouth, anus, vagina, often show indications of recent hemorrage.
The mucous membrane of the lips, gums, mouth, pharynx, often present dark inspissated mucus, crusts adhering to them and upon removal of these the underlying membrane appears pale and bloodless and is sometimes studded with petechiae.
The internal parts are also anemic. The mucous membrane of the stomach and intestines, bladder, rectum, often present superficial erosions and petechiae in large numbers. They are also sometimes seen in the mucous
Membrane of the air passages.

The stomach and intestines often contain large quantities of fluid and partly coagulated blood and the bronchi may contain liquid blood and bloody sputum. In one case the Fallopian tubes were found filled with blood.

The lungs membranes frequently show petechia on their surface, and in the subserous tissue; and the bronch cavities may, though rarely, contain considerable effusions of blood.

The lungs are often congested and edematous and present numerous petechia.

The heart is usually dilated and its muscular substance pale and flabby and sometimes fatty. Its cavities may contain small quantities of semi-coagulated blood. Petechia are frequently observed on the surface of the heart and in its substance.

The spleen and lymphatic glands
present no constant changes, but the spleen has been “repeatedly found enlarged and its pulp thin of a pasty consistency.” (Billroth, Virchow Archiv. B.XIII. I. 466)

It has sometimes been found shrivelled with yellow spots.

(See Note End of Treatment)
The lymphatic glands in some instances are enlarged and Hindenlang found pigment in the lymphatic glands in the neighborhood of the purpuric patches (Ref. a)

The liver and kidneys are frequently normal though often shrivelled with petechiae and the pelvis of the kidney sometimes contain blood.

The Brain is anemic. It presents petechiae and rarely larger hemorrhages of blood.

In a case reported by Ponfick the medulla of the bone was found to contain large and small hemorrhages. (Ref. 6)

Ref. a. Virchow Archiv. LXXIX. III. 50.

Ref. 6. vii. LVI. 48. 534. 72.
We have no knowledge of any change in joint cavities that have been affected with Rheumatic symptoms beyond an observation in one case where the synovial fluid was found to be increased and the membrane hyperemic.

(Ref. a.)

The changes observed in the blood and vessels will be considered further on. (See Pathogenesis.)

Treatment.

Most cases of Simple Periarthrosis recover without treatment.

In all cases absolute Rest in bed should be enjoined.

The Room should be kept cool and fresh should be favorable hygienic surroundings.

All unnecessary movements and physical efforts should be avoided and anything likely to excite the heart's motion and thereby cause increase of blood.

pressure in the vessels, which would tend to favour hemorrhage. The diet should be simple and nutritious, with an abundance of milk and of carminative food should be given cold or iced. Alcoholic stimulants are not usually required.

Fresh vegetables have not the same curative effect on the disease as in Scirrh.

Any tendency to constipation must be avoided and counteracted by mild aperients or faeces and no violent purgation must be allowed, as it may excite intestinal hemorrhage.

Blood letting was once much practised to relieve a suppurative phlegmonic condition but the loss of blood is often so great in the ordinary course of the disease that no such treatment can be sanctioned.

With regard to medical treatment numerous drugs
have been used though no
remedies can be rated to exert
a specific influence over uraemia.

The mineral acids, especially
sulphuric, have been much
used, in doses of 15-20 min. of
its dilute acid, every 30th hour,
and were instilled by hokhoff.
They are given with the view of
reducing the tendency to haemorrhage
and restraining it and they
are doubtless capable though
innocuous maintaining their
efficacy. (Ref a)

Acetate of lead has been
employed with doubtful advantage.

Iron, in the form of the succinic
parachloride, has been a
favorite remedy in large doses,
both diluted. Some observers
however think that the preparation
of iron should not be given till
all tendency to hemorrhage has
ceased and that its early use
has led to relapses. In a case
published by Dr. Mackay. (Ref b)

This appeared to be the case.

Later on, during convalescence, it is a valuable remedy.

Spirits of laudanum, in some instances, has been beneficial in checking haemorrhage, in repeated doses of 10-20 min. in marriage. There is a remarkable tolerance of laudanum in Purpura.

If it is our most reliable remedy and experience is daily speaking in its favour.

It is the most rational remedy, from its action in the Capillaries through the tarsomotor nerves, inducing tarsomotor spasm and checking the tendency of transudation of blood corpuscles through the walls of the vessels.

Dr. Duncan Ralston strongly advocates its use in Purpura hemorhagica (Ref. a.)

It may be given hypodermically and this is in most cases the more preferable method.

though it has in some instances proved dangerous from continued consumption from the mixture. (Rush).

Dr. Sand found great benefit in one case from Faradization after failure of every other remedy. (Ref. a.) It may be supposed to be of service by its improving the tone of the nervous system, which is probably at fault in some forms of fibrosis. (see Pathogn.)

Hysterics and the hypodermic injection of salicylic acid have been tried, with doubtful advantage.

Clairborne has treated cases with conserving sublimates with apparent success (Ref. b) and in cases depending on the presence of specific fumes which will be shown sometime. (see Pathogn.) This treatment can be supported and is well worthy of further trial. Dr. Stabenon and Faye have spoken highly.

of Arsenic as preventing the formation of fresh haemorrhages and checking haemorrhage from mucous membranes. (Ref. a) and its good results may be attributed to its beneficial action in cases of sarcoma, myoma, or possibly from its germicidal properties, by acting directly on the blood.

Local means of checking haemorrhage may have to be resorted to, by Arsenic, insertion of plugs, application of styptics, astringent washes, injection of iced water &c.

Laughr has recently used Locaine locally with apparent success and he considers its effects due to its causing contraction of the vessels. (Ref. b)

The various complications must be treated as they arise on general principles.

In chronic cases of anaemia Transfusion may be employed.

but the success attending its use has not been encouraging. During convalescence, tonics are needed, eczine, iron, wine, tonica, arsenic and ample nutritious diet.

Note. The Enlargement of Spleen. It appears to me to be probable, that in cases of protracted hemorrhage, where there has been a great strain on the Blood, that the Spleen (if Holliker's view of its physiology is correct) may Enlarge in a compensatory manner in order to supply the loss. This we may conceive may also occur in certain blood diseases. And further that the spleen so enlarged and presumably increased in function may pour into the Blood Stream Cells in such quantity as to interfere with their proper transformation, so possibly account for certain irregular cells sometimes found in those conditions.
Pathogenesis.

The one prominent clinical feature of Purpura has been shown to be the extravasation of blood into the tissues of the body or its escape from the various mucous membranes.

It is certain from the variety of circumstances under which Purpura is developed and from the want of uniformity in the pathological change that have been found by competent investigators to exist in different cases, that no one pathological condition or set of conditions, can be associated with its development.

We must therefore consider minutely the pathogenesis of the disease in its different aspects.

In many diseases such as Pneumonia, Anæmia, Bright's Disease and in Specific Fevers, as has been before referred to, there is a tendency to the development of cutaneous and other hemorrhages of Purpuric resemblance. Such can be
The more easily accounted for as they occur secondarily in the course of some recognised disease, while the patient is cachetic and has suffered from the effect of mortified tissue change.

It is easy to follow in many such cases the mechanism of the hæmorrhage, the patient's blood is impoverished, its constitution altered or it nearly contains specific foreign elements; it can therefore more readily escape from the capillary vessels which in common with every other tissue in the body, have been illnourished and weakened and thus are more liable to allow of an escape of blood, either from diseased or from minute ruptures in the capillary walls.

In other instances, the hæmorrhagy may be the consequences of thrombosis or embolism.

Such cases as these can hardly be considered under the head of Purgina; they are consecutive and purely symptomatic and
The hemorrhagic tendency is not as a rule a prominent symptom. Equally comprehensible are those forms of so-called Purpura, which occur so frequently, as Krukenberg has shown, during convalescence from acute disease.

He has pointed out that hemorrhagic extravasations are apt to occur, not immediately after the subsidence of the acute symptoms but at a more advanced period of convalescence. In these cases it is possible that there is some connection in the recurrence of the symptoms with the "exceptional and peculiar relations which frequently exist at that very time between the volume of the blood on the one hand and the existing power of the vascular apparatus on the other."

The central nutrition of the tonsils suffer during the course of severe disease, in direct proportion to the impairment in the composition of the blood, and the walls of the blood vessels, and particularly,
of the capillaries, are involved in this nutritive and functional
decadence." (Ref. a.) Hence the capillary walls are less resistant
and more permeable.

This may lead to hemorrhage
during the height of the illness,
but it more commonly occurs
during convalescence, since
there is a corresponding diminution
in the force of the heart's action,
and in the volume of the blood,
during the course of severe morbid
processes, so that the tendency to
hemorrhage is not so likely
to occur; it remains "latent."

Also as convalescence proceed,
the strength of the vessels improves
coincidently with the increase in
the heart's action and in the volume
of the blood and nutritive fluids,
so that there is no disproportion
between the two, and consequently,
no especial strain on the vessels.

Sometimes however these processes
do not take place uniformly
at at

Ref. a, Zeileis's Gd. Vol. XVII. p. 266 Sup.
and at corresponding times.
If the walls of the blood vessels do not regain their tone as the same
rate as the heart's action increases and as the blood increases in
volume, then the weakened vessels may yield to the strain put upon
them and lead to the occurrence of hemorrhages. In fact a "Traumatic
Hemorrhagic Diathesis" exists
till the limbs as far again their
strength as to balance the force of
the heart's impulse and the pressure
of the unaccustomed volume of
blood.

This view is supported by the fact
that the Reptile's condition has
been observed to develop after any
special exertion during convales-
cence, such as getting out of bed
up to which the heart's action would
be unduly accelerated.

We can readily explain also
its Hemorrhagic Diathesis that
occasionally occur in the course
of heart disease, whooping cough.
where the circulation of the blood is retarded and disturbed. The hemorhages being the result of mechanical causes.

Again, cases of "Toxic" Purpura occurring after the administration of certain drugs, as Chloral, Quinine, Iodide of Potash, are mostly capable of explanation on account of the chemical changes that take place in the blood. In the case of Chloral Dr. Richardson (Pafra) has pointed out that the hemorhages are caused by the accumulation in the blood of Sodium Formate, which holds the fibrin in a state of undue solution, and the blood loses to a great extent its power of cohesion and thus the fibrin, albumen and colouring matter readily diffuse through the membranes. Doubtless other drugs known to produce Purpuric Eruptions do so in many instances by.
altered chemical conditions, though the exact nature of these changes has not been clearly demonstrated. In these cases, the extravasation may be caused by direct action on the blood vessels. This has recently described the minute blood vessels as obviously altered and disorganized within the area of the bullae caused by the administration of doses of Potash and he thinks lozée Rhusura to be due to more extreme changes in them.

A purpuric eruption then has been seen to occur under a variety of circumstances, where its causation admits of some definite explanation. These forms, however, are so evidently secondary that they cannot, in any sense, be looked upon as characteristic of a special disease. In what might be called typical Purpura, either Simple, Rheumatic or Hemorrhagic,
we have seen its character of an essential disease, apparently independent of other pathological complications. Here occurs spontaneously a "Transitory Hemorrhagic Diathesis": we have no evident causal mental condition to fall back upon, and we must inquire closely into the symptoms and conditions that present themselves in order to try and arrive at some clue as to its pathogenesis.

It will be well then to analyze the different pathological symptoms and anatomical appearances that form the chief features of the disease.

Firstly, with regard to the Hemorrhagic Diathesis, which is our great clinical index. It is in all cases a simple extravasation which may be the result of chapped or of capillary rupture. There is no evidence of any inflammatory action; no previous erythema,
In local hyperemia, and the anatomical lesions show no signs of inflammation.

The Petechiae and free hematomas, further, are not dependent on mechanical injuries nor on any evident local condition. With regard to the Febrile symptoms commonly present, fever is often seen in Purpura complicated with Articular symptoms but the latter cannot be held responsible in all cases as fever also occurs in cases unattended with Rheumatic symptoms and further, we sometimes have Purpura with Articular symptoms, without any definite disturbances.

Fussemann considers (Fussemann, 1865) febrile movements during the course of the illness as probably of a nervous nature, from the coagulated blood, which he thinks acts sometimes as an inflammatory irritant on surrounding parts, causing...
light fever, but it is very doubtful if either of these causes play any substantial part in the production of fever, as the latter is often seen in cases where the dehydration of blood has been very limited.

Dr. Morris further suggests an "Andenke fever" in some cases.

He maintains that a "predisposition to reticile movements" accompanies the more intense grades of anemia and is the immediate result of the successive poverty of the blood. "In some cases of Plague fever the reticile symptoms show parallelism with the grade of existing anemia", the fever disappearing as the anemia improves. This was demonstrated by a case carefully studied at Basle.

Russell (Ref a) disproves this theory from observation of cases where pyrexia occurred with blood showing 77% of red corpuscles

and in another 48%, and moreover a fall in corpuscular richness is not accompanied by purpura under ordinary anaemic conditions.

There is little doubt that the febrile condition is of different causation in different cases. In many instances it probably results from inconstant causes, independent and distinct from the Purpuric condition. In other instances it is reasonably to suppose the fever as one of the indications of a deranged nervous system, the Purpuric extravasation being a further result of the same cause. The evidence in favour of which will be discussed later. So again, specific organisms in the blood which will be shown to exist in some forms of Purpura, may well account for fever in other cases. Whether this is directly brought about by their inducing increased activity of sedation,
either by acting as ferments or in some other way; or whether the blood poison affects the temperature indirectly through the nervous system, either by affecting the nerve centres, or by inducing it reflexly by producing irritation in the capillaries, it is impossible at present to decide.

The rheumatic symptoms which are present in some cases of purpura are probably not biologically akin to true rheumatism. Purpura rheumatia never develops into severe articular rheumatism; profuse night sweats, characteristic of rheumatism are entirely wanting and there is no tendency to the occurrence of peri or endocarditis. So we must conclude that purpura rheumatia cannot be considered a "hemorrhagic form of ordinary articular rheumatism." Amusingly, its press mentions changes in the joints have been observed,
and it is very doubtful if the changes are inflammatory. (Brunnemann). Bohn (Ref 2) thinks the changes are due to collateral hyperemia and edema, caused by embolism of small vessels in the neighborhood of the affected joint, but such have not been demonstrated.

Ed. Brunnemann considers the joint symptoms as more probably due to structural change in the walls of the vessels, which, on account of the subsynovial vascularity of the synovial structure, allow at an early stage of percolation of large quantities of liquor synoviales into the cavity of the joints and at a later stage, permitting the transudation of blood corpuscles. The pain and swelling in the joint depending on the amount of effused serum or blood.

The same may result whether "structural change" are present.

in the vessels or not, as the local conditions may have been induced by other causes, and these probably residing in the blood.

No better explanation of the joint symptoms can be offered.

Having discussed the evidence afforded by the special symptoms present in Purpura, with the view of elucidating the question of its pathogenesis, we are forced to assume the existence either of:
1. A Primary Disease of the Blood.
2. or of the Blood Vessel
3. or of their Regulating Nervous apparatus.

It will be well now to consider what actual pathological changes and conditions have been observed in cases of Purpura.

In the first place, what pathological conditions have been found to exist in the blood?

No chemical changes in the blood are known. (Atkinson)
The colour of the blood is said to be dark in recent cases and bright in old standing cases, where there has been copious haemorrhage. (Emmerman) Ref. a.

The coagulability of the blood is not as a rule affected. (Emmerman, Abbe).

Rayer and Bier however consider that the blood is at first intact. It loses its power of coagulation.

Allowing this however in some cases, we have ample evidence that it is not a constant condition in Purpura Haemorrhagica.

As to the changes in the constituents of the blood, Emmerman says, "a genuine oligocyturia does not appear to exist primarily in the blood; when it occurs it is developed at a later period and is due to the haemorrhages." (Ref. a).

In a case very carefully observed at Basle, very severe but not fatal, the relative proportions of red and white cells were another.

Ref. a. Emmer. C. E. 1911.
was normal during the first day of the disease. Subsequently
the white slightly exceeded the red.

This is only what occurs as the
result of copious hemorrhage.
The colour of the blood in this case
was at first normal, afterwards
somewhat paler. The coagulability
was not affected.

Benekeut (cited) carefully exam-
ined the blood microscopically
in cases of Peripneum in infants
and describes, spontaneous alter-
ation in the elements of the blood,
consisting in diminution of red
and relative and absolute
increase of white cells and loss of
fibrous. The cells are deformed,
contain nuclei and are mixed
with oval bodies containing
nuclei.

Pezoldt (ref b) observed in microsc.
- ope examination, small sharply
bordered, clear colo red corpuscles and numerous
abnormal small white ones

Refa. Paris med. 2 Br. 1, 79. Ref b. Stangels, Sitzungsber. 78
and some intermediate forms.

These results show an existing leukemic condition of blood in Pernicious but not certain if it is causal.

In some instances, a slight excess of solids in the blood, in others a slight deficiency of solids, has been supposed to have existed.

Atrine has been found diminished.

Ed in quantity in some cases, increased somewhat in others, more often it is normal in amount.

Darker has observed two cases where there was a slight increase of iron.

Richardson (cf. a) has divided Pernicious into Agueous, Saline and Vascular, from supposed alteration in the constitution of the blood.

In "Agueous" Pernicious, he says "In the blood the relative natural proportion of water to the colloidal matter is disturbed; the water is in excess and the cohesive attraction..."
between the particles of the colloid is reduced, and the blood, imperfectly protected by the plastic fibres (which shows no deficiency) is liable at any weak point to escape, to run from the vessels in fine streams, or to diffuse in the form of a purpuric blot, into the peripheral surfaces of vascular organs or on the surfaces of membranes.

In some experiments Richardson conducted, he found that by injecting water into the peritoneal cavity of an animal, he produced fluidity of the blood, and when the amount of water added was equal to one fifth of the weight of the animal, it proved fatal. The blood in these cases was freely coagulable or did not coagulate at all. It flowed rapidly from a wound and was readily effused under the skin. In one case of appendicitis purpura where the blood was examined the specific gravity was 1.035, and did not coagulate,
The water was increased to 860 parts in 1000 and the fibrine reduced to one part in 2000.

In Saline Purpura, there is no deficiency of fibrine in the blood but there is an excess of soluble saline material, which holds it in a state of undue solution, and thereby renders the blood more liable to escape from the vessels.

Specific gravity is also increased.

Ashham has proved the occurrence of Purpura from this cause by the observation of a patient who habitually took Bicarbonate of Ammonium, until his blood became permanently fluid.

Richardson maintained that this condition is seen in gouty, and is produced by the excessive use of salted foods.

In “Facetal” Purpura, which includes the forms of more commonly seen, the blood appears to be perfectly natural; it coagulates firmly, i.e. of good volume, and the corpuscles are normal.
Richardson considers this variety
the due to some change in the
capillary vessels, either of paralytic
origin or from structural defec-
tration.

Within the last few years,
our eyes have been opened to the
existence of a new element, bearing
in the Pathogenesis of Rurputa,
by the presence of microorganisms
in the Blood.

Russell (c.f.a.) after careful observation
and study of cases of Rurputa
Splenorrhaphia, is satisfied that
the Blood is the seat of the Disease,
and he maintains that the dilu-
ition and destruction of the blood
capillaries is out of all proportion to
the amount of the hemorrhage.

From a clinical consideration
of the disease he concludes that
it presented the character of a
specific Fever due to a specific
poison in the blood.

Mr. Watson Cheyne, at the
request of Dr. Russell, examined

Ref a. Brit. Med. Journ Vol ii. 03. 1. 1815
Specimens from a severe case of *Ampulla tetranemastica* and he discovered in the tissues the existence of distinct microorganisms. Shortly after this, he found microorganisms in another case which had died under the care of Dr. R. Smith.

In May, 1884, I had the opportunity of observing a severe and fatal case (which is reported in the appendix) and being specially impressed with the virulence of the symptoms, its sudden onset and rapid and uncontrolled course, I felt convinced of the existence of some definite or specific blood disease. A careful post-mortem examination was kindly undertaken for me by Dr. Sims Woodhead, and the results of a further microscopical examination have shown, in this case also, the existence of masses of microorganisms in most of the tissues. The clinical history and the macroscopical changes found post-mortem.
of this and of the other two recorded cases are given in the Appendix.

In our present inquiry, it will be well to note fully the characters of the microorganisms and the microscopic conditions which were found in these three cases, and to compare them.

In Dr. Russell’s case, Mr. Watson Cheyne (Ref. 2) states that the capillaries at the deeper part of the haemorrhages were plugged with small bacilli, and here and there, among the effused blood, were small colonies of these bacilli and a few isolated bacilli.

The typical mode of growth was evidently in colonies.

The capillaries were not merely blocked plugged by these grains but their walls were distended and in some cases ruptured.

Here was no evidence of inflammation round the masses and the surrounding tissues appeared quite healthy.


p. 244.
The individual bacilli varied somewhat in length but the average length was \( \frac{1}{700} \) inch and the breadth \( \frac{1}{2000} \) in. Some apparently contained spheres, sustained rounded bodies, in the cells, two as a rule in each. In their reaction with the aniline dyes, they resembled the common forms of microorganisms such as the Bacillus Anthracis but were best demonstrated by an alkaline solution of Methylene Blue.

"The close arrangement of the organisms in the colonies and the presence of spheres might lead one at first sight to a conclusion that the organisms in question were micrococci but careful examination with good lenses and correct illumination show distinctly that they are bacilli."

In Dr. Dy's Smith's Case, also examined by Mr. Watson Cheyne, he reports that between two large extravasations in the substance
of the lung, were a "considerable number of vessels containing colonies of microorganisms."

The capillaries and some of the larger vessels are completely blocked by these masses. In other of the larger vessels, the colonies did not completely fill the lumens of the vessels.

The organisms are described as Streptococci, forming long chains, which are coiled together to an h-form when masses at the centre of the plug and in the capillaries, while in the smaller masses lying in the centre of the larger vessels, the chain formation was not so evident.

The individual cocci averaged 2–5 μm in diameter and the chains were generally of short length. They stained with methylene blue.

There were no short chains of free cocci. No evidence of inflammation around the masses.

In the thorax, there was an
Occasional extravasation and at
the base several vessels were
plugged with Streptococci.
This plugging appeared only in the
deeper parts of the hemorrhages,
and was not present superficially.
Several other tissues failed to
deshow any microorganisms, and
this was probably due to the section
not extending deep enough.

In my case, (not hitherto noticed)
Dr. Woodhead, who has kindly
examined the tissues with great
care, states that he has discovered
in the Liver, masses of microorganism,
Emboli or Thrombi, blocking up
the lobular capillaries.
The organisms are micrococci
in foamy masses or in Strepto-
cocci arrangement.
It was difficult at first, owing
to the density of the masses, to
ascertain definitely their exact
form, whether the individual organisms
were micrococci or very minute
bacilli but further observation
has shown them with certainty to be the former. They do not occur in chains. In the heart there are similar masses, in the small vessels between the bundles of muscular fibres. Near the zymotic surface there are minute haemorrhages in the immediate neighborhood of these jpegs.

In the kidney, the small straight vessels in the pyramid contain numerous similar masses. A few of the cortical capillaries are alsodistended at points. In the small vessels of the spleen there are masses here and there but they are not nearly so numerous. In the wall of one of the larger vessels (in one of its small nutrient vessels) where the haemorrhage was well marked, there are similar jpegs. Doubtless similar masses of microorganisms will be found in the skin.

In all the organs that is marked
Cloudy swelling and in the brain slight portal or interlobular affection.

General symptoms where the micro-organisms are plainly seen are sent with this paper, in illustration.
They were prepared for me by Bloodhead.

Mr. Watson Cheyne concludes from the study of his cases, that judging from the size of the colonies of micro-organisms and the distinction of the walls of the capillaries, the bacilli had been growing in the blood for some time, and further from the number of the capillaries and small vessels that were plugged blocked by these micro-organisms and from the position of the plugs around the margin of the extravasation, he is convinced that these plugs had been the cause of the hemorrhage, their action in the same manner as any other embolus.

She states that the organisms
differ in their mode of growth from most of the other organisms of the same classes which have as yet been described, viz. They form colonies in the blood.

The bacilli as yet described which grow in the blood and cause disease, do not form plaques in the vessels, with the exception of the Typhoid Bacillus.

The difference in the microorganisms in the different cases is a very important matter for consideration, and cannot be readily explained. Further careful observation is needed and location Cheyne points out that as the tendency of the organisms is to grow in colonies, it is necessary not only to examine the blood but also the tissues surrounding the abnormal reactions. The necessity of
looking for any "local source where the micro-organisms may be growing and pouring their ptomaines into the blood" is also d卦fined.

Loeffler (above) found that by injecting micro-organisms from cases of Diphtheria into the blood of guinea pigs that hemorrhage were induced, and these apparently as a result of an alteration in the blood or blood vessels without the occurrence of emboli.

Watson Cheyne concludes, "that we may have to do with an infective disease of which the source is, the entrance of certain specific organisms into the blood, and their growth in it. As possibly the primary affection may be distinct from micro-organism, but a disclosed condition, leading to such alteration in the fluids of the body that the incalculable organisms in the mouth and

[Re: Mittheilungen der Genuthheitskampt, 1881]
Intestinal tract may be able to penetrate into and use the blood, form embolus and lead to hemorrhage. The suspect that the same may occur in Sunny from alteration in diet allowing microorganisms to grow in the blood, and these are killed by fresh vegetables, restoring the blood to a healthy condition.

It is certain that microorganisms do not exist in all cases of Neumonia Hemorrhagica. Eyne failed to find them in two cases, subsequent cases that he examined, and Dr. Angel Money did not succeed in two others when he especially looked for them.

If such a condition is common, it is strange that the disease never occurs as an epidemic for epidemically, and has never been known to have been communicated from one to another in man.
Petone however has demonstrated by experiment on animals (ref a) the infective nature of certain forms of Puerpera.

The injected blood from cases of Puerpera into rabbits and produced in them copious extravasations of blood and the blood of these rabbits showed bacilli and micrococci in abundance.

Ref a. To Specimentale 57/83.
What evidence have we regarding the Blood Vessels in Punjura?

Sparks (Reft.) contends that the fact of the hemorrhagic spots being so frequent on the feet and legs, points to weakness of the vessels as the main cause.

Von Hesper (Reft.) has been led by recent researches to attribute the disease to a actual impairment of the nutrition of the capillaries.

Thur (Reft.) has described the minute blood vessels as "obviously altered and disorganised" within the area of bullae, caused by the administration of Lodhi of Pach and he thinks Lodhi Punjua to be due to "more definite changes" in them.

Jimmern's (Reft.) suppose a fatty degeneration of the Vascular tissue to take place in old standing cases, but this occurs in other cases where there has been great loss of blood.

(Reft. a) Punjura, Lancet Oct. 7 Med. (Reft. b) Zeitschrift für klein Med Kfl. 3.85 (Reft. c) Red Chin. Review. LXXII.
(Reft. d) German Arch. Vol Xvii.
Wilson Fox (ref.1) found in one case angioneurotic degeneration of the coats of the capillaries in the neighbourhood of the petechiae. This was also found in the muscles and in all probability the patient was syphilitic and the haemorrhages were only one of the indications of the general tissue changes.

Taffe (ref.2) suggests that marked alteration in the culture of the blood may soon be followed by disease of the smaller vessels and thus both actively participate in the marked process.

Ref. 2. Taffe's Prize. (Bast. of Med. Pupils).
Of late years much attention has been directed to the vasomotor nervous system as a Cause of Anemia.

Fabre goes so far as to say that all varieties of Anemia are groups of symptoms dependent on abnormalities of the nervous system. So in this light Anemia is only a Clinical manifestation of disorder of vasomotor innervation and may have as remote causes the chromatic or vegetative distension of the various blood changes from different causes or anything indeed that affects indirectly the vasomotor nervous mechanism. (Univ. cycl.)

Rigal and Cornil (L. F.) think that the hemorhages are the result of either sympathetic irritation or of diminished action of vasomotor centres, and this view Atkinson (who has recently written on the subject (R. F. System of Medicine) accepts as a probable Cause.

Phillips (L. F.) says "It is possible
That disturbed conditions of the vasomotor nerves might as alter
local blood pressure as because rupture of capillaries or at least
alteration of diapedesis through the 

broadened interstices of the capillary walls.

Richardson (Ref. a) attributes certain 
forms of Paraplegia, to changes in 
the Capillary vessels during paralytic 
of paralytic origin.

There are a number of circum-
stances in favour of the hereditary 
origin of the disease:

Simon has found by experiment 
on animals that hemorrhages 
result from section of the sympath.

etic ganglia in frogs.

Kothnagut also found by 
experiment on rabbits that multiple 
hemorrhages in the lungs resulted 
from certain lesions of the Central 
Cortex. (Ref. b)

Richardson (Ref. a) ascertained by 
experimenting with animals

Ref. a Medizinische Wochenschr. 174. 2741.
Ref. b. Centralblatt für 
Medizinische Wochenschr. 174. 2744.
that the inhalation of nitrite of amyl was capable of modifying the pulmonary circulation (by modifying nervous tension) as to produce at will either febril of the pulmonary structures or exsudation or hemorrhages into the parenchyma, in fact, an extravasation of blood resembling a purpuric blotch.

The experiments show that when the minute vessels of the skin are in circulation loss their nervous control, that hemorrhages may be a result, and that in certain forms of Purpura, the local hemorrhages may be induced by local arterial inervation.

Weir Mitchell (1850) has recorded several cases bearing on nervous origin, where severe neuralgia was followed by localized extravasations of blood, over the seat of pain. Also in locomotor ataxia, multiple bruises like ecchymoses, occurred during attacks of lightning pain.

Ref. Am. Jour. of Medicine. Vol. LViIII p. 120.
and corresponding to the course of the cutaneous nerves. They were of varying size and proportionate to the violence of the pain. The same have also been observed in sciatica and in connection with hemianesthesia and hyperesthesia. 

Flaming (of a) flow several hours is a proof of nerve origin.

1. Most cases present a history of nerve waste, as fatigue, mental emotion, fright, and a prominent symptom at onset, before hemorrhages have occurred, throughout the course and after cessation of hemorrhage, is exhaustion and muscular weakness, whether there be pigmentation or not.

2. Analogy which exists as the acknowledged influence of the sympathetic nerve over cutaneous eruptions as erythema, herpes, Addison's disease, pigmentation in Pregnancy et.

3. The symmetry of the eruption,
The rapid appearance and the fact that further hemorrhage is abruptly arrested while the patient is exposed to the same circumstances, hypotonic and diuretic and while the constipation of the blood can hardly have undergone any alteration.

4. The close connection between disease of central spinal center and Porphuria. (seen in central spinal fever)

The case recently reported by Doyle (before referred to) where a gentleman became subject to Porphuria (occurring annually) after being a friend immediately after death from the same disease, suggest very strongly the possibility of the origin of the disease from impressions on the nervous system. The result of treatment also point in this direction.

In the first place, the beneficial effect of resin is the explained with action on the capillaries through the vacuomotor nerves,
Inducing vasomotor spasm and checking the tendency of extravasation of blood corpuscles through the walls of the vessels.

Assume also which is markedly observed in vasomotor hemorrhages has been found successful in the treatment of Purpura.

Shand (1874) has in one case obtained good results from the use of Paraldehyde and thinks it effectively improving the tone of the nervous system.
Conclusions.

From the foregoing observations, we are enabled to arrive at certain conclusions with reference to the pathogenesis of Puerpera, though our knowledge of the subject is far from complete or precise.

It has been shown conclusively that Puerpera does not depend on any one pathological condition, and we can safely infer that cases presenting similar clinical symptoms may have different modes of origin.

With regard to the blood as the seat of morbid change, the mass of evidence goes to prove that in the majority of cases there is no primary alteration in the normal constitution of the blood, no marked disproportion in its natural elements, and no constant change in its ordinary characteristics.

We cannot attach much importance to the varying and inconstant changes that have been observed by different investigators in the character of the blood, nor
Consider them as essential in Purpura.

As a secondary condition one finds the ordinary evidence of anaemia, induced by repeated hemorrhage.

The blood changes observed by Richardson, satisfactory as they appear in theory in accounting for the causation of some forms of Purpura, have not been observed in the majority of cases and the classification is considered by some to be rather of a "speculative character than a basis of ascertained facts."

With regard to the causation of Purpura from the presence of microorganisms in the blood, on the other hand, we have certain proof, from the evidence of the three cases now recorded, that in certain cases of Hemorrhagic Purpura, these infests in the blood specific forms and their substance will the blood have in all probability been the cause of its development.
We have also proof that microorganisms do not exist in all cases, though there may be clinically similar.

The questions bearing on this subject however have already been discussed.

These observations have opened a new field for further inquiry, which will undoubtedly bring other points to light.

With regard to the Blood Vessels,

no definite or uniform changes have been found in the structure of the capillaries or vessels, and in many cases no perceptible change has been observed at all.

It is reasonable to suppose in some instances the existence of nutritive changes in the vessels occurring either secondarily from prolonged illness, or is it not possible that such may occur as a primary affection from impairment of special trophic nerve centre or from some other cause? We can however
arrive at no definite conclusion in respect of the Blood vessels in
that

Purpura, beyond the fact of their
showing no abnormality in the
majority of cases.

The Evidence in favour of

Disarrangements of the Nervous system
as a cause of Purpura, carries
much weight and it is most
probable that some forms of
Purpura are due to this cause.
(Case iii. in appendix is given as
an illustration.)

The Experiments of Simon, Rothkegel
and Richardson and the facts
previously noted in support of their
theory, show very forcibly the influence
of the Nervous system over the Blood
vessels and prove that Hemorrhage
may result from certain nervous
disarrangements. Whether the
hemorrhagic tendency is induced
by sympathic irritation or by
diminished activity of the Vasomotor
centres, it is difficult to say, but
we conclude that through nervous
influence the blood pressure in the
Jesuits may be so altered as to allow of the transmission of blood corpuscles through their walls or possibly to lead to their rupture, and it must be borne in mind that the resisting power of the capillaries may be weakened by impairment of their nerve supply without their showing any pathological change.

This fact bears out the negative results that have been obtained from examination of the vessels in cases of Purpura——


"Whilst there are alterations in blood in some cases, in the blood vessels in others, in the regulating nervous mechanism in others, no one of these is sufficiently constant to unite all forms of Purpura in such a way that we can regard them as different varieties of one common process." There is no physiological factor common to all."
In conclusion, it is obviously preferable to regard Rupura, as we know it at present, as a symptom of different primary morbid processes, rather than consider it as a disease, with such a wide and varied pathological history.

Assuming its origin from morbid changes connected with the blood or vessels or from disarrangement of the nervous system, it should be our endeavor in every case that comes under our notice, to associate it with one or other group of causes, by careful inquiry into its history and by observation of the clinical and pathological appearances.

And it would be well, in order to assist its more accurate study, if this was adopted in fact, to form a classification based on an etiological basis and not one founded merely on clinical types.

Much remains yet to be
learnt on the subject but it is more than probable that further observation will show the more frequent existence of specific organisms, in the lower forms of Pulpura.

In all fatal cases a careful post mortem examination should be made and the blood and tissues submitted to microscopic examination.
Appendix.

Record of Cases.

Among a series of cases of Purpura observed during the last few years, four will be briefly detailed to illustrate the different forms of the disease and the clinical history of the two cases, already published, in which microorganisms have been found, will be given for the sake of comparison with my own.

Case I. "Purpura Simplex"

B. B., a somewhat anemic boy of 12 years of age, had been suffering for some weeks previously with pleurisy, with effusion. He had recovered from this, but was weakly and pale.

On rising from his bed one morning (Dec. 1876) he was surprised to find his feet covered with dark spots. He was in no pain and had felt well the previous evening.
There was no loss of appetite, and he did not feel in any way different from his ordinary somewhat fettle condition.

The spots were maculae, of a dark purplish colour, slightly raised, not disappearing on pressure, varying in size from a pinhead to that of a split pea, irregular in shape and distributed irregularly over the dorsum of the foot, which was slightly oedematous.

There were no other symptoms, no joint pains; the pulse and temperature were normal.

He was kept in bed with a milk and beef tea diet, ordered a medicine containing Tincture of Bichlorides of Iron.

The following day, this similar spots were seen on the front of the leg, mostly small and rounded and extending only halfway toward the knee. They were present in both legs. The pulse and temperature showed no rise and the patient felt well. No further treatment...
The spots gradually faded, exhibiting the characteristic color change. The adenitis entirely disappeared and in a week's time only faint yellow indications of the spots remained and the boy rapidly regained strength.

This illustrates the simplest and most harmless form of Purpura, occurring in a child weakened by previous illness and only appearing as an indication for tonic treatment; the cause residing in the blood and vessels, the former impoverished by and the latter weakened in resisting power, sharing with the other tissues the effects of prolonged illness.

Case II.

"Purpura Rheumatica"

J. L., a well-nominated school boy, aged 11, has since infancy been subject to extensive Rheuma affecting the greater part of the body. Thrombic, healthy and 7
healthy family. So hereditary hemorhagic tendency.

For more than a week he had not felt well, he had no appetite, complained of headache and pains in the ankle and knee but was able to get about.

The exsanguination Drunken had within the last fortnight been disappear. The had not been so free from it for years.

On March 12, 87, the ankles were so painful and swollen that he was unable to stand or walk and was obliged to confine himself at the house. He was constantly "crying out with pain." Some "spots" were first noticed on his feet a long time before the same evening, and he obtained very little sleep owing to the pain in his joints.

The following morning the pain was somewhat relieved but the "spots" were much increased in number and advice was sought.

On examination, there was
a well marked Purpurae Eruption on both feet, extending halfway up the leg. Some were irregular bright red patches, others were purple, also copious pin-head shaw, altos, and minnow, bright red and purple spots, the size of ordinary spot.

There were only one or two small excoravations in the neighborhood of the knee joints, but the Eruption was copious at the sides of the ankles; the dorsum of the foot was less affected.

The spots were not raised. They were permanent, not disappearing on pressure. Both feet and legs were edematous. There was no pain on pressure.

The rest of the body was free from Eruption.

He complained of headache and movement of the Scalp, caused pain. The ankles were puffy and the right knee swollen and tender, and painful on movement. Tongue moist & white.
Date 30. Temperature 98, no cardiac murmurs, but a loud "bruit de diable" audible in neck. The urine was healthy.

Examination of the throat per os in front of tongue, showed no evident change. She had no external hemorrhage.

was ordered confinement to bed, a diet of milk and beef tea, and a mixture of Syrup, Starch, and Arsenic.


Date 60. Temperature 98. 

March 8. Date 53.

Eruption more faded on feet and legs but a number of small pin point extravasations seen on neck and front of chest and abdomen. Still complaining of considerable pain in knees.

March 16. Date 76. Temp. 98.4. Has slight pain in knees. Eruption assuming a yellow faded tinge and disappearing.


This case is illustrative of an ordinary case of so-called "Purpura Rheumatica", unattended with fever and ending in recovery in the course of a fortnight.

The most probably he included among Purpura from blood changes. Though the cause is not very evident, possibly the excessive sweating of the patient had to do with it. Development by increasing blood pressure in the vessels.

Case III

Acute Hemorrhagic Purpura.

Basil P., aged 35, came with formation Monday - Nov. 14th.

On the previous Saturday he was following his ordinary occupation as a railway porter.
During his domestic trouble he had of late suffered considerable mental worry, and was in a somewhat depressed state of health. While in Church on Sunday afternoon, he "felt queer," complained of some headache and was very shivering. There was also a feeling of itching in the skin over the chest.

He went home and went to bed, and on looking at his chest, he noticed a red rash on the skin over the left side. He felt hot and feverish, and passed a restless night.

On the following morning, he found his body covered with the same red rash and at once sent for his medical man who told him it was scarlet fever and ordered his removal to hospital.

On examining him (Monday afternoon) there was a profuse and apparently diffused scarlet eruption on the skin, extending...
on both sides of the chest and abdomen, leaving a space about four inches broad in the middle line, both in front and at the back, unaffected.

The buttocks, thighs, and upper part of the leg were in the same condition. The eruption gradually fading towards the feet which were nearly free.

The lower part of the neck, the shoulders, and upper arms were also covered with the same eruption. They lessened below the elbows and were hardly perceptible in the hand.

The face and head were entirely free.

On closer examination, there were seen to be a number of small points of extravasation, the size of a pin head, of a deeper colour, scattered over the upper mentioned amid the general scarlet background.

These were more marked in the lower part of the arms.
and lips and central part of the chest and abdomen where the diffused scarlet rash was less apparent. There was no cutaneous edema and the tiphen was not raised.

The color did not disappear on pressure. Both the diffuse rash and the petechial spots were permanent.

Rinching up a bit of skin and pressing it firmly between the fingers, did not dispense the color in the least.

Patient complained of headache, a loss of appetite and feverishness. Bowels were rather constive. Pulse quick and temperature at admission 104°. He had a white barred tongue, moist to touch. There was no sore throat, no glandular swellings. No cough, urine was healthy. There was no hemorrhage from any mucous membrane.

He was placed in a separate ward, ordered a milk diet.
given a purge and a febrifuge mixture.

The next day the temperature had fallen to 103.2°. He felt better. There was no fresh eruption nor any further eruption.

He made a steady and continuous improvement. The fever diminished, the temperature declining about a degree each day. Headache abated. The tongue gradually cleaned and on the 5th day after admission the pulse and temperature were normal, he was beginning to get an appetite for food and anxious to get up.

The eruption after the second day began slowly to fade; there was no extension of it.

By the 8th day the skin had assumed a dirty cherry color, in which the pustules were still quite perceptible.

On the 10th day he was out of bed and the only evidence of the eruption was the small pustules.
 petechial points which could be indistinctly seen on the skin. There was no subsequent dis-

 examination of the cuticle.
 The patient rapidly regained strength and was discharged on the 18th day after admission.

 This case presents most unusual clinical symptoms, and to which I can find no parallel in the literature of the subject, I have considered as an Acute Form of Heroin Purpura.

 There was apparently a temporary blood stasis in the minute capillaries of the skin, staining the tissues, permitting of small exudation of blood through the capillary wall.

 From the history of nerve exhaustion from mental worry, the sudden onset, the marked blanching of the skin and the sudden, rapid recovery, all point to
some derangement of vasomotor innervation. This probably of central origin and possibly from diminished action of the vasomotor centers forming the cutaneous capillary circulation.

One cannot well conceive any alteration in the blood or any structural change in vessels which would be sufficient to produce such formidable symptoms and yet permit of so rapid a return to its normal condition, as to allow so speedy a restoration to health.

Case IV.

"Purpurea Hemorrhagica"

John M., aged 28.

Previous to this illness he was a hearty, strong built man and enjoyed the best of health. He worked as a dock labourer and was chiefly engaged in loading and unloading ships. He was occasionally addicted
to drink.

On the morning of May 8th, 1864, he remarked on rising from his bed, complained of pain in his back & shoulders, and was unable to do work. On the following day he remained in bed, felt weak and unwell.

He was first seen on May 11th when he complained of headache, pain in the back, loss of appetite & felt generally ill. The skin was hot but moist, and the tongue slightly sourred. There was no depression in the skin and no other indication of illness.

After the visit he got out of bed, and shortly after, his landlord noticed some dark spots on his neck and arms which soon increased in number.

On the 13th, there were a considerable number of small purpuric spots, especially in the neck and arms. During the day he suffered from agitis & in the evening he noticed some blood
in his urine and stools.
She was given spirits in frequently repeated doses.
In the 14th, Mr. Condor was worse. The oedemata were much increased in size, number, and extended over the greater part of the body. They were most marked on the legs, the front of the chest and back. The face also showed numerous petechiae and blotches, and the conjunctiva was infiltrated with blood. There was some oedema of the forehead and scalp, which puffed on pressure. He fumes were watery. The oedemata in some parts were small and darkly coloured, the size of pinheads, then were larger, of a lighter colour and more diffused. Those on the legs were darker, almost black and many were of considerable size.
The oedemata were in some instances, raised and appeared as papules, in other parts there
with small bleeds containing blood. (A further description of the condition is given in the account of the autopsy.)

There was slight trickling of blood from the nose; the urine appeared to consist almost entirely of blood, which did not coagulate on standing.

There was copious haemorrhage from the mouth and the face was with blood with a very offensive smell. The pulse was weak, very feeble and imperceptible. Respirations rapid. Temp. 101.6.

The mental faculties were unimpaired and he had an anxious, profitable expression.

Drugs were freely administered to perpetuate in strength doses found in manuals.

His condition showed no improvement. The haemorrhage continued. His pulse became weak, and the breathing rapid and laboured.

At 10 pm. of the same day, he became suddenly deteriorated strongly.
attempted to get out of bed and was with difficulty restrained. About midnight during one of his struggles he got up, he fell back and expired.

Post mortem examination,
by Dr. Woodhead. May 15.

Body very well nourished. Post mortem rigidity well marked. No pustule, quantity of blood appears to have escaped from extravasation under cuticle. Similar extravasation on each side of nose, extending to cheeks. In left eye, hemorrhage into conjunctiva extending to margin of cornea at inner and upper part. Smaller patches at outer side. few punctiform hemorrhages. In right eye, several punctiform hemorrhages mostly towards side. Rapids normal. Evidence of prominent conjunctiva.

Lips round mouth and on teeth. One or two small hemorrhages on lips.

On the whole of the body, a peculiar emphysema very marked.
on chest, flanks,从前, leg, not-affecting joints markedly and leaving feet comparatively unaffected. Eruption is of two kinds, 1. Dark purple patches, especially marked on legs and chest, between mammae.

There are patches of considerable size formed by running by the 2. Smaller masses, they are slightly raised, do not disappear on pressure. Along with these and situated between them are a series of bright pink spots, which appear to project more than the purple, the smaller projecting part being paler than the surrounding base, some are slightly depressed in centre. There are most marked on the从前 and flanks.

Again there are a series of small domes, not raised above this level, on the abdomen where decomposition has set in, there are elevated punctures, small pustules, similar papules on penis, some being depressed in centre.
Comparatively few papules on neck and ears.

Evidence of discharge of blood from anus.

Bladder, exceedingly dark in color, apparently some hemorhage in subcutaneous tissue. Where an incision was made over thorax and abdomen.

Be cutting into seth to remove skull cap, tissues very edematous.

Dura mater considerably thickened, pale and adherent to calvarium on each side behind foramen.

Surface of brain somewhat anemic. Thickening of arachnoid especially where dura mater is adherent. No hemorrhages.

Brain in section exceedingly anemic, ischemic, pales, no hemorrhages and nothing else peculiar.

Left lung, perfectly free, evidence of decomposition very marked. Upper lobe considerable emphysema. Marked congestion with evidence here and there of infarcts.
Hamorrhage. Very marked adema.

Right lung. Bound by old adhering all over lung. Substance very soft and friable with marked congestion and adema and haemorrhages similar those in left lung.

Lung, large pale, evidently very fatty. Suck bladder contained quantity of very dark colored bile. Substance very soft and friable. On upper surface of lung several haemorrhages, notably a large one to the right of the puleiform ligament and extending into it. On left lung numerous punctiform haemorrhages on surface.

On opening into Pericardium. There were a number of punctiform haemorrhages on the anterior surface of both ventricles and the line of septum.

Heart very flabby, contains little or no blood.

On left auricular appendic
Deep hemorrhage.

Deep staining, deeper coat of coats. Color value, complete.

Muscular coat of heart, very firm and very deeply stained.

Leaflet between auricle and atrium. Slight opening 1/4 in. in diameter in foramen ovale. A posterior aspect of right atrium also some minute hemorrhage.

Numerous hemorrhage, edges of mitral valve and with muscular papillae and chorda tendineae.

Around the aorta, several extravasations of blood.

Stomach showed several small extravasations in its surface, and contained some dark blood.

The intestines showed numerous extravasations in mucous surface and contained large quantity of dark blood.

Left kidney, soft, flabby and large. Considerable amount of adipose and a few hemorrhage, but the connective tissue surrounding it.
Both cortic and medulla pale and fatty looking.
Considerable haemorrhage in pelvis where the tissue is also edematous.
Capsule strips off readily. Surface pale and mottled.
Right kidney: not so large.
Very considerable haemorrhage into surrounding connective tissue. On section, same as left.
The connective tissue in the Pelvis of right kidney completely filled with Blood. Congestion at bases of Pyramids. No haemorrhage into substance. Capsule strips off readily leaving cystic areas between fatty patches.
For all haemorrhage in Cortex. Supra renal capsule apparently normal.
Spleen somewhat light in colour. Malpighian Bodie not very well marked. Substance not soft. Scrapings somewhat pale, hot at all like a pelitic spleen.
Bladder contained decomposed
cloth of considerable age (3 in x 1 3/4 in). Several haemorrhage into membrane at girt, otherwise healthy.

This case is given as an example of an extreme case of the worst form of Puerpera.

The discovery of specific organisms in the uterus, previously described, adds exceptional interest to the case. Now these organs gained access to the body, we are unable to say. In this instance the man was a dock labourer and in his occupation, unloading ships, it is possible that he may, by some means, have admitted the germs into his blood from the handling of unloading cars.
The two following Cases are those in which Microorganisms have been demonstrated in the tissues, and are the only other instance recorded.

The symptoms are briefly given for clinical comparison.

Dr. R. Smith's Case.

A healthy boy of 14, with

no family history and no

previous haemorrhagic tendency.

Ten days before admission to

hospital, he felt poorly and had

fever from a boil. A few days

after two teeth fell out without

pain and this was followed by

constant oozing of blood from

the gums. This was also

accompanying, and an eruption of

petechiae in the skin, the latter

being noticed four days after commencement of illness.

On admission, there was continual

oozing of blood from the mouth,

rhinorrhea and conjunctivitis.

The body was covered with Eddy marks.
Some large. There was great palpable pain. Suffered much from thirst, had good appetite and felt well.


A cephalea burst at base of head. No hemorrhage from stomach or bowels. Urine normal. Spleen not enlarged. Liver quite normal, no retroperitoneal hemorrhage.

On the 9th day from first bleeding, the hemorrhage ceased after prolonged use of digitoxin.

Pallor increased. became intenso cyanotic. Died without paroxysm or convulsion. Three days after admission; 13 days after commencing illness.

Post-mortem examination.

Great anemia. No disease of viscera. Small erosion in stomach.

Echymoses in alimentary, urogenital and respiratory mucous membranes. Spleen black from blood. Echymosis with pleura, pericardium. Hemorrhage into lungs, alveoli filled with blood.

Also with Brain, large hemorrhage
in the right internal capsule and mid-thalamus. Some subarachnoid hemorrhage and in these areas hemorrhage in tonsil and testis. Liver and spleen normal. No evidence of inflammation. Enlargement of lymphatic glands. Blood not leukemic.

**Dr. Russell's Case.**

Girl 12 years old. No history of bleeding. Never had rheumatic fever. Irresistible cause of illness. A fortnight before admission to hospital, suffered from pains in joints and hands. Ecchymosis appeared in skin, affecting whole body. There was epistaxis and bleeding from ear. Was under treatment 18 days. Last day of two unconscious. Temperature was high the last four days; day of death 104.6. Illness apparently extended over a period of a month. Post-mortem examination.

In clinical comparison of these three cases, we see no uniformity of symptoms nor special post-mortem appearances that would suggest their specific nature. They are all cases of so-called "Droplethia Purpura Hemorrhogia" of a severe type. They are not equally serious, my own case showing the most alarming symptoms and rapid uncontrollable course.

In Russell's case there were antecedent joint symptoms. The temperature is not necessarily high throughout the illness. In one instance it was normal, so in
no reliable guide to special diagnosis.

Persistence of hemorrhage till death is not essential, showing that organisms may still be present in the blood and yet not constantly cause active hemorrhage. Death may result from anemia induced by previous hemorrhage.

The duration of the illness may extend over four weeks.

Any severe case of hemorrhagic Purpura, especially if there be elevation of temperature, should suggest the possibility of specific origin, but we cannot point to any distinctive clinical features which would make the suspicion more certain.

The blood and tissue in every such case should be submitted to careful examination.