Fig. 5.1
Normal sciatic nerve.
Transverse section of the nerve showed the fascicular arrangement of the nerve bundles. The nerve fascicles (NF) were surrounded by an outer connective tissue layer, the epineurium (E). Each individual fasciculus was surrounded by a connective tissue layer named the perineurium (P†).

Mason's trichrome stain X 400

Fig. 5.2
Normal sciatic nerve.
Longitudinal section, showing that the nerve fascicles (Nf) differed in size. Large fascicles contained more nerve fibres. The nerve fibres were parallel to each other.

Silver stain X 160
Fig. 5.3
Normal sciatic nerve.
The epineurium consisted of thick connective tissue bundles (CT) which contained several large blood vessels (bv) and many spindle shaped fibroblasts (Fibro†).

Mason's trichrome stain X 1600

Fig. 5.4
Normal sciatic nerve.
Transverse sections showing that the epineurium was surrounded by adipose tissue, large globular fat cells storing drops of fat (f).

Osmium fixed and toluidine blue stained plastic section X 525
Fig. 5.5

Normal sciatic nerve.
Longitudinal sections showing that the collagen bundles of the perineurium (P †) were orientated parallel to the direction of the nerve fibres.

Mason's trichrome stain X 400

Fig. 5.6

Normal sciatic nerve.
High magnification micrograph, longitudinal section, showing many myelinated (MN) and non-myelinated (NN) nerve fibres. Both were surrounded by endoneural collagen fibres (†). Schwann cells (Sc) were seen within the endoneural tubes.

H and E stain X 4000
Normal sciatic nerve.

A high magnification micrograph of a portion of transverse section showing that the nerve fasciculus was surrounded by perineurium (P) and contained myelinated nerves (MN) of varying diameters. Many clusters of non-myelinated nerves (NN) containing Schwann cells (SC) were seen between the myelinated nerves.

Osmium fixed and toluidine blue stained plastic section X 4000

Normal sciatic nerve.

Longitudinal section of the nerve fasciculus. The myelinated nerve contained Nodes of Ranvier (Nr). Osmium fixed and toluidine blue stained plastic section X 1600
Fig. 5.9
Normal sciatic nerve.
Longitudinal section through the nerve fasciculus showing intact myelinated nerves which contained intact Schmidt Lanterman incisures (SL†).
Osmium fixed and toluidine blue stained plastic section X 1600

Fig. 5.10
Normal sciatic nerve.
Transverse section through a portion of nerve fasciculus showing each nerve fibre was surrounded by a thin endoneural tube (†) which consisted of fine thin collagen fibrils. Each myelinated nerve consisted of a centrally positioned axon (Ax†) surrounded by myelin (My†). Between the endoneural connective tissue, there were many fine endoneural blood capillaries (bv†).
Mason's trichrome stain X 4000
Fig. 5.11

Sciatic nerve, 20 minutes after freezing.
The general fascicular arrangement was well preserved. Connective tissue bundles of the epineurium (E) showed mild disruption. The perineural connective tissue (P †) was still surrounding each nerve fasciculus.

Mason's trichrome stain X 400

Fig. 5.12

Epineural connective tissue of the sciatic nerve, 20 minutes after freezing. The epineural blood vessels (bv) were congested, some of the blood vessels were ruptured with damaged connective tissue (†).

Mason's trichrome stain X 1600
Fig. 5.13
Sciatic nerve, 20 minutes after freezing.
Portion of the nerve fasciculus which contained myelinated nerves (MN) and non-myelinated nerves (NN). The connective tissue of the endoneural tubes was almost intact (COL↑), in a few areas there was disruption in the continuity especially in large nerve fibres (↑). The axons of the myelinated nerves were swollen and irregular. Schwann cell nuclei (Sc↑) were pyknotic.

H and E stain X 4000

Fig. 5.14
Sciatic nerve, 20 minutes after freezing.
Transverse section through the nerve fasciculus showing the endoneural tubes were still intact (↑). The endoneural blood capillaries were also still intact (bv↑) but their endothelial cells (endo↑) showed early stages of degeneration.

H and E stain X 1600
Fig. 5.15
Sciatic nerve, 20 minutes after freezing.
Longitudinal section, showing damaged and retracted Node of Ranvier (NR†).
Osmium fixed, toluidine blue stain, plastic section X 1600

Fig. 5.16
Sciatic nerve, 20 minutes after freezing.
Transverse section showing that large calibred myelinated nerves were more distorted than small calibred myelinated nerves.
Osmium fixed, toluidine blue stained plastic section X 1600
Sciatic nerve, 2 hours after freezing.

Transverse section. The nerve fibres were widely separated from each other and from the perineurium. Spaces between the nerves and the perineurium contained oedematous fluid.

H and E stain X 400

Fig. 5.18

Sciatic nerve, 2 hours after freezing.

The epineurium (E) contained oedematous fluid with many red blood cells (RBC) and a few leucocytes (leu†).

H and E stain X 400
Fig. 5.19
Sciatic nerve, 2 hours after freezing.
Longitudinal section. The blood vessels (bv) were congested, some contained damaged endothelial cells (endo†) and the lumen was ruptured (†). The lumen of the damaged blood vessels contained many leucocytes (leu†).

H and E stain X 400

Fig. 5.20
Sciatic nerve, 2 hours after freezing.
Transverse section, portion of nerve fasciculus in which the nerve fibres were more distorted. The endoneural collagen fibres surrounding the nerve had disrupted (†).

Mason's trichrome stain X 4000
Fig. 5.21
Sciatic nerve, 2 hours after freezing.
Transverse section. The intra-fascicular blood vessels (bv †) were congested with red blood cells. The endothelial cells were degenerated (endo †) and Schwann cells were pyknotic (Sc †).

H and E stain X 300

Fig. 5.22
Sciatic nerve, 2 hours after freezing.
Longitudinal section. The keratomyelin honeycombs were irregular (†). There was an increase in Schmidt Lanterman incisures (SL †). Most of the endoneural tubes were still surrounded by collagen fibrils (Col †).

Mason's trichrome stain X 1000
**Fig. 5.23**
Sciatic nerve, 2 hours after freezing.
Longitudinal section showing contracted axons (Ax).
Schmidt Lanterman incisures (SL†) were opened widely and increased in number.

Osmium fixed and toluidine blue stained plastic section X 1600

**Fig. 5.23a**
Sciatic nerve, 2 hours after freezing.
Longitudinal section, the myelin sheath was retracted leaving long naked axons (†).

Osmium fixed and toluidine blue stained plastic section X 1600
Fig. 5.24
Sciatic nerve, central region 24 hours after freezing.
Transverse section. The epineural connective tissue was still surrounding the nerve fasciculi (E). The collagen bundles were widely separated. The lumen of the epineural blood vessels contained fine microthrombi (♦). The perineural connective tissue layer (P†) was still widely separated from the nerve fibres in many areas.
H and E stain X 400

Fig. 5.25
Sciatic nerve, central region, 24 hours after freezing.
Transverse section. The epineurium contained fatty droplets (Fat†) and thick homogeneous masses (†). The small nerve fasciculus showed less damage than the large fasciculus.
H and E stain X 400
Fig. 5.26
Epineurium, central region, 24 hours after freezing. Two epineural blood vessels, the lumen of the large vessel was packed with red blood cells and a few leucocytes (leu↑). The endothelial cells (Endo↑) showed different stages of degeneration (↑). The lumen of the small blood vessels (bv) contained thrombus. The endothelial cells of this vessel were totally damaged. The epineurium (E) contained many degenerated fibroblasts (Fibro↑) and a few polymorphonuclear leucocytes (poly↑).
H and E stain X 1600

Fig. 5.27
Epineurium, central region, 24 hours after freezing. Highly damaged epineural blood vessels, the vessel contained thrombus and had ruptured.
H and E stain X 1600
Fig. 5.28
Sciatic nerve, central region, 24 hours after freezing. Longitudinal section showing the myelinated nerves still surrounded by endoneural collagen fibrils (Col †). The degenerating myelinated nerves were irregular, their myelin had a beaded appearance (†). In many areas fragments of myelin (My †) were seen. Schmidt Lanterman incisures (SL †) were in different stages of degeneration, in many areas closing the lumen of the nerve fibres. The myelin was highly damaged and severely retracted at the Nodes of Ranvier (NR †).

Osmium fixed and toluidine blue stained plastic section X 1600

Fig. 5.29
Sciatic nerve, central region, 24 hours after freezing. Transverse section showing the axons (Ax †) were highly degenerated and irregular. Myelin debris (My) was still surrounded by almost intact endoneural tubes (†).

Silver stain X 4000
Fig. 5.30
Sciatic nerve, central region, 24 hours after freezing. 
High magnification micrograph of the myelinated 
nerve fibres showing irregular, irregularly stained 
axons (Ax) surrounded by granular irregularly 
stained myelin (My).

H and E stain X 4750

Fig. 5.31
Sciatic nerve, proximal region, 24 hours after 
freezing. 
The epineurium (E) was less damaged, blood vessels 
(bv†) were congested. Many polymorphonuclear 
leucocytes (poly†) were seen between the connective 
tissue bundles. The nerve fibres (N) showed 
less damage.

Mason's trichrome stain X 400
Fig. 5.32
Sciatic nerve, proximal region, one week after freezing.
The endoneural tubes contained irregular necrotic debris of the myelinated nerves (My†). Many regenerating myelinated nerves (MNr†) had appeared within the endoneural tubes.
Loyez's stain X 1600

Fig. 5.33
Sciatic nerve, proximal region, one week after freezing.
Transverse section from a portion of a fasciculus. Most of the endoneural tubes contained necrotic debris (†) and Schwann cells (SC†). Within some of the endoneural tubes there were intact myelinated nerve fibres (MN†), other tubes were empty and a few contained regenerated myelinated nerves (MNr†). The blood capillaries were intact (bv).
H and E stain X 1,600
Fig. 5.34
Sciatic nerve, proximal region, one week after freezing.
The endoneural tube contained faintly stained necrotic debris (↑) and many Schwann cells (SC ↑). Between the endoneural connective tissue bundles there were many active fibroblasts (Fibro ↑).

H and E stain X 1600

Fig. 5.35
Sciatic nerve, proximal region, one week after freezing.
Longitudinal section showing many endoneural tubes which contained nerve necrotic debris (↑), tiny regenerated myelinated nerves (MNrt ↑) and many Schwann cells (SC ↑) were lined up to produce bands of bungnar.

Loyez's stain X 1600
Sciatic nerve, proximal region, one week after freezing.

Transverse section from a portion of nerve fasciculus which contained many endoneural tubes, some of these tubes contained intact but irregular large myelinated nerves (MN†), others contained necrotic nerve debris (†) and peripherally regenerated tiny myelinated nerves (MNR†). A few endoneural tubes contained several peripherally regenerated myelinated nerves. Some of the endoneural tubes contained necrotic nerve debris only (†).

Osmium fixed and toluidine blue stained plastic section X 1600

Sciatic nerve, proximal region, one week after freezing.

Transverse section of nerve fasciculus showing an increase in endoneural fibroblasts (Pibro†). The epineurium (E) contained many active fibroblasts and numerous fine blood capillaries (bv†).
Sciatic nerve, central region, one week after freezing.
Transverse section showing the epineurium (E) and
perineurium (P†) had retained their integrity.
Between the epineural connective tissue bundles, there
were many active phagocytes (phago†) and fibroblasts
(Fibro†). Some of the epineural blood vessels (bv†)
were highly congested with red blood cells while others
also contained some polymorphonuclear leucocytes
(poly†). In some areas the epineural blood
vessels were completely occluded by a thrombus (Thr†).
Within the nerve fasciculi, the endoneural tubes
contained degenerated necrotic masses (†). Between
the endoneural collagen fibrils there were many
congested blood capillaries (bv†) and a few
phagocytes (phago†).

H and E stain X 400

Sciatic nerve, central region, one week after freezing.
The endoneural connective tissue contained many
blood capillaries (bv†), active fibroblasts
(Fibro†) and phagocytes (phago†).

H and E stain X 1600
Fig. 5.40
Sciatic nerve, central region, one week after freezing. Transverse section; portion of nerve fasciculus containing many endoneural tubes of totally necrotic nerve fibre (†).

Silver stain X 1600

Fig. 5.41
Sciatic nerve, distal region, one week after freezing. Transverse section showing the epineurium (E) and perineurium (P†) was still intact. The intact endoneural tubes contained necrotic nerve fibres (†).

Mason's trichrome stain X 400
Fig. 5.42
Sciatic nerve, distal region, one week after freezing.
Transverse section, the endoneural tubes contained necrotic nerve debris (↑). Some of the tubes contained active Schwann cells (SC ↑).
H and E stain X 1600

Fig. 5.43
Sciatic nerve, distal region, one week after freezing.
Longitudinal section, myelinated nerves (MN) were degenerated and segmented, lipoidal droplets were seen between the damaged myelin (Lip ↑). In some endoneural tubes, Schwann cells (SC ↑) could be seen. In some areas small calibred myelinated nerve still showed widened Schmidt Lanterman incisures (SL ↑).
Osmium fixed and toluidine blue stained plastic section X 1600
Fig. 5.44

Sciatic nerve, proximal region, 2 weeks after freezing.
Longitudinal section showing the endoneural tubes containing many tiny peripherally regenerated myelinated nerves (MNr†). Some of which were passing through the necrotic nerve debris (†). Osmium fixed toluidine blue stained plastic section X 1600

Fig. 5.45

Sciatic nerve, proximal region 2 weeks after freezing.
Longitudinal section showing endoneural tubes containing many fine regenerated myelinated nerves (MNr†). Lined up Schwann cells (SC†) were seen within the endoneural tubes.
The endoneural connective tissue contained a few polymorphonuclear leucocytes (poly†) and active fibroblasts (Fibro†).

H and E stain X 1600
Sciatic nerve, proximal region, 2 weeks after freezing.
Most of the still intact endoneural tubes contained necrotic nerve debris (♦), Schwann cells (SC †) and regenerated myelinated nerves (MNr †). The inter fascicular blood vessels between the endoneural connective tissue were intact (bv †).

H and E stain X 1600

Sciatic nerve, proximal region, 2 weeks after freezing.
The epineurium (E) and perineurium (P) were intact and contained many fibroblasts (Fibro †) and a few macrophages (Mac †).

H and E stain X 4000
Sciatic nerve, proximal region, 2 weeks after freezing. Transverse section showing many intact myelinated nerves (MN†), others were still degenerating (†), their endoneural tubes contained necrotic debris. Some of the endoneural tubes contained Schwann cells (SC†) and a few rounded axons (Ax†). Fibroblasts (Fibro†) could be seen between the endoneural connective tissue.

Osmium fixed and toluidine blue stained plastic section X 2000

Sciatic nerve, central region, 2 weeks after freezing. Longitudinal section showing many endoneural tubes which contained necrotic nerve debris (†) and many active Schwann cells (SC†).

H and E stain X 1600
Fig. 5.50

Sciatic nerve, central region, 2 weeks after freezing. Longitudinal section showing the endoneural tubes were still intact and contained necrotic nerve debris (†). Schwann cells (SC †) were seen within the tubes. The endoneural connective tissue was still intact and contained active fibroblasts (Fibro †).

Mason's trichrome stain X 4000

Fig. 5.51

Sciatic nerve, central region, 2 weeks after freezing. Oblique section through a nerve fasciculus. Several endoneural tubes contained Schwann cells (SC †), necrotic nerve (†) debris. In some areas tiny myelinated regenerated axons (MNR †) were seen within the endoneural tubes.

Silver stain X 1600
Fig. 5.52
Sciatic nerve, central region, 2 weeks after freezing.
Transverse section of a portion of nerve fasciculus
showing many endoneural tubes which contained
degenerated myelinated nerve debris (†).
Other endoneural tubes contained clusters of axons
(Ax†) which had no myelin.

Osmium fixed and toluidine blue
stained plastic section X 1600

Fig. 5.53
Sciatic nerve, central region, 2 weeks after freezing.
The epineurium was increased in thickness.
Between connective tissue bundles there were numerous
active fibroblasts (Fibro†), intact blood vessels
(bv†) and many fine blood capillaries (†).

H and E stain X 1600
**Fig. 5.54**

Sciatic nerve, central region, 2 weeks after freezing. The epineurium (E) was thick and contained fibroblasts (Fibro †). There was no regenerating adipose tissue. Between the collagen bundles at the periphery there were many regenerating muscle cells (M †).

H and E stain X 400

**Fig. 5.55**

Sciatic nerve, distal region, 2 weeks after freezing. Longitudinal section showing intact epineurium (E) with many active fibroblasts (Fibro †) and intact perineurium (P). The endoneural tubes contained necrotic debris (†) and many Schwann cells (SC †). Some of the Schwann cell nuclei were pyknotic (N †). Within some of the endoneural tubes fine basophilic axons which contained myelin could be recognised.

H and E stain X 1600
Fig. 5.56
Sciatic nerve, proximal region, 3 weeks after freezing.
Longitudinal section showing many myelinated nerves (MN) and an intact Node of Ranvier (NR†). Some of the nerve fibres contained fine branches (†) which contained no Node of Ranvier or Schmidt Lantermann incisures.

Osmium fixed and toluidine blue stained plastic section X 1600

Fig. 5.57
Sciatic nerve, proximal region, 3 weeks after freezing.
Transverse section through the nerve fasciculi showing endoneural tubes which contained intact myelinated nerves (MN†); some other endoneural tubes contained a few fine peripherally regenerated myelinated axons (MNr†); other endoneural tubes contained many non-myelinated axons which were associated with Schwann cells (SC†).

Osmium fixed and toluidine blue stained plastic section X 525
**Fig. 5.58**

Sciatic nerve, central region, 3 weeks after freezing. Longitudinal section through a nerve fasciculus showing many endondural tubes which contained degenerated necrotic nerve debris (†), within some tubes fine myelinated regenerating nerves (MNrt†) were growing through the necrotic debris, many active Schwann cells (SC†) could be seen.

Osmium fixed and toluidine blue stained plastic section X 1600

**Fig. 5.59**

Sciatic nerve, central region, 3 weeks after freezing. Transverse section through a portion of nerve fasciculus showing several endoneural tubes, some containing necrotic nerve debris (†) and Schwann cells (SC†). Others contained centrally positioned Schwann cells surrounded by many fine non-myelinated regenerating axons (Ax†).

Osmium fixed and toluidine blue stained plastic section X 4000
Fig. 5.60
Sciatic nerve, central region, 3 weeks after freezing. Transverse section through a portion of nerve fasciculus showing intact perineurium (P) which contained many active spindle-shape fibroblasts (Fibro †). The endoneurium was thick and contained many active endoneural fibroblasts (Fibro †), macrophages (Mac †) and endoneural tubes, which contained necrotic nerve debris (†), Schwann cells (SC †) and regenerating fine axons (Ax †).

H and E stain X 1600

Fig. 5.61
Sciatic nerve, central region, 3 weeks after freezing. Transverse section showing nerve fasciculus surrounded by intact perineurium (P). Most of the endoneural tubes were intact but were irregular. Between the endoneural connective tissue the blood capillaries (bv †) were intact.

H and E stain X 550
Fig. 5.62
Sciatic nerve, central region, 3 weeks after freezing.
Transverse section through the sciatic nerve showing the epineurium (E) was much thickened and fused with the thickened epimysium of the juxtaposed muscle tissue. Many regenerating muscle cells (M†) could be seen distributed through the epineurium.

H and E stain X 550

Fig. 5.63
Sciatic nerve, distal region, 3 weeks after freezing.
Transverse section through the nerve fasciculus showing many endoneural tubes containing degenerated necrotic nerve debris (♦) and many fine regenerating axons (Ax†). Other endoneural tubes contained fine regenerating axons (Ax†) only.

Osmium fixed and toluidine blue stained plastic section X 1600
Sciatic nerve, proximal region, 4 weeks after freezing.

Transverse section through a nerve fasciculus showing early stages of compartmentation, each compartment consisted of several endoneural tubes, each endoneural tube consisted of several regenerated fine intact myelinated nerves (MNr↑) and some still non-myelinated axons (Ax↑). Some of the endoneural tubes still contained degenerated nerve debris (↑) surrounded by several Schwann cells (SC↑). The endoneurium contained intact blood capillaries (bv↑) and a few macrophages (Mac↑).

Osmium fixed and toluidine blue stained plastic section X 1600

Sciatic nerve, proximal region, 4 weeks after freezing.
Longitudinal section through the nerve fasciculus showing many intact myelinated nerves (MN) with Schmidt Lanterman incisures (SL↑). Nodes of Ranvier were scarce.

Osmium fixed and toluidine blue stained plastic section X 1600
Fig. 5.66

Sciatic nerve, central region, 4 weeks after freezing. Transverse section through the nerve fasciculus showing many endoneural tubes which contained regenerated fine myelinated nerves (MNr †). Many endoneural tubes still contained necrotic nerve debris (†). The endoneural connective tissue contained macrophages (Mac †) and many active fibroblasts (Fibro †). The perineurium (P) was intact and contained many active fibroblasts (Fibro †).

*Osmium fixed and toluidine blue stained plastic section X 1600*

Fig. 5.67

Sciatic nerve, central region, 4 weeks after freezing. Longitudinal section showing endoneural tubes with regenerated myelinated nerves (MNr †) and necrotic nerve debris (†).

*Osmium fixed and toluidine blue stained plastic section X 1600*
Fig. 5.68
Sciatic nerve, central region, 4 weeks after freezing. Longitudinal section showing the endoneurial tubes containing many active Schwann cells (SC†).

H and E stain X 1600

Fig. 5.69
Sciatic nerve, central region, 4 weeks after freezing. Thick dense epineurium (E) contained numerous fibroblasts and was directly associated with the perimysium (P) of the adjacent muscle.

H and E stain X 400
Sciatic nerve, distal region, 4 weeks after freezing.
Transverse section through the nerve fasciculus showing early compartmentation. Most of the endoneural tubes contained degenerated nerve debris (†), some of the tubes had regenerated axons (Ax †) which possessed no myelin. A few endoneural tubes contained fine regenerated nerves surrounded by a thin myelin layer (MNr †). The perineurium (P) was intact surrounded by intact epineurium (E) containing fat cells (F) of the adipose tissue.

Osmium fixed and toluidine blue stained plastic section X 400

Sciatic nerve, distal region 4 weeks after freezing.
Transverse section through nerve fasciculi. Each fasciculus contained many endoneural tubes with Schwann cells (SC †). The endoneural connective tissue was intact with intact blood capillaries (bv †) and fibroblasts (Fibro †). The intact epineurium contained fibroblasts (Fibro †) and a few macrophages (Mac †).

H and E stain X 500
Fig. 6.1

Normal sciatic nerve.

Transverse section through nerve fasciculus, showing many myelinated (MN†) and non-myelinated (NN†) nerves. Each myelinated nerve was surrounded by a Schwann cell (SC) enclosed by a basal lamina (BL†). Many non-myelinated (NN) axons were surrounded by one Schwann cell (SC). Myelinated and non-myelinated axons contained similar axoplasmic organelles. All nerve fibres were embedded in the endoneural connective tissue (EN).

X 10,000
Connective tissue layers of the sciatic nerve.
The outermost layer of the connective tissue was the epineurium (E) which contained connective tissue fibrils and fibroblasts (Fibro).
The perineurium (P) was made up of alternating layers of collagen fibrils (COL†) and thin elongated fibroblasts.

X 6,000
Fig. 6.3

Connective tissue of the normal sciatic nerve.
Portion from a nerve fasciculus showing part of the perineurium which contained elongated flattened fibroblasts (Fibro †) which were separated by thin bundles of collagen fibrils (COL †).

X 20,000
Fig. 6.4

Normal sciatic nerve.

Transverse section through a portion of nerve fasciculus showing the endoneurium consisting of collagen fibrils (COL†) and fibroblasts (Fibro). Some of the collagen fibrils were closely associated with the external surface of the basal lamina, forming the endoneural tube structure (†).

X 30,000
Normal myelinated nerve.

A transverse section through a myelinated nerve fibre, showing a centrally positioned axon (Ax) which consisted of cytoplasm (axoplasm) containing abundant microtubules (Tu ✦), neurofilaments (Nu ✦), vesicles (Ves ✦) and tubular profiles of the granular endoplasmic reticulum. The axon was surrounded by smooth membrane, the axolamina (La ✦).

The myelin layer (My) consisted of a series of light and dark lines in repeating pattern; within the innermost layer the internal mesaxon could be seen (Mes ✦).

Schwann cell cytoplasm was enveloping the myelinated nerve. The outermost part of the Schwann cell (Sc) called the neurolamina (✦) was surrounded by a basal lamina (BL ✦).

X 15,000
Fig. 6.6

Normal Schwann cell of the myelinated nerves.
The Schwann cell (Sc) consisted of a large rounded nucleus (N) surrounded by cytoplasm containing mitochondria (Mito †), Golgi bodies (Gol †), ribosomes (Ribo †) and many profiles of rough endoplasmic reticulum (Rer †).

X 15,000
Fig. 6.7

Normal sciatic nerve fibre.
Longitudinal section through a myelinated nerve fibre showing the oblique cone shaped cliffs, Schmidt Lanterman incisures (SL†).
The axon (Ax) contained many parallel thin neurofilaments and microtubes as well as elongated rounded mitochondria (Mito†).

X 20,000
Fig. 6.8
Normal sciatic nerve fibre.
Longitudinal section through a myelinated nerve showing the structure of the Node of Ranvier.
The axoplasmic organelles within the axon (Ax) were concentrated at the node.
The arrows indicate the termination of the cytoplasm of adjacent Schwann cells.

X 15,000
Fig. 6.9

Normal sciatic nerve.
Transverse section through a non-myelinated nerve fibre.
The endoneural tube contained a centrally positioned Schwann cell nucleus (N), surrounded by cytoplasm containing intact cytoplasmic organelles. The axons were embedded within the Schwann cell and each axon was enclosed by Schwann cell membrane. At some point around the periphery of each axon, the Schwann cell membrane was reflected off to produce the mesaxon (Mes↑). Each axon contained neurofilaments (Nu↑), mitochondria (Mito) and microtubules (Tu↑). The axolemma (La↑) was thin and smooth. The axons and their Schwann cells were enclosed by intact basal lamina (BL↑).

X 40,000
Fig. 6.10

Sciatic nerve, 20 minutes after freezing.
Transverse section through a myelinated nerve fibre showing the myelin sheath (My) was disrupted and swollen and the axon (Ax) had lost its internal structure. The endoneural collagen fibres (COL) were still intact. The basal lamina (BL) was ruptured in some areas (†).

X 10,000
Sciatic nerve, 20 minutes after freezing.
Longitudinal section through a myelinated nerve fibre showing a degenerated myelin sheath; at points where the axolemma (la †) remained in contact with the myelin sheath (My), the myelin lamellae were still intact.
The axon (Ax) had contracted irregularly in many areas and was covered by disintegrating axolemma (la †). The axonal mitochondria (Mito) were degenerated and the axon was packed with degenerated axoplasmic organelles (†).

X 40,000
Sciatic nerve, 20 minutes after freezing.

In the myelinated nerves, the area of the Nodes of Ranvier (NR ↑) showed the most discrete damage. The myelin sheath (My) was disrupted and retracted. The axon (Ax) was damaged and the axolemma was out of register.

The axoplasm contained degenerated mitochondria (Mito ↑) and numerous different sized vacuoles (Vac ↑). The basal lamina (BL ↑) was still intact, invaginated into the axon. The endoneural collagen fibrils (COL ↑) were still intact.

X 10,000
Sciatic nerve, 20 minutes after freezing.

Longitudinal section through a myelinated nerve fibre, showing damaged Node of Ranvier (NR). Another nerve fibre contained damaged Schmidt Lanterman incisures (SL). The diameter of the axon (Ax) was reduced at the area of the incisure.

X 10,000
Fig. 6.14

Sciatic nerve, 20 minutes after freezing.
Transverse section through a myelinated nerve fibre which showed typical degenerated changes. The Schwann cell nucleus (N) was irregular, with irregularly accumulating chromatin (♦).
The cytoplasm was floccular containing a few vacuoles (Vac).

X 15,000
Sciatic nerve, 20 minutes after freezing.
The endoneurial blood vessels contained slightly distorted endothelial cells (endo†). The lumen contained many damaged red blood cells (RBC). The endoneurium was still intact (En).

X 6,000
Sciatic nerve, 20 minutes after freezing.
Longitudinal section through a severely damaged myelinated nerve fibre. The myelin sheath (My) was severely disrupted and fragmented.
The axon (Ax) contained numerous vesicles, vacuoles (Vac) and a few electron dense bodies (†).

X 15,000
Sciatic nerve, 20 minutes after freezing.
Longitudinal section through the non-myelinated nerve fibres showing the Schwann cell nucleus (N) was still almost intact, surrounded by finely granular cytoplasm which contained swollen mitochondria (Mito). The basal lamina (BL †) was still intact.

X 10,000
Fig. 6.18

Sciatic nerve, 20 minutes after freezing.
Longitudinal section through non-myelinated nerves.
The non-myelinated axons (Ax) showed less damage,
the axoplasmic mitochondria (Mito) were swollen
with disintegrated internal cristae. The
axolemma (La†) and the basal lamina (BL†) were
still intact.

X 10,000
Fig. 6.19

Sciatic nerve, 2 hours after freezing.

A portion of myelinated nerve fibre showing that the myelin was severely damaged and degenerated, fine osmium particles (†) could be seen associated with the damaged myelin. The axon (Ax) was degenerated and contained disintegrated neurofilaments (Nu †) and microtubules (Tu †). The mitochondria (Mito) showed further degenerative changes.

X 15,000
Sciatic nerve, 2 hours after freezing.

Transverse section through a myelinated nerve fibre. The myelin sheath (My) was degenerated. The axon (Ax) was irregular and contained homogeneous axoplasm. Schwann cell cytoplasm was granular and contained many vacuoles (Vac). The basal lamina (BL †) was still intact.

X 15,000
Fig. 6.21

Sciatic nerve, 2 hours after freezing.
Portion of an endoneural tube which contained a degenerated myelinated nerve fibre. The damage to the myelin, axon and Schwann cell was so extreme, the nerve components had mixed. The intact basal lamina (BL↑) was still surrounding the damaged nerve fibre.

X 10,000
Fig. 6.22

Sciatic nerve, 2 hours after freezing.

The micrograph shows a portion of damaged myelin (My). The endoneural collagen fibres (COL †) were separated by finely granular oedematous fluid (O). Between the endoneural layer, different shapes and sizes of cellular debris and dense bodies could be seen (†).

X 20,000
Fig. 6.23

Sciatic nerve, 2 hours after freezing.
Transverse section through non-myelinated nerve.
The axons (Ax) were swollen and contained disintegrated microtubules, neurofilaments and axolemma. The multivesicular bodies (↑) were less damaged. The mitochondria (Mito) still existed and contained disintegrated cristae. Schwann cell cytoplasm (Cy) was reduced and granular, containing many rounded vesicles. The basal lamina (BL ↑) was still intact surrounding the degenerated nerve fibre.

X 15,000
Fig. 6.24

Sciatic nerve, 2 hours after freezing.

Portions of an endoneural tube containing less injured non-myelinated axons (Ax) in which the axoplasm contained intact multivesicular bodies (†), neurofilaments (Nu †) and microtubules (Tu †).

X 30,000
Fig. 6.25

Sciatic nerve, 2 hours after freezing.

Transverse section through a portion of nerve fasciculus from the proximal region, showing myelinated and non-myelinated nerve fibres. The myelinated nerve fibre (MN) was less damaged. The myelin layer (My) was intact. The axon (Ax) was almost intact and contained a few disintegrating microtubules and neurofilaments. The Schwann cell cytoplasm (Cy) and the non-myelinated nerve (NN) were still intact.

X 15,000
Sciatic nerve, 2 hours after freezing.

A portion of a longitudinal section of a myelinated nerve of the proximal region showing a Schmidt Lanterman incisure (SL) which contained disrupted and disorganised myelin lamellae (My†). The axon (Ax) at the node was packed with neurofilaments and microtubules. The Schwann cell cytoplasm (Cy) was intact, surrounded by intact basal lamina (BL†).

X 15,000
Fig. 6.27

Sciatic nerve, 2 hours after freezing.
A longitudinal section through a myelinated nerve of the proximal region showing degenerated myelin (My); irregular, disintegrated microtubules, neurofilaments and degenerated mitochondria (Mito†). X 20,000
Fig. 6.28

Sciatic nerve, 24 hours after freezing.

Transverse section through many myelinated nerve fibres of the central region, showing the highly disrupted myelin sheaths (My) surrounding irregular amorphous axons (Ax).

X 10,000
Fig. 6.29

Sciatic nerve, 24 hours after freezing.

A portion of a myelinated nerve from the central region, showing degenerated myelin (My) which was irregularly accumulated. The axon (Ax) was degenerated and fragmented, containing fine granular matrix and many electron dense organelles (†). The axolemma was disintegrated. The Schwann cell was indistinguishable from the necrotic nerve debris. The intact basal lamina (BL †) was still surrounding the nerve fibre.

X 15,000
Fig. 6.30

Sciatic nerve, 24 hours after freezing.

Transverse section through a portion of a myelinated nerve showing the axon (Ax) was irregular, displaced and consisted of amorphous matrix containing many vacuoles (Vac †) and degenerated axonal debris (†). The nerve fibre was surrounded by oedematous fluid (0).

X 15,000
Fig. 6.31

Sciatic nerve, 24 hours after freezing.

Transverse section through a myelinated (MN) and non-myelinated (NN) nerve fibre of the central region, showing the massive degenerative changes.

X 10,000
Fig. 6.32

Sciatic nerve, 24 hours after freezing.

The endoneural connective tissue of the nerve fasciculus at the central zone contained oedematous fluid (O), eosinophilic polymorphs (poly), red blood cells (RBC), degenerated cellular debris (†) and accumulations of lysosomal bodies (ly †).

X 15,000
Fig. 6.33

Sciatic nerve, 24 hours after freezing.

Portion from a nerve fasciculus showing that the damaged nerve fibres, myelinated (MN) and non-myelinated (NN) were widely separated, surrounded by oedematous fluid (O).

X 6,000
Fig. 6.34

Sciatic nerve, 24 hours after freezing.

A portion of an endoneural tube from the central region which contained degenerated, non-myelinated axons, showing the normal axon - Schwann cell pattern had disappeared. The endoneural tube contained degenerated necrotic debris (†) and remnants of the degenerated non-myelinated axons (Ax). The basal lamina (BL †) was still intact.

X 10,000
Fig. 6.35

Sciatic nerve, 24 hours after freezing.

Portion of the endoneural tube shown in Fig. 6.34, which showed what were thought to be the remnants of the degenerated non-myelinated axons (Ax).

$X\ 30,000$
Sciatic nerve, 24 hours after freezing.
Transverse section through a nerve fasciculus from the distal region, showing that large myelinated nerve fibres had exhibited more distortion and degenerative changes than the small myelinated nerve fibres.

$X \ 6,000$
Sciatic nerve, 24 hours after freezing.

Transverse section through a small myelinated nerve fibre from the distal region which showed normal axon (Ax). The myelin layer (My) showed focal myelin disruption (†). The Schwann cell nucleus (N) was intact and the cytoplasm (Cy) contained many rounded vacuoles (Vac). The basal lamina (BL †) remained intact.

X 20,000
Fig. 6.38

Sciatic nerve, 24 hours after freezing.

Transverse section through a large myelinated nerve fibre from the distal region, showing the axon (Ax) was entirely filled with degenerated organelles (†). A small remnant of the axon (Ax†) could be seen near the central area of the axon. The degenerated axon was still surrounded by the disrupted myelin layer (My). The basal lamina (BL†) and the endoneural collagen fibrils (COL†) were still intact.

X 20,000
Fig. 6.39  
Sciatic nerve, 24 hours after freezing.  
Endoneural tube containing a non-myelinated nerve fibre from the distal region. The endoneural tube contained many non-myelinated axons (Ax) and a Schwann cell. The axons were irregular and showed early stages of degeneration; they contained disintegrated microtubules, neurofilaments and axolemma. The axonal mitochondria showed disintegration of the internal cristae. The Schwann cell cytoplasm (Cy) was granular, containing fine rounded vesicles (Ves †) and degenerated mitochondria. The basal lamina (BL) was still intact.  
X 30,000
Fig. 6.40

Sciatic nerve, 24 hours after freezing.
The endoneurium of the distal zone contained intact, irregularly orientated collagen fibrils (COL†).
A phagocyte (phago †) could be seen within the connective tissue between the damaged nerve fibres.

X 20,000
Sciatic nerve, 24 hours after freezing.

Transverse section through a myelinated nerve from the proximal region, which showed a contracted axon (Ax), containing an accumulation of neurofilaments (Nu †), short profiles of microtubules (Tu †), axonal vesicles (Ves †) and many mitochondria (Mito †). The axolemma (La †) was still intact, and in many areas it was widely separated from the myelin layer (My).

X 15,000
Fig. 6.42

Sciatic nerve, 24 hours after freezing.

Section through a portion of a nerve fasciculus from the proximal region, showing a ruptured myelinated nerve fibre. The axonal debris (♦) had escaped into the endoneurium. The endoneural tubes containing non-myelinated axons (NN) and Schwann cells (SC) were less damaged.

X 20,000
Fig. 6.43

A portion of nerve fasciculus from the proximal region showing a myelinated nerve fibre and non-myelinated axons. In the myelinated nerve, the Schmidt-Lanterman incisure (SL) was still recognisable, widely open, interrupting the continuity of the axon (Ax).

X 10,000
Fig. 7.1

Sciatic nerve, one week after freezing.

A portion of a nerve fasciculus of the proximal region, showing small intact myelinated nerve fibres. Other endoneural tubes contained larger myelinated nerves showing different stages of degeneration and regeneration. One of these endoneural tubes contained degenerated axons (ax), surrounded by myelin debris (My) enclosed by Schwann cell cytoplasm (SC). Towards the periphery and underneath the basal lamina (BL †) many fine regenerated axons (ax †) could be seen. Between the intact endoneurium there were many active fibroblasts (Fibro) with large nucleoli (N), their conspicuous cytoplasm contained many wide profiles of rough endoplasmic reticulum (Rer) which contained fine granular material. The macrophages (Mac) contained large autophagic vacuoles filled with necrotic nerve debris. Many profiles of necrotic nerve debris (†) could be seen between the endoneural collagen bundles (En).

X 20,000
Fig. 7.2

Sciatic nerve, one week after freezing.
A portion from one endoneurial tube of the proximal region which showed an intact basal lamina (BL†) and contained many Schwann cells (SC), necrotic debris (†) and a regenerated axon (ax). One Schwann cell was surrounding the regenerated axon.

X 15,000
Fig. 7.3

Sciatic nerve, one week after freezing.

A portion of one endoneural tube of the proximal region containing an old degenerated myelinated nerve. The degenerated axon (ax) and myelin (My) was surrounded by new Schwann cell cytoplasm which contained many Golgi zones (Gol †). The regenerated axons (Ax †) contained fine rounded microtubules (Tu †) and intact axolemma (La †). The old Schwann cell (SC) was degenerated and pushed towards the periphery. Old Schwann cell cytoplasm was scarce, containing a few degenerated cytoplasmic organelles and degenerated mitochondria (Mito †).

X 15,000
Sciatic nerve, one week after freezing.
Transverse section through a portion of degenerated myelinated nerve fibre from the proximal region, showing the contents of the degenerated Schwann cell (SC) were mixed with the necrotic nerve debris (†).

X 15,000
Fig. 7.5
Sciatic nerve, one week after freezing.
Transverse section through many endoneural tubes from the proximal region. The endoneural tubes contained Schwann cells (SC) and many intact fine non-myelinated axons (ax) which contained microtubules (Tu↑), rounded vesicles (Ves) and mitochondria (Mito↑). The axolemma (La↑) was intact, surrounded by Schwann cell membrane. Schwann cell cytoplasm was rich in intact cytoplasmic organelles.

X 20,000
Sciatic nerve, one week after freezing.

This micrograph showed the endoneurium of the central region containing different sizes of globular fatty inclusions (Fat) and many phagocytes (phago). The autophagic vacuoles of the phagocytes contained fragments of the degenerated nerve debris (†). The endoneural collagen fibrils (COL†) contained osmophilic speckles.

X 10,000
Sciatic nerve, one week after freezing.
Transverse section through small myelinated nerves (MN) and non-myelinated nerves (NN) of the central region. The small myelinated nerves were degenerated, surrounded by intact basal lamina (BL†). The non-myelinated axons contained fine granular matrix (†) and degenerated disintegrated tubules (Tu†). The endoneural tubes contained Schwann cells (SC).

X 15,000
Fig. 7.8

Sciatic nerve, one week after freezing.
Transverse section through a degenerated myelinated nerve from the central region, showing an active Schwann cell (SC) whose cytoplasm contained many vacuoles with degenerated necrotic debris (↑).

X 15,000
Fig. 7.9
Sciatic nerve, one week after freezing.
This micrograph showed convoluted basal lamina (BL †) free from necrotic nerve debris, surrounded by endoneural collagen fibrils (COL †).
X 40,000
Fig. 7.10

Sciatic nerve, one week after freezing.
Transverse section through several endoneural tubes of different sizes from the central region. A small endoneural tube contained an empty axon (Ax) and fine regenerated intact axons (ax).
A large endoneural tube contained several active Schwann cells surrounding many fine regenerating axons (ax) which contained long mesaxons (Mes†).
Within the large endoneural tubes there were several large, rounded structures (†) packed with rounded vesicles (Ves†) and different sizes of electron dense bodies.

X 10,000
Sciatic nerve, one week after freezing. Transverse section through many myelinated nerve fibres (MN) and non-myelinated nerves (NN) of the distal region. The nerve fibres were widely separated from each other by spaces containing floccular material mixed with the endoneural collagen fibrils. The small myelinated nerves and the non-myelinated axons showed less injury than the large myelinated nerves.

X 6,000
Sciatic nerve, one week after freezing.
Transverse section through degenerating myelinated nerve fibres from the distal region. The myelin was distorted and the axon (AX) was irregular. The vacuolated Schwann cell cytoplasm (CY) was withdrawn from the sides of the fibres. The basal lamina (BL↑) was still intact.

X 15,000
This micrograph showed that the axon was surrounded by a layer of widely separated myelin lamellae.

X 60,000
Fig. 7.14

Sciatic nerve, 2 weeks after freezing.
An oblique section through an endoneural tube from the proximal region, which contained degenerated necrotic nerve debris (†), Schwann cell cytoplasm (Cy) and a profile of a regenerating axon (ax). Between the endoneural connective tissue (En), there was an endoneural fibroblast (Fibro) and many membrane-bound profiles of cellular necrotic debris (Nec †).

X 10,000
Fig. 7.15

Transverse section through an endoneural tube from the proximal region which contained many fine regenerated axons (ax†) and a large almost empty axon (AX). The basal lamina was still intact, surrounded by intact endoneural collagen fibrils (Col†). A phagocyte (phago†) could be seen in close proximity to the endoneural tube.

X 40,000
Sciatic nerve, 2 weeks after freezing.

A portion of an endoneural tube from the proximal region showing an advanced stage of nerve regeneration. A Schwann cell contained extensive and well developed rough endoplasmic reticulum (Rer †), numerous accumulations of ribosomes (Ribo †), several Golgi zones (Gol †) and many fine rounded mitochondria (Mito †). The basal lamina (BL †) was still intact and there was evidence of new basal lamina formation ( †). The axon (ax) was surrounded by myelin sheath (My) in which the outer lamella was not readily fused with the others.

X 30,000
Fig. 7.17

Sciatic nerve, 2 weeks after freezing. Transverse section through a portion of endoneural tubes from the proximal region. One of the endoneural tubes contained a large regenerating axon (ax) surrounded by a loose myelin layer (My).

X 40,000
Sciatic nerve, 2 weeks after freezing.
Transverse section through a portion of an endoneural tube containing a regenerated axon (ax) surrounded by Schwann cell cytoplasm (Cy). The myelin lamellae (†) were still loose and not yet condensed. The regenerated nerve contained intact internal and external mesaxons (Mes †).

X 40,000
Fig. 7.18
Sciatic nerve, 2 weeks after freezing.
Micrograph of the endoneurium of the central region, showing two endoneural tubes which were almost empty. These endoneural tubes contained some peripherally situated necrotic nerve debris (†) and a fatty globular body (Fat†). One of the endoneural tubes contained a portion of Schwann cell cytoplasm (Cy) in which the cellular membrane was ruptured.

X 10,000
Fig. 7.19
Sciatic nerve, 2 weeks after freezing.
Longitudinal section through an endoneural tube of the central region which contained necrotic nerve debris (†) surrounded by Schwann cell cytoplasm (Cy). The newly regenerated axons (ax) were parallel to the long axis of the nerve tube. The degenerated and regenerated nerves were still surrounded by the intact old basal lamina (BL †).
X 10,000
Fig. 7.20

Sciatic nerve, 2 weeks after freezing.

High power micrograph showing an active Schwann cell nucleus (N) which contained fine granular cell cytoplasm. Between the endoneural connective tissue active phagocytes (phag) could be seen.

X 20,000
Fig. 7.21

Sciatic nerve, 2 weeks after freezing.
Portion of a nerve fasciculus from the distal region showing the myelinated nerves were degenerated.

X 10,000
Fig. 7.22

Sciatic nerve, 2 weeks after freezing.

A portion of an endoneural tube from the distal region, showing a myelinated nerve fibre in the early stages of Wallerian degeneration. The axon (AX) was irregular and was displaced from its normal central position. The myelin layer (My) was disrupted and degenerated. A portion of Schwann cell cytoplasm (Cy) could be seen at the periphery. The basal lamina (BL†) was still intact surrounding the nerve fibre.

X 15,000
Fig. 7.22a

Sciatic nerve, 2 weeks after freezing.
A portion of an endoneurial tube containing a degenerating myelinated nerve fibre (MN), surrounded by active Schwann cell cytoplasm (Cy) and many newly regenerating axons (ax).

X 20,000
Sciatic nerve, 3 weeks after freezing.

Portion of a nerve fasciculus from the proximal region showing three endoneurial tubes. One of them was empty and consisted of collapsed basal lamina (BL †) only. Another endoneurial tube (†) was partially filled with regenerating axons. One of the endoneurial tubes was fully regenerated and contained an active Schwann cell (SC) and many different sizes of regenerating axons (ax). Between the endoneurial collagen bundles (En) an active fibroblast (Fibro) could be seen.

X 15,000
Fig. 7.24
Sciatic nerve, 3 weeks after freezing.

Portion of an endoneural tube from the proximal region showing that Schwann cells which contained regenerated axons (ax) were slightly separated from each other; each Schwann cell contained new basal lamina (bl†). The old basal lamina (BL†) still existed. The regenerated axons showed different stages of myelination.

X 20,000
Sciatic nerve, 3 weeks after freezing.

Transverse section through an endoneural tube from the proximal region which contained several Schwann cells (SC) within whose cytoplasm were many regenerating axons (ax). Each axon contained one long mesaxon (Mes†). In one of these axons the mesaxon was wrapped around the axon in which early stages of myelin formation had begun.

Within the cytoplasm of one Schwann cell fatty inclusion (Fat†) and fine electron dense necrotic debris still remained. The endoneural fibroblasts (Fibro) send elongated cytoplasmic extensions around the regenerating endoneural tube.

X 15,000
Fig. 7.26
Sciatic nerve, 3 weeks after freezing.
Transverse section through an endoneural tube from the proximal region containing centrally positioned remnants of the old degenerated nerve, surrounded by Schwann cell cytoplasm (Cy). The regenerated axons (ax) were confined to the peripheral areas.
X 20,000
Sciatic nerve, 3 weeks after freezing.

Transverse section through several endoneural tubes from the central region. Each endoneural tube contained several Schwann cells (SC) which showed early stages of separation. Schwann cells were partially covered by a new basal lamina (bl †), the old basal lamina (BL †) still existed. Between the old and new basal laminae a few fine collagen fibrils (COL †) could be seen. Within the cytoplasm of one Schwann cell a mass of degenerated necrotic nerve debris ( †) was still evident. The regenerated axons were in different stages of myelination.

X 15,000
Fig. 7.28
Sciatic nerve, 3 weeks after freezing.

Transverse section through an endoneural tube from the central region which contained numerous regenerated non-myelinated axons (ax). One axon contained a large fatty inclusion (Fat †) and another axon lacked normal axonal contents.

A new basal lamina (BL †) was deposited in some areas and collagen fibrils (COL †) could be seen between the new and the old basal laminae.

X 20,000
Fig. 7.29

Sciatic nerve, 3 weeks after freezing.

This micrograph showed a regenerated nerve unit from the distal region.

X 20,000
Fig. 7.30

Sciatic nerve, 3 weeks after freezing.
Transverse section through an endoneural tube from the distal region which contained an active Schwann cell (SC) and many fine intact regenerating axons (ax). The Schwann cell cytoplasm contained a little necrotic debris (†) and many degenerating nerve axons. The axolemma (La †) of the degenerating nerve axons showed disintegration processes.

X 30,000
Fig. 7.31

Sciatic nerve, 4 weeks after freezing.

Portion of a nerve fasciculus of the proximal region which contained many endoneural tubes surrounded by abundant endoneural collagen bundles (En) and active fibroblasts (Fibro). The regenerated nerve fibres were still partially surrounded by the remnants of the old basal lamina (BL †) and each Schwann cell was surrounded by intact new basal lamina (bl †). Schwann cells and their associated axons were separated by spaces containing fine collagen fibrils (COL †). The regenerated axons differed in size. Within each endoneural tube only one large axon showed advanced stages of myelin formation. The myelin sheath (My) was intact. The fine still non-myelinated axons (ax) were intact.

X 10,000
Fig. 7.32
Sciatic nerve, 4 weeks after freezing.
Portion of a nerve fasciculus which contained thick endoneurial collagen bundles (En), phagocytes (phag), remnants of the old basal lamina (BL †) and many newly formed endoneural tubes. Each endoneural tube was surrounded by intact basal lamina (bl †) and contained Schwann cells (SC) and many tiny regenerated axons (ax).

X 15,000
Sciatic nerve, 4 weeks after freezing.

A transverse section of a portion of a nerve fasciculus of the proximal region showing several endondural tubes which contained intact myelinated (MN) and non-myelinated nerve fibres (NN). The endoneural tubes of non-myelinated nerves contained numerous intact axons surrounded by Schwann cell cytoplasm (Cy). Each nerve fibre was surrounded by intact basal lamina.

X 15,000
Fig. 7.34

Sciatic nerve, 4 weeks after freezing.
High magnification micrograph of a portion of a fine regenerated myelinated nerve fibre, from the proximal region, showing a portion of a Node of Ranvier (NR †) and the myelin lamellae terminations (†).

X 60,000
Fig. 7.35

Transverse section through endoneural tubes from the central region which contained regenerated axons (ax) and their Schwann cells (SC). The regenerated axons were in different stages of myelination.

X 30,000
Portion of a nerve fasciculus of the central region containing many endoneural tubes, each of which was surrounded by intact thin basal lamina (bl†). In some of the endoneural tubes and within the Schwann cell cytoplasm (Cy) different shapes of degenerated nerve configurations still existed (†). In another endoneural tube the old basal lamina (BL†) remained and the regenerated nerve axons (ax) and their Schwann cells were not fully separated. Between the endoneural connective tissue (En) active endoneural fibroblasts (Fibro) could be seen. 

X 15,000
Fig. 7.37

Portion of an endoneural tube from the central region which contained an intact active Schwann cell (SC), regenerating axon (ax) and necrotic myelin debris (†). The old basal lamina (BL †) showed disintegration processes and a new thin basal lamina (bl †) was formed.

X 40,000
Fig. 7.38
Sciatic nerve, 4 weeks after freezing.
Portion of an endoneural tube of the distal region which contained a degenerated old nerve fibre which was centrally positioned and had a degenerated irregular axon (AX) loosely surrounded by degenerated myelin (My). The degenerated nerve was surrounded by Schwann cell cytoplasm (Cy). Within the same endoneural tube a fine regenerated myelinated nerve fibre was established and contained an intact axon (ax) surrounded by intact myelin.

X 20,000
Sciatic nerve, 4 weeks after freezing.

Transverse section through an endoneural tube from the distal region containing Schwann cells (SC) and regenerated axons (ax). Within the Schwann cell cytoplasm (Cy) necrotic nerve debris (†) still existed. Schwann cells showed early stages of separation. The old basal lamina (BL †) remained. In many areas a new basal lamina (bl †) could be seen.

X 20,000
Fig. 7.40

Sciatic nerve, 4 weeks after freezing.
Regenerated axon from the distal region showing early stages of myelin formation (†).

X 30,000