Thesis for the Degree of M. D., Edin.

Submitted by
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Some Observations on Herpes hoster (hona).
Some Observations on Herpes Zoster (or Zona).

This disease is best known by the name of Herpes Zoster, but it is often called simply Zoster or Zona, and is popularly known as Shingles, a corruption of the Latin word, cingulum a belt. The name Herpes (Greek ἑρπετός to creep) refers to the fact of the vesicles of the herpetic eruption appearing in successive crops and creeping along the skin as it were. Dr. Pye-Smith defines the word Herpes as “the common Latin term for an eruption of the trunk, in contrast to porrigo an eruption of the head” and adds in a footnote: “The word ἑρπετός is derived

1 Fagge & Pye-Smith, Principles & Practice of Medicine, Volume II, p. 826
2 do. do. do.
derived from ἑρπετής. Herpes dicitur 'co quod videtur ἑρπετής, quod est serpere per summam cuitem, modo hanc ejus partem modo proximam occupans.' From the same creeping progress 'the disease was according to Bataian, called formica by the Arabs.' The name Zoster or Zona (Greek ᾁστόρ, or ἕζων, a girdle or belt) refers to 'the likeness of the eruption when seen on the trunk to a girdle half-encircling the body.'

**Synonyms**

Dr. Balmanno Squire: — "The Shingles; la Zona; la Sangle; le Cincturon; der Gürtel; čestor; Zona repens; Ciccius Anigulum; Zona Serpiginosa; Zona Bolatica."}

Fagge and Pale-Smith: — "Zona nigra — ignis sacer (Celsus) — [Exedens

1 System of Medicine, Reynolds (1879) Vol. I p. 909
2 Principles and Practice of Medicine, Vol. I p. 936 (1841)
"Excedens praecordium herpes (Sulpicius)
- Erysipelas phylyctaeodes (Cullen)
  - Shingles; a corruption of cirigulum
  - zona and zoster, a belt"

Dr. Bulkley: "G. Gürtelkrankeit"

Nomenclature of Diseases: "G. Gürtelrose"

**Definition.** Herpes Zoster is an acute eruption of vesicles which appear in clusters, each cluster forming on a patch of erythematous skin and in most cases separated from the neighbouring clusters by intervals of sound skin, the eruption being generally associated with pain either before, during, or after its manifestation, occurring in the area of distribution.

2. Nomenclature of Diseases (R. C. F. London 1896) p. 245
of a cutaneous nerve, and sometimes accompanied by slight febrile dis-
turbance.

Herpes zoster seems to occur more frequently in practice than my hospital experience or reading of medical text-books would have led me to believe. Indeed it so happened that previously to May 1895 I had never seen a case of herpes zoster; but during that month and the four following months eight cases came under my observation and in the period from September 1896 to March 1897 other five cases were brought to my notice.
Aetiology

There is still some obscurity about the actual causation of herpes zoster. Dr. Pye-Smith says that "with regard to the causes of herpes zoster "almost nothing is known." The determining factor in each case is not always the same. Dr. Allan Jamieson gives four groups of causes viz: 1. Traumatic.
2. "Progressive advance of the inflammation from diseased bones or soft parts which have become unhealthy." 3. Toxic. 4. Infectious.
To these four I would add exposure to cold and wet, sudden atmospheric change, and mental disturbance. Charcot also believes that a traumatic origin of herpes zoster is by no means rare; he also mentions one case of

1. Pagge and Pye-Smith's Principles Practice of Medicine 1891 Vol. 1 p. 940
2. Diseases of the Skin p. 153 - 155
of cancer of the vertebral column in which the spinal ganglia and nerve trunks were so compressed and irritated that an eruption of zona followed in consequence.

As regards toxic causes Dr. Jamieson mentions the occurrence of zona after carbonic oxide poisoning, and refers also to its appearance sometimes during the administration of arsenic to which fact also both D. R. Frederick Taylor and Pye-Smith draw attention. Gout, rheumatism, and alcoholism may be put under toxic causes as I think that some cases of herpes zoster are directly caused by these toxic states of blood which in others however may only act as predisposing causes.

One of my cases occurred in a rheumatic subject, and another in an alcoholic subject, and a third

Case

2. Diseases of the Skin, p. 153-5
3. Practice of Medicine, p. 838 (1891)
case occurred in the son of a man who had had severe alcoholism. Quain says that "a predisposing cause of herpes is the gouty or rheumatic diathesis." Buzzard also mentions a case of zona occurring in a patient with tabes dorsalis, the patient himself having had muscular rheumatism and his father gout. In regard to infectious causes it is possible that some cases of zona may be caused by a micro-organism. The facts adduced in support of this view are that zona rarely recurs in the same person, often appears in epidemics, and that the eruption runs a definite course like an exanthem, and is similar in its histological changes to variola. Foster has also been seen in association with beri-beri and there has been a suspicion of infection in a few.

2. Buzzard. Diseases of Nervous System p. 169
5. Fagge Oye Smith ibid Vol. II p. 937
recorded cases!

Exposure to cold and wet I believe is occasionally the cause of herpes zoster. It seemed to be the immediate determining cause in one of my cases. Dr. Balmanno Squire, 2 Quain, 3 and Dr. Bulkley, 4 all state that herpes zoster may follow exposure to cold and wet. Dr. Bulkley 4 says, "Atmospheric changes, cold draughts, and exposure to cold can cause the nerve inflammation associated with the eruption." According to Dr. Allan Jamieson 5 "Byrom Bramwell holds that zona may be the result of a common (atmospheric endemic, or local) cause."

Mental disturbance is credited by some observers with sometimes causing herpes zoster. In one of my cases the disease followed a violent outburst of passion and no other cause.

2. Reynolds's System of Medicine Vol. 7 p. 909
3. Dictionary of Medicine Vol. 7 p. 641
cause could be discovered. Dr. Bal-
mamo Squire says it may be
excited by violent fits of
passion. Roche mentions five
cases which he thinks were due
to mental disturbance, and
Pochin records one case. Shock
and mental emotion may as well
as violent fits of passion, excite
the disease.
As I have already stated, I think
that in some cases the gouty,
alcoholic or rheumatic state
may act as a predisposing cause
to herpes zoster. But in ad-
dition to these there are one or
two other predisposing causes
which deserve attention, and
chief among these I would place
the neuroptatic disposition.
Out of thirteen cases under my
personal observation, six or
about 46 percent were dis-

1 Reynolds System of Medicine Vol. V, p. 909 (1879)
2 British Medical Journal 1894 Vol. II, p. 867
distinctly neurotic in character and one of these (Mrs. L.) was markedly so. This patient, Mrs. L., a farmer's wife residing in this neighborhood aged 75 yrs, very dull and stupid mentally (as are also her sons) was attacked in July 1895 with severe intercostal zone and during Mrs. L.'s illness a married daughter of Mrs. L. who had come to attend her mother contracted simple meningitis; Mrs. L.'s father died an inmate of a lunatic asylum, as did also a daughter of hers. Anaemia and debility are other important predisposing causes, and particularly I think the type of anaemia and debility found in persons of middle life and advanced age called senile; in other words, those who are up in years and whose powers of resistance are diminished either
by natural infirmity or by chronic disease seem more liable to herpes zoster than healthy and robust persons in adolescence or in the prime of life. Goodhart says that herpes is "very common, only seen in the out-patient room in conditions of feeble health, without any certain evidence of the pre-existence of fever." As regards age and sex Dr. Pryce-Smith says that "it occurs equally in both sexes and at almost all ages." Most of the cases I saw (eight out of thirteen) were in men, and only one case occurred in a child, all the rest with the exception of a lad of nineteen years being well up in years and a few of advanced age. Both Goodhart and Bulkley observe that herpes zoster is common.

1 Diseases of Children p. 686 (1891)
2 Principles & Practice of Medicine vol ii p. 740 (1891)
3 Diseases of Children p. 687 (1891)
4 Keating's Cyclopaedia & Diseases of Children vol ii (1891)
among children. Dr. Pye-Smith gives one instance where there was an element of heredity. Dr. Balmaine Squire, who says that zona occurs at all ages, also states that it is commoner in summer than in "winter," which also was my experience, only two of my cases occurring during the winter months, and which serves to point out that climatic or seasonal change if not sometimes the direct exciting cause of herpes zoster appears at least to act as a predisposing cause to that disease.

1. Principles and Practice of Medicine Vol. II p. 940 (1891)
2. Reynolds's System of Medicine Vol. V p. 909 (1879)
Symptoms.

Pain is the most common subjective symptom of herpes zoster, although it is sometimes absent. Indeed, Dr. Pye-Smith says that "in the majority of cases of shingles (two out of three according to von Bärensprung) pain is altogether absent." The pain is usually of a burning character, but it is also described by some patients as a grating, grinding, tearing pain. Some also have the feeling as of insects creeping over the affected skin. The pain usually comes on suddenly and gets gradually worse till the eruption appears, when in many cases it seems to diminish a little, while in others it continues quite as severe. It appeared that in the former class of cases the
eruption was generally much more marked than in the latter. The amount of pain suffered, as far as one could judge, seemed to vary in different cases very much and bore no proportion to the severity of the eruption. Indeed, some complained of little or no pain, merely an uncomfortable burning sensation. In others, moreover, especially those of neuropathic disposition, the pain is very severe, and induces great restlessness and sleeplessness. There may be no other symptoms present except the pain, burning sensation, and itching, or there may be some slight febrile disturbance with malaise, headache, furred tongue, etc. When there is any febrile disturbance, as there generally is according to Dr. Balmanno Equire, the temper.

Reynold's System of Medicine vol. 1 p. 909 (1874)
Temperature seldom exceeds 100°F or 101°F, but varies from 99°F or 99.4°F to 101°F or 101.4°F. Often it is not raised above 99°F or 99.4°F, and sometimes it is normal throughout. Dr. Pye-Smith says that "zona runs an acute course of a week or two and is seldom "attended with fever or disorder of "the general health." He also re-
marks on the immunity from pain in herpes zoster which young patients enjoy, but states that pain is usually present in adults and in patients of ad-
vanced years. Febrile disturb-
ance and severe pain are I think, more often present and more marked when present in patients beyond middle life or of advanced years than in young people, and also in patients the general tone of...
whose system is low, than in the strong and healthy. Thus one patient, a robust middle-aged man with a typical intercostal zona complained of no pain at all, while an anaemic dyspeptic lad with trigeminal zoster complained of severe pain for some days and had very restless nights.

Herpes zoster very often lasts more than a week or two; it may be three or four weeks before the disease quite subsides. Usually the pain begins to disappear altogether or to be so slight as to cause no more than a little inconvenience before the eruption has faded away from the skin. This favourable termination unfortunately does not always occur. In some cases especially in elderly people the pain continues after the eruption has quite subsided, and may trouble the patient for weeks.
or months and occasionally even years, and sometimes undermines their health and strength; indeed some elderly people after an attack of herpes zoster never recover their wonted vigour, but remain permanently frail, and nervous, and broken down in health.

A gentleman Mr. T., of Gilmoreby in this neighbourhood, aged 83 years, whom I have been recently attending for pleurodynia, showed me on his right side the scarring left by an attack of shingles which he had about six years ago; he still suffers from pain in the region which was then affected and this pain he says is worse in changeable weather and is a little relieved by pressure and rubbing over the affected area. The length of time that this troublesome neuralgia may last is uncertain, and varies greatly.
in different cases. Trousseau records a case in which it lasted fourteen years. Dr. Pye-Smith says it may last ten years. In addition to the neuralgia which so often follows herpes zoster other neuræ may remain, and according to Ullna, "paralyses, atrophies and other nerve disturbances" occur. Other symptoms of herpes zoster are recorded by different observers, and the most notable of these symptoms is paralysis of motor nerve fibres mentioned by Drs. Allan Jamieson and Frederick Taylor. Jamieson says: "The motor nerve filaments participate also in the neuritis and this explains why paralysis may occur in the course of zoster." Dr. F. Taylor: "In a few cases paralysis of associated motor nerves or nerve fibres has been seen."
"most of the seventh or third nerve in facial zoster, but also of the nerves to the deltoid and abdominal muscles." Von Bärensprung met with two cases in which vomiting occurred. He also, according to Dr. Pye-Smith, "tested the cutaneous sensibility with a pair of compasses and found that in two cases it was considerably increased, while in a third it was diminished." Two cases of Sir Thomas Watson's are related by Dr. Pye-Smith: "one in which zona affected the scalp, and in which the patient, who had for seven years been plagued with continued noises in the head, became free from that symptom, and remained so for eighteen months afterwards." The other case was that of a man in whom the eruption came out in February and who suddenly lost a cough which had teased him all winter.

1 Fagge: Pye-Smith, vol. 4, p. 939 (1891)
2 do. do. do. p. 938 (1891)
Physical Signs.

The eruption on the skin constitutes the most important physical sign of herpes zoster. This eruption is vesicular in character. The vesicles, "containing," according to Goodhart, "neutral or feebly alkaline fluid" usually appear in clusters of from ten to twenty each cluster lying on a patch of erythematous skin. These vesicles may remain separate or they may coalesce and form large bullae. The clusters of vesicles appear in succession and those appear first which lie nearest the roots of the particular nerve affected, a fact which Dr. Pye-Smith makes mention of. As regards the microscopical appearances of the vesicles the best descriptions I can find are those of Unna and Dr. Haight of New York which I quote the former.

1 Diseases of Children p. 687 (1891)
2 Fagge, Pye-Smith, Principles of Practice of Medicine (1847) Vol. ii p. 937
former taken from Dr. Norman Walker's translation of Unna's Histopathology of Diseases of the Skin, and the latter from Fagge and Pye-Smith's Principles and Practice of Medicine. Unna says: "The vesicle of Foster has a structure unlike that of most other vesicles. There is in it a form of epithelial degeneration in its most perfect development which is present though in less degree in other processes (varicella, variola) and this definitely affects the appearance of the vesicle. Where in other cases the process of colligation converts the prickle layer into a system of cavities vacuoles appear in the oedematous much enlarged epithelial cells and the cells then present a meshwork of small cavities and larger ones arising from confluence (reticulating degeneration). In Foster, on the contrary, all the cells affected by colligation preserve [their

Histopathology of Diseases of Skin translated by Dr. Homer Walker (1896) p.150
their contour even their size. They lose their prickles and thus the connecting bridges fall apart and lie free and loosely heaped one on another at the base of the blister. The rapid appearance of the Toster vesicle is to be explained by the acutely developed specific degeneration of all uncornified epithelium which not only separates their connections but converts the cells into a peculiar, plastic, ductile mass. The power of this poisoning action in 'hoser is particularly evident on comparison with other processes where a similar one is present in less degree as in variola. In that the ballooning degeneration affects only the young est epithelial cells, in which marginal and interval protoplasm are not yet completely separated; all older epithelial cells undergo only reticulating degeneration with partial retention of their cell-mantle. But in
"Foster the ballooning transformation, attacks also the older epithelial cells, lying immediately underneath the horny layer, whose cell-mantles present active resistance to the degeneration." As regards Dr. Haight's observations on the vesicles Dr. Paye-Smith says: "His observations showed that their roofs consist of the horny layer of the cuticle, with some of the superficial elements of the rete mucosum adherent to the under surface; their floors are formed by the bare summits of the papillae, with the deepest elements of the rete occupying the depressions between them; their cavities are traversed by numerous bands consisting of masses of the intermediate elements of the rete, drawn out into long spindle-cells, and cells with several tapering processes. The fluid which the vesicles contain is at first transparent.
but after a time the presence of floating leucocytes renders it opalescent, and ultimately it may become purulent, or acquire a purple colour from the escape of blood through the softened tissues beneath. The cutis itself seems always to take some share in the inflammation, leucocytes being scattered in the spaces between its fibrous bundles, and along the vessels and nerves. When pus is formed, if the roots of the vesicles have been removed by the friction of the clothes, ash-coloured surfaces are exposed looking like layers of false membrane. In other words, the histological changes in Poxter are essentially identical with those which have been described in varicella. The severity of the eruption I observed varied very much in different cases, and this is most noticeable in inter-

Dr. Bulkeley in Keating's Cyclopaedia of Diseases of Children vol. II. p. 42 says, "The amount of eruption varies greatly in different cases."
intercostal zona. In two of my cases the eruption merely consisted of a few clusters of papules (following the course of an intercostal nerve) which never formed vesicles. In these cases there was very little erythema. There was, no doubt, a mild hyperaemia in the papillae, but no exudation of lymph or leucocytes.

In other cases on the other hand which were typical there were interrupted patches of erythema with clusters of vesicles on them. Unna* says that these patches are "always separated by healthy areas of skin," but in one case, of more severity than usual, under my care the erythema extended in a continuous broad band along four intercostal spaces from the spine to the sternum; in this case the erythema was very

*Unna, Histopathology of Diseases of the Skin, p. 149.

says: "more rarely they are arrested at the papular stage!"

Unna ibid. p. 149.
very pronounced, and the clusters of vesicles were very numerous and large; many of the vesicles coalescing and forming large bullae; the skin felt quite hard and stiff like leather; there was much induration no doubt due to excessive pouring out of leucocytes and lymph; afterwards ulcers formed where large bullae had been prematurely ruptured and these ulcers had red raised edges with ash-grey bases discharging some blood and pus. Ulceration and gangrenous sloughing rarely occur in herpes zoster and when they do occur, the patient is generally of advanced years. In most cases the vesicles begin to dry up in a week or ten days and leave dry brownish scabs which begin to come off about fourteenth to twentieth days. Sometimes according to Unna's view and then the vesicles become purulent or haemorrhagic and

[Histopathology of Diseases of Skin trans. by Dr. E. Walker]
then break down readily, very rarely
they are from the commencement
replaced by grouped military necrosis.
According to Charcot there is increased
local temperature in herpes zoster.
Herpes zoster most frequently
affects the trunk. Sometimes in
that region there may be a few
vesicles transgressing beyond the
middle line. In one of my cases there
was a patch of erythema with six
or seven vesicles on it beyond the
middle line behind. The occurrence
of this both Drs. Pye-Smith and
Bulkeley attribute to the overlapping
of the nerves of the opposite sides.
When the eruption appears on the
trunk, the lower its site the more
perpendicular and the less hori-
ontal does the direction, which
the eruption takes, become.
When herpes zoster affects the face
the

1. Charcot’s Diseases of Nervous System (1885
   Vol. 72), p. 113
2. Fagge & Pye-Smith (1887), Vol. 11, p. 938
the eruption follows the distribution of the sensory portion of the fifth cranial nerve and it is noticeable how the clusters of vesicles appear opposite the points of emergence of the various branches of the nerve. In one case under my observation a cluster of vesicles appeared over the malar bone, another just above the zygoma, a third on the tragus of the external ear, and a fourth at a point on the chin corresponding to the mental foramen; there was no eruption on the eyelids and no conjunctivitis or ulceration of the cornea, so that very likely only the second and third divisions of the fifth cranial nerve were affected. In connection with this nerve Dr. Pye-Smith says:—“When the two lower divisions of the trigeminal nerve are involved, a few vesicles
venicles often appear on the mucous membrane of the mouth and palate. Paget has recorded an instance in which necrosis of the alveoli followed extraction of a tooth in the infra-alar region so that some of the teeth fell out. Herpes zoster is also said to have followed the extraction of teeth. Many observers have recorded eye-symptoms in connection with herpes zoster when it affects the first division of the fifth cranial nerve. Dr. Pye-Smith states that not only ulceration of the cornea may be present but also iritis and sight may be seriously damaged. Dr. Hutchinson has remarked that the ocular affection never arises unless the eruption occupies the distribution of the nasal twig.

Herpes zoster also occurs on the neck and follows the distribution of the upper cervical nerves. It also occurs...
occurs on the shoulders and may follow the cords of the brachial plexus down the arm. Dr. Pye-Smith says that the vesicles do not often extend beyond the elbow. In one case that I know of vesicles appeared in the upper intercostal region and on the inner side of the arm and forearm down to the wrist; probably the intercosto-humeral was one of the nerves affected. Dr. Norman Walker I also published a plate representing clusters of vesicles extending down the forearm. In a case of herpes zoster which I have been recently attending (March 1897) and which occurred in a man aged 64 years, the second and third left intercostal nerves were affected. There were groups of vesicles on a level with the lower half of the scapula extending from half an inch beyond

1. Fagge, Pye-Smith, Vol. II, p. 938 (1891)
2. Medical Annual, 1896, p. 359
beyond the middle line behind round to the axilla at the apex of which there was a cluster of vesicles. Over the pectoral region there were only a few isolated vesicles, but there were several clusters on the posterior internal aspect of the upper arm to within three inches of the elbow. In this case the intercosto-humeral nerve was affected and very likely there was also affected the second intercosto-humeral nerve from the third dorsal nerve which when present "supplies filaments to the armpit and inner side of the arm".

As regards the lower limb, herpes zoster chiefly affects the buttock and thigh and may follow the branches of the sacral plexus e.g., the small sciatic nerve. According to Dr. Pye-Smith it often affects the external cutaneous or anterior crural

1 Gray's Anatomy p. 696. (1887)
2 Fagge & Pye-Smith vol. II, p. 938 (1891)
crural nerve. He also states that
"Mr. Hutchinson says that it never
extends beyond the knee, and the
only instance to the contrary is one
figured by von Bärensprung in
which there were a few small
papules as low as the middle of the
calf." Recently however several
cases have been recorded of herpes
zoster occurring below the knee.
Two cases of zona below the knee
were recorded by Dr. Mahon¹ in
the British Medical Journal and
other cases are recorded in the
same periodical by Drs. Symon-
Eccles, John Crisp, P.O. Watkin
Browne, and W. C. Afrod. ²
As regards the side affected most
of the cases I observed were right-
sided, but Dr. Pye-Smith ³ thinks
that "there is probably no difference
in the liability to it of the right or
left side." He also states that "true
zona is always strictly unilateral." Dr. Bulkley 2 however observes that cases have occurred where there has been a double zoster at the same line, thus making a complete circle or girdle around the body. According to Dr. Pye-Smith 3 Mr. Hutchison once saw a zoster in the course of the fourth dorsal nerve on the right side associated with a frontal zoster on the left side. In one of von Büren sprung's cases an ordinary zoster, limited to the right half of the thorax, was accompanied by a single vesicle in the left axilla, the patient having been suffering from severe burning pains on both sides. Coats 4 says that "there are cases recorded in which one half of the body was affected, and in some of these there was a hemiplegia due to a coarse lesion in the brain."
He also states that “there are also a few cases on record of universal or nearly universal herpes, as if a general centre for the whole body were irritated.” That herpes zoster may occur in utero, as far as I remember, I believe Mr. Hutchinson has conjectured, and that its result is fibroma molluscum which according to Coats is probably associated with the nerves of the skin and is often congenital.

1 Coats, Manual of Pathology p. 867 (1883)
2 do do do p. 873 (1883)
Pathology.

The pathology of herpes zoster is somewhat obscure perhaps owing to the fact that the disease is never fatal and the evidences from post-mortem examination can only be got in cases where the patient has died from some other cause.

Herpes zoster manifests itself as a vesicular eruption on the skin, but it has an intimate relation to certain changes in the nervous system, and its site on the skin varies according to the particular part or parts of the nervous system involved. The chief facts which point to its nervous origin are its exact nervous distribution, the neuralgic character of the pain which usually accompanies the eruption, the structural changes met within parts of the nervous system especially in the ganglia of the posterior roots of spinal nerves, its occurrence in [the

\[\text{"zoster is never fatal"}, \text{ Fagg & Bye-Smith (1891) vol II p.936}\]
the course of organic disease of the central nervous system such as hemiplegia,\(^1\) locomotor ataxia,\(^2\) and cervical pachymeningitis, the frequency with which it is found in patients of a neuropathic disposition and neurotic family history, its relation to shock, mental \(\_
\)
motion, and other forms of mental disturbance, and its appearance after injury to nerves.

The eruption is an inflammatory one. Coats\(^3\) states that "there is hyperaemia and oedema of the papillary layer of the skin. The serous exudation collects in the Malpighian layer of the epidermis separating its cells just as in the case of the small-pox eruption. The vesicle is divided by a network composed of the elongated and contorted epidermic cells, which

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1. Coats, Manual of Pathology p. 367 (1883)
2. do do do (1883)
3. Coats, 3rd ed. (1891)
5. do do (1883)
often present clear spaces or vacuoles in their substance. In the serous content of the vesicles there are leucocytes, and these may accumulate till the fluid approaches the nature of pus. The papillary layer is also frequently the seat of infiltration with round cells. Occasionally there is haemorrhage, and the papillary layer of the skin may be destroyed, so that when healing occurs by granulation a cicatrix may be the result.” But the relation of the eruption to the nervous system has been closely investigated and certain structural changes have been found frequently associated with herpes zoster. The most constant of these is inflammation of the ganglion on the posterior root of a spinal nerve and of the nerve below it. According to Dr. Bulkeley “the skin lesions in zoster are the direct result of irritation

Keating's Cyclopaedia of Diseases of Children, Vol. II (1889)
irritation of the nerve or nerves distributed to the affected skin. This irritation may exist in any part of the course of the nerve, but is most commonly found in the spinal ganglia, and a number of autopsies have demonstrated interstitial neuritis of the posterior sensory ganglion, as was first shown by von Bärenspling. But later researches have also demonstrated this to be healthy in certain cases, while neuritis existed in other portions of the nerve; cases also are reported where there was haemorrhage into the Gasserian ganglion, also into the cauda equina in a case of crural herpes, also where there was disease or injury of the spinal cord, and many other conditions inducing nerve-irritation and inflammation. The nerves near the eruption have been found to be the seat of a perineuritis."

[According}
According to Dr. Pye-Smith, von Bäresprung in 1861 was the first to suggest that these ganglia were the starting-points of the disease. His opinion was verified by Charcot and Cotard who found that whereas the nerve-roots were healthy, the ganglia and the nerve-trunks to a little distance outside the intervertebral notches were much reddened and slightly swollen, their stroma being also unduly rich in nuclei. Precisely similar appearances were afterward discovered by von Bäresprung himself in a child which died soon after an attack of shingles; and additional evidence to the same effect has since been obtained. In addition to inflammation of the ganglion on the posterior root Dr. Frederick Taylor makes mention of other facts.

Fagge & Pye-Smith vol II p. 940 (1891)

Practice of Medicine p. 856 (1891)
pathological changes which have
sometimes been found in herpes
zoster, namely inflammation of the
sensory root above the ganglion,
peripheral neuritis, neuromata,
and haemorrhage into the Gass-
erian ganglion.

From physiological experiment
viz. nerve-section the Gasserian
ganglion ("which corresponds to
the spinal ganglion on a spinal
nerve") and the ganglia on
the posterior roots of spinal
nerves are known to exercise
trophic functions. Trophic
centres are also believed to
exist in the brain and Spinal
cord. These trophic centres in
the spinal cord are affected
in such diseases as locomotor
ataxia, poliomyelitis anterior,
aeuta, and progressive mus-
cular atrophy. There is now

Hirke's Handbook of Physiology, Haliburton
1896 p. 217
no doubt that nerves do exert a
trophic influence; nearly every
-one is agreed upon this point;
and Charcot also remarks
that "there is nothing better
established in pathology......
than the existence of trophical
troubles consequent on lesions
of the nervous centres or of the
nerves." Both Halliburton
and Coats hold that the
proof that there are distinct
trophic nerve-fibres anatomic-
ally is not very conclusive.
Still I am inclined to believe
that there do exist distinct
trophic nerve-fibres for this
reason that, supposing the
manner in which trophic in-
fluence is exerted takes the
form of nervous impulses
propagated from a trophic
[Centr

1 Dis. of Ner. Syst. (M.S.S. vol 72) p. 7
2 Kirk's Handbook Physiology (1896) p. 376
3 Manual of Pathology (1883) p. 866
centre along nerve-fibres, it is difficult to conceive how in a sensory nerve such as the posterior spinal root below the ganglion the same nerve-fibres could convey one set of nerve-impulses towards the central nervous system producing sensation and another set of nerve-impulses travelling in the opposite direction i.e. towards the periphery producing trophic influence. It is more probable I think that as there are motor centres with motor nerve-fibres proceeding from them, so there are in like manner trophic centres with trophic nerve-fibres proceeding from them. Coats in speaking of the anterior cornua of the grey matter in the spinal cord thinks that possibly the "trophic ganglion cells"

I. Manual of Pathology (1883) p. 430
cells and proper muscular ones are different and yet situate "close together." Possibly also in the Gasserian ganglion and in the posterior spinal ganglia there are trophic ganglion cells as well as purely sensory ones, although anatomically they cannot be distinguished from the other. And here I should anticipate myself by remarking that it may be that in cases of herpes zoster there is interference with the functions of both the trophic and sensory ganglion cells and that in some characterised by mild eruption and severe pain the interference with the sensory function is greater than the interference with the trophic function, and vice versa with those cases in which the eruption is severe
Severe and the accompanying
pain proportionately slight.
Most authorities are agreed
that herpes zoster is connected
with the nervous system, and
is a tropho-neurosis. Dr. Pye-
Smith: "Herpes zoster or
zona, an eruption erythematous;
it is true, in its anatomy and
course, but which is so de-
 monstrably connected with
nervous disorder, that it is
rightly separated from all
other forms of dermatitis."
and again, "There can how-
ever be no doubt that zona
is a true tropho-neurosis."
Niemeyer says: "It may be
regarded as established that
herpes zoster depends upon
disease of the trophical fibres
of the motor and sensory

1 Haggard, Pye-Smith (1891) Vol. II, p. 827
2 de L. d. 1940
3 Text-Book of Practical Medicine (1883) Vol. II, p. 462
nerves, which supply the part affected.) Coats: "This disease is typically of nervous origin," and also, "The nervous origin of herpes has been abundantly established." Goodhart says: "vesicles... mapping out the distribution of one or other of the cutaneous nerves." Mr. Jonathan Hutchinson says: "Herpes zoster is an example of an inflammation of the skin located by sensory nerves." Dr. Allan Jamieson: "Pathologically the disease is a neuritis." Dr. Bulkley: "the skin-lesions in herpes zoster are the direct result of nerve-irritation of the nerve or nerves distributed to the affected skin." Charcot [also

1 Manual of Pathology (1883) p. 866
2 id. id. id. p. 867
3 Diseases of Children (1891). p. 687
5 Diseases of Skin p. 1148
6 Keating's Cyclopaedia of Dis. of Children (1889) Vol. II
7 "Hist. of Nerv. Syst. (1:3:5 vol. 7) p. 20 or 109-126
also maintains that zona is the result of disordered trophic-nervous action in contradiction to the theory that vasomotor disturbance caused it. However, Dr. Norman Walker states that "recently there has been considerable doubt thrown on the connection of herpes with the nervous system, and it has been related to the blood-vessels in preference... the larger one's material, the more certainly does he become convinced of that fact, and it is, in very many cases, quite impossible to indicate which nerve is the one implicated." Hillier describes two vesicular eruptions under herpes: one in which the vesicles are not definitely arranged he terms herpes

1. Medical Annual (1896) p. 359
2. Diseases of Skin (1865) pp. 130-131
herpes phlyctenodes, and the other herpes zoster in which there is definite arrangement of vesicles which follow the course of a nerve. Herpes phlyctenodes very likely is an eruption resembling herpes zoster in all but the definite arrangement and nervous origin of the latter, and may be the disease to which Dr. Norman Walker refers when he says that “in very many cases it is quite impossible to indicate which nerve is the one implicated.” There is some doubt as to the exact seat of herpes phlyctenodes (Niemeyer, Dr. Balmain, Squire, and Dr. Pye-Smith all give different accounts of it). According to Unna, Pfeiffer regards arterial embolism as the cause of the localisation of the groups.

1. Medical Annual (1876) p. 359
4. Pye-Smith (1891) Vol. II p. 827
5. Unna’s Histopathology of Diseases of Skin, transl. by Dr. Norman Walker (1896) p. 149
of vesicles, but luma remarks that 
"this needs further investigation." Charcot has shown that trophic disturbances are not produced by irritation or paralysis of vasomotor nerves but in all probability by irritation of trophic nerves. In herpetic zoster we have seen that the most frequent seat of inflammation in the nervous system is in the spinal ganglia, but that inflammation too in the spinal cord and brain may give rise to herpetic zoster showing that the spinal ganglia are not the only trophic centres for the skin but are probably connected with other trophic centres both in the brain and spinal cord. Now just as irritation of a motor nerve gives rise to contraction in the muscle supplied by that nerve, and as irritation of a sensory nerve gives
rise to pain, so, a priori, irritation of a trophic nerve will very likely give rise to increased supply of blood to the skin in its area of distribution and so by continued irritation to inflammation. Charcot on this point says:—“Now, as regard its application” (i.e. of trophic-nerve theory) “to the interpretation of pathological phenomena, it is easy to conceive that a frequent result of morbid irritation set up in nerves, endowed with such properties” (trophic) “would be to carry disturbance into the intimate nutrition of the innervated parts, and to provoke therein, occasion serving, the consecutive development of the inflammatory process.” Seeing that neuritis is generally present in herpes zoster, some have asked what the herpetic eruption is not found
found in all cases of neuritis. The answer probably is that according as the neuritis affects trophic, sensory, or motor nerve-fibres so will the phenomena of trophic, sensory, or motor disturbance manifest themselves, and that in the numerous cases of neuritis in which there is no cutaneous eruption probably only the motor and sensory fibres of the nerve are affected and the trophic fibres for the skin are not affected (although the trophic fibres for the muscles may be). What causes this inflammation of the spinal ganglia and neuritis which is associated with herpes-zoster? The exact cause is not known. Probably there are various causes some of which are predisposing and others exciting. The manner in which I think the exciting causes mostly act is by producing some chemical...
change in metabolism which widens irriation and inflammation of the
spinal ganglia. The irritant in
some instances may be inorganic
e.g. arsenic (Dr. Payne-Smith),
or organic e.g. gout and alcohol-
ism or a hormone circulating
in the blood and manufactured
by a microorganism; or the
change in metabolism may be
induced by mental disturbance,
or by some atmospheric and
climatic condition. In support
of the microbic theory there is the
fact of the disease occurring in
epidemics, of its rarely affecting
the same person twice, and of
the eruption running a definite
course like an exanthem and
being very similar in its histo-
logical changes to variola. In
support of atmospheric or seasonal

[Influence

1 Payne-Smith (1891), Vol. II, p. 940
2 do do do do do do do
influence being the cause is the fact of the disease being far more common in summer than in winter.

We certainly know that multiple neuritis may arise as the result of faulty chemical action, and the introduction of foreign chemical substances into the body e.g. poisoning by lead, arsenic, copper will cause neuritis, and neuritis may follow diphtheria, scarlatina, enteric fever etc. or occur in the course of gout or diabetes. So that comparing herpes zoster with neuritis it seems probable that faulty chemical action produced in a variety of ways may cause herpes zoster in much the same manner as neuritis is caused.

Cf. Dr. Frederick Taylor, Practice of Medicine (1890)
Diagnosis.

There is usually not much difficulty in diagnosing herpes zoster. The eruption is characteristic, and its unilateral arrangement and limitation to the area of distribution of a cutaneous nerve together with the history and symptoms are the chief points which help one in coming to a conclusion. In those cases where pain is felt before there is any sign of the eruption a provisional diagnosis of neuralgia might have to be made until the appearance of the eruption showed the true nature of the case. Niemeyer and Dr. Pye-Smith say little or nothing about diagnosis. Dr. Balmanno Squire on the other hand says:—“Herpes zoster may be mistaken for Erysipelas, Eczema, or Pemphigus.” He continues:—

2 Jagger & Pye-Smith (1891) Vol. II p. 936 et seq.
However, in bullous erysipelas, the inflamed areola is generally much more extensive than in zona. On the other hand, the blebs are much less numerous and a good deal larger, besides being irregular in shape; the margin of the erysipelasous surface too is distinctly raised. In eczema, although that disease may occur in patches, yet the patches have neither the well-defined margins nor the systematic arrangement of zona. Again, the vesicles of eczema are smaller and much more crowded together than those of herpes. The isolation and the volume of the vesicles of herpes may cause it to be mistaken for pemphigus; but in the latter, although the bullae may be small and near to one another, they are never arranged in systematic groups. Zona is an acute, pemphigus almost always
"a chronic disease." According to Dr. Hillier, we have also to dis-


tinguish between herpes zoster and herpes phlyctenodes. He
describes this latter affection as clusters of herpetic vesicles occur-
ring on different parts of the body without any definite arrangement.
He writes: "Herpes zoster exhibits characters precisely similar to
herpes phlyctenodes, but is 'peculiar from the number and
arrangement of the clusters.'
Niemeyer\(^2\) gives the name herpes


phlyctenodes to clusters of vesicles
appearing on parts of the face
other than the lips "such as the


cheeks and eyelids," and Dr.


Balmanno Squire\(^3\) applies it to


herpes occurring on parts of the


body other than the trunk. So that


what is exactly meant by herpes


phlyctenodes is not very clear. Dr.


Pope Smith\(^4\) describes it as "of uncertain


seat."


\(^1\) Diseases of Skin (1869), p. 131


\(^2\) Pract. Medicine (1883), vol. 1, p. 462


\(^3\) Reynolds, Sot. of Medicine (1879), vol. 7, p. 491


\(^4\) Függer, OE., Smith (1891), vol. 8, p. 27
Prognosis.

This is very favourable in the great majority of cases. Zoster is never fatal although Pliny says "neceat si cinxerit"—"it kills if it encircles"; and a popular tradition to the same effect still exists in England." Dr. Bulkley says:—"Zoster is really a self-limited disease and even under adverse circumstances, offers a favourable prognosis."

The neuralgias and neuroses which sometimes remain after herpes zoster are apt to be very troublesome and persistent and not readily amenable to treatment. They chiefly occur in old and debilitated people. In them also according to Dr. Ball—manno Squire 3 herpes zoster is
“apt to assume a gangrenous form.” We must also bear in mind that scarring and pitting are apt to occur in severe cases and especially when the disease attacks the face.

Drs. Pye-Smith, Bulkley, and Allan Jamieson all point out the danger with which the eye is threatened when the eruption appears in the neighbourhood of that organ.

1 Fagge & Pye-Smith (1891) Vol. ii. p. 937
2 Keating’s Cyclo. of Dis. of Children (1889) Vol. ii. p. 43
3 Diseases of Skin p. 148
Treatment.

Herpes zoster runs a definite course like an exanthem and tends to a natural recovery. I think that possibly the eruption acts as a counterirritant to the inflammation of the spinal ganglia because the pain is often relieved by the appearance of the eruption and as I have before remarked there seems to be less pain comparatively when the eruption is severe than when it is mild; further for the neuralgia which often follows herpes zoster "von Bädensprung," according to Dr. Pye-Smith, I found blisters useful and they have been often applied with good success over the roots of the affected nerves.

In most cases of herpes zoster rest in bed is not essential. The

1 Tagge & Pye-Smith (1891) Vol ii p. 941
treatment of herpes zoster may be conveniently divided into local and constitutional; treatment of the cause does not here come into play as we do not know exactly what that is.

As regards local treatment, then, the chief aim is to protect the inflamed and painful area of skin from contact and friction with the patient's clothes, and to prevent premature rupture of the vesicles. The treatment that answers this purpose best is the application to the skin of a dry powder such as starch powder or boracic acid powder (to which some would add a little morphia, cocaine or zinc oxide), and securing firmly over the skin a piece of thin linen or muslin previously dusted with the same powder. This plan is one which Dr. Bulkeley greatly re-
recommends. He says:—"When this dressing is comfortable and remains in position, it may be left intact even for a number of days, and when taken off the eruption will be found to be quite dried up." Other forms of local treatment have been recommended such as painting the skin-surface with flaccile colloidion. Covering the affected area with boracic lint on which has been spread some unguentum acidi borici or unguentum zinci oxidi seemed to me to answer very well in some cases; Goodhart advocates this plan, but Dr. Bulkley is of opinion that plasters and ointments are to be avoided in the main." Dr. Norman Walker re-commends Unna's zine lime which he thinks he has seen cause abortion of the younger vesicles. Anodyne liniments

1. Keating's Cyc. of Dis. of Children (1889) vol. ii. p. 43
2. Dis. of Children (1891) p. 687
3. Medical Annual (1896) p. 360
liniments or ointments according to Dr. Bulkley are sometimes useful when there is excessive pain, and calamine and zinc lotion when there is much burning heat. I have found lead and opium lotion to be highly serviceable in cases where there was much pain or burning heat. Dr. Balmanno Squire also recommends the liquor plumbi subacetatis as a lotion, and for the gangrenous form of the eruption in old people he advises either the application of a stimulating lotion or dusting over the surface with sulphate of quinine.

As regards constitutional treatment, the main indications are to improve the patient's general health if that is defective, and to relieve pain and discomfort. It is often advisable to give an aperient first of all such as sulphate of magnesia or sulphate of soda.

1. Keating's Cyclopedia of Dis. of Children (1899) Vol. II p. 44
2. Reynolds' Syst. of Medicine (1879) Vol. V p. 912
soda as Robin advises. In many cases where there is not much pain and no febrile disturbance we may begin with tonic treatment and the best tonic is quinine with which maybe combined strychnine and, if there be anaemia, some preparation of iron. A formula such as the following answers the purpose very well:

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**Recipe**

Quininae Sulphatis 3f
Magnesii Sulphatis 3iio
Ferris Sulphatis grs. XVI
Acidi Sulphurici diluti 3iv
Liquoris Strychniae 3f
Aqua ad 38
St. a. f. mist.

Sg: Take one tablespoonful three times a day in water after food.

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In other cases before resorting to tonic treatment, it will be found necessary to treat the neuralgic pain with sedatives; the most generally useful of which are opium, bromide of potassium, and antipyrin. Opium in the form of Dover's powder given in 10 gr. doses and repeated every three or four hours, if necessary, I found exceedingly useful in relieving the pain of herpes zoster. Bromide of potassium was also often very efficacious in my experience, and I generally combined it with the extract of belladonna. Robin gives pills composed of the extract of belladonna, hyoscyamus, and stramonium for the neuralgia, and says, "If these pills do not relieve the pain, antipyrin must be given internally."
When there is febrile disturbance as well as pain it is advisable to combine salines with the bromide of potassium and at the same time to enjoin a light diet and rest in bed. In some cases I found it a useful plan to give quinine and acids during the earlier part of the day, and a mixture containing bromide of potassium in the late afternoon and evening and once or twice during the night if required. The following formulae I found of benefit:

**Recipe**

Potassii Bromidi F.111

Potassii Bicarbonatis F.111

Potassii Citratis F.111 p

Magnesii Sulphatis F.111 p

Tincturae Belladonae F.116

Tincturae Cardamomi Co. F.31

Aqua ad 38

S.t.h. St. mist

Sq: Take one tablespoonful every three or four hours in water. For afternoon and evening. [Recipe]
Recipe
Quininae Sulphatis 3\%  
Acidi Sulphurici diluti 3\%  
Aqua ad 36  
6\% mist.

Sg.: Take one tablespoonful twice a day in water
For Morning

Antipyrin is often of great service in allaying the pain. \(\frac{V}{4}\) to \(\frac{X}{4}\) grains every four hours would be a sufficient dose. Dr. Norman Walker says it "acts like a charm." For severe pain the hypodermic injection of morphia may sometimes be required.

In some cases of herpes zoster characterised by great restlessness and sleeplessness I found it advantageous at first to combine chloral hydrate in doses of \(\frac{V}{4}\) grains along with the bromide of

Medical Annual (1896) p. 360
of potassium, and two or three doses of such a mixture as the following generally had the desired effect of relieving the pain and inducing sleep.

Recipe
Potassii Bromidi ₣Ⅳ
Chloral Hydratis ₣Ⅳ
Syropi Tobutami ₣Ⅳ
Mixturee Chloroformi Co. ₣Ⅳ
Aquae ad ₣Ⅳ
S.t.IU. Ht. mist

Sq.: Take one tablespoonful every two or three hours in water as directed.

In nearly all cases of herpes zoster after the pain has subsided, in addition to having a sufficiency of good nourishing food, the patient will require some form of tonic and the best probably is quinine along with iron and strychnine. For the neuralgia which often follows...
an attack of herpes zoster especially in elderly people there is unfortunately not much benefit to be derived from treatment. Dr. Bulkley recommends quinine for this neuralgia as also for the neuralgia which preceded and the neuralgia which accompanies herpes zoster. Dr. Pye-Smith 2 thinks that "in old patients some form of opiate is almost always needful". He has not much faith in anodynes applied locally but thinks "cocain is perhaps the most efficient." 2 He also mentions 3 the relief which some patients have felt when taking vinum colchici which Dr. Hægge used to prescribe, and the success of blisters "applied... over the roots of the affected nerves." 2

1 Keating's Cyc. of Diseases of Children (1889) Vol. II p. 43
2 Hægge & Pye-Smith (1891) Vol. II p. 941
3 do do do do do do p. 940
Dr. Frederick Taylor thinks arsenic should be tried, and menthol rubbed in locally or morphia injected, and according to Crocker "blisters over the origin of the nerve and the continuous current give good results." The simple interrupted current also does great good and the constant current sometimes gives more benefit (Dr. J. Grainger Stewart). Robin recommends antipyrin injected hypodermically, and also says: "Subcutaneous injections of the glycerophosphate of soda may also be tried." Dr. Balmanton Squire recommends in desperate cases section of the affected nerve.

The line of treatment calculated to give most benefit to old or middle-aged people who

1. Taylor's Practice of Medicine (1891) p. 856
2. Lectures on Practice of Physic (1891-2)
Suffer from neuralgia after herpes zoster would be, I think, change of air and scene, and travel, and a visit to some mineral or chalybeate spring, and the administration of tonic medicine such as iron and quinine to improve the general health combined with the application of the interrupted or constant current, reserving for the more severe attacks of pain the hypodermic injection of morphia or the administration of some opiate internally.

Samuel Davidson
Barnard Castle
Co. Durham
19th April 1897