

## TĒ 9 CHIU<sup>n</sup> SĪN-KENG HĒ-THÓNG

Sîn-keng sī teh chú-chái<sup>n</sup> sin-thé só-chāi chok-iōng ê ki-koan, ū hun chòe:

1. Tiong-chhu-khì-koan (中樞器官, *central nervous organ*).

2. Thôn-tō-khì (傳道器, *conducting nerves*).

3. Chiong-khì (終器, *end organs*).

I. Tiong-chhu-khì-koan chiū-sī náu-chhé (腦髓, *brain*), kap chek-chhé (脊髓, *spinal cord*), chòe sîn-keng tiong-ng ê chêng-hú; sî-siōng teh siū seng-khu tak só-chāi chin chōe ê chhì-kek (刺戟, *stimulus*), koh-chài kàng bēng-lēng kàu kun-bah, hō i ōe thàn i ê ì-sù (tē 91, 93 tô).

II. Thôn-tō-khì sī sîn-keng-chhiam-î lâi chiâ<sup>n</sup>-ê, (ū-sî kiò-chòe náu-kun, náu-sò<sup>n</sup>, *nerve*). Tī chiah-ê ê tiong-kan ū-ê thôn chhì-kek kàu tiong-chhu-khì, ū-ê sàng bēng-lēng kàu bé-liu, chhin-chhiū<sup>n</sup> tiān-sìn-sò<sup>n</sup> ê khoán (tē 93 tô).

III. Chiong-khì sī chhin-chhiū<sup>n</sup> tak só-chāi siat ê tē-hng thia<sup>n</sup>, lâi kám-siū kiók-pō ê chhì-kek. Chiah-ê chhì-kek sī chhin-chhiū<sup>n</sup> peh-sì<sup>n</sup> jiáu-lōan á-sī hoa<sup>n</sup>-hí, á-sī ūi-tiòh sím-mih tãi-chì beh jip pín; i ê chhì-kek, seng kàu thia<sup>n</sup>, chiū-sī chiong-khì; chiah keng-kè thôn-tō-khì, chiah sàng kàu tiong-chhu-khì. Chiong-khì sī teh chòe chit hō ê lō-ēng, chhin-chhiū<sup>n</sup> ngó-koan-khì hit khoán-ê.

Náu kap chek-chhé thang pí-phēng chhin-chhiū<sup>n</sup> kòng tiān ê lāng, tī tiān-pò-kiók, iā sîn-keng chhin-chhiū<sup>n</sup> tiān-sò<sup>n</sup>; tùi tiān-pò-kiók sì-kòe thôn kàu tak só-chāi. Tùi gōa-bīn hit ê lāng siū tiān-pò kóng-khí gōa-bīn ê sū; iā i thang kòng tiān-pò, kàng bēng-lēng kah gōa-bīn ê lāng tiòh chòe tãi-chì.

Kun-bah, chōa<sup>n</sup>-thé ê lâi-bīn ū chiong-khì, tùi thôn-tō-khì siū-tiòh tiong-chhu-khì ê bēng-lēng, lâi kiâ<sup>n</sup> i ê chok-iōng.

Sîn-keng-chō-chit sī sîn-keng sòe-pau, kap sîn-keng-chhiam-î, í-kip chit ê ték-piát kiat-liân ê chō-chit lâi chiâ<sup>n</sup>.

Chiah ê sîn-keng sī tùi náu-chhé kap chek-chhé hun chhut-ê; sī chin chōe ê sîn-keng-chhiam-î chū-chip sa<sup>n</sup>-háp lâi chiâ<sup>n</sup>, kàu tī sin-thé tak só-chāi, chiām-chiām hun, khì kàu hō bák-chiu só khòa<sup>n</sup> bōe-tiòh ê chhiam-sī (*nerve fibrils*). Iā hun-pò tī kúi-nā khoán ê ki-koan-tiong, lâi chiap-liân chiong-khì (tē 93 tô).

Náu-chhé hun chòe sì pō-ūi:

1. Tōa-náu (*Cerebrum*).
2. Tiong-náu (*Pons Varolii*).
3. Sió-náu (*Cerebellum*).
4. Iân-chhé (延髓, *Medulla oblongata*).

I. Tōa-náu tī thâu-khak-khang ê hit téng-bīn, chiàm chòe tōa pō-hun ê mih, sī chó-iū ê tōa-náu-pò<sup>n</sup>-kiû lâi chiâ<sup>n</sup>-ê. Chit ê chó-iū pò<sup>n</sup>-kiû ê tiong-ng, ū chit tiâu tit-tit ê lih-phāng, chiū-sī tui chêng-bīn thàu kàu āu-bīn; chóng-sī hit ê phāng m̄-sī keh-tng, sī ū chōe-chōe sîn-keng-chor-chit sa<sup>n</sup> liân-teh. Náu-chhé tui gōa-bīn lâi khòa<sup>n</sup>, ū chōe-chōe hōe-hūn khut-khut khiok-khiok chhin-chhiū<sup>n</sup> hùt-thō-jîn ê khoán-sit; hūn-tiong ê khang-khiah ū chhim khín bô sa<sup>n</sup>-tāng, tē it chhim-ê chha-put-to chit chhùn chhim; kok lāng ê náu-chhé ê hūn iah bô sio-tāng. E<sup>n</sup>-á ê hūn kah bô chhim iah bô sīm-mih bēng; kàu tiong-liân chiū kah-bēng.

Náu-chhé ū sîn-keng-sòe-pau (神經細胞, *nerve cells*), sîn-keng-chhiam-î (神經纖維, *nerve fibres*), kap sîn-keng-chhiam-î tiong-kan ê chit, chiū-sī tèk-piát kiát-liân ê chor-chit (*neuroglia*).

II. Tiong-náu ê só-chāi, sī tī tōa-náu ê ē-bīn pēng. Tiong-náu tī téng-bīn kap tōa-náu kiát-liân; tī āu-bīn kap sió-náu kiát-liân; ē-tóe kap iân-chhé kiát-liân; só-í ū-sī miâ kiò-chòe náu-kiô (腦橋; tē 95 tô). Náu ê gōa-bīn sī hé-hu-sek ê chor-chit, lâi-bīn sī pēh ê chor-chit. Tī náu-lāi ū gō ê khang, miâ kiò náu-sek (腦室, *ventricle*). Tī náu-sek-lāi ū náu-chek-chhé-ék (腦脊髓液, *cerebro-spinal fluid*).

III. Sió-náu sī tī tōa-náu ê āu-bīn ê ē-pō, chó-iū ê sió-náu-pò<sup>n</sup>-kiû lâi chiâ<sup>n</sup>-ê. Sió-náu ê téng-bīn-pō, kiát-liân tī téng-bīn ê chor-chit, beh khi tōa-náu ê só-chāi. Sió-náu ê tiong-ng-pō, kiát-liân tī tiong-náu; ē-bīn-pō, kiát-liân tī iân-chhé. Chit ê kiát-liân ê chor-chit, kiò chòe sió-náu-kha (小腦腳, *cerebellar peduncle*), ū sa<sup>n</sup> tui kha kiát-liân-teh (tē 95 tô).

IV. Iân-chhé sī chek-chhé kap tiong-náu chiap-liân ê só-chāi, sī chha-put-to chit chhùn tng. Sîn-keng-chhiam-î tui náu-chhé thàu tui ē-bīn, kàu iân-chhé. Tī iân-chhé ê sī, chiah ê sîn-keng sio phòah, hun tui ē-bīn lóh-lâi; tī tò-pēng-ê kiâ<sup>n</sup> tui iū-pēng khi, tī iū-pēng-ê kiâ<sup>n</sup> tui tò-pēng khi. Só-í nā tò-pēng ê náu siū-siong, chiū chiâ<sup>n</sup>-pēng ê seng-khu pòan-sin-put-sūi, (半身不遂), chiū-sī seng-khu chit pò<sup>n</sup> bōe tín-tāng.

Náu-chhé ê tāng, lâm-ê chiū-sī 1400 *grms.*; lú-ê, 1260 *grms.*

Sîn-keng ũ n̄ng khoán chiū-sī ti-kak-sîn-keng (知覺神經, *sensory nerves*), kap ũn-tōng-sîn-keng (運動神經, *motor nerves*). Chiah-ê ũ n̄ng hāng ê lō-ēng, chit hāng sī tùi gōa-bīn lâi thong-tī náu, hō lāng ōe kak-ngō, ōe chai seng-khu-gōa ê sū; chit hō sī kiò-chòe ti-kak-sîn-keng. Koh chit-hō ōe bēng-lēng kun, hō i ōe thàn lāng ê ì-sù lâi chhun kiu; chit hō kiò-chòe ũn-tōng-sîn-keng.

Lāng put-lūn beh chòe sím-mih, sī tùi náu tãi-seng chú-í, sîn-keng chiū liām-pi<sup>n</sup> thōan bēng-lēng kàu kun, hō i ōe thàn i ê ì-sù, put-lūn sī hō i chhun á kiu, bô m̄-thàn i ê bēng-lēng. Ta<sup>n</sup> siat-sú hit ê khoán bó só-chāi ê ũn-tōng-sîn-keng lâi koah-t̄ng, sui-jiân ũ chú-ì beh hō hit só-chāi tín-tāng, iáh bōe thàn i; só-í ōe chai sī tùi ũn-tōng-sîn-keng lâi thōan náu ê hoan-hù, kun chiū ōe chhun-kiu.

Phê ê lâi-bīn ũ sîn-keng chōe-chōe, só-í kiám-chhái chhák-tiòh, á-sī sio-tiòh, á-sī put-lūn bong sím-mih mih, chiū liām-pi<sup>n</sup> ōe chai; ta<sup>n</sup> siat-sú hit ê khoán bó só-chāi ê ti-kak-sîn-keng lâi koah-t̄ng, chiū hit só-chāi lóng m̄-chai thià<sup>n</sup>, m̄-chai chiū<sup>n</sup>; in-ūi án-ni thang chai hit ê ti-kak-sîn-keng sī thōan ti-kak ê chhi-kek.

Phê ê sîn-keng ōe hun-piat sio-léng, chhō-iù, tâm-ta, iáu-kú bōe hun-piat ti<sup>n</sup>, kiām, sng, khó; chiah-ê sī háp tī chhùi-chih ê sîn-keng só ōe hun-piat-ê, kiò-chòe bī-sîn-keng (味神經). Hit ê ti-kak-sîn-keng ōe pun kúi-nā hō-ê, chhin-chhiū<sup>n</sup> tī bák-chiu-lāi ê sîn-keng ōe hun-piat kng-àm, hō lāng ōe khòa<sup>n</sup>-kì<sup>n</sup>, kiò-chòe sī-sîn-keng (視神經); tī hī-khang-ê, sī hun-piat sia<sup>n</sup>-im, hō lāng ōe thia<sup>n</sup>-kì<sup>n</sup>, kiò-chòe theng-sîn-keng, (聽神經); tī phī<sup>n</sup>-khang-lāi-ê, sī hun-piat phang-chhàu, kiò-chòe hiù-sîn-keng (嗅神經); tī chhùi-chih-ê, hō lāng ōe chai kiām-chiá<sup>n</sup>, sng, khó, kiò-chòe bī-sîn-keng; tī phê-ē hō lāng nā bong-tiòh mih, ōe hun-piat sī tōa-sòe, chhō-iù, sio-léng, khin-tāng. Chiah-ê lóng sī iàu-kín hō lāng chai seng-khu-gōa ê tãi-chì.

Chhiú ê sîn-keng sī tùi kēng-chui-sîn-keng (頸椎), kap heng-chui-sîn-keng (胸椎) hoat-chhut-ê, chiū-sī tùi âm-kún ē-pō ê ê só-chāi.

Kha ê sîn-keng sī tùi io-chui-sîn-keng (腰椎神經), kap chiàn-kut-sîn-keng (薦骨) hoat-chhut-ê.

Tē sa<sup>n</sup> chéng ê sîn-keng, sī tī pak-tó kap heng-khám-lāi, teh liāu-lí lâi-chōng, kiò-chòe kau-kám-sîn-keng, (交感神經, *Sympathetic nerves*).

Tōa-náu ê chok-iōng: Tōa-náu siū bé-liu ê chhi-kek (*stimulus*), lâi kám-kak, chiū-sī ngó-koan-khì ê tiong-chhu-khì. Iā kàng bēng-lēng kàu kun-bah hō in ōe

thàn i ê ì-sù, chiū-sī ēng i ê chú-ì lái hō sūi-ì-kun (隨意筋) tín-tāng; iā sī chōan-jian tók-lip ê tiong-chhu-khì. Koh-chài tōa-náu sī tōa cheng-sîn ê só-chāi, ì-sek, phòan-tòan liāu-sū, pah-sng, kì-ek (記憶, *memory*). Chóng-sī án-chái<sup>n</sup>-iū<sup>n</sup> chia̍h ū chit khoán ê kî-lêng, hiān-chhú-sî iáu-bē chai.

Sió-náu ê chok-iōng, sī hō láng ōe kiâ<sup>n</sup>, ōe khiā, ōe khiā tit-tit bô iô-choah, iā teh kóan sūi-ì-kun ê khui-lát.

Iân-chhé sī teh kóan sim kap hì. Nā-sī iân-chhé siū-siong, tãi-khài láng chiū ōe sí, só-í iân-chhé sī tē it iàu-kín ê só-chāi.

Chek-chhé kap sîn-keng ê chok-iōng, chit hāng sī teh thōan chhì-kek tùi bé-liu kàu tōa-náu; kap thōan tōa-náu ê bēng-lēng kàu kun-bah, lái-chōng, seng-khu ták ūi.

Láng ê chhiú tín-tāng ê sî, ū chit ê chhì-kek sī tùi tōa-náu hoat. Chit ê chhì-kek só kiâ<sup>n</sup> ê lō, chiū-sī tōa-náu, tiong-náu, iân-chhé (tī iân-chhé ê lái-bīn, chia̍h ê sîn-keng kè pēng), chek-chhé, chek-chhé ê chēng-kak, chek-chhé-sîn-keng ê chēng-kun, chhiú kun-bah ê sîn-keng, kàu sîn-keng ê bé-liu (tē 99, 100 tô.)

Chiah ê chhì-kek, nā tùi tōa-náu iū-pêng khí, seng-khu chó-pêng òe tín-tāng; iā nā tùi tōa-náu chó-pêng khí, seng-khu iū pêng òe tín-tāng. Chit-ê sī in-ūi ūn-tōng-sîn-keng teh kè pêng (*crossing of the motor nerve fibers in the medulla*). Iū-chhiú nā chhák-tiòh, hit ê thià<sup>n</sup> ê chhì-kek ū thōan kàu tōa-náu, m̄-sī iū-pêng, sī kàu chó-pêng. Chiah ê ti-kak ê chhì-kek teh chiū<sup>n</sup> kàu tōa-náu ê sī, tī chek-chhé kap iân-chhé ê lāi-bīn ū keng-kè tùi hit pêng chiū<sup>n</sup>-khì.

Khòa<sup>n</sup> tē 100 tô chiū òe chai ūn-tōng ê chhì-kek, kap ti-kak ê chhì-kek só tiòh kiâ<sup>n</sup> ê lō, iā só tiòh keng-kè ê só-chāi. Hit ê khah tōa tiâu ơ-ơ-ê, sī ūn-tōng chhì-kek ê lō, hiah ê chit tiám chit tiám khah sòe-ê, sī ti-kak chhì-kek ê lō. Hiah ê chì<sup>n</sup> teh pí hō lāng chai, ūn-tōng ê chhì-kek teh lōh-kē, ti-kak ê chhì-kek teh chiū<sup>n</sup> kôai<sup>n</sup>.

N C H,	Tōa-náu chó-pêng,
N I,	Tōa-náu iū-pêng,
C,	Chek-chhé,
P K,	Phê, kap Kun-bah,
a b,	Tī iân-chhé kè-pêng ê só-chāi.

Hóan-èng-chok-iōng (反應作用, *Reflex action*). Chit-ê chiū-sī chek-chhé koh chit hāng ê chok-iōng, ū-sī kiò-chòe hóan-siā-chok-iōng. Chhek-kài-kut ê ē-tóe thâu-chêng ū chit tiâu kun, nā ká i kòng chit-ē, kha chiū ka-kī òe sió-khóa that chìn-chêng. Chit-ê m̄-sī lāng ê chú-í chiah án-ni. Chit ê lí, sī kòng ê chhì-kek, kiâ<sup>n</sup> kè ti-kak-sîn-keng kàu chek-chhé. Tī chek-chhé-lāi, liū-thōan kàu ūn-tōng-sòe-pau, tùi chia chhì-kek thōan kè ūn-tōng-sîn-keng, kàu kha kun-bah ê sîn-keng bé-liu, hō kha òe that tùi thâu-chêng-khì.

Nā khòa<sup>n</sup> tē 101 tô, chit hō hóan-èng-chok-iōng khah òe hiáu-tit. Tī chia N sī sîn-keng-sòe-pau. Thōan chhì-kek kàu hia chiū-sī sîn-keng A. Chit tiâu sîn-keng sī tùi phê-hu S lāi. Kap sîn-keng-sòe-pau ū koh chit tiâu sîn-keng sa<sup>n</sup>-liân E; chit tiâu kiâ<sup>n</sup> kàu kun-bah M. Nā-sī phê-hu siū-tiòh chhì-kek, chhin-chhiū<sup>n</sup> chhák-tiòh, sio-tiòh, **chit** ê chhì-kek liām-pi<sup>n</sup> thōan tùi sîn-keng A, kàu sòe-pau N. Sòe-pau siū-tiòh chit ê chhì-kek, liām-pi<sup>n</sup> kàng bēng-lēng kàu kun-bah M. Chit ê bēng-lēng só kiâ<sup>n</sup> ê lō, chiū-sī hit tiâu E sîn-keng; tùi án-ni hit ê kun-bah M, chiū liām-pi<sup>n</sup> kiu-khí-lāi. Sîn-keng A sī ti-kak-sîn-keng; sîn-keng E sī ūn-tōng-sîn-keng. Lāng nā chhùi-lāi kām sng ê mih, nōa-chōa<sup>n</sup> chiū liām-pi<sup>n</sup> chhut nōa-ék khah chōe; chit-ê iā sī tùi hóan-èng-chok-iōng.

Khùn, sī sîn-keng tiā<sup>n</sup>-tiòh ê sî-kî; hit ê sî-chūn, tiong-chhu-khì-koan cheng-sîn ê chok-iōng chiām-sî thêng. Ài khùn ê in-toa<sup>n</sup>, iáu-bē tek-khak chai, ũ kúi-nā ê lí-lūn: chit-ê sī tī náu-lāi ê huìh-kng ũ sok-óa, hō náu-lāi ê huìh khah chió, hō náu chiām-sī pîn-huìh (*anaemia*). Ū lāng kóng, chit-ê ê in-toa<sup>n</sup> sī lāng cheng-sîn ê sî, teh chòe kang á-sī thák-chheh, bô lô-ēng ê mih chhin-chhiū<sup>n</sup> thòa<sup>n</sup>-sng, ũ chek-chū tī i ê seng-khu-lāi; iā hit ê thòa<sup>n</sup>-sng nā kè-thâu oē kám-kek iân-chhé. Iân-chhé ê chok-iōng ê chit hāng sī teh kóan-lí huìh-kng, tui án-ni náu-lāi ê huìh-kng oē sok-óa, hō huìh lī-khui náu, án-ni chiū lāng oē ài beh khùn. Teh khùn ê sî, hiah-ê bô lô-ēng ê mih ũ pài-chhut, iā seng-khu ê lát ũ chek-chū khah chōe. Tiong-chhu-khì nā ũ chu-ióng-liāu kàu-giáh chōe, lāng liām-pi<sup>n</sup> chiū chí<sup>n</sup>.