
LOKWALŌ LWA GO TSHELA
SENTLÊ

THE BOOK OF HEALTH

MACVICAR AND SHEPHERD



THE LOVEDALE PRESS

LOKWALÔ LWA GO TSHELA SENTLÊ

Lo kwadikwe ké

Dr. N. MACVICAR, M.D., LL.D., D.P.H.

le

Dr. P. M. SHEPHERD, O.B.E., M.B., Ch.B.



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1952

THE BOOK OF HEALTH

By

Dr. N. MACVICAR, M. D., LL.D., D.P.H

and

Dr. P. M. SHEPHERD, O.B.E., M.B., Ch.B.

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KETAPELE.

MOKGWA WA GO DIRISA LOKWALO LO.

Lokwalô lo, ga lo a lebagannngwa fêla go dirisiwa ké baithutwana le matitšhere mo dikoleng tsa rona, mme lo kwadilwe ka maikaêlêlô a go thusa batho botlhe, bagolo le bana go tshela ka boitekanêlô, mme ka go dira jalo go tshela matshelô a mantlê.

Re batla gore batsadi ba itse se se rutwang bana ba bônê, gore le bônê ba tlê ba re tšhole-tse, mme ba tshegetse se re lekang go se dira. Re tla bôna thušô e, fa batsadi ba tlhaloganya mme ba diragatsa se bana ba se rutwang. Tirô e, e tlhókafala thata mo thutong ya boitekanêlô.

Matitšhere a ka thusa lefatshe ja ôñê fa a ka rulaganya gore bagolo ba na ba kôpana gangwê kgotsa gabedi ka beke ka lobakanyana go itisa ka kgaolô ngwê ya lokwalô lo. Ba ka nna ba tšwêlêla pele ka go oketsa go bala dikwalô tse dingwe, le fa go phuthegile batho ba le babedi kgotsa ba le bararo fêla, lobaka lo tla šwêlêga-molemô.

Kgakololô ka fa lokwalô lo, lo tšhwanetseng go dirisiwa ka gônê ké gore : A lo se dirisiwe fêla jaaka lokwalô lwa go bala, mme bogolo a lo lebagannngwê le se baithutwana ba ka se bônang ba ba se dira ka bosi.

Ga go batlege go bôna baithutwana ba senya lobaka ba bala kaga boitekanêlô, mo

boemong jwa gore nakô eo, ba dirê ka mabôgô ditirô tsa boitekanêlô, jaaka go fêela lolwapa kgotsa segôtlô le ntlo, kgotsa ka go agêlêla sediba se batho ba motse ba nwang mo go šônê le go kganêla lešwê.

Fa go na le lobaka, a baithutwana ba ithutê dilô tse di ntseng jaaka go “busetsa phegêlô,” le thutô e e bidiwang “Thušô ya Ntliha.” A ba dirê dilô tse ka bosi, eseng go utlwa kgotsa go bala fêla kaga se se dirwang. Mafoko a batlang go tlhômêlwa thata ké kaga go ja dijô tse di siametseng go otlala mmele.

Re leboga Dingaka Macvicar le Shepherd barulaganyi ba lokwalô lo, le Ngaka Mookami wa lefatshe ja Tshireletšo J.W. Stirling, O.B.E. yo o thusitseng thata ka kgakolôlô ya mathata a puô ya bongaka, yo e bileng e leng ênê o rebo-tseng lokwalô go gatisiwa. Tiro ya phetolêlô e dirilwe ké Mr. Theo. Gaboutlwelwe. Lekang thata gore lokwalô le mafoko a lônê di itsewe ka bophara jwa lefatshe ja rona.

H. J. E. DUMBRELL,
Molaodi wa Thutô.

THULAGANYÔ YA DIPOLÊLÔ.

KÊTAPELE. H. J. E. Dumbrell, O.B.E., B.A.,
Molaodi wa Thutô mo Bechuanaland
Protectorate vii

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GO ITUMÊLÊLA THUSO.

Ditšupô tse di bonalang mo pp. 43, 44, 45 le 46 di gatisitswe ka têtêlêlô ya National Dairy Council, Chicago le Transvaal Milk Union. Ditšhwantšhō tse di bonalang mo p. 80 di tšwa mo lokwalong lo lo bidiwang *Ronald Ross* ka têtêlêlô ya Bagatisi ba Student Christian Movement Press, Limited.

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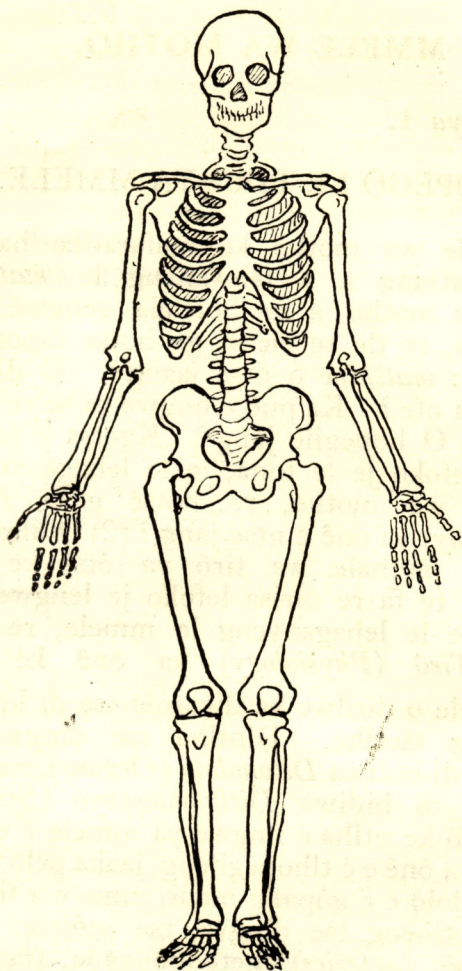
MMELE WA MOTHO.

Kgaolô ya 1.

POPÊGÔ LE TIRÔ YA MMELE.

Mmele wa motho ké mafaratlhatlha a a gakgamatsang a a tšhwanang le *matšhine*. Yare fa motho a re bolêlêla sengwê kaga *matšhine*, re tle re eletse go botsa dipotšô di le pedi: *matšhine* o ntse jaang? O dira ka mokgwa ofe? Ka puô e nngwe re be re botsa gore (1) O bopegile jang? Kgotsa e re fa re dirisa lefoko je le tona, je le lebaganyeng le mmele wa motho, re botsê gore *Popêgô* (*Anatomy*) ya ôné e ntse jang? (2) O dira 'ng? Kgotsa mothale wa tirô ya ôné ke 'ng? Mme e re fa re dirisa lefoko je lengwe je le tona, je le lebaganyeng le mmele, re botse gore *Tirô* (*Physiology*) ya ôné ké 'ng?

Mmele o dirilwe ka dikarolô tse di lomaga-ntšweng tšotlhe. Dintlha tse dingwe tsa mmele di bidiwa *Ditokololô* (*Organs*), mme tse dingwe di bidiwa *Ditlhômaganyô* (*Systems*). *Tokololô* ke ntlha e nngwe ya mmele e e nang le tirô ya ôné e e tlopegileng, jaaka pelo. Pelo ké tokololô e e gôpang madi, mme e a fitisetse mo dintlheng tse dingwe tsa mmele. Pelo, methapô, (*arteries*) methapônyana, (*veins*) le dinthanyana kgotsa ditlhalenyana (*capillaries*) tse di kôpanyang methapô e megolo le e



Marapó a mmele.

A Skeleton

mennye, di akarediwa ka leina ja *Tlhômaganyô*, gonnê di dira mmôgô go tsaya madi a pelo e a gôpang. Tlhômaganyô e, e bidiwa Tlhômaganyô ya tikologô ya madi (*Circulatory System*) Go na le ditlhômaganyô tse dingwe gapê, jaaka tsa marapô, tsa go tlhafuna dijô, tsa go fegêlwa, tsa morotô, le tsa ditshikana.

TLHÔMAGANYÔ YA MARAPÔ.

(*Skeleton or Skeletal System*)

Marapô a mmele a dirilwe go tshegetsa le go sireletsa. Marapô a a kwenneng a leoto le a mokwatla a kitlanya mmele, mme a o tshegetse. Marapô a tlhôngô, a sefuba le lothêka a dirilwe ka kgakgamatšô gore a sireletse ditlhômaganyô tse dikgolo tse di mo teng ga ôné. Diripa tse tharo tse dikgolo tsa mmele ké tlhôngô, sefuba le mpa. Tlhôngô e tshegeditse bobôkô. Mo teng ga sefuba go pelo le makgwafo. Ka fa tlase ga dikgopô, le fa go ka twe mo mpeng, go maname sebeti, lobêti, le diphîô. Mo mpeng go mogodu, mala le mala a mannye. Marapô a lothêka a sireletsa setlha le lela je legolo, le popêlô mo basading.

Marapô a tlhôngô a bidiwa logata. Bogodi-mo jwa tlhôngô bo bidiwa setlhoa, botlase jwa tlhôngô bo bidiwa boitshetlêlô. Marapô a mokwatla ké kgolê ele ngwê-fêla go ya kwa tlhôngong. Lesapô ja mokwatla ga le a tshegetsatse fêla, ebile le sireleditse, gonnê mokôlêla wa mmele o phunyeletsa mosima o mokôlêla o leng mo go ôné. Marapô a mangwe a magolo ké :

Lesapô je le kwa godimo, le je le kwa tlase ja ditlhaa.

Dikgopô le marapô a sefuba.

Legetla (*Scapula*) le lesapô la thamô.

Marapô a letšôgô : Letšôgô je le kwa
godimo = *humerus*

Letšôgô je le kwa tlase (*radius
ulna*)

Malokololô, le marapô a seatla.

Marapô a lothêka le a maragô :

Marapô a leoto :

Serope = *femur*.

Momô = (*tibia, fibula*)

Legwejana le marapô a lonao.

Malokololô. Golô fa marapô a kôpanang gonê go bidiwa malokololô. Malokololô a mangwe a *tlhômame*, jaaka dikgopô di tlhômame mo marapong a sefuba. Malokololô a mangwe a a tsikinyêga jaaka sekgono le malokololô a lengôlê.

TLHOMAGANYO YA TLHAFUNO.

(*Alimentary or Digestive System*)

Mo mmeding go tlhômaganyô ya dijô, le fa go ka twe ya mala. Molomo ké kgôrô ya tlhômaganyô e, mme ké kgôrô e e ka tšwalwang go kganêla lorole le dilô tse dingwe tse di diphatsa tse di ka tsêhang ka leganô. Mo leganong go na le ditokololô tsa go latšwa (kgotsa go lekêlêla ka loleme) mme di lekêlêla dijô tšotlhe pele di ese di tsene mo mmeding, ebile go na le mênô a a tlhafunang dijô go di siamisetsa se mmele o se tlhôngang. Dijô di feta ka mokgokgoma go ya kwa mogodung,

mogodu o tshegetsa dijô, o bo o thuse go di sila, mme o di fetisetsa kwa maleng. Mala le ônê a sila dijô, mme go tloga mo maleng, botute jwa dijô jo bo otlang, le jo bo kwentshang mmele, le go o thuthafatsa, bo tsêwa ke madi go bo isa mo dintlheng tšotlhe tsa mmele. Mala a methale e le mebedi e megolo, ké lela je le bôtlana, boleele jwa lônê ké dikgatô tsa dinao di le mašomé a mabedi a metšô mebedi, le bidiwa lela je le bôtlana gonnê le sesane go na le je legolo, ntšwa lela je legolo, je le atlhameng thata, lônê boleele jwa lonê ele dikgatô tsa dinao dirôba menwana ele mebedi fêla. Masalêla a dijô, a mmele o sa a tsayang, a fetisiwa ka mala, mme a fetoge masepa. Mala a tšwanetse go bêrêka ka letsatsi le letsatsi go thibosa lešwê le.

Fa go twe tsela ya dijô, go têwa leganô, mkgokgoma, mogodu, mala le lela je legolo

TLHOMAGANYO YA TIKOLOGO YA MADI.

(*The Blood or Circulatory System*)

Pelo e kgorometsa madi go tsamaya le methapô (*arteries*) le methapônyana (*veins*). Methapô ké mesêlênyana e e tsayang madi a a itshekileng go a isa mo dintlheng tšotlhe tsa mmele. Mo mading a a itshekileng a, go na le botute jo madi a bo tšhotseng mo dijong tse di jelweng, mme botute jo, ké jônê bo kwentshang mmele. Methapônyana ké mesêlênyana e e tsayang madi a a sa itshêkang mo dintlheng tšotlhe tsa mmele, mme e a ise mo pedung le mo makgwafung.

Mesêlê e megolo ya mmele ké :

Mo sefubeng = Mothapô o mogolo wa mmele mo mpeng le (*aorta*) le methapônyana e megolo (*the main veins*).

Mo tlhogong = Methapô ya thamo (*the le thamô carotid arteries*) le methapônyana ya mometsô (*the jugular veins*).

Mo letšogong = Methapô ya madi a letšôgô ja godimo, le ja tlase (*the brachial, radial, and ulner arteries*) Go na le methapônyana e e dumalang kgotsa e e patileng e megolo e.

Mo maotung = Methapô ya serope, (*the femoral*) le methapônyana ya leoto kwa letlhafung (*popliteal and tibial arteries and veins*).

Pelo e itaya ga 72 ka motšotšo, fa motho a itekanetse mo mmeding. Fa re rata go bôna gore a pelo e itaya jaaka e tšhwanêtse go ka bo e itaya, re baya menwana mo mothapong wa letšôgô fa pele ga seatla, gonnê mothapô o, o bofefo go utlwiwa go na le methapô e mengwe mo mmeding otlhe. Sé, se bidiwa go itaya ga mothapô wa letšôgô.

TLHÔMAGANYÔ YA PHEGÊLO.

(*The Respiratory System*)

Makgwafo a gôpa phêfô e e itshekileng, mme a ntshe e e sa itshekang. Phêfô e e itshekileng e tsêna mo pedung e tšwa kwa makgwafung, go tšwa mo pedung methapô e

isa mo dintlheng tšotlhe tsa mmele. Phefô e e sa itshêkang e tsenngwa mo makgwafung, e tšwa mo dintlheng tse di kgakala tsa mmele, ke madi a a mo methapônyaneng.

Phefô e e itshekileng e tlhōkafala thata gore mmele o itekanêlê. Fa re rôbala mo kamo-reng, kgotsa mo tlwaneng, mme *difenster*e le mejakô di tšwetšwe ka kitlanô e kgolo, e tla re ka lobaka phefô e itshekologe, mme re nne re gope phefô e gapê le gapê ka lobaka lotlhe lo *difenster*e le mejakô di ntse di tšwetšwe go se na phefô e ntšha e e itshekileng e tsê nang. Go tla nna fêla jalo fa re ka ikhuru-metsa, kgotsa ra itshokeletsa ka dikobô re ise re robale. Go nwa phefô e e sa itshêkang go diphatsa thata mo mmeding.

TLHÔMAGANYO YA MOROTÔ.

(*The Urinary System*)

Diphiô di tlhōtlha madi a mmele, mme di fitisetse tshenyêgô le lešwê kwa setlheng. Setlha se tshegetsa madi a a lešwê, a jaanong a bidiwang morotô, go tloga mo setlheng morotô o tšwêla kwa ntlê.

LETLALÔ LA MMELE.

Letlalô la mmele le lônê le thusa go tlosa tshenyêgêlo le lešwê ka go ntsha mofufutšô ka marofanyana a gongwê le gongwê mo mmeding wa motho. Ebile letlalô gapê le a sireletsa. Fa letlalô le ka ngapiwa kgotsa la phanngwa, mosegô o o mo letlalông e ka nna tsela e megare (*germs*) e ka tsê nang ka yônê, mme megare e, ya tsenya bolwetsi.

A go tlhalogangwê gore lešwê jotlhe ja mmele, le tšwa ka mala, makgwafo, le dphiô le letlalô le mmele. Motho yo o godileng o ntsha di“ *ounce* ” di le 100 tsa metse ka letsatsi le letsatsi, ké gore tsa morotô le mofufutšô. Fa go le tsididi, o rota gantsi, mme a fufule go le gonyê. Fa go le mogote, mofufutšô o oketsege, mme morotô o ngotlege. Fa go leka-le-kana fêla, ké gore go se tsididi, le gônê go se mogote, mmele wa motho yo o godileng o ntsha di-“ *ounce* ” di le 50 tsa morotô le di le 50 tsa mofufutšô ka letsatsi.

TLHOMAGANYO YA DITSHIKA.

(*The Nervous System*)

Bobôkô bo tšhwana le kgosi e e tsamaisang le go laola sengwê le sengwê. Baromiwa ba bobôkô ké ditshika. Losika lo logolo lwa mmele, thapô ya mokôlêla, e maname mokwa-tla jaaka mogatla o motelele go tšwa kwa bobôkong, mme mogatla o mo telele o, o na le maphata a le mantsi. Go na le methale e le mebedi ya ditshika. Ditshika tse dingwe ké baromiwa ba ba lereng mafoko mo kgosing, mme tse dingwe di tsikinya dintlha tse dingwe tsa mmele go tsikinyêga kafa kgosi e laolang ka gônê. Ditshika tse dingwe di ka dira tirô tse tšoo-pedi. Ditshika tse di isang mafoko kwa bobôkong di bidiwa *ditshika tsa tlhaloganyô* (*sensory nerves*). Ditshika tse di kgweetsang mmele go dira, kgotsa go tsikinyêga, di bidiwa *ditshika tse di kgweetseng* (*Motor nerves*). Mokgwa o o bonôlô o o šupang kafa

ditshika tse di dirang ka gônê, ké jaaka fa monwana wa rona o fisiwa ké molelô. Pele motho o utlwa botlhoko jo bo tlang ka ditshika tsa tlhaloganyô, jaanong o gôna monwana ka tirô ya ditshika tsa tlhaloganyô tse di kgwe-etsang mesifa ya monwana le letšôgô.

Maphata a a tšwang mo thapong ya mokô-lêla a bidiwa ditshika tsa mokôlêla. Maphata a, a a kôpana, mme a ipope ditshika tse dikgolo tse di phatlalalang le mmele otlhe. Gantsi, ditshika tse dikgolo tse, di tsela ngwê-fêla, ebile di bidiwa ka leina le le lengwê-fêla jaaka methapô le methapônyana e re setse re e boletse.

Kwa ntlê ga ditshika tse tsa mokôlêla, go na le bobedi-bobedi (*pairs*) jwa ditshika di le lešomê le bobedi jwa *ditshika tsa bobôkô*. Bobedi-bobedi jwa ntlha, ké ditshika tsa monkgô, bobedi-bobedi jwa bobedi, ké ditshika tsa pônô, Bobedi-bobedi jwa boraro, jwa bonê, le jwa borataro bo tsikinya dithaka go ya kwa le kwa ; jwa botlhano ké ditshika tse di nêêlang letlalô la sefatlhêgô le mênô, (losika lwa botlhano ké losika lo lo re utlwisang botlhoko fa re tšwerwe ké motlhagare), bobedi-bobedi jwa bošupa bo tsikinya mesifa ya sefatlhôgô, ebile ké jônê bo re dirang gore re tshêgê, tsa borôba menwana e le mebedi ké ditshika tse di re nayang kutlô, tsa borôba monwana o le mongwê-fêla ké tse di re nayang go latšwa (ké gore go utlwa ka loleme), tsa bošomê ké ditshika tse di kgarakatshêgang tse di phololêlang go tsêna kwa magalapeng, dikodu,

mometšô, mogodu, pelo, sebetle le lobêê, ditshika tsa lešomê le bongwê-fêla di tsêna mo mesifeng ya thamô, mme tsa lešomê le bobedi di tsêna mo loleming.

Ditlhômaganyô tse tšotlhe di tšwanetse go itekanêla mme tsa dira mmôgô ka tšhwanêlô gore mmele o fôle, mme o tshelê-sentlê.

Kgaolô ya 2.

DITSHIKA TSE DI FAPHEGILENG. TIRO LE TLAMÊLO YA TŠONÊ.

Ditshika tse tlhano Ditokololô tsa ditlha-
tse di faphegileng. loganyô tse di faphegileng.

MONKGÔ	=NKÔ
GOLATŠWA	=LOLEME LE MAGALAPA
KAMÔ	=LETLALÔ
PONÔ	=MATLHÔ
KUTLÔ	=DITSÊBÊ

Ditokololô tsa ditshika tse di faphegileng di dirilwe ka maatlametlo a faphegileng, mme di batla go tlamêlwa ka botšwerere,

I. *Tlhaloganyô e e faphegileng = Monkô = Tokololô = nkô.*

Tlhaloganyô ya monkô ga twe ké yônê e e boruma le ya pele-pele mo ditlhaloga-nyong tšotlhe. Bontsi jwa diphôlôfôlô bo dirisa tlhaloganyô e, go feta ditlhaloganyô tse dingwe le go gaisa batho. Tlhaloganyô ya

monkgô e lootsegile thata mo dintšeng mme di e ikantsê thata.

Ditshika tsa monkgô (*nerves of smell*) di khutla ka fa tlase ga sephaphatšhana sa letlalô se se kwa godimo ga letlalô la nkô. Nkô e lekêlêla menkgô yotlhe, mme e romele mafoko kwa bobôkong gore menkgô e o e ntse jaang.

Yare fa motho a fegêlwa ka go iketla, bogolo jwa phefô bo tsene ka botlasê jwa nkô. Ere fa a fegêlwa thata phefô e patelesege go tsêna ka nkô kwa godimo, kwa ditshika tsa monkgô di leng gônê. Ké gônê kafa re tle re fegelwe thata fa re rata go gôpa bodupa jwa sethunya ka botlalô.

Phefô yotlhe e e tsê nang mo mmeding e tšwanêtse go tsêna ka dinkô. Ké têmalô e e mašwê go fegêlwa ka molomo. Mo nkong go na le boditsenyana jo bo kganêlang lorole le lešwê go phololêla le mmele otlhe. A go êlwê-tlhôkô gore lorole lo lo ntseng jaalo lo seka lwa letlwa go aga mo nkong. Yare motlha mongwê re othimole, gonnê nkô ya bo e leka go tlosa sengwê se se šakgatsang sephaphatšana kgotsa lotha lwa letlalô la nkô. Fa motho a tšwerwe ke “mhikêla,” o tle a thologe metse ka dinkô. Sé, gapê, nkô ya bo e leka go tlhatšwa lešwê kgotsa megare e e tsentseng mhikêla. Fa re tšhwerwe ké mhikêla, nkô e tle e ruruge mo teng, mme e palelwe ke go dupêlêla, gonnê mafêlêlô a ditshika a bo a katiegetse mo borurugeng, mme monkgô o palêlwa ké go kgabaganyetsa kwa mafelelong a ditshika.

II. *Tlhaloganyô e e faphegileng : Ditokololô: Loleme le magalapa.*

Ditokololô tsa go latšwa (kgotsa go utlwa ka loleme) di na le maphatanyana, mme maphatanyana a ka bônwa sentlé ka kwa moragô ga loleme. A bopegile jaaka tlhaka e, V. Maphata a, a na le dikala tsa tatšô. Dikalanyana tse ké dingatanyana tsa mafêlêlô a ditshika. Dikalanyana tse tsa tatšô di kwa magalapeng a molomo, mme tse dingwe di ka fa morago ga mometšô.

Go na le methale e le menê ya tatšô, Botshe, botšarara, letšwai le botlha, mme mothale mongwê le mongwê o na le dikalanyana tsa tatšô tse di romêlang mafoko kwa bobôkong.

Ereka dijô tšotlhe di tsêna ka leganô go ya mmeding, mme dilatšwiwa di be di lekelelwe ké ditokololô tsa tatšô, go tlhókafala thata gore leganô le nne phêpa ka metlha. Go šwabisa thata go bôna maganô a batho ba le bantsi, le mênô a le lešwê. Fa leganô le le lešwê kgotsa le na le boladu, lešwê le boladu di tla tsêna mo mmeding, mme boitekanêlô jwa mmele otlhe bo senyege. Go batlêga thata gore melomo ya rona e nnê phêpa le gore dijô tse re di jang le metse a re a a nwang, a itshêkê mme a nnê phêpa ka metlha. Masalêla a dijô a a iphitlhang fa gare ga mênô a bodisa mênô, mme a nkgise leganô, ké gônê mênô a tšwanetseng go tlhatšwiwa ka segotlhi kgotsa ka phatsanyana ya logong gabêdi ka letsatsi moragô ga dijô. Leganô le lônê le phêrafadiwê ka metse.

III. *Tlhaloganyô e e faphegileng. Kamô = Tokololô = Letlalô.*

Ditokololô tsa Kamô di mo letlalong bogolo. Mo letlalong tôta, ké gore di kwa teng ga letlalô eseng fa godimo. Jaaka ditlhaloganyô tsa tatšô, ditlhaloganyô tsa Kamô le tšônê di na le methale e le menê ya mafêlêlô a ditshika mo letlalong. Mafêlêlô a ditshika a romêla mafoko kwa bobôkong kaga *Kamô*, gore a e *setlhabi*, a e ya *fisa*, kgotsa e *tsididi*.

Go molemô thata gore mmele o nnê phêpa ka metlha, fa letlalo la mmele le le phêpa le tla thusa gore marofanyana a mofufutšô o tšwang ka ôné a se ka a kabala. Mmele wa rona o nna phêpa fa re tlhapa ka metse a a itshêkileng le ka *sesepe*. *Sesepe* le metse a a bothitô di thusa go tlosa lorole le lešwê ka bonakô. Fa re ka dirisa *sesepe* se se siameng, eseng *sesepe* se se sa dirêgang, go ka nna molemô thata.

Dinala, e ntse ké letlalô le le dirilweng ka mokgwa o o faphegileng go dira tirô e e faphegileng. Masalêla a dijô a atisa go kgomarêla fa gare ga menwana ya seatla le ya maoto, le mo dintlheng tsa dinala. Ga go lebege sentlê go bôna tsela e ntšho, e e mo ntlheng tsa dinala, gonnê e re bolêlêla gore mong wa dinala o letla lešwê go tlhômama mo dinaleng. Go dira jaalo go ka senya boitekanêlô jwa mmele wa motho, gonnê gongwê le gongwê kwa lešwê le gônê, megare e e jalang bolwetsi le yonê e gônê, mme megare e, ke dilô tse di tlhabanang

le boitekanêlô jwa batho, mme fa e ka fenya mo ntweng ya yônê, batho ba tsênwa ké bolwetsi, mme motlha-mongwê ba šwe. Ga re ka ke ra lesa mmaba go aga mo tlung ya rona fa re itse gore o gônê. Jaanong ka re itse gore baba ba, ba ditshidinyana ba atisa go nna kae, re tšhwanetse goba lélêka ka go tlhapa mebele ya rona le ka go kgaola dinala, le go ntsha lešwê lotlhe ka fa tlase ga dinala.

Fa motho a sena go tlhapa ka metse a a bothitô, motho o ka itshêla metse a a tsididi mo mmeding, gonnê metse a a tsididi a tlho-tlheletsa letlalô go lere madi a a bothitô, mme motho a ikutlwe phôlô ya motho a sena go tlhapa ka metse a a tsididi.

Letlalô le le fa godimo ga dintlha tsa menwana, le na le mafêlêlô a ditshika tsa kamô mme di bosisi thata go feta tsa ditokololô tse dingwe.

IV. *Tlhaloganyô e e faphegileng. Pônô = Tokololô = Matlhô.*

Matlhô a tshwana le *difenster* tse re bonang ka tšônê. Fa matlhô a buduladitšwe, mmele otlhe o lefifi.

Re ithutile mo Kgaolong ya I, gore ditokololô tse di faphegileng tsa mmele di sireleditšwe ka mokgwa o o faphegileng. Leitlho ké tokololô e kgolo, mme le beilwe mo khuting ya marapô, ebile le na le losire (losi) lo lo ka tšwalwang ka bonakô go kganêla dilô tse di diphatsa.

Go tlhókafala thata gore leitlhô le nnê le ntse le na le bongôlanyana mo teng ga jônê, gonnê go na le kgekgele kwa godimo ga losi, mme tirô ya yônê ké go nna sedibêla sa metse. Sedibêla se, se ntse se rothisa metse a a kgabaganyang leitlhô, mme jaalo se nne se tlhatšwe thaka ya leitlhô. Metse a feta lerofanyana go ya kwa nkong. Fa selabê, kgotsa ntshi di ka tsêna mo leitlhong, kgekgele e rothisa metse a le mantsi go leka go tlhatšwa lešwê kgotsa ntshi mo leitlhong. Metse a, re a bitsa dikeledi.

Leitlhô le dirilwe ka mokgwa o o gagamatsang go amogêla lesedi, ntšwa le gana go amogêla lesedi le le letona ka nakô e le ngwêfêla, lesedi je, le tlhomilwe mo teng, le kwa morago ga leitlhô kwa ditlhaloganyô tsa pônô di leng gônê. Ditlhaloganyô tse di isa mafoko kwa bobôkông kaga ditšhwantšhō tse lesedi le di šupang.

Matlhô a ka gadima kwa le kwa ka tirô ya ditshika tse di kgweetsang di dira mo mesifeng ya leitlhô.

Fela jaaka mo ditokololong tse dingwe, go tlhókafala thata gore leitlhô le nnê le le phêpa. Thurugô ya leitlhô ké bolwetsi jo re lo itseng, mme e ka senya leitlhô thata, kgotsa ya ba ya fofatsa. Thurugô e, e tla ka go lesa lešwê le lorole tse di nang le megare go tsêna mo leitlhong.

V. *Tlhaloganyô e e faphegileng : Kutlô : Tokololô : Tsêbê.*

Tsêbê e na le dikgaoganyô di le tharo : *kwa-ntlê, bogare*, le boteng, Ntlha e e tšwe-tseng kwa ntlê, (ké gore tsêbê) le lerofa je re le bonang, ké tsêbê *Kwa-ntlê*.

Fa re ne re ka bôna mo teng ga lerofa, re ne re tla bôna gore le tšwetšwe kwa tlase ké letlalô je lesesane je lešweu, mme le papannwê go kgabaganya lerofa. Letlalô je, le bidiwa *pitsana ya modumô (drum)*.

Mo teng ga pitsana e, ké *bogare* jwa tsêbê. Felô fa, go na le phefô mo teng le marapônyana a le mararo a a tlhomaganyeng go kgabaganya.

Fa O feta fa, o tsêna mo *botennyeng* jwa tsêbê, fa losika lwa kutlô lo tšwang gônê go ya kwa bobôkong.

Modumô o tsêna mo kgorong e e kwa ntlê, fela jaaka motho a letsa lonaka kgotsa phala, tsikinyêgô ya phefô e itaya pitsana e ; e phaphasele ; mme e tsikinye maraponyana a mararo a mo bogareng jwa tsêbê, mme mafoko a bolêlang modumo a isiwe kwa bobôkong ké ditshika tse di mo botennyeng jwa tsêbê.

Pitsana e, e mo teng ga tsêbê gore e tle e sirelesêgê. Kana tlhôle e matsêtsêlêkô jang kaga dilô tse di batlang tshireletšo. Letlalô je le khurumetseng pitsana le boruma go phunngwa. Motlhamongwê le ka phunngwa ke boladu fa bogare jwa tsêbê bo rurugile. E tle e re motlhamongwê batho ba nne ba intshe ditšhoka mo tsebeng ka logong. Go

diphatsa thata go dira jalo. Fa sekhurumelô sa pitsana se ka phunyêga, kutlô e tla nna tshesane. Fa go na le sengwê se se kabileng tsêbê, a motho a ye kwa ngakeng. Fa tsêbê e le lešwê, mme e tletse ditšhōka le gônê go batla ngaka. Ditšhōka ké lookwane lo lo logetsang tsêbê, mme le gale e ka re motlha opê lookwane lwa feta selekanyō, mme jaalo lwa kaba tsêbê.

Fa tsêbê ka kwa ntlê e ka nna phêpa ka metlha, lorole le lešwê ga di ka ke tsa bōna sebaka sa go tsêna.

Ditlhaloganyō tse di faphêgileng tse tlhano tse, di batla tlamêlô e e faphêgileng ya bophêpa.

Kgaolô ya 3.

BOIPABALELO JWA MOTHO KA ESI,
DIAPARO, MORIRI.

Tlamêlô ya Letlalô.

Letlalô ga le khutle go nna le ntsha mofufu-tsô le lookwane le go itlobola. Jalo letlalô le dira lešwê ja lone ka losi. Mehama ya letlalô e e sa apesiwang ke sepê, jaaka sefatlhōgō, le diatla di amogêla lešwê je le tšwang kwa ntlê. Mehama e e sa apesiwang, le mafêlô a a fufu-lang bobbe, bogolo ka fa tlase ga magwafa, le fa gare ga maoto e tšwanetse go tlišwiwa ka letsatsi le letsatsi. Go tlhapa mmele ka letsatsi lengwê le lengwê ké se batho botlhe ba tšwanetseng go se gwalalêla. Fa go se kake ga dirêga jaalo, a mmele o tlhatšwiwê bonnye gabedi ka beke.

Mo mafelong a metse a thôkafalang, go ka dirêga gore motho a tlhapê mmele, mhama o le mongwê-fêla ; motho a simolole ka tlhôngô a e go tsêna kwa maotung, a dirisa metse a ntse a le mangwê-fêla a selekanyô sa mogotšana. Basimane ba ba ša le basetsana ba tšwanetse go tlwaediwa mokgwa o, gore o kôkôtêgêlê mo go bônê. Fa metse a tlhókafala thata, metse a selekanyô sa mogopo a ka lekana go tlhapa mmele fa motho a tlhapêla mo mogotšaneng. Kolobetsa khainyana, O e tshasê *sesepe*, mme O tlhapê ka yônê, O tloge O gamolê *sesepe*, mme O e dirê jalo gapê. Fa O na le dikhai di le pedi, ngwê O ka tlhapa sefatlhôngô le tlhôngô, e nngwê wa e dirisa mo mhameng o o setseng.

Sesepe se se ka dirisiwang :

O seka wa dirisa *sesepe* se se bidiwang *Carbolic soap* fa O tlhapisa masea le banyana ba ba nnye, le fa e le *sesepe* se se tlhatšwang diaparo, jaaka *sesepe* se se sêtlha, kgotsa se se bududu kgotsa se se bidiwang lesedi ja letsatsi (*sunlight*). Di babisa letlalô, gore le ngwaiwê, bogolo fa go le mariga. O dirise *sesepe* sa *toilet*, kgotsa bogolo O seka wa dirisa *sesepe*, mme O tlhapisê ngwanyana ka matse a le osi fêla le ka khai e e bolêta.

Tlamêlo ya diatla.

Diatla di tšhwanetse go tlhapiwa pele ga dijô dingwê le dingwê. Dinala le tšônê di nnê phêpa, le letlalô je le kwa moragô ga dinala le gotlhwê.

A mongwê le mongwê a nnê le seiphimolô.

Botlhoko jwa matlhô bo tsêna ka ntata ya gore bana ba lolwapa ba tle ba dirise seiphimolô se le sengwê-fêla. Dinthô tsa letlalô le bolwetsi jo bo thêlwang bo tla ka yônê tsela e. A mongwê le mongwê, ngwana mongwê le mongwê, le losea tôta, a nnê le seiphimolô se se tšhwailweng.

Tatlhêgêlô ya boitumêlô jwa bophêpa :

Ngwana yo o lešwê, yo tlhōgō ya gagwê e tletseng dinta ga kake a itapolosa sentlê bosigo, o lala a tlhanamologa, a ingwaya tlhōgō. Boitekanêlô jwa gagwê bo senyege ka ntata ya go bisa go robala monate le ka tidimalô jaaka ngwana yo o phêpa. Mme ere ka letsatsi le letsatsi, bosigo le bosigo a nne a tšwelele pele jaalo.

Ngwana yo o phêpa ga a tšhwenyege ka tsela e. O a tshameka, a ithute, mme a itumele a ba a lebale gore o na le letlalô.

Diaparô.

Dilô tse diaparô di dirwang ka tšônê ké boboa jwa dinku, Tlhale, le khai ya sei.

Diaparô tse di dirilweng ka boboa di bothithô ebile di a ikanyêga, ka gonnê ga di še ka bonakô. Lefa go ntse jaalo di batla madi a matona, ebile di thata go tlhatšwiwa.

Diaparô tsa Tlhale.

Diaparo tse di dirilweng ka tlhale di madi a kwa tlase, di bonôlô go tlhatšwiwa, mme ga di ônale ka pela. Ga di senye madi, mme ga di bothithô fa go le tsididi, ebile gape diphatša

tša tšônê ké go ša ka bonakô. Mo lefatshing leno ja Afrika wa Borwa batho ba le bantsi ba šwa ka go ša, diaparô tša bônê tse di dirilweng ka tlhale di kapile molelô. Diphatsa dikgolo thata mo baneng ba ba aparang diaparô tša mothale o. Banyana ba ba nnyenye ba ba aparang diaparô tse, ba seka ba tlogêlwa ba le bosi gaufi le molelô wa leišô.

Diaparô tša Sei.

Diaparô tša *sei* di dirilwe ka boboa jo bo bonôlô, mme gantsi boboa bo kopanngwa le tlhale. Diaparô tša mothale o di tlhatšwêga sentlé, le gônê di tsaya sebaka di ise di ônale, ebile di thata. Ga di bothithô, mme le tšônê, jaaka diaparô tša tlhale di kapa molelô ka bonakô.

Diaparô di tšhwanetse go rêpa, tša lekana motho sentlé. Ga go batlege sepê se se ka pitlaganyang thamô, mmele kgotsa ditshika. Diaparô tse di semoma di kgoreletsa tikologô ya madi.

Diaparô tse di tshesane mo mmeding, ya re fa go le tsididi di lese mogote go falola, me jalo di koafatse mmele go kgoreletsa malwetsi mangwê, bogolo thurugô ya makgwafo.

Go diphatsa go ikoêlêla diaparô, bogolo fa go le mogote ; gonnê go dira jalo go kganêla mogote go tšwa mo mmeding, go batlêga thata gore mogote o tšwe mo mmeding.

Fa banyana ba bipile mmele otlhe wa bônê ka diaparô, ba rwele ditlhako, *dikausi*, maro-kgwê, dibaki, dikatiba : Batsadi bangwê ba tle ba itumele go apesa bana ba bônê jalo, mokgwa

o, o koafatsa bana, marapô a bônê a nne botôbêtôbê, mme a atise go ôbêga. Ngwana yo o golang o batla go aramediswa letsatsi. Fa go le mogote, a bana ba aparê lotsatsa, ba tsamaye ba sa rwala sepê mo maotung, mabôgô a bônê a apogile.

Diaparô tsa teng di tshwanetse go nna phêpa.

Lešwê ja letlalô le tsêna mo diaparong tsa teng, mme le bole, le dire gore diaparô di nkgê bošula. Ka bonakô fa hempe kgotsa seaparô sengwê sa teng, se simolola go nkgâ bošula a di apolwê go aparwê disele. Fa motho a rwele ditlhakô le *dikausi*, a motho a tlhapê maoto ka letsatsi lengwê le lengwê, *dikausi*, di fapaanngwê fa di somolola go nkgâ bodupa. Ditlhako tsa rêkêrê ga di a siama. Di fufudisa dinao, mme di di nkgise.

Bolwetsi jwa lophalô (go ingwaya) ké bolwetsi jo bo thêlwang ké diaparô tse di lešwê. Fa bolwetsi jo bo le gônê, diaparô tšotlhe tsa teng di batla go tsenngwa mo metsing, a a tlhatleilweng, mme tsa belêla mo go ônê, dikgôkgô tsa tlhatswiwa ka setlôlô sa *sebabole*. Fa e le banyana ba tshasiwe *baseline* e kopantšwe le setlôlô ka go lekana. Dira jalo ka malatsi otlhe go fitlhêla dinthô, kgotsa logôgô lo fôla.

Dinta mo diaparong. Dinta di bônwa mo bathung ba ba sa tlhapeng, kgotsa ba ba sa fapaanyeng diaparô tsa bônê tsa teng. Mekgwa ya bophêpa e kgoreletsa dinta. Batsadi ba tshwanetse go tlhokômêla diaparô tsa bana le

go runa bana, gonnê e ka re motlha-mongwê bana ba thêlwa ké ba bangwe dinta kwa me-tshamekong.

Mo mafatshing a le mantshi, batho ba ba se nang kitsô ba ithaya gore dinta di tšwa mo letlalong. Se, ké go tlhoka tlhaloganyô. Dinta di tšwa mo maeng a dinta tse dingwe.

Dinta di fenngwa ke mogote o mogolo, Ké gônê ka fa dinta di leng dintsi mo mafatshing a a tsididi go gaisa mo go a a mogote, ebile gapê ké gônê ka fa dinta di leng dintsi mariga go feta selemô. Ke tlwaelô e e siameng go itlwaetsa go anêga diphatê le dikôbô mo letsatsing ka malatsi otlhe, fa go ka dirêga a di anêgwê mo lentšweng je le sepapetla kgotsa fa godimo ga ditlhomešô tsa *disenke*. Kgotsa fa O rata O ka apaya diaparô, kgotsa wa di sidila ka tshipi e e molelô, wa tlhokômêla go sidila memenô.

Fa O bolaya dinta mo tlhogong, tsela e e botoka ke go beola moriri, O o tšhubê, O sekolê tlhôngô. E seng jalo O tlhakanye *parafina* le *ole* le metse a tletseng *sesepe*, mme O inê moriri mo go ônê ; metse a a tletseng *sesepe* a lekane le *ole* e e tlhakantšweng sentlê. Jaanong o rwalê, kgotsa O bipê tlhôngô ka khai mme O e lesê bosigo jotlhe. E re ka mošô O tlhapê tlhôngô ka *sesepe* le metse a a molelô. *Parafina* e le yosi e ka re motlha-mongwê ya phanya letlalo ja tlhôngô. O kopanye ntlha e le ngwê-fêla mo dintlheng di fêra menwana e le mebedi tsa mafura a dirilweng ka matlhonkomane (*nut oil*) kgotsa O tshase mmele otlhe, ka *sesepe* se

se boleta sese bidiwang *Pamula Soap*, mme O kgaole moriri. Manô a, a tlhagisitswe ké Lekgotla ja Kopano ja Pabalêlô, (Union Public Health Department).

Baithutwana ba tšhwanetse go nna phêpa.

Mo dikoleng di le dintsi Matitšhere a bopeletsa bana ka mošô mongwê le mongwê, mme ba keleke mongwê le mongwê ka kêlôtlhokô, ba tlhokômetse moriri, mênô, diaparô, diatla, le dinala. Mo dikoleng tse di kopanyeng le Lekgotla ja Banyana ba Sefapano se se Fibidu (Junior Red Cross) tlhatlhobô e dirwa ke baithutwana ka bosì.

Tlamêlô ya mênô.

Gotlha mênô maitseboa mangwê le mangwe O ise O ye go robala, gore leganô la gago le lale le le phêpa bosigo jotlhe. Go botoka gore O a gotlhe moragô ga dijô dingwê le dingwê. (Betšwana ba bogolo-golo ba ne ba dira jalo). O gotlhê kwa godimo le kwa tlase gore O tle O gotlhê sentlê fa gare ga mênô. Fa O ka tlopolo letšwainyana, mme wa le tsenya mo metsing, le siame fêla jaaka melemô e mengwe ya mênô e e dubilweng go gotlha mênô. Molôra wa dikgong o batho ba bangwe ba o dirisang go gotlha mênô ga wa siama, gonnê o utlwisa marinini botlhoko. Leswê je le sêtlha je le tle le ipope mo menong le tšwanetse go falwa.

Mênô a a simololang go bôla, a tšhwanêtse go seka-sekwa ké ngaka ya mênô, (dentist).

Go bôla ga mênô.

Erile pele ma-Afrika a bo a na le mênô a pôpôta, mme le gompieno bangwe ba sa ntse ba na le ôné. Dijô tsa Bašweu ke tšônê di senyang mênô a batho ba le bantsi gompieno. *Borôthô jo bo šweu*, dikuku (*biscuits*) *Reise yo mošweu*, bogôbê jo bo apeilweng ka bupe jo bo boleta thata, dijô tse di latlhegetšweng ké thata ya tšônê ka go silwa boleta gore di be di tlhokê thata ya go nonotsha marapô le mênô, dijô tse di mediwang fêla di sa tlhafunwe, tse di tlhokisang mênô tirô ya go tlhafuna, dijô tse di ngaparêlang fa gare ga mênô, dimomona, (*sweets*) di senya thata. Botshe fa bo bela bo dira botlha, mme botlha jo bo simolole go bodisa mênô. Thutô e dingaka le dingaka tsa mênô di e rutang ké e : tlamêla mênô a gago go nna phêpa, mme O je dijô tse di sa tšwaisiwang bobé ka botshe, bogolo O ikanye go ja tse di magwata. Maungô a siame thata, mme maši ké ôné dijô tsa mannete. Maši a na le taka e tšhweu (*lime*) mme ké yônê e e nang le dilo tse di nonotshang meno.

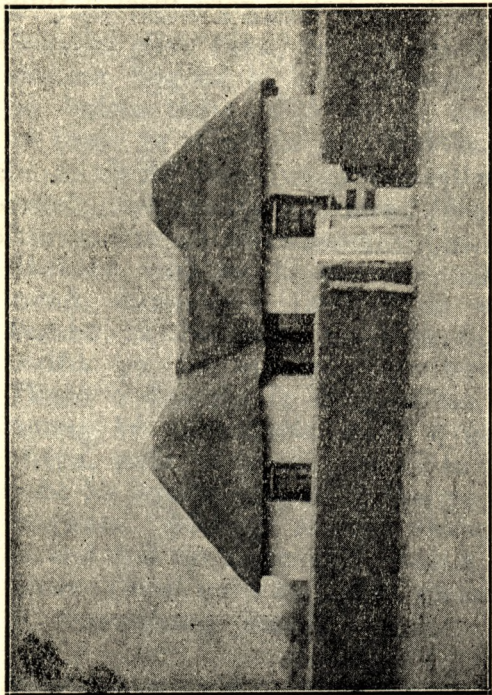
Thulaganyô ya dinakô tsa dijô :

Pabalêlô ya boitekanêlô e batla gore go nnê le dinakô tse di tlhomameng tsa dijô. Bana ba tšhwanetse go ja pele ba ise ba simolole go ya sekoleng. Fa ba seka ba ja, e tla re dinakô di ntse di feta ba koafale ka ntlha ya tlala, mme ba palelwe ké go ithuta. Jalo ba senye lobaka lwa bônê le lwa titšhere.

Ké thušô e kgolo mo banyaneng go nwa maši ka komiki e kgolo ka letsatsi lengwê le lengwê ka nakô ya sekole se tshameka. Kwa Enyelane, le kwa Amerika go dirwa jalo. Matitšhere otlhe a bolêla gore maši a thusa bana go ithuta. Gapê a ba thusa go gola le go nonofa.

Tlwaêlô ya mekgwa e mentlê :

Bana ba tšhwanetse go tlwaediwa go ithoma (go ya nageng) ka malatsi otlhe ka dinakô tse di tlhomameng, mme tlwaêlô e, e tshegediwê le mo dinakong tsa bogolo.



(Photo by Miss C. J. Foster.)

Ntlo e e siameng

A Good House.

SERIPA SA II

TIKOLOGO.

Kgaolô ya 1.

KAGÔ YA MATLO.

Kakaretšo :

1. Ntlo ga ya tšhwanêla go nna *nnye*. *Matlo a pitlologileng* a naya ba ba nnang mo go ôñê sebaka sa go rôbala mongwê le mongwê a le kgakala le yo mongwe. Go rôbala jaana go ba naya phefô e e lekanyeng, e bile go kga-nêla malwetsi a a thêlwang gore a se anamê.

2. Matlo a a lefifi ga siamêla boitekanêlô jwa botshelô. Phatsimô ya letsatsi e bolaya dilomi le lešwê, mme bogolo e bolaya megare le ditshidinyana tse di anamisang bolwetsi jwa lohuba. Ké gônê a ntlo e nnê le *difensterere* tse di atlhameng.

3. Fa e se fêla go le pula e e nang ka phefô kgotsa go le phefô, kgotsa phefô le pula mmôgô, *difensterere* ga di a tšhwanêla go tšwalwa gotlhe. Le bosigo tôta, di tšwanetse go bulwa. Batho ka dinakô tšotlhe ba tlhôka phefônyana e e tsibosang. Malaô a tšhwane-tse go bêwa gaufi fa thoko ga difensterere go tila phefô e e bošula.

4. Ntlo e tšhwanetse go nna phêpa. Go se kgwelwe sepê fa fatshe. Go se nne dilomi mo dipoteng kgotsa mo malaong.

5. Ntlo e tšhwanêitse go nna sephiri sa ba ba agileng mo go yônê fêla, e kgaogantšwe le matlo a mangwe, le fa e le ka kagêlêlô, lobota, kgotsa setsha sa lefatshe. Ké ka tsela e fêla motho o ka kgônang go kgaoganya bana le bana ba matlo a mangwe, le go tla malwetsi a a ntseng jaaka sefuba sa mokwatlalalô, le sekgwaripana. Go aga ka sebopêgo se, go thusa le go kgalemêla bana.

6. Fa go ka dirêga go batlêga gore *dikamore* tsa kagô di nnê mo tlung e le yôsi, eseng go nna kwa le kwa. Ké mokgwa o o mašwê go aga matlo ka go a kgaoganya-kgaoganya. Bana ba tšhwanetse go rôbala ka fa tlase ga ditlhomešô di le dingwê-fêla le batsadi ba bônê. Ka tsela e, batsadi ba tla itse se bana ba se dirang, le gore a ba itekanetse.

7. Molelô kgotsa segotsetso, di nnê fa thoko ga *kamore* fa felong fa go siameng ga leišô. Fa e le molelô o o kwa ntlê fêla, o tšhwanetse go sirelediwa kgore banyana ba ba nnye ba se ka ba o atamêla.

8. Fa O batla mannô a ntlo, O batlê setsha se se omileng le se se phêpa. O êpê mesêlê go dikologa ntlo go kganêla metse gore a se senye fa fatshe le methêô ka nakô tsa dipula.

9. Dipôtana di se ka tsa tsenya metse kwa tlase (O agê lobôta lo lo kganêlang metse go nyêlêlêla), mme lobôta lo dilwe ka *semêntê*, kgotsa ka majênnyana a a thugilweng.

10. Matlo a a ruletšweng ka bojang a bothitô mariga, mme a tsididi selemô, a ša ka bonakô, mme ga kake a thusa go bêêlêla

metse a pula. Matlo a a ruletšweng ka ditshipi a tsididi mariga, a mogote selemô, mme a thusa go dibêla metse a pula. Matlo a a ntseng jaana a batla kobô ya ditlhomešô (*ceiling*).

GO TSENYA PHEFÔ.

Go tsenya phefô ké go fapaanya phefô mo *kamoring*, gore *kamore* e tsidifalê, phefô e fokê mo go yônê. Mo kamoreng e e tšwetšweng, phefô ga e foke, mme phegêlô e e tšwelang kwa ntlê ka e le metse le longola, e dira gore batho ba ba mo *kamoring*, ba gotêlê, ba opiwê ke tlhôgô, ba tlhokê go nna sentlê. Fa ba tšoga mo mošong, ga ba na keletšo ya dijô, mme motlha-mongwê ba nne ba ekege.

Difensere tse di butšweng ké tšônê di itseng go tsenya phefô. Ditenenyana tsa ditshipi tse di phuntšweng marofanyana (*perforated metal bricks*) le tšônê di thusa thata. Di ntsha moya o o lešwê, o ya reng o thuthafetse o ikôkôanye ka fa tlase ga sebipô sa ditlhomešô.

Moya otlhe o tsêna ka diphatlhana tsa dipalêlô le tsa bophaphatô jwa lobôta lwa mmu. Fa go agilwe ka *setene*, go na le kobô ya ditlhomešô mo *dikamoring*, go batlêga thata gore batho ba ba agileng mo tlung ba akanyetse manô a go tsenya moya. *Difensere* di nnê di butšwê ka metlha.

Go diphatsa thata :

Mo motsing mongwê, monna le mosadi w. gagwe, e rile go le tsididi ba tsêna mo *kamo-*

ring go robala. Ntlo e ne e agilwe ka *setene*, ditlhomešô di na le kobô. Ntlo e ne e na le *fenstere* le setšwalô, mme go no go se na fa go gotsiwang gônê. Erile ka go no go le tsididi, monna a gotsetsa molelô wa magala mo lephakatheng ja *parafina* je le nang le marofa, mme e rile magala a se na go fêla musi, a tsenya lephakathe mo *kamoring*, a le baya fa godimo ga *setene* se se tshegetšweng ka tshipi. Monna le mosadi ba tšwala setšwalo le *difensterere* thata, mme ba rôbala. E rile ka mošo ba fitlhêlwa ba šule. Go no go rileng ?

Fa molelô wa magala o o ša mo felong fa go tšwetšweng, magala a tlhôka moya o o lekanyeng gore a tukê sentlê, a tle a ntshê musi o o nang le mogau, mme e re fa batho ba hêma musi o, ba šwe.

Fa batho ba ise ba thulamele, kgotsa fa ba ka kubuga e tle e re pele ba tsewe ké sedidi, ba fegelwe thata, mme ba bo ba ka tlhatsa. Fa ba ka kgôna go tšwela kwa ntlê, ba ka thusêga. Fa ba thulametse, ba sa tšoge, ba tla šwa. Dingaka di bitsa musi o mogau, (*carbon monoxide*).

Fa *kamore* e se na kobô ka fa tlase ga ditlhomešô kgotsa fa go na le lerofa le legolo fa tlase ga kgoro, kgotsa *fenstere* e thubegile go ka tsêna moya o o lekanyeng go nonotsha molelô, le go o kganêla go dira tšhefi ké gore musi o o nang le mogau.

Moya o o tšwang mo *moto-kareng* o diphatsa ka gonnê o na le musi o o nang le mogau. Kgaraga ya *moto-kara* (*motor*

engine) ga ya tšhwanêla go kgotlediwa *kara* e sa le mo ntlwaneng, fa ntlwana ya *moto-kara* e tšwetšwe.

Thušô ya moya o mo ša :

Bolwetsi jwa makgwafo (*Tuberculosis*) ké bolwetsi jo bo tsênang lolwapa, ké gore bana ba ntlo, mme fa ntlo e le potlana, bo phatlalala thata. Re tšhwanetse go phutholola matlo a rona, re a bulê gore letsatsi le moya di tsênê.

Batho ba ba itlwaêditseng go robala kwa ntlê gore ba fokwê ké moya, kgotsa ba ba robalang mo mekatakong, e tle e re ba tšoga ka mošô ba ikutlwe ba lapologile ebile ba nonofetse tirô. Batho ba le bantsi ba ba lwalang bolwetsi jwa lohuba (*consumption*) le fa e le jwa mekoti (*phthisis*) ba fôla ka ntata ya go rôbala kwa ntlê, le go ja dijô tse di siameng.

Go ntse fêla jalo le fa motho a bêrêka kwa ntlê, jaaka balemi, badiri ba dipolasi, bakgweetsi ba di-*moto-kara*, ba itekanetse go gaisa batho ba ba dirêlang mo matlung jaaka bagatisi, basigi, le bakwaledi.

Dikole tsa kwa ntlê :

Dikole tsa kwa ntlê, ké dikole tse di rutêlang mo mekatakong e e ruletšweng go kganêla phefô le letsatsi, di siametse boitekanêlô jwa matitšhere le baithutwana, go gaisa dikole tse di rutêlang mo teng ga ntlo. Mo mafatshing a tsididi, dikole tsa mothale o, di itšhupile gore di botoka thata. Dikole tse ebile ga di batle madi a le mantsi go a giwa.

Matlo a a theetšweng bolwetsi :

Fa motho yo o bobolang bolwetsi jwa magwafo a rôbala mo tlung, go bofefo gore a anamisê bolwetsi mo tlung eo. Mme batho ba ba agileng mo go yônê, ba bo ba ka tsênwa ké bolwetsi. Fa ntlo eo, e le kgologolo, go botoka gore e rutlwê. Fa e le ntlo e ntlê, lobôta le fa fatshe lo tšhwanetse go kgatshiwa melemô e e bolayang dilomi le megare. Moragô dipôta di tšhwanetse go matlolwa bodilô, kwa godimo le fa fatshe, ga dilwa gapê Go kgatsha fêla ka melemô e e bolayang dilomi le ditshidinyana ga go thuse sepê fa motho a sa kgobole dipôta.

*Kgaolô ya 2.***BOITHOMELÔ.**

Fa motho a ithuta kaga Boitekanêlô, ga go a lekana go itse melaô e le mentsi, le go leka go e gakologêlwa. Melaô e mentsi ya botshelô jo bontlê, e thailwê mo methaong e se kae, mme methaô e, e bidiwa tshimologô, kgotsa methaô ya boamarure.

Fa re akanya thutô ya boithomêlô, (*sanitation*) re fitlhêla e thailwe mo mothaong o o sa le o rutwa batho bogologolo. Moše o na a dira melaô e le mentsi ya botshelô, mme kaga Boithomêlô o rile :

“ O tla nna le felô gapê kwa ntlê ga botlhao-
lêlô, mme O tla tšwêla ntlê gônê : mme O
tla tsaya *garawê* kgotsa phang mo gare ga

ditlhômêlo tsa gago, mme e tla re fa O ithoma kwa nageng, O tla êpa ka yônê, mme O tla retologa, O katele se se tšwang mo teng ga gago." Deut. xxiii : 12, 13.

Molaô o o beilweng fa godimo, ké gore lešwê lotlhe le le tšwang mo maleng, le tšhwanetse go katêlwa ka mmu ; mme ké ka ntlha ya dibakô di le pedi :

1. Gore dintshi di se ka tsa nna mo lešwêng, mme tsa tsaya bontlhangwê jwa lônê go bo isa go sele.
2. Fa lešwê le bipilwe ka mmu, mmu o nyeletsa lešwê.

Mo malatsing a gompieno batho ga ba kake ba tsamaya ba tšhotse phang kgotsa *garawe* jaaka Moše a laetse batho ba gagwê. Mme batho ba sa ntse ba tshegeditse molaô le fa mokgwa jaanong o fapaanye le wa bogologolo. Mo boemong jwa go nna le felô kgakala, jaaka kwa ntlê ga botlhaolêlô kgotsa motse, jaanong go agwa mafelô gaufi, mme mafelô a, a bidiwa boithomêlô. Mo boemong jwa go ya gongwê kwa nageng, kgotsa kwa dikgweng, jaaka batho ba le-bantsi ba sa ntse ba dira, batho botlhe ba lolwapa longwê le longwê, kgotsa ba motse, kgotsa sekole ba tšhwanetse go ya kwa boithomêlong (*latrines*). Fa batho ba dira jaana, ditsha tse di dikologileng matlo di nna phêpa, mme dintshi ga di bone sepê se di ka se jang kgotsa sengwê se di ka tsayang megare mo go šônê.

Mafelô a boithomêlô a methale e le mebedi :

Mothale mongwe ké go êpa khuti e e ka nnang dikgatô tsa dinao di le lešomê kgotsa go feta. Khuti e nnê le sekhurumêlô, mme go nnê le mosimanyana wa lešwê. Sekhurumêlô sa mosima ga se khurumololwe le fa e le leng ka nakô yotlhe e go se nang opê o ithomang. Go ka latlhêlwa molelô mo khuting ka beke le beke, gonne molelo o itse go phêpafatsa thata. Motlha mongwê batho ba tle ba age ntlo fa godimo ga khuti, mme ere kwa ntlê ga ntlo e, go nne le magotsetšo le mosêlê o o ntshang musi mo khuting, mme musi o tšwe ka lerofana ja musi je le ntlheng e nngwe. Ka tsela e, dintshi tšotlhe tse di batlang go nna mo boithomelong di šwe. Fa khuti e setse e atamêla go tlala, mmu o duleng mo khuting fa e epiwa, o katêla khuti. Jaanong go epiwe e ntšha.

Fa batho ba le bantsi ba dirisa boithomêlô, go ka epiwa maithomêlô a le mantsi, ngwê fa thokô ga e ngwe jaaka go dirwa mo dikoleng, kgotsa maithomêlô a ka dirwa mo mafelong a a kgaoganyeng, jaaka go dirwa maithomêlô a motse.

Go batlêga thata gore leteng ja ntlo ya boithomêlô le nne le omile le sa nelwe ké pula, dipôtana tsa ntlo ya boithomêlô di nnê bokgakala jwa dinao di le pedi go tloga mo khuting.

Mothale o mongwe wa boithomêlô e ka nna mosêlê.

Fa go dirwa mothale o, go epiwa mosêlê o o

boteng bo kgatô tharo, kgotsa di le nnê, di-*inch* dile lešomê le borôba menwana e le mebedi bophara. Lešwê le wêla mo mosêleng motho a kotame fa godimo ga mosêlê, moragô a katele lešwê ka *garawe*, a dirisa mmu o e rileng go epiwa wa tshêlwa fa godimo ga dipôta tsa mosêlê.

Boithomêlô e ka nna kgamêlô :

Fa go dirisiwa kgamêlô, e tšhwanetse go thololwa kgapetsa gangwê fêla ka letsatsi. Fa kgamêlô e thololwa, a e thololêlwê mo khuting kgotsa mo moseleng, mme go katêlwê lešwê. Mothale o, o siametse ntlo e e nang le bana.

Ga go a lebana go dira boithomêlô jwa mosêlê kgotsa jwa khuti gaufi le sediba kgotsa molapô, gonnê fa bo le gaufi le sediba kgotsa molapô, lešwê le ka nwêla mo sedibeng, mme ja tsenya bolwetsi mo go ba ba nwang metse.

Sé segolo, basimane le basetsana ba tšhwanetse go ithuta go dirisa boithomêlô, le go latlha mokgwa o o kgatlhanong le boitekanêlô jwa botshelô, go ya gongwê le gongwê kwa sekgweng kgotsa kwa nageng gaufi le ntlo. Setsha se se gaufi le boithomêlô se tšhwanêtse go nna phêpa, go se tlogelwe lešwênnyana lepê le sa katêlwa, gonnê fa le ka tlogêlwa le sa katêlwa, letsatsi le phefô di tla le omisa, mme ditshidinyana tse di ne di le mo go yônê, di ka nna tsa fokwa ké phefô.

Ga go a lekana go kgatsha melemô e e bolayang megare le dilomi tse di anamisang

bolwetsi, go botoka gore mafelô a a ntseng jalo, motho a tlhokisê lobaka lwa go bapala dilô tse di ka lereng bolwetsi.

**Go tšhuba Matlakala (Thutubudu) :*

Ga se tirô ya basimane le basetsana gore e re ba sa lôpiwa e nnê bônê ba bolêlêlang bagolo, se bagolo ba tšhwanetseng go se dira gore motse wa bônê o nnê phêpa, mme le fa go ntse jaalo basimane le basetsana ba ka thusa thata go kganêla mafelô go lešwêfala. Ba ka lesa go latlha dilô tse di lešwê, le tse di se nang thušô mo gare ga motse, kgotsa gaufi le matlo, jaaka diakô tse di kgologolo tsa mabêlê, maungô a a bodileng, dikgapa tsa magatšane kgotsa dilô tse di sa thuseng sepê, jaaka dinaka, le ditlhako tsa dikgomo tse di bolailweng, metêmê e megologolo, le mabôtlôlô a a thubegileng. Mabôtlôlô a a thubegileng, dikerekere tse di šwapanyeng, maungô a bodileng, kgotsa dithapô tsa maungô tse di sa ntseng di na le maungô, ké dilô tse di tšhwanetseng go gakologêlwa ka metlha, gonnê mabôtlôlô a a thubegileng le metêmê e megologolo e ka sega dinao, maungô a bodileng, kgotsa dithapô tsa maungô di kôkôanya dintshi, mme dintshi gantsi di tšotsê bolwetsi.

Fa motho a na le nthô mo mmeding, mme khai e e ntse e fapile ntho e tlošwa go bêwa e sele ; khai e kgologolo e tšhwanetse go tšhubiwa ka bonakô, gonnê boladu jo bo mo khaing bo na lô ditshidinyana tse di anamisang bolwetsi, ebile gapê khai e e ntseng jalo e atisa

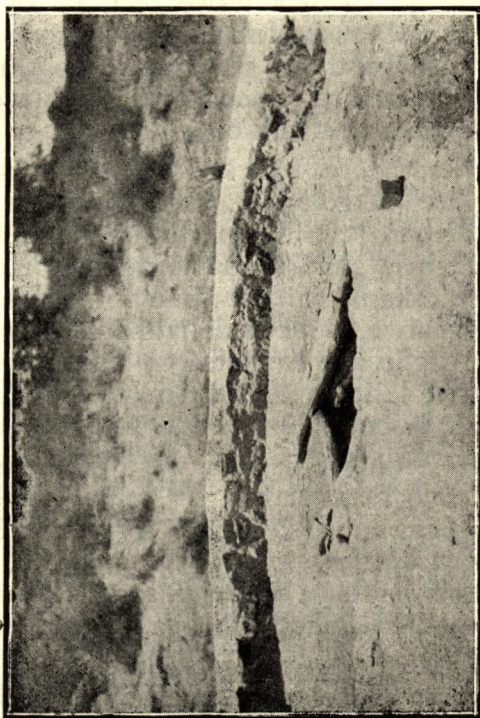
go phuthaganêlwa ké dintshi ; dintshi di rata boladu fêla jaaka basimane le basetsana ba rata botshe, mme dintshi tse, di tsaya boladu le megare go e isa kwa bathung ba bangwe.

Ga se go kganêla lešwê fêla, re ka ba ra thusa go phêpafatsa felô fa go ntse go le phêpa gale. Re ka thusa go fêêla le go tihatšwa, mme jaalo ra dira gore sengwê le sengwê se se gaufi le rona se kgatlhê.

Re itse gore megare e, e tshela mo dilong tse dikgologolo, mme e golele gônê, jaaka diaparô tse dikgologolo, ditshidinyana tse, di tshela gapê le mo loroding. Ké gônê dilô tse dikgologolo tse di senang thušô, a di se tshegediwe, mme a di latlhêlwê mo molelong. Matlo a tšhwanetse go fêêlwa ka letsatsi lengwê le lengwê, mme matlakala a ntlo le a segôtlô le ôné a tšhwanetse go tšhubiwa.

Motse mongwê le mongwê o tšhwanetse go nna le felô fa matlakala a tšhubêlwang gônê. Mo metsing e megolo mafelô a go tšhubêlwang matlakala (*incinerators*) a tle a agiwe. Mo metsing e mafelô a a ntseng jaana a iseng a nne gônê, matlakala akatšhubêlwa fela mo nageng.

Fa batho ba ka tshegetsa melaô e e bole-tšweng mo Kgaolong e, melaô ya boithomêlô e tla tlhômama, mme maungô e tla nna boitekanêlô jwa batho.

*Sediba kwa Ramoutsa.**A Well at Ramoutsa.*

Kgaolô ya 3.

METSE.

Mokgwa o re bônang metse ka ôné :

1. Pula.

2. Metse a a fa godimo ga lefatshe, mo makadibeng, matamô, metšwêdi e e fa godimo ga lefatshe, didiba, melatšwana, le dinoka.

3. Metse a a tšwang kwa tengteng ga lefatshe, jaaka metse a metšwêdi, kgotsa metse a a bônwang ka go phunya lefika.

1. Metse a pula a itshekile, fa e se mo metsing e e tletseng mosi. Fa motho a ka a beeletsa a thologa mo ditshiping tse di phêpa le mcsêlê e e phêpa, mme a a tshegets a mo ledibeleng le le phêpa, a tla nna a itshekile. Maphoi a a nnang mo ditlhoeng tsa matlo, gantsi a lešwêfatsa metse a. Go tlhókafala thata gore mesêlê yotlhe e itshêkê. E tšhwanetse go kêlêkwa gangwê le gapê, makakaba otlhe a tlosiwa le lešwê, fêla ka fa go tlhókafalang ka gônê.

Madibêla (*tanks*) a tšhwanetse go fêêlwa ka ngwaga le ngwaga fa go ka dirêga. Ké tirô e e bokete gonnê pula ga e ne ka dinakô tse di tlhômameng, mme e ka ne e re fa ledibêla le se nâ metse, le tlhatšwiwa, gore e re pula e na e le fitlhêlê le fêêtšwe.

Madibêla a tšhwanetse go nna le dikhuru-mêlô tse di kitlaneng go kganêla montsane go tsêna mo teng. Montsane o tle o tsalele mo

ledibeleng, ebile o ka tšhwenya mo tlung fa o tsaletse gaufi le yônê.

2. *Metse a a fa godimo :*

Metse a pula fa a kôpana le mmu wa lefatshe, a tlhakana le tse di seng phêpa ka bonakô. Metse a fa godimo ga lefatshe, jaaka metse a megojana, kgotsa a matamô, gantsi a itshekologile thata, gonnê a lešwafaditšwe ké mašwê a batho le malôkô a dikgomo. Melatšwana le yônê e lešwêfadiwa ka ôné mokgwa o.

3. *Metse a letamô :*

Metse a motšwedi o o fologang mo lefikeng, o o sa kgaleng le go le leuba, a tšwa kwa tengteng thata. Fa metse a le molelô, re itse gore a tšwa kwa tengteng thata.

Mo mafelong a lokgêrê, gantsi fa motho a ka phunya lefika o ka tšhwara metse a a ka fa tlase, mme a tlihatlosediwe kwa godimo ka Lofêtlho (*windmill*) kgotsa ka *Pômpô*.

Metse a a tšwang mo metšweding e e boteng, kgotsa mo didibeng a itshekile.

Bokete jwa metse :

Metse a a kopanyeng le *lejê la taka e tšhweu* a na le taka e tšhweu, mme a bidiwa gore a "thata." Metse a a tšwang mo metšweding e e boteng kgotsa mo didibêng, le ôné a ka nna thata, fêla jaaka metse a melatšwana a a folo-

gang mo dithoteng tse di nang le majê a taka e tšhweu le ônê a ka nna thata.

Metse a a thata a tšhwenya thata go tlhatšwa. Ga a phoke lofulô, mme jalo a senye *sesepe*.

Mokgwa o mongwe wa go tlosa bothata ké go bidisa metse. Taka e ikgata mo pitsaneng. Bothata jo, ké jwa lobakanyana fêla. Go na le bothata jo bongwe jo bo sa tlosiweng ké go bidisiwa ga metse. Bo bidiwa bothata jo bo nnetseng rure.

Metse a a nang le bothata jwa lobakanyana fêla ga diphatsa go nowa, gonnê motlha mongwê go tle go nne molemô go a dirisa ka a etleetsa marapô le mênô ka taka go gola. Metse a a bothata bo nnetseng rure a tsenya ditlhabi le tšhololô (*diarrhoea*).

Metse a pula a bolêta, mme a siametse go tlhatšwa.

Metse e le mentsi e tle e goge metse a noka e a itshekise. E mengwe e gôga metse a a itshekileng kwa godimo ga dithaba.

Tirô ya metse :

Metse, jaaka rotlhe re itse, ké selô se se tlhokêgang thata mo bathung le mo diphôlô-fôlong. Ga re ka ke ra tshela kwa ntlê ga metse.

Metse a tlhokêga thata mo mogodung le mo maleng go etleetsa go sila dijô. Metse ké karolô e kgolo ya madi le ya botute (*lymph*) jo bo kolobisang dintha tsa mmele. Madi le

botute di tsamaisa mo mmeding otlhe dijô tse di jelweng, le moya, kgotsa phefô e e tšwang mo makgwafung. Di tsaya ditshenyêgêlô tsa mmele tšotlhe, mme di di ise kwa diphiong, le mo letlalong, le mo makgwafung. Gapê, metse a batlêga go tsaya tshenyêgô yotlhe ya mmele, go e ntsha mo mmeding ka sebopêgô sa motlhapô le mofufutšô.

Mebele ya rona bogolo e dirilwe ka metse, mme ka re ntse re latlhêgêlwa ké metse a re a thololang, go batlêga thata gore re nnê re busetse metse gapê mo mmeding. Metse a a mo mmeding otlhe, ké gore a a mo mading le mo botuteng, ga a khutle go êlêla. Ga go a siama go ka lesa molatšwana go kgala, o tšhwanetse go nna o êlêla.

Re amogêla metse a le mantshi mo bogobeng le mo dijong tse dingwe, le mo go se re se nwang. Ga go a tšhwanêla gore re nwê fa re e ja, ké phošô go šabêla dijô ka metse mo leganong. Dijô tse di thata jaaka borôthô, di tšhwanêtse go tlhafunwa, me tsa mediwa kwa ntlê ga go di šabêla ka *tee* kgotsa ka sengwê se se metse. Metse a molomo, ké gore mathe (*saliva*) a nôlôfatsa borôthô, mme a bo sile. Borôthô jo bo mediwang ka bonakô, bo šabi-lwe ka *tee* ga bo silege sentlê, mme go dira jalo go senya boitekanêlô jwa botshelô.

Nako e e siameng go nwa metse, ke pele-nyana ga dijô fa mogodu o le lolea.

Ditirô tse dingwe tsa metse :

Metse a a tlhokêga go apaya, le go tlhatšwa dijana, go tlhapa mebele ya rona le go tlhatšwa diaparô.

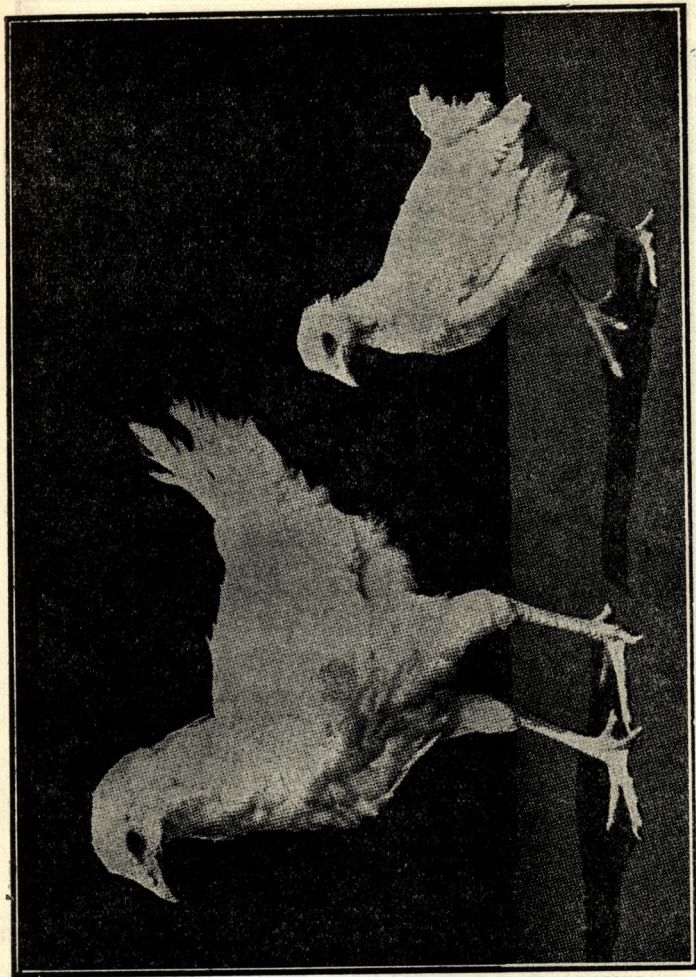
Metse a go tlhapa kgotsa go tlhatšwa ga a tlhokafale bobebobe mo botshelong, mme a tlhokafala thata mo *botshelong jwa pudulogô*. Ke kile ka ne ke itse Motšwana mongwê yo o tlotlêgang, yo o na a tlwaetse go jêla nala Bašweu ba ba rutilweng, mme ba b ba mo rata : e ne e le monna yo o maitseô a mantlê, ebile a le phêpa. O kile a nthaya a re : “ E rile ke sa le lekau ka itlwaêtsa go tlhapa ka letsatsi lengwê le lengwê, mme le gompieno ke sa dira jalo.”

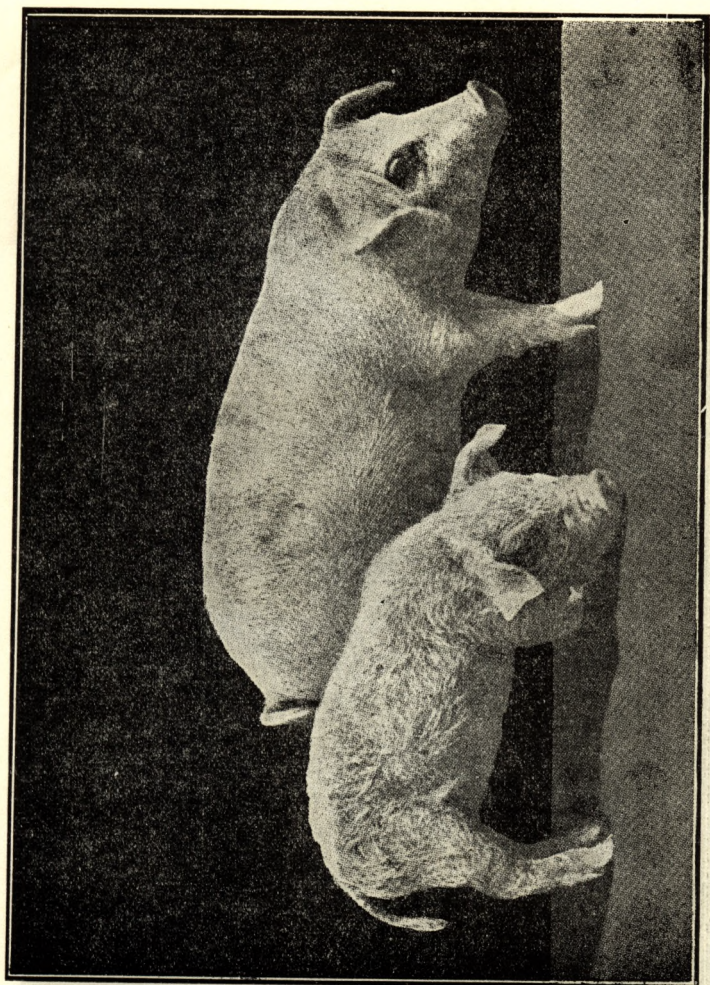
Maši a dira Pharologanyô.

Mo go ngwê le ngwê ya dintšhwantšhō tse tharo tse, diphôlôfôlô tse di šutšwang ke balekana mmôgô. Dintša le dikolobe e ne ya re di sena go kgwa tsa fiwa dijô dingwê le dingwê tse di ka dijang, le dikokwana le tsônê di dirilwe jalo di sena go thujwa ; mme ntša e kgolo le kolobe e kgolo le koko e kgolo di ne tsa okelediwa ka maši ka letsatsi lengwê le lengwê, mme ya re diphôlôfôtšwana tse dinnye tsônê tsa se ka tsa ba tsa bôna maši !

Milk makes the Difference.

In each of the three following illustrations the animals shown are of the same age. The dogs and the pigs after weaning were given all the ordinary food that they could eat and so were the chickens after hatching but in addition to this food the bigger dog, the bigger pig and the bigger chicken received milk every day but the smaller animals and the smaller chicken had no milk at all !





SERIPA SA III.

DIJÔ.

Kgaolô ya 1.

TIRO YA DIJÔ :

Go ja dijô, ké sengwe sa dilô tse di re itume-disang, ntšwa re e ja gore re tle re tshelê, mme re sa tshela gore re tle re jê.

Fa go twe go tshela, go têwa gore : go na le ditsikinyêgô dingwe tse di ntse di tšweletse pele mo mmeding. Ditsikinyêgô tse ké :—

1. KGOLO (GROWTH).
2. PAAKANYO (REPAIR).
3. MOGOTE (HEAT).
4. NONOFO (ENERGY).

1. *Kgolô :*

Mosadi yo o botlhale o baya ngwana wa gagwê mo selekanyong (*scale*) bonnye ka kgwedi le kgwedi. Fa ngwana a itekanetse bokete jwa ngwana bo tla gola ka kgwedi le kgwedi, gonnê ngwana yo o itekanetseng, ke ngwana yo o golang ka metlha. Fa go twe kgolô, ga go tewê gore ditsikinyêgô tse dingwe tse tharo di ntse di eme sentlê fêla, go têwa gore e re di ntse di eme sentlê ebile go na le sengwê gapê fa godimo se se oketsang mmele. Ebile se oketsa bokete jwa ôné. Sebakô se se dirang gore basimane le basetsana ba ikutlwê tlala bobé, ké gore ba a gola, ba sa ntse ba aga

mebele ya bônê, ga ba ise ba khutle go gola. Mosimane yo o dingwaga thataro o bokete jo bo karolô ya bonê ya bokete jo o tla bo tšharang fa a godile, ntšwa mosimane wa dingwaga tse thataro a a ja ntlha nngwe ya dijô (*half*) tse di jewang ke motho yo o godileng. Mosimane wa dingwaga di le lešomê le metšô e le mebedi o tšhwere ntlha e ngwe ya bokete jwa gagwê e le monna, ntšwa a a ja selekanyô sa karolô di le tharo mo go tse nnê se monna o se jang. Mosimane o batla go ja jaana gonnê o a gola.

2. Paakanyô :

Mmele wa bo o ntse o dira, le fa ebile motho a robetse. Pelo e ntse e tšweletse pele go gôpa madi go a isa mo mmeding otlhe, makgwafo a hêma moya go o tsenya le go o ntsha, mogodu le mala ga di khutle go sila dijô, mala, letlalô, le diphio, di tšhwere tirô ya tshenyêgêlô ya mmele, ka bokhutshane, mmele otlhe o a dira, le fa go ka twe o dira ka go iketla.

E re ka mmele o dira ka metlha, o senya dikgolokwenyana (*cells*) tse e leng tšônê di dirang mmele, mme dikgolokwenyana tse di batla go nna di baakanngwa, fa di sa tlhole di ka dira tirô ya tšônê, go batlege gore go tlê tse dingwe tse di ntšha.

Fa mmele o tšogile, o batla paakanyô e kgolo thata, gonnê mo boemong jwa go dira ka go iketla jaaka fa o robetse, o dira ka mafega; pelo e itaya ka bonakô, makgwafo a fegêlwa ka natla, mme a batla go tlala moya (*oxygen*) gore o a thusê go ntsha moya o o lešwêfetseng,

diphiô le letlalô di ntsha lešwê lotlhe mo mmeding, mesifa e tsikinyêga thata, mme diphotongwane di batla gore ditshika tsa tšônê di baakanngwê, bobôkô le jônê bo batla dijô tse di okeditšweng, gore bo tle bo itse go tsamaisa ditirô tsa mmele.

3. Mogote :

Fa mmele o tshela sentlê, mogote wa mmele o ema mo selekanyong se se tlhomameng sa mogote (*standard temperature*) ; selekanyô sé, se bidiwa selekanyô sa ga Fahrenheit (98.4 *degrees Fahrenheit Scale*). Selekanyô sé, kgotsa phetogô nngwê e e ka se tšholetsang kgotsa ya sedigêla tlase e ka lehangwa ka lomaô lo lo bidiwang *thermometer*, lo lo simolotšweng ké motlhalefi yo o bidiwang Fahrenheit. Fa lomaô lo lo šupa mogote wa selekanyô sa 98 *degrees Fahrenheit*, re itse gore letsatsi le mogote thata. Fa selekanyô sa moya se riti-betse, kgotsa go le tsididi, mmele o dira thata, o leka go tshegetsatsa selekanyô sa mogote wa mmele se se batlêgang. Ké gônê ka fa re jang bobbe mariga go feta dinakô tse dingwe tsa ngwaga. Fa motho a êta mo lefatshing je le tsididi, motho yoo, o batla dijô thata, bogolo dijô tsa mothale mongwê tse di gotsang mogote mo mmeding go fêta tse dingwe.

Go tlhókafala thata gore re tshegetse selekanyô se se tlhomameng sa mebele ya rona, gonnê fa selekanyô sé se ka wêla kwa go 95 *degrees Fahrenheit*, motho o a šwa.

Mo malwetsing a le mantsi, mogote o tle o fete selekanyô se se tlhomameng, mme e be e le gore mmele o dira tirô e menaganyeng go leka go lélêka bolwetsi jo bo mo go ôné.

4. *Nonofô :*

Ntlha e ngwe ya dijô tse di jelweng e tsêwa ke ditsikinyêgô tsa mesifa ya mmele. Motho yo o dirang tirô e e bokete, o batla dijô thata, go gaisa motho yo o dirang a ntse fatshe.

Basimane gantsi ba ja go feta basetsana, gonnê basimane ba tshameka metshamekô e e sidilang go fêta basetsana. Gakologêlwang gore tsikinyêgô nngwê le nngwê ya mmele, e dirwa ké tse di jelweng.

GO TLHOKÔMOLOGA TIRO YA DIJO GO SENYA BOITEKANÊLO JWA MMELE.

Dijô tse di sa lekaneng :

Fa motho a ja dijô di le di nnyennye, mmele o a senyêga. Fa dijô di sa tlala ka mogotšana, bokete jwa mmele bo a latlhêgêlwa, gonnê mmele o tla tlhoka se se ka o godisang, le go o baakanya, mme mogote le nonofô le tsônê di tla ngôtlêga.

III. *Dijô tse di tšwakantšweng sentlé :*

Fa dijô di sa tšwakanngwa sentlé, le fa di le ditona, botshelô jo bontlê bo a amêga. Re tla bôna mo Kgaolong e e tlang gore go na le dijô

tse di batlêgang, gonnê dijô tšotlhe ga di lekane ka go otlâ, le ka dilô tse di thusang Kgolô, paakanyô, mogote, le nonofô.

Go tlola selekanyô sa go ja.

Fa motho a ja go tlola selekanyô, ditokololô tsa mmele di a kabala, mme di kgorelesege go dira ka phuthologô.

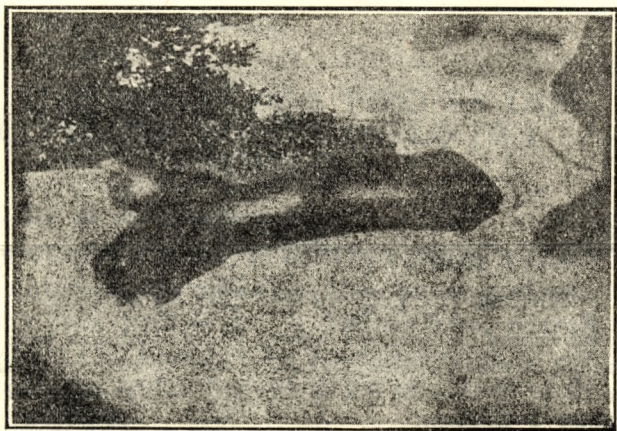
Dijô di tlhókafala thata mo mmeding ka go otlâ ga tšônê le bontsi jwa tšônê, mme se se thusang gore mmele o golê o itekanetse ké go ja selekanyô se se otlang.

TLHÔKA-DIOTLÔ MO BANENG BA BANNYE.

Mo nakong tsa leuba mo metseng go tle go tlhokwe maši le merôgô mme bagolo mmôgô le bana ba duwe ke makgophe. Bane ba babedi ba ba ne ba fôla ka bonakô ba sena go fiwa maši la matute a dilamune.

MALNUTRITION IN YOUNG CHILDREN

In times of drought in country districts neither milk nor wild vegetables are to be got and adults and children suffer from a sickness called scurvy. These two sick children recovered quickly when given milk and orange juice.



Scurvy in small children from the lack of fresh food. Painful swelling. Lips and skin bleed.

Makgophe mo banyaneng ka ntata ya go tlhoka dijô tse nana.
Thurugô e e bothoko. Molomo le letlalô di tšwa madi.

Kgaolô ya 2 :

DIJÔ TSE DI TLHÔKÊGANG.

1. *Dijô tse di godisang.*

Maši ke ôné dijô tse di fetang tse dingwe tšotlhe ka go otlâ mmele gore o golê, le go baakanya, le go šafatsa mo nakong ya bogolo.

Maši a siametse go godisa ka gonnê a na le tšompêlô (*casein*). Tšompêlô ke selô se go dirwang tšhise (*cheese*) ka šônê, ebile gapê a na le taka e tšhweu ka sebopêgô se se etleetsang marapô le mênô go gola.

Maši gape a siametse go gotetsa le go kwe-ntsha mmele. Gapê a na le mafura a go dirwang serethe (*butter*) ka ôné, le botshe jwa sukere (*milk sugar*). Maši gapê a na le dilô tse dingwe tse di bidiwang diotli (*vitamins*), diotli tse di tlhôkafala thata mo botshelong.

Maši a motsadi a na le sengwe le sengwe se losea lo se tlhôkang, mme ka metlha fa go ka dirêga, losea lo tšhwanetse go anya letsêlê ja mma lônê, eseng sepê gapê molobakeng lwa dikgwedi tse thataro tsa ntlha. Masea a a otlwang ka dijô tse dingwe, a atisa go lwala, mme bontsi jwa ôné a a šwa, mme banyana ba ba anyang letsêlê labommabô fêla ba tshela sentlé, ga ba šwe ba le bantsi. Ba gola ka mmele go gaisa ba bangwe. Mmangwana le êné o tšhwanetse go nwa maši a kgomo gore a mo nonotšhê go otlâ ngwana wa gagwê sentlé.

Bana ba ba golang, ba tšhwanetse go nosiwa maši, dikomiki di le tharo, kgotsa di le nnê ka letsatsi. E ka nna maši a lobese, kgotsa madila, methale yo mebedi e siame.

Botôrô e e thata (*cheese*) le botoro e e dirilweng ka maši ké dijô tse di siameng thata. Mokarô le ôné o siame. E re ntšwa o mogilwe mafura, lefa go ntse jalo o sa ntse o na le botute jo botoro e dirwang ka jone (*casein*), le taka e tšhweu le sukere le dikarolô tse dingwe tsa maši. Fa lolwapa lo sena kgomo, mme lo sa kgone go ka rêka maši a a itekanetseng, go ka rêkwa mokarô gore bana ba o nwê ka letsatsi lengwê le lengwê.

Mae, nama, le tlhapi, di tšhwana fêla le maši ka go nonotsha mmele, mme lefa go ntse jaalo, maši a siametse bana thata. Fa maši a seô, mae a ka tsaya boêmô jwa ôné. Nama ga ya siamêla banyana. E atisa go ba galefisa le go ba lwatsa. Ga go a siama go ja nama ya dikgomo tse di šuleng.

Dinawa le tšônê di na le mokô o o bogale go nonotsha go gola ga ngwana, lotlhodi, le matlonkomane. Le ôné mmedi, mabêlê, le methale e mengwe ya dijâlô. Mme nonofô ya kgodišô e e mo dinaweng le dijâlô tse dingwe ga e ka ke ya dirisiwa ké batho botlhe go otlala mmele o o golang. Ntlha dingwe tsa dijâlô ga di a lebagana. Ngwana yo o otliwang ka mabêlê fêla, kgotsa ka mmedi, o tle a je thata mme a sa kgore, mme lefa a jelê jalo ga a kitla a gola sentlê. Mme ngwana yo o

nwang maši ka letsatsi le ngwê le lengwê o tla gola sentlê thata.

2. *Dijô tsa tirô le tse di lereng mogote :*

Dijô tse di siametseng go godisa mmele, ebong nama, maši, mae, dinawa, le matlonkomanane, di siametse le go tshegetsa mogote wa mmele le go o nonotsha, fa e se masea, a a iseng a lekane go tlhafuna dijô tse ; dijô tsa temô le tsônê di ka dira tirô e, ebile ga di madi a kwa godimo go rêkwa.

Dijô tsa temô ké tse di ntseng jaaka mabêlê a *garase*. (Ké mothale wa mabêlê a Sekgowa) (*oats*), korong, (*wheat*) reise (*rice*), mabêlê a Setšwana, mme di le dijalô tse dingwe.

Methale yotlhe ya mabêlê, ké yônê dijô tse di nonotshang mebele ya batho go dira.

Mabêlê a lefatshe lengwê le lengwê a siametse batho ba lefatshe leo. Mmedi, kwa go nang pula e e lekanyeng, le mabêlê a Setšwana, mo lefatshing je pula e nang sentlê, ké tsônê dijalô tse dikgolo mo lefatshing ja Tshireletšo (Bechuanaland Protectorate). Mabêlê a Sekgowa, le dijalô tse dingwe jaaka (*oats*) di a lengwa mo ntlheng tse dingwe. Gakologêlwang gore mmedi o mofibidu o otlaga go gaisa o mošweu.

Mo dingwageng tse di gaufi, go tlhagile, lesedi je legolo kaga dijalô. Fa mabêlê a o, a silwa bolêta thata, mokô wa go otlaga wa fokotsêga. Go tlhobola mabêlê go tlosa kobê ya mabêlê kgotsa moroko, mme moroko ko

ônê o o otlang thata. Mmedi o o sidilweng bolêta (le fa barekisi ba ka re o siame thata) ga o wa siama jaaka o o silwang kwa gae, kgotsa mmedi o o silwang ka letlapa.

Go ntse fêla jalo le methale yotlhe ya mabêlê. Reise e tšhweu (*white rice*) e e motlhofo thata, le yônê e tlositšwê moroko wa yônê, o eleng ônê dijô. Borôthô jo bošweu (*white bread*) ké dijô tse di sa thuseng sepê, fa ba bapisiwa le borôthô jo bo rokwa (*brown bread*) jo bo dubilweng ka bupi jo bo sa fefewrang (No. 1 whole meal).

Maina a dijô :

Maši a a lekanyeng ka letsatsi le letsatsi, mabêlê, kgotsa dijô tse di tšhwanang le mmedi o mofibidu, kgotsa mabêlê a Setšwana a jewa dikgobê, kgotsa a silwa kwa gae, le merôgô ka letsatsi le letsatsi kgotsa digwêê (*bulbs*)—fa bana ba ja dijô tse, ba tla gola, batho ba bagolo ba tla nonofa go dira tirô tsa bônê tsa malatsi, mme botlhe ba tla tshela sentlé.

Mme fa maši a seô, le merôgô e mengwe ya naga e seô, mme digwêê di tlhókafala, batho ga ba ka ke ba nna ba tshela sentlé fa ba ja mothale o le mongwê jaaka mabêlê fêla. Dijô tse dingwe di tšhwanetse go nna gônê tse di ka tlatsang tse—mae, nama, dinawa, kgotsa botôrô e e thata (*cheese*), kgotsa maungô a a lemilweng gore a tlatse bonnô jwa maungô a naga. Maungo a lemilweng a ka nna *di-khabeje*, *spinak*, *lettuce* (*lettuce* e tle e tlha-tšwiwe, mme e jewa e le tala), *tomato* le yônê e

jewa e le tala, di *onion* di ka apêwa kgotsa tsa jewa di le tala, makwele le fa e le ditapole kgotsa maungô a a ntseng jaka *lamune*, di-*naartjies*, *diperekisi*, di ka jewa di le tala. Dilo tse tšotlhe di naya mokô kgotsa dilô tse di tlhokwang ké boitekanêlô jwa mmele. Makwele ga a rekwe ka madi a mantsi, mme a tšhwanetse go tlhakana le dijô tsa letsatsi lengwê le lengwê. A siametse botshelô, a siametse le batho ba ba dirang, mme a thusa mmele go gola.

Manô a mantlê fa motho a ka kgôna, ké go nna le dikgomo tse di gangwang le tshimonyana, mme fa go se ka ke ga dirêga, motho o tšhwanetse go akanya go fudugêla go sele kwa go bonôlô go bôna dilô tse gônê. Batho ba ba sa jeng dijô tse nana, le fa ba sa rôbala mo phateng, ba ntse ba tsamaya, ba tla kôafala go fêta jaaka ba na ba ka nna fa ba ja dijô tse nana. Bana ba ba sa nweng maši ga ba nonofe jaaka ba tšhwanetse. Ga go a lekana go nwa maši dikgwedi di le tharo kgotsa di le nne kwa merakeng, bana ba batla go nwa maši mo lobakeng lotlhe lwa ngwaga.

Ga go thusa sepê go gakolola batho kaga boitekanêlô jwa bônê, fa bônê ba ikaetse go nna ba na mo mafelong a a senang dijô tse ba di tlhokang. Metse e megolo e siame fêla mo mafelong a dijô tse nana jaaka maši, merô gô maungô di ka rekwang ka madi a a kwa tlase ka letsatsi lengwê le lengwê.

KAPEO LE TLAMELO YA DIJO.

Kapeô e ithutwa ka kitšô ya temogô, ké gore ka go apaya. Motho o rutwa ké bommaagwê go apaya, kgotsa batho ba bangwe ba ba setse ba lemogile go apaya. Sé mokwadi wa Kgaolô e o ka se dirang ké go bêêla mmadi ditemogô dingwe tse dingaka di di lemogileng ka thutô ya tšônê, fa di ithuta kaga dijô tse di otlang.

Maši ké dijô tse di nonneng, mme ditshidinyana tse di jalang bolwetsi di tsêna ka pela mo go ônê. Bolwetsi jo bo thêlwang bo ka tsêna mo mašing, bo tšwa mo kgomung e e lwalang kgotsa motho yo o lwalang a gama ; kgotsa a tšhwara maši ka tsela ngwê. Maši a a tšwang mo kgomung e e gôtlhông, kgotsa e na le dinthô mo letseleng, kgotsa e tšhêga, kgotsa e na le bolwetsi bongwê, a seka a dirisiwa. Motho yo o tšwerweng ké letšoroma (*fever*) motabôgô, mometšô, kgotsa a gôtlhôla, a se ka a letlwa go gama dikgomo kgotsa go tšhwara maši moragô.

Kwa merakeng, fa bagami le dikgomo di itekanetse, se se botoka fa go le mogote ké go lesa maši a rema ; mme a nowê a sa le themisane. Madila a a lotsatsa ké dijô tse di jêgang sentlê ebile a siametse go otlala bagolo le bana.

Fa maši a rekwa mo motsing, go botoka gore a apewê go bolaya ditshicinyana tsa bolwetsi tse e ka reng motlha mongwê tsa ba di tsenye mo go ônê. O tshêlê maši mo pitsanyaneng, mme o e bêê mo molelong o o sa kueng musi. O lebêlêlê maši, mme ere O

bona dipudula di ka nna tharo kgotsa nnê di bônala fa godimo, O tlhatlolê pitsa, mme O tshêlê maši mo sejaneng se se phêpa. E re fa a tsidifetse, O khurumêlê sejana ka sekhurumêlô kgotsa ka khai e e phêpa. Go botoka go a tsidifatsa ka bonakô ka go tlhôma pitsa mo metsing a tsididi. A bêê mo felong fa go tsididi, fa go phêpa. Fa go le tsididi, maši a a dirilweng ka mokgwa o, a tla itekanêla letsatsi lotlhe, mme fa go le mogote, O a dirise mo nakong tse thataro, eseng go tlola nakô di le lešome le bobedi. Mo nakong tsa leuba, maši a meteme (*condensed milk*) kgotsa maši a a omisitšweng a ka dirisiwa.

Nama e apêwa sentlê ka go e apaya ka bonya ka mogote. Go bela go e kwatlalatsa bohe, go e besa go a siama.

Go apaya go nolo~~fatsa~~ ntlha tse di mesifa tsa nama, mme ebile go bolaya dibokwana tse di ka nnang mo go yônê.

Fa go le mogote thata, O se ka wa boloka nama ka boleele. O e bêê e ntse e omile. Morô wa nama, le nama e e golokilweng (*meat pie*) di tsênwa ké dilabê ka bonakô, ebile di diphatsa, ka di tsenya bolwetsi jo bo ka tsayang motho. Nama ya namane e atisa go nna diphatsa, bogolo fa namane e kile ya lwa.

Mae a apêwa ka mekgwa e le mentsi, motlha mongwê a apêwa a le osi, kgotsa a tlhakangwe le mabêlê, kgotsa dijô tse dingwe, jaaka phuting (*pudding*). Ké fêla kafa motho o ratang ka gônê.

Mabêlê a batla go apêwa sentlé. Mmedi le bupi jwa mmedi di tsaya lobaka lo lo telele. Dijô tse di sa apêêgang ga di tlhafunege.

Dinawa le lotlhodi di batla go apêwa go fitlhêla di nna botôbêtôbê. Mothale o mongwe wa nawa (*soya beans*) ké ôné o o gaisang methale yotlhe ya dinawa ka go otlá. Mothale o, wa dinawa o ka silwa, mme fa o tlhakantšwe le mabêlê a mangwe ké dijô tse di siameng thata.

Makwele a batla go apêwa go fitlhêla a nna bolêta mme eseng sebaka se se telele. Makwele a apeilweng ka go fufudiwa, kgotsa ka go apêwa ka matlape, a tlhatšwiwa fêla, mme a ôméla mo pitseng a ka obolwa mo tafoleng. Ka tsela e, botute ga bo senyege, eleng jônê mokô wa lekwele tôta. Fa makwele a ka obolwa, a tsenngwa mo metsing moragô, bogolo jwa botute jo eleng jônê bo tlhókêgang thata bo senyêga fêla.

Molaô o, o raya le methale e mengwe ya dijô eseng makwele fêla. Reisi e tšhweu (*white rice*) e latlhêgêlwa ke mokô wa yônê mo tshilong. Fa e ka ba ya tlhatšwiwa gapê e ise e apewe, e latlhêgêlwa le ké mokônyan o o no o setse, mme fa e ntse e tlhatšwiwa, e tla ana e latlhêgêlwa go ya kwa pele.

Fa tlhapi e ka apêwa ntlha e nngwe, ntlha e e nang le monônô e fetêla kwa metsing, mme e latlhege.

Go na le dijô tse dingwe tse di nang le mogau jaaka maungô mangwê, (*cassava*) kgotsa

maungô a a botšarara kgotsa a a botlhoko mo leganong, methale e, ya dijô, e batla go tse-nngwa mo metsing, ya bela, mme moragô metse a tšhololwa. Kwa ntlê ga methale e e nnê molaô o o tlhomameng gore metse a a kileng a bela, dijô di le mo go ônlê, a se tšholo-lwe Ka fa melaong ya botshelô, tatlhêgêlô ya monônô wa metse a tšhololwang a kile a apaya dijô, e kgolo thata. Fa motho a sa dire morô, go batlêga gore motho a tlhadiê go le go nnye fêla ké gore ere dijô di sena go butšwa, go seka ga sala metse apê.

Thutô e nngwe e kgolo e tlhagile, mme ké gore, *sota (soda)* ga e batlêge mo kapêong ya merôgô, e senya mokô wa merôgô, mekô e eleng yônê e etleetsang merôgô go nontsha mmele, mekô e e re thusang mo bolwetsing jwa go tlhôka madi mo mmeding (*scurvy*) le malwetsi a mangwe. Fa motho a apaya dijô ka boleele, le gônê o senya mokô kgotsa botute jo bo nang le monônô wa go otlâ mmele. Molaô o mongwe ké gore merôgô e se apewe ka boleele, merôgô mengwe e siametse go jewa e le tala, jaaka *lettuce, tomato*, le digwêê (*carrots*). E tšhwanetse go tlhatšwiwa ka metse a a itshekileng. Digwêê (*carrots*) di ka papetlwa, me tsa tshasiwa fa godimo ga borôthô kgotsa serethe (*butter*).

Mo dinakong tsa leuba, fa maungô le merôgô di tlhókafala motho o ka fetola dijô ka go medisa mabêlê a setšwana kgotsa dinawa pele di ise di apewe. Fa go dirilwe jaalo, lobaka lwa kapêo lo nnê lokhutshane thata. Mo nakong

ya leuba, diroa (*wild bulb*) di siame go jewa ka malatsi otlhe.

Merôgô e e sa ntseng e le meša, e tšwa kwa tshimong e siame thata.

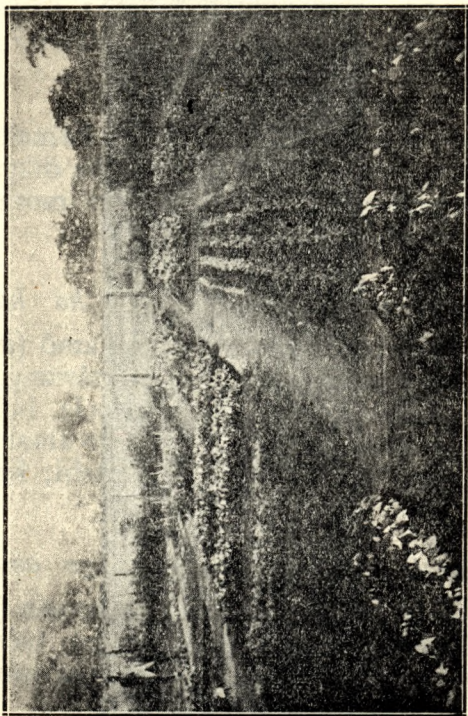
Go setse go lemogilwe gore merôgô e metala, e latlhêgelwa ké monônô ka bonakô fa e le mo letsatsing kgotsa e ka segwa. *Dikha-beje (cabbages)* tse di šwabileng, ga di lekane ka monônô le tse nana, tse di sa ntseng e le gônê di tšwang mo tshimong. Sé se re ruta gore fa re ka nna le metse, lefatshenyana, re le dirisê go jala merôgô. Dithunya ké dilô tse dintlê, le tšônê di ka lengwa fa pele ga ntlo, mme maungô ôné, ké dilo tsa botshelô le boitekanêlô, mme a batla setsha se se siameng, se se ka nosiwang. Makwele le ôné a siame fa a santse a tšwa mo tshimong a le nana.

Diphatsa tsa dintshi le lešwe :

Dijô tšotlhe di tšhwanetse go tlamêlwa gore di se tsênê lorole le dintshi, ebile di tšhwanetse go tlamêlwa mo diruiweng le mo diatleng tse di seng phêpa.

Go boloka dijâlô mo sefalaneng :

Mmedi kgotsa mabêlê a Setšwana a tšhwanetse go omisiwa sentlê pele, mme ya dirang gônê a tsenngwang mo sefalaneng, sefala se tšhwanetse go tlala, mme sa kanwa gore go se tsene phefô kgotsa moya mo teng. Tšhupa ga e kake ya tshela fa e sa fokwe ké moya kgotsa phefô.



(Photo by F. Phiri)

• *Tshimo ya Sekolo kwa Mochudi, B.P.*

A School Garden at Mochudi, B.P.

MALWETSI A A THÊLWANG.

Kgaolô ya 1.

MALWETSI A A THÊLWANG ESENG
KA KAMO: LE A A THÊLWANG KA
KAMO.

Malwetsi a a thêlwang a phatlalala ka mekgwa e le mentsi, mme a kôkôantšwê ka dikgaolô tse di šupang kafa a tšwang mo mothung go ya go yo mongwe.

1. Bolwetsi jo bo sa thelweng ka kamô:

Bolwetsi jo bo sa thelweng ka kamô (*infectious disease*) ké bolwetsi jo bo tšwang mo mothung yo mongwe go tsêna o sele, bobedi jo bo ise bo ke bo kopane, kgotsa bo amane, le gônê bolwetsi bo sa thêlwa ké ntshi, kgotsa metse.

2. Bolwetsi jo bo thêlwang ka go amana:

Bolwetsi jo bo thêlwang ka go amana (*contagious disease*) ké bolwetsi jo bo tsênanang motho yo o itekanetseng ka go ama mmele, diaparô, kgotsa lešwê ja molwadi.

Re setse re ithutile gore megare (ditshidinyana) gantsi ké tšônê di jalang bolwetsi. Megare e, le dintshi tse dingwe ga di tshele bolwetsi tšotlhe, ké gore, megare e mengwe ga e diphatsa. Fa megare e e thêlang



Megare ya lohube e mela mo borekerekeng jo bo mo galaseng e e motšuléllô. Megare e, e tserya lohube.

E tšhwana le mohubô (mould).

The tubercle bacillus growing on Jelly in a glass tube. This germ causes consumption. It looks like mould.

bolwetsi, e ka tsêna mo mmeding e tsenya bolwetsi jo bogolo.

Malwetsi a na le maina, ebile a methale. Motho yo o farologanyang batho ga a ka ke a ba a tsiakanngwa ké mo-Afrika le mo-India. Ngaka e e itseng malwetsi ga e ka ke ya ba ya tsiakanngwa ké bolwetsi jwa makgwafo (*tuberculosis*) le bolwetsi jwa matsabane (*syphilis*). Me fêla jaaka malwetsi a na le maina ebile a le methale, le megare e e jalang malwetsi, le yône e methale ka popêgô, ebile e methale le ka tirô e e dirang.

Popêgô ya megare le ditirô tsa yônê :

Megare e e jalang bolwetsi jwa makgwafo e bopegile jaaka thôbane (*rod shaped*) mme bogolo e tlhasêla makgwafo le molokololô. Megare e e jalang bolwetsi jwa matsabane e bopegile jaaka moririnyana o o tšhophegileng mme é tlhasêla letlalô le mesifa e e ka fa tlase ga letlalô, moragô e tlhasele marapô le ditokolô tsa mo teng. Megare ea nthô e e mo letlalong (*boil*) o bopegile jaaka thôbane, motlhamongwê jaaka lee la koko.

Megare e e boletšweng fa godimo e mennye thata e ka bônwa fêla ka galase e e bonatsang dilô tse dinnye ka go di golofatsa. (*microscope*)

MOKGWA O MALWETSI A A THÊ- LWANG A TSAMAYANG KA ÔNÊ.

Malwetsi a a thêlwang a jalwa jang? Bogolo a jalwa ka phegêlô, ebile gapê a jalwa ka go kgwa, le ka se motho o se kgwang. Sefuba le *influenza*, le sefuba se se bataolêgang (*whooping cough*) le setlhabi (*pneumonia*), di thêlwa di tšwa mo phegelong ya yo o lwalang. Bošwata (*measles*) kgotsa sompane le sekgwaripane di tsêna ka go kgwiwa ké molwadi, bolwetsi jwa makgwafo kgotsa lohuba (*tuberculosis*) bo thêlwa ka go fegêlwa, jaaka fa motho yo sa lwaleng a tlhakanêla borobalô le motho yo o lwalang lohuba lwa mekoti (*phthisis*). Bogolo lohuba lo thêlwa ka go kgwa segôtlhôla. Molwadi yo o tšhwerweng ké lohuba, o ka nna le megare mo makgwafung bogolo fa ebile lo pataganye le lohuba lwa mekoti (*phthisis*). Molwadi wa bolwetsi jo, o a gôtlhôla a be a kgwe. Segôtlhôla se ome, mme megare yônê e nne e tshele mo segôtlhóleng se se omileng, phêfô e nne e e foke, mme e e fokele mo makgwafung a batho ba ba itekanetseng.

MALWETSI A A THÊLWANG KA GO AMA, LE TSELA YA GO THÊLWA GA ÔNÊ.

Matsabane(*syphilis*), lepêrwa (*leprosy*) morotwana (*gonorrhoea*), dibokwana, le thurugô ya dintshi tsa matlho, (*conjunctivitis*), ké malwetsi a a tsewang ke batho ba ba itekanetseng ka go

ama mebele, diaparô, kgotsa moithomô, le fa e le motlhapô wa ba ba nang le malwetsi ao.

Mhikêla le ôné o ka thêlwa ka go amana le yo mongwe. Tsela e e bofefe ya go thêla sefuba ke ka go atlana.

Mooki wa molwetsi le êné o ka tsaya bolwetsi mo go yo mongwe a bo isa kwa go o sele fa a se kêlô-tlhôkô go tila go dira jaalo. Motlhapô kgotsa moithomô wa molwadi yo o tšhwerweng ké bolwetsi yo bo thêlwang o tšhwanetse go tshêlwa melemô e e bolayang megare, kgotsa wa fisiwa.

GO IPABALELA KGATLHANONG LE MALWETSI A A THÊLWANG.

Ké tšhwanêlô ya motho yo o lwalang malwetsi a a thêlwang go itisa gore a se dire sepê se se ka phatlalatsang bolwetsi jwa gagwê. Ebile gapê ké tšhwanêlô ya yo o sa lwaleng gore a itise go se ipee mo diphatseng tsa go tsênwa ké bolwetsi.

Motho yo o lwalang bolwetsi jwa lohuba, o tšhwanetse go gotlhôlêla mo khaing, mme a e tšhubê moragô. Go kgwa segôtlhola ké mo-kgwa o o mašwê thata, bogolo fa motho a lwala bolwetsi jo bo thêlwang, jaaka mometšô, makgwafo, ; go di phatsa thata.

Go kile ga bônwa kitsišô mo Kantorong ya mo'se e kwadilwê jaana :—" batho ba ba nang le maitseô ga ba kgwe segôtlhola ;" a ba bangwe le bônê ba se kgwe."

Motho ga a tšhwanêla go dirisa *kama*

(comb) ya yo mongwe, le fa ele seikgotlhô, (brush) kgotsa seiphimolô (towel).

Go tlhaba sekgwaripane ké phemêlô e kgolo kgatlhanong le bolwetsi jwa sekgwaripane, mme basimane le basetsana ba tšhwa-netse go tlhokômêla go tlhabiwa. Bagolo le bônê a ba tlhabiwê.

Letsatsi, phefô e nana, *sesepe*, le metse le bophêpa di thusa thata go kganêla malwetsi go phatlalala.

Megare e e jalang bolwetsi e ka tsêna, ebile e tle e tsene mo mmeding ya batho ba le bantsi, mme ba se ke ba lwale. Ke 'ng se se dirang jalo gore megare e palêlwê ké go tšhêla bolwetsi jo e bo tšhotseng? Sebakô se se dirang gore setshidi se palêlwê ke go tsenya bolwetsi, ké ka gonnê mmele o nonofile thata go tlhabana le go lêlêka bolwetsi bo ise bo tlhômame. Ke gônê, fa re ka tlamêla mebele ya rona, diphatsa dinnyenye gore e ka tlasêlwa ke bolwetsi.

Kgaolô ya 2.

MALWETSI A TSÊNANG KA METSE.

Bolwetsi jwa mogote o o bidiwang “*enteric fever*” bo tsêna mo mmeding ka molomo.

Fa molwadi yo o tšhwerweng ke mogote wa “*enteric fever*” a ka ya go ithoma gaufi le molatšwana kgotsa sediba, felô fa o itho-metseng gônê, o tlogetse megaré ya bolwetsi jwa gagwê. Jaanong a re re : pula e tla go na

mme e tsaya mašwê, e a kgokolosetsa mo molatšwaneng kgotsa mo sedibeng. Batho ba ba nwang mo sedibeng, ba nwa bolwetsi jwa “*enteric fever*.” Ga ba bone megare gonnê mennyenye go ka bônwa ka matlhô. Fa batho ba ntse ba nwa metse ba tsenya megare mo mebeding ya bônê. Megare e ba e metsang e ka re motlha mongwê ya bo e se kae, mme ya ata e ntse e le mo mebeding ya batho ba, go fitlhêla lobaka lwa tshipi, motlhaopê e ka nna lobaka lwa ditshipi di le tharo kgotsa di le nnê, jaanong ka lobaka lo, e be e le mentsi go ka simolola bolwetsi jwa “*fever*.” Batho ba le bantsi ba ka tsênwa ké bolwetsi jwa “*fever*” jo ba bo thetšweng ké motho a le mongwê-fêla, mme bangwê ba bônê ba ka šwa. Ké poitshêgô e kgolo thata.

A re re : motlhamongwê motho yo o tšhwerweng ké *febara* e, o lwala thata, ebile o bokoa, mme mosadi wa gagwê o tholola serua sa gagwê, kgotsa o tsaya kobô ya molwadi e e amilweng ke lešwê ja molwadi, mme a e tlhatšwe fa thokô ga molatšwana, le gônê go tla nna fêla jaaka re setse re boletse. Molatšwana o tla tsaya bolwetsi, mme batho ba ba nwang mo go ôné ba tla tsênwa ké febara.

Dilô tse ga di a tšhwanêla go nna jalo. Motho yo o tšwerweng ke mogote wa *enteric* ga a tšhwanêla go tsamayêla kwa ntlê, mme mosadi wa gagwê o tšhwanêtse go tshêla serua sa molwadi melemô e e bolayang megare le fa e ka nna motlhapô. A di tlogêlwê nako di le pedi, mme e re morago a tšhololêlê serua mo

khuting e e epilweng kgakala le sediba kgotsa molatšwana. Dikobô tsa molwadi le diaparô di tšhwanetse go lala mo metsing di inilwe mo melemong e e bolayang megare, pele di ise di tlhatšwiwe, mme ga di a tšhwanêla go tlhatšwediwa gaufi le metse a a nowang, kgotsa molatšwana. Mašwê ké go bo batho ga ba kae, ba ba itseng se ba tšhwanetseng go se dira ; melatšwana, didiba, matlodi le mata-mo, metse a tšônê a tsênwa ke bolwetsi, mme jalo *febare* e tšwelele pele.

Go sa ntse go na le diphatsa tse dingwe gapê tsa malwetsi a mangwe a a tsênang ka ntata ya metse a lešwêfadišweng. Motabogô (*Dysentery*) o ka tsena motho ka tsela e, ntšwa bogolo bolwetsi jo bo tsamaisiwa ke dintshi. Motôšhololô (*diarrhoea*) le ôné o ka tsena motho ka tsela ya go nwa metse a lešwêfadišweng ké bolwetsi jwa pele.

Metse a lešwêfadišweng ke moithomô wa motho, e ka re motlhamongwê a bo a na le mae, kgotsa maenyana a diboko. Fa batho ba nwa metse ao, maenyana a, a fetoga diboko, mme a simolole go tšhwenya.

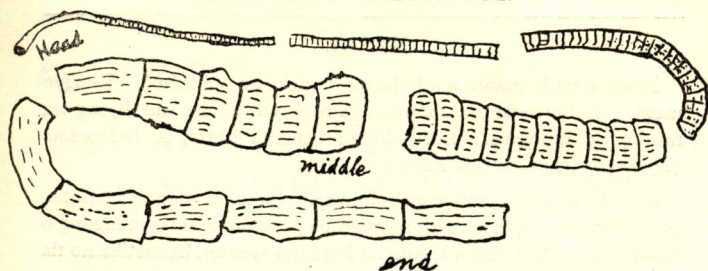
Thutô e yotlhe e re ruta ka fa re tšhwane-tseng go tlhôkômêla metse a a nowang ka gônê.

Mo metsing e megolo, le metsana, metse a tla ka mesêlê. Motlhamongwê a bo a tšwa mo motšweding o o phêpa, kgotsa a phepafadiwe ka ditlhare tsa bongaka. Metse a mothale o, re ka a a nwa ka thitibalô.

Mo metsaneng e menye, e e senang me-

tšwedi e e ntseng jaana, le mo metsaneng e e kwa nageng ke selô sa ka metlha gore batho ba tsênwê ke mogote wa *enteric* ka ntata ya go nwa metse a a lešwêfaditšweng. Tsela e le ngwê-fela go tila diphatsa tse ké go tlhatlaya metse a re a a nwang. Mo tlung nngwê le nngwê a go nnê le sejana se se lekanyeng, se nne le sekhurumêlô kgotsa sebipô, mme sejana se, a se tladiwê ka letsatsi lengwê le lengwê metse a a bedileng. Fa mongwê wa lolwapa a batla metse a a tsêê segô, mme a gê mo sejaneng se. Mosadi wa ntlo o tšhwanetse go itlwaetsa go tlatša sejana ka nakô e e lebanyeng ka letsatsi le letsatsi. Metse a bedileng a tšhwanetse go tlhatšwa dijana. Motlhamongwê go ka nna molemô go itsise batho gore dingaka di ka tlhaba motho go kganêla bolwetsi jwa mogote wa *enteric*. Go itlhaba ka mokgwa o, gantsi go thusa sebaka sa dingwaga di le pedi fela.

Bolwetsi jwa go tlhapa madi (Bilharzia) bo tsêna motho fa a šapile kgotsa a ka nwa métse a melatšwana mengwê e e nang le dibokwana tsa bolwetsi jo. Melatšwana e e nang le megare e, e gônê. Batho ba tšhwanetse go tila go tlhapa mo go yônê. Fa metse a a gilweng mo melatšwaneng a ka tshegediwa malatsi a le mabedi, ga a diphatsa fa motho a tlhapa ka ônê ka letsatsi ja boraro. Dibokwana tse dinnye tse, ga di tshele ka lobaka lo lo telele. Fa metse a bedisitšwe, a ka nowa fêla ka bonakô.

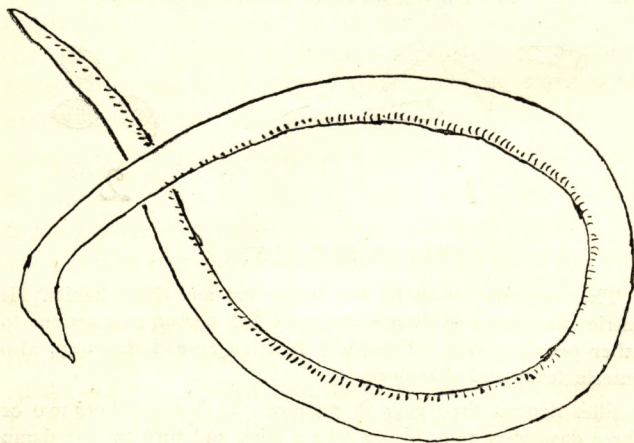


Monyoga mo maleng a motho o ka nna boleele jwa dinao di le thataro gongwê go feta. O ingaparêla ka tlhōgō.

A Tapeworm in a person's bowel may be six feet or more in length. It holds on by its head.

SEBOKO SE SE KGOLOKWE—ROUND WORM.

(Selekanyō sa tlholêgō)—(Natural Size).



MONYONYO—THREAD WORMS

(Selekanyō sa tlholêgō)—(Natural Size).

NTSHI.

Ntshi e na le maoto a a bobowa le mekgwa e e lešwê. E tsaya megare ya bolwetse mo mantleng a molwadi e e ise mo dijong tsa motho yo mongwe. Letšhololô le anama jaana, le *letšhoroma* (*Dysentery*) le (*Enteric Fever*).

Dintshi di tsalêla mo motšhotelông. Fa go le mogote, letsatsi, gongwê malatsi a le mabedi moragô ga pula, mme o tsaya logong o ribogolola motshotêlô o o šola ka lônê mo sakeng, ka metlha no tla bona :

1. Dintshi e le gônê di tsalwang, di sena go thujwa mo maeng: dibokwana tse ditshwaanyana, di ithokgonyathokgonya. Morago ga malatsi a matlhano di a fetoga :

2. Seémô sa bobedi : di thokwa, di thatanyana, mme ga di ithokgonye. Morago ga malatsi a mangwe a matlhano di a thujwa mme di tšwe e le dintshi tse di feleletseng go gola.



THE HOUSE FLY.

The common house fly has hairy feet and dirty habits. It carries the germs of disease from the sick person's excretions to other people's food. Dysentery is often spread this way, also enteric fever and diarrhoea.

Flies deposit their eggs in manure. In hot weather, two or three days after rain, if you take a stick and turn up the damp manure in the kraal, you will often see :

1. Young flies in first (larva) stage, after coming out of eggs : small white worms, actively moving. After five days they change into :

2. the second (pupa) stage : brown, hard outside, not moving. After other five days these split open and out of each comes a full-grown fly.

*Kgaolô ya 3.*MALWETSI A THELWANG KE DI
DIGAGABI LE DIPHOLÔFOLO.

Digagabi le diruiwa di thusa go jala malwetsi thata. Thutô ya bongaka mo dingwageng tse di mašomê a le matlhano tse di fitileng, e ntse e le go latêla lorala lwa dilô tse di jalang bolwetsi. Mo dingwageng tse di mašomê a le marataro tse di fitileng, megare e, e ne e sa itsewe. Kitšo ya go lemoga megare, e le go bôna ka fa digagabi le diruiwa di jalang bolwetsi ka gônê, e fetotse megopolô ya batho kaga malwetsi, le kafa a ka kgorelediwang ka gônê.

Ngaka Livingstone o kwadile jaana : “ Ke eletsa go baya fa thoko, ntlha e nngwe ya bo-tshelô jwa me gore ke tsantsabetse pheko e e ka phekolang bolwetsi jo bo boitshêgang jwa *African fever*.....E tla re dikôkômana tsa rona di se na go lemoga gore ke 'ng se se dirang bolwetsi jwa *febara*, di tla re tlhomogêla pelo ka ntata ya go tlhôka lesedi je le phololetseng..... Losaisai lwa montsane lo šupile, jaaka lo ntse lo šupa ka metlha gore montsane o jala bolwetsi jwa *malaria*.” Mme ke Ngaka Ronald Ross yo morago go sena go feta dingwaga di le dintsi, o šupileng gore montsane ya re o se na go loma motho yo o na a tšhwerwe ké bolwetsi jwa *malaria*, o tseye megare mo mmeding wa yônê, mme e nne e golele mo teng ga mmele

wa montsane, e re mōntsane o loma motho, o tsenye bolwetsi mo mothong yo o lomi-lweng.

Motho jaanong o tllhabana le megare e, e e jalang bolwetsi, mme o leka go e bolaya, go e kganêla fa e tšhwanetseng go nna gônê. Thulaganyô e e latêlang e bolêla maina a megare e e jalang bolwetsi, le bolwetsi jo e bo jalang, le pheko e e ka phekolang. :

Segagabi kgotsa
Serutwa se se
tsayang Bolwetsi
Bolwetsi jo bo
Tsewang.

Manô a go kganêla le Ipabalêlô.

DINTSHI

MOTABOGÔ
DIARRHOEA

Dintshi di tsaya bolwetsi ka go tsamaya fa godimo ga matlakala, lešwê, masepa, dinthô, kgotsa tlhagala. Maoto a tšônê a a nang le moririnyana a tsaya megare mmôgô le lešwê, mme a tseye megare go e isa kwa ntshi e tla yang gônê gapê, motlhamongwê ké mo dijong, kgotsa mo mašing le fa e le mo metsing.

Manô a go kganêla ké gore dintshi di seka tsa tsêna mo dijông, le fa e le mo mašing kgotsa mo metsing.

Mantlwana a Boithomêlô fa a dirisiwa ka metlha a thusa thata go ngôtlala palô ya dintshi.

Segagabi

Bolwetsi

Manô a go kganêla le Ipabalêlô.

Dintshi di rata masepale matlaka-
la go atêla mo go ônê. Ké gônê
Mantlwana a Boithomêlô, le mafelô
a go Tshubêlwang matlakala mo go
ônê, (*incinerator*) e leng dibolaô tse di
tlhokêgang thata go tllhabana le
dintshi.

DINTSHI

MOTŠOLOLO
DYSENTERY

Ké bolwetsi jo bo bogale jwa
mothale wa bolwetsi jwa motabogô
(*diarrhoea*). Manô a go kganêla a
tšhwana le manô a bolwetsê jwa
motabogô (*diarrhoea*). Maši le me-
tse a batla go bedisiwa pele, gonnê
go bedisa metse go bolaya megare e
e mo go ônê. Maši le metse a ka
lesiwa go fôla, mme e re a ise a diri-
siwe, a nnê a ntse a bipilwe.

DINTSHI

FEBARA

ENTERIC

FEVER

(Typhoid)

Go bolaya dintshi tse ditala le
dintshi tsa ntlo ké boiphemêlô kga-
tlhanong le bolwetsi jwa *enteric fever*

Bophêpa, le go bedisa maši le
metse jaaka re buile kaga manô a go
kganêla malwetsi a go taboga (*diarrhoea*) le motšololô (*dysentery*) go
thusa thata go kgoreletsa bolwetsi jo.

DINTSHI

THURUGÔ YA

MATLHO

CONJUNCTI-

VITIS

Go bolaya dintshi tse ka metlha
di siêlang go tsêna mo matlhong a
bana le a bagolo, ké manô a siameng
go kganêla bolwetsi jwa thurugô ya
matlhô (*conjunctivitis*). Dintshi di

Segagabi

Bolwetsi

Manô a go kganêla le Ipabalêlô.

tsaya bolwetsi jo ka mekgwa ya tšônê ya go ja dinthô , le ditlhagala.

Khainyana ya losire e beilwe fa godimo ga tlhôngô ya ngwanga fa a robetse e thusa go kganêla dintshi gore di se mo amê.

TSETSE
FLIESSLEEPING
SICKNESS

Re tšhwanetse go tlihabana le ntshi ya Tsêtsê. Ntshi ya Tsêtsê e rata go nna mo moruting gaufi le metse, mme fa ditlhare tse di mo thoko ga dipôta tsa molapô di ka rêngwa, thêmo e ka thusa go ngôtla dijadi tsa bolwetsi jo. Bolwetsi jo bo tlhagileng kwa Ngamiland bo kgathatsa tlhômêlô ya bolwetsi jo mo lefatshing ja Bechuanaland Protectorate.

MONTANE

MALARIAL
FEVER

Montsane o rata metse gore o tlê o bêê mae, mme a thubiwe go fetoga montsane. Maenyana a montsane a ka bônwa ka bofefo fa motho a kêlêka metse a montsane o mo go ônê. Fa metse a kgala, kgotsa motho a ka tshêla *parafina* mo go ônê, matsaenyana ga kitlâ a tlhôla a gola. Fa montsane o ka bonwa gaufi le ntlo, tšhwanêlô ké gore motho a batlê fa motšwêdi o gônê.

MONTSANYANE—YOUNG MOSQUITOES

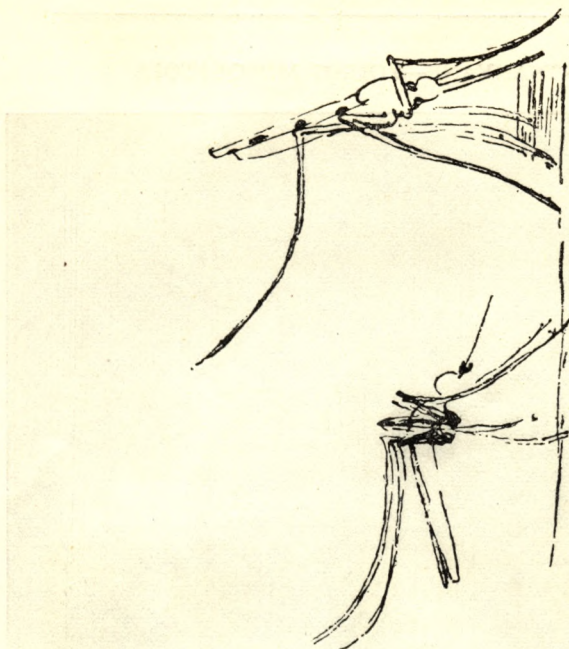


Montsanyane o baya mae mo metsing, (ke gore o tsalêla mo metsing); montsanyane o tšwa mo maeng. Setšhwantšhō se, ke sa metse ale mo galaseng e kgolokwe, mme go šupiwa montsanyane e le gônê o thujwang. Pele e menyenye thata.

Mosquitoes deposit their eggs on water. Out of the eggs come the young mosquitoes (larva stage). This is a photograph of water in a round glass showing young *Anopheles* mosquitoes at the larva stage. They are very small at first.

Notice that these young *Anopheles* mosquitoes, lie flat on the surface of the water. Young *Culex* mosquitoes, when they come to the surface to breathe, hang with their heads down.

Elathlôkô gore mothale wa montsane o o bidiwang *Anopheles* o tlhamaletse ha godimo ga metse. Mothale wa montsane o bidiwang *Culex*, ônê ha o tswa mo metsing go gopa moya o ema ka tlhōgô ha godimo ga metse.



This was the original sketch made by Ronald Ross, which first showed the altitude of mosquitoes. Ross has frequently reproduced under different names elsewhere -

R. Ross.
July. 12. 11

Setšhwantšhō se, sa montsane, (se feta selekanyō sa montsane jaaka o ntse) se dirilwe ke Sir Ronald Ross; ngaka e e ne ya lemoga gore montsane ke ōnē o o tsenyang bolwetsi jwa Malarial Fever, go tswa mo mothung go ya mo go yo mongwe. Montsane o o emeng ka tlhōgō ke ōnē (*Anopheles*) o o tsenyang bolwetsi jwa Malaria. O mongwe (*Culex*) ga o jale malaria.

The sketch on page 80 of mosquitoes (larger than life) was made by Sir Ronald Ross, the doctor who made the great discovery that mosquitoes convey the malaria parasites from person to person. The one with its head down is the kind (*Anopheles*) that carries malaria. The other (*Culex*) does not carry malaria.

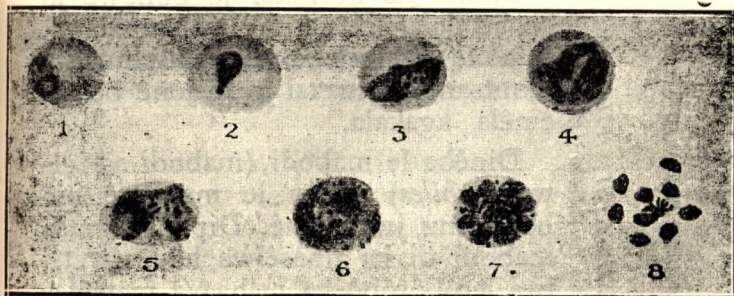
(From "Ronald Ross" by kind permission of The Student Christian Movement Press).

(Setshwanthsô se tswa lokwalong se dirilwe ke Ronald Ross ka tetlêlô ya Bagatisi ba The Student Christian Movement).

MEGARE YA LETŠHOROMA.

Mogare ke selô se se golang mo mading, se se dirang letšhorma, o bônwa ka galase e e se godisang thata-thata.

Mogare o o tsenyang bolwetsi jwa Malaria o bônwa o gola moteng ga madi. Morago galo bakanyana mogare o a kgaogana, o ate mo mading.



THE MALARIAL PARASITE

The thing (parasite) growing in the blood, which causes Malarial fever, as seen through a microscope which magnifies it one thousand times.

The Malarial parasite is here seen growing inside a red blood cell and eating it up from within. Finally it divides into a number of young parasites, each of which will soon enter another red blood cell.

DINTSHI Segagabi

YELLOW
FEVER Bolwetsi

Manô a go kganêla le Ipabalêlô.

Ga go na bolwetsi jo bo bidiwang *yellow fever* mo Bechuanaland Protectorate kgotsa mo South Africa. Mme mo kgaolong e e ntseng jaaka Mochudi, B.P. go na le mentsane e e tsamayang ka bolwetsi jwa *yellow fever*. Go fitlhêla, jaanong mentsane e, ga ya tshôla bolwetsi jo. Ké gore mentsane e ga e diphatsa. Mme le fa go ntse jaalo, re tšhwanetse go tlhabana le metsane e e sa tsenyeng bolwetsi go fitlhêla e nyêlêla.

MATSETSE DINTSHI

BOLWETSI FILARIA
(Elephantiasis)
Jwa Lerôbôrôbô

Filaria ké bolwetsi jo bongwe jo bo sa tlala-tlang mo Bechuanaland, mme fa Tshireletšo e ka thukhuthwa montsane, bolwetsi jo le jônê bo tla êmêla kgakala.

Dipêba le mabodi, (mabodi a bidiwa *gerbiles*) di na le matsêtsê mo boboyeng jwa tšônê. Dipêba kgotsa mabodi di ka tlhasêlwa ké bolwetsi jwa lerôbôrôbô ka ntlha ya matsêtsê a. Fa pêba kgotsa lebodi di ka bolawa ké bolwetsi jo, matsêtsê a tšhotseng bolwetsi, a tla batla mmele o sele go tshela mo go ôné ; mmele o sele o, e ka nna mmele wa motho.

A go bolawê dipêba le mabodi gore bolwetsi jwa lerôbôrôbô e se re kgotsa jwa anama.

Segagabi

DINTA

FEBARA TYPHUS

YADINTA FEVER

Bolwetsi

Manô a go kganêla le Ipabalêlô.

Fa dinta tse di tšhotseng bolwets jwa *typhus fever* di ka loma motho yo o itekanetseng, motho yo o lomi lweng le ênê o ka tsênwa ké *typhus fever*. Bolwetsi jo bo ka khutla go anama fa batho ba ka ipabalêla go nna phêpa, mme malwapa a bônê a tlhôka lešwê le dinta.

Fa motho mongwe a ka fenngwa ke malwetsi a a bolêtsweng fa godimo, motho o tšhwanetse go akantshana le ngaka gore molwadi o ka pheko-
lwa jang. Lefa motho a ka dira jaalo, go sa ntse go tlhôkafala go dira manô otlhe go dira-
gatsa manô a a bolêtsweng go kganêla bolwetsi
gore bo se anamele kwa go ba bangwe.

NTA.

Bolwetsi jwa Typhus bo tšwa mo mothung mme bo tsene yo mongwe ka go jalwa ké dinta. Setšhwantšhō sé, se šupa nta e e atolositšweng, mme fa thoko go šupiwa makgantsêtsê a ngaparetse mo ditlhaleng.

Nta e, ke ya dikobô, mme makgantsêtsê a gomile morokô wa diaparô tsa ka fa teng. Dinta tsa tlhōgô di goma mae mo moriring

Setšhwantšhō se, sé tšwa mo Lokwalong lwa ga Skaife lwa *Elementary Biology*, ka tetlêlô ya bagatisi, Messrs. Maskew Miller, Cape Town.



THE LOUSE

The infection of Typhus Fever is carried from person to person by lice.

Here you see a louse magnified, and along side of it a louse egg sticking to a fibre still more magnified.

This is clothes louse and the egg is attached to a fibre or thread of the persons underclothing. Head lice attach their eggs to hairs. (From Skaife's *Elementary Boilogy*, by kind permission of the publishers, Messrs. Maskew Miller. Cape Town).

SERIPA SA V.

KAKARETSŌ.

Kgaolô ya 1.

GO ITSHIDILA (EXERCISE)
LE ITAPOLOŠŌ.

Thušô ya go Itshidila :

Fa O tlhokometse ngwanyana, O tla lemoga gore, fa ese fêla a robetse, ngwanyana ga a ka a ba a nna fêla. Mmele wa gagwê wa bo o ntse o itshidila ka gale, bogolo mabôgô le maoto. Motlhamongwê re ka gopola gore itshidilô e, ké lefêla, ga e na thušô. Ga go a nna jaalo. Tsikinyêgô e ya dikgaolô tse dintsi tsa mmele e tlhókafala thata mo kgolong ya ngwana.

Legale e tle e re motlhamongwê banyana bangwê ba šwe tokololô kgotsa ditokololô. Fa ngwana a šule tokololô, o tle a sitege go itshidila tokololô sentle mme e re fa tokololô ele leoto a le goge fêla fa a leka go tsamaya. Fa re kélêka tokololô, re tla lemoga gore ka ntata ya go bisa go tsikinyêga ka bofefo, leoto le tla nna lesesane, le be le nne maôtlô fêla. Mmele otlhe wa ngwana o no o tla nna jalo fa ngwana a na a sa itsikinye-tsikinye : Mesifa ya gagwê e nne mesesane, e nne maôtlô, e tlhoke pepêgô e ntlê.

Go *Itshidila* go thusa jaana :

1. Go itshidila (*exercise*) go thusa ka go romêla madi mo dintlheng tšotlhe tsa mmele, go *kwentsha mesifa*, go nonotsha bobôkô, go šafatse makgwafo, go bo go dire gore mmele o fufulê.

2. Go dira gore mesifa e thuthafalê. Ké gône ka fa e tle e re fa go le tsididi re siele go tsamaya ka bonakô, mme re nne re akge mabôgô a rona.

3. Go itshidila go tlamêla mmele gore o itekanêlê. Lo ka lemoga kafa pelo e tle e itêê ka thata le ka bonakô fa re dira tirô ngwê. Le fa go ntse jalo re tšhwanetse go tila go imetsa pelo go tlola tekanyô.

4. Go itshidila go tlosa mafura a mmele a a sa thuseng sepê. Mogote o mo mmeding o tšhube mafura a a mo letlalong la motho.

Go *Itshidila* mo go *siameng* :

1. *Drill*. Fa re ka nna lobaka lo lo telele mo sekoleng, kgotsa ra nna gongwê, mebele ya rona e tšhwarwa ké bogatšu, e tlhamalale, e se ke e nne jaaka pele re ise re nnele rure fa fatshe ; fa go ntse jaalo, e batla gore re itshile jaaka fa re dira *drill*. *Drill* e e siameng ké e e dirang gore mesifa e e ka nnang makgolo a le mabedi, e e mo mmeding, e sidilêgê. Go molemô go itshidila mmele wa rona ka bonakô re se na go tšoga, mo mošong.

2. *Metshamekô (Games)*. Ka dinakô tse dingwe kwa ntlê ga tsa sekole, go batlêga gore re tshameke metshamekô, mme gapê, metshamekô e e siameng ké e e sidilang bontsi jwa mesifa, le e e lootsang bobôkô, leitlhô, le tokololô. Metshamekô ya sekole e e rulagantšweng, jaaka metshamekô ya go tlhôma lobelô, *football*, *basket-ball*, *tennis*, e siame thata. Re tšhwanetse go ithuta go tshameka le rona, eseng go lebêlêla ba bangwe fêla.

Metshamekô e tšhwanetse go re ruta go nna bofefo, gore e re fa re fentšwê re amogêlê phenyô ka mowa o o siameng le go tshameka ka "thokgamô."

3. Go *tsamaya*. Go tsamaya ké itshidilô e e siameng thata, mme motho o tšhwanetse go iphutholola maoto ka letsatsi lengwe le lengwê.

4. Go *palama baesekele* ké mothale o mongwe o siameng thata go iphutholola mmele, mme batho ba le bantsi ba o rata thata.

5. Go *šapa*. Go šapa ke itshidilo e e thusang thata, mašwê ké ka go bo go se na fa go ka šapiwang gônê mo lefatshing le le sekaka jaaka la Bechuanaland Protectorate, le mafelô a mangwe a a kwa teng ga South Afrika.

6. *Tshimo ya sekole*. Ké itshidilô e e siameng thata, gonnê motho o dira a ntse a fokwa ké mowa o moša, ebile gapê motho o dirisa mesifa e le mentsi. Gapê tshimo ya sekole e thusa ka maungô le merôgô, dilô tse gantsi di seong mo dijong tsa ma-Afrika,

ntšwa maungô le merôgô di batlêga thata go nonotsha mmele, le go o otlâ.

Go tlhókafala thata gore re itshidile ka malatsi otlhe, mme fêla jaaka mo dilong tšotlhe, tirô e, e tšhwanetse go nna le dinakô tse di tlhômameng.

Moragô ga go itshidila, bogolo fa re fofutsê, re tšhwanetse go aparta thata dikobô tse di bothitô, gore re se tsenwe ké seramê.

Drill le diitshidilô tse dingwe tse di tšhwanang jaaka tsa Mephato ya Bašupa-tsela, Mophato wa Basimane (Boys Brigade) le Mophato wa Basetsana (Girls Life Brigade) le Matsaya-Tsela e siametse mmele, mme mephato e, ya batho ba ba bôtlana e tšhwanetse go kgwathalediwa pele.

ITAPOLOŠO LE BORÔKÔ.

Moragô ga letsatsi je motho o tlhotse a dira, kgotsa a iphutholola mmele ka lônê, le fa motho a na a itshidila tlhaloganyô, kgotsa mmele, go eletsêga thata gore mmele o lapologê, mme o robalê. Borôkô bo tlhókafala thata gore motho a tle a tshelê: Fa motho a rata go itekanêla mo mmeding o tšhwanetse go rôbala ka lobaka lo' lo siameng.

Batho ba ba bôtlana ba tšhwanetse go rôbala lobaka lo lo telele go feta ba ba godileng,

Banyana ba tšhwanetse go rôbala dinakô di le lešomê le metšô e le mebedi ka letsatsi lengwê le lengwê.

Makawana le Barweetsana ba tšhwanetse go rôbala dinakô di rôba monwana o le mongwê-fêla, mme bagolo bônê di le thataro, go ya go di roba menwana e le mebedi.

Bosigo ké nakô ya go rôbala. Ngaka nngwe e kwadile jaana: "dikonsarta tsa bosigo jotlhe, kgotsa tse di tšwang masigo a a sa, ga di a siamêla banyana, mme ga di a tšhwanêla go lêtlêlêlwa."

Kgaolô ya 2.

THUSO YA NTLHA MO TSIETSING.

1. *Mogau (Poisoning).*

Tipi, (*dip*), melemô e e bolayang megare, e e ntseng jaaka *carbolic acid*, le *lysol*, le *caustic soda*, (e go dirwang sesepa ka yônê) ké methale mengwê ya magau. Batho ba tšhwanetse go tlhokômêla thata gore banyana ba se ka ba ba ba atamêla dilô tse; metêmê, kgotsa mabotlolo, tse di kileng tsa tsenya melemô e, ga di a tšhwanêla go tlhatlaya metse kgotsa go tsenya dijô. E kare le fa di kile tsa tlhatšwiwa, mogau wa bo o sa tloga otlhe, Melemô e mengwe jaaka *di-tablets* e tšhwanêtse go lêtlêlêlwa, mo kesing kgotsa mo khabotong (*cupboard*).

Se se ka dirwang fa motho a jele mogau (poison):

Motho o tšhwanetse go bitsa ngaka fa e le ga-ufi, mme motho a ba a bolêla leina ja mogau o o

jelweng fa o itsewe, eseng jaalo, motho yo o jeleng tšhefe o tšhwanetse go isiwa kwa ngakeng.

Mo nakong o lekê gore molwadi a tlhatsê. O tsenyê menwana kwa moragô ga mometsô. Fa e se kake ya re O dira jaalo a tlhatsa, mo nosê lošwana lo logolo lwa letšwai (ké gore selekanyô se se ka tsenyang dikomiki di le nnê kgotsa di le tlhano) tsa metse a a bothito. (Fa tšhefe ele *caustic soda*, O seka wa leka go mo tlhatsisa, bogolo O mo nêê metse ka komiki, mme o tshele mo komiking lošô lo lo tona lwa *vinegar* kgotsa botute jwa *lamune*, kgotsa mo nêê tlhoa ya maši a madila. A aparê thata).

Mafoko a, a raya fa motho a jele *tšhefe rure*. Gantsi batho ba tle ba *gopole* gore ba jesitšwe (ka mokgwa wa boloi), boamarure e le gore ba tšhogile. Thutô ké yônê e tla tlosang boeleele jo.

2. Go longwa ke nôga :

Fa motho a lomilwe ké nôga, mo fapê ka khai fa godimo ga tokololô e o lomilweng mo go yônê, O segê ka sebopêgô, sa tlhaka ya "H" fa godimo ga malomô, mme O tšholetse letlalô le O le segileng. Fa O na le *permanganate of potash*, O tshasê nthô. Fa e seô, gôpa madi ka molomo, mme O kgwe tšhefe. Fa dipounama tsa gago di na le dinthô kgotsa molomo wa gago o le dinthô, O seka wa gôpa madi, mme O tamusê madi ka menwana ya gago. O nosê molwadi *tee* kgotsa *kofi*, O mo ise kwa ngakeng e e gaufi.

3. Go ša :

Fa diaparô tsa mosadi di ka tšhwara molelô, se se botoka ké go re a rapame, molelô o nnê kwa godimo, go o kganêla go ya le mmele wa gagwê otlhe. Thêla metse fa godimo ga kgabô, kgotsa O mo apesê ka kobô e e dirilweng ka boboya, kgotsa *jase* ya banna.

Diphatsa tse dikgolo ké fa mosadi a ka leka go sia. Fa a dira jalo, phefô e butšwêla molelô, mme jaanong molelô o phatlalale thata, mme o bo o ka mmolaya.

Fa mosadi a dira kwa masimo, a a rapamê, a lekê go tima kgabô, kgotsa a lekê go ithêla mmu.

Fa a šele thata, (le fa ntho e se kwa teng) mme go na le Ntlo ya Kokêlô (Hospital) a motho a isiwe *gasepatala* ka bonakô, mme a bônê ngaka.

1. Fa motho a le kgakala le ngaka, a molwadi a aparê thata. Motho ya re fa a šele thata a sielwe ke go tsênwa ké seramê, mme seramê se atisa diphatsa tsa lošo. Ntlo e molwadi o mo go yônê e nne bothitô motshegare le bosigo. Molwadi a seka a ba a tšwa mo *kamoring*.

2. O fapê nthô ka masela a a phêpa kgotsa khai nngwê e e bolêta e e inilweng mo mafureng a tlhapi (*cod liver oil*), kgotsa o e tshase *vaseline*. E re O ise o tshase, O tsenyê thipa e o tshasang ka yônê mo metsing a a bedileng, mme O itse go tshasa *vaseline*. E ne e re ka tsatsi ja bobedi o tlosa dikhai.

Fa O sena sepê sa dilô tsê, O no O nna O tlhêla *tee* (*tea*) e e bothithô fa godimo ga nthô,

(O bedise *tee* gore e nonofê), mme o seka wa fapa nthô ka sepê. Dikhai di ka tla tsa ngaparêla, mme tsa atisa ditlhabi. O nne O thele *tee* jalo gabedi ka letsatsi. O seka wa kgobola dikgôgô. O ganê dintshi.

3. E re nthô e ntse e alafiwa, a mongwê a nêê molwadi maši a a tlhatleilweng, fa maši a seô, a a nêwê *tee* kgotsa *kofi*. Molwadi a nnê a nwê maši jaalo, fa go ka dirêga, ka letsatsi lengwê le lengwê le dijô dingwê tse di motlhofo, mme tse di tiisang mmele.

4. *Go itêwa ke Tladi : Go gôpa musi o o tšhefe wa tladi.*

Fa motho e le gônê o itêwang ké tladi, kgotsa a ntshitšwe mo nokeng, eketse o betilwe, kgotsa a ntshitšwe mo *kamoring*, kgotsa mo ntlwaneng ya *moto-kara*, (*garage*) mme a tagilwe ke musi o o tšhefe (*monoxide poisoning*) e ka re motlhaopê a bo a robetse, lefa a sa fegelwe, mme a sa šwa. Fa motho yo o, a sa ka ke a bôna phefô mo makgwafung a gagwê, o tla šwa. Wêna leka go mmoloka.

O dirê ka bonakô. A a rapamê ka sefatlhôgô, repisa diaparô tsa gagwê mo thamung, mme O lebisê tlhôngô ya gagwê kwa thoko, O phuthololê mabôgô a gagwê, mabôgô a ikaêgê ka fa ditlhakoring tsa tlhôngô tšôôpedi. (b) Khubama o pharaletse fa godimo ga molwadi O lebaganye le tlhôngô ya gagwê. (c) Baya diatla tsa gago ka bopapetla kwa moragô ga mokôtlo (mo dikgopong tse di kwa tlase) seatla se sengwe ntlheng e nngwe, se sengwe

ntlheng e nngwe, menwana ya kgonethe e lebile kwa teng, mme e le gaufi le mokokotlo. (d) Obama, mabôgô a ntse a tlhamaletse, mme o *tobetse* ka bonya, le ka thata. Ka tsela e, mowa (le metse, fa motho a betilwe) a tla tšwa mo makgwafung a molwadi. (e) Ere mabôgô a gago a ntse a ntse jaalo, O lesê kगतêlêlo, mme o wêlê kwa diretheng, Phefô e tla tsêna mo makgwafung jaanong.

Tirô e, ya go ntsha musî o o tšhefe e tšhwanetse go boêlwa-boêlwa ga 15 go ya go 18 ka motšotšo. Fa O rata gore O itse gore O tšhwere nakô sentlê, O ka bala, *ngwê, pedi, tharo, nnê, tlhano* O ntse o dira tirô e e bole-tšweng mo temaneng ya (d) le (e). O dire jalo lobaka lwa *hora* kgotsa *di-hora* dile pedi O ise O tlhoboge.

Ga go na diphatša dipê go tšhwara motho yo o iteilweng ké tladi. *Motlakase (electricity)* wa bo o setse o phunyeleditse mme le wa yo tladi e mo iteileng, mme jaanong o fetile.

Basimane ba tšhwanetse go ithuta go itsenya phefô mo makgwafung (*artificial respiration*) mo gare ga bônê. E ka re motlhamongwê ba boloka botshelô jwa mongwê ka go itse go dira jaalo.

5. *Dinthô...*

Fa nthô e tšwa madi thata, mme e le nnye, tamusa nthô ka monwana wa kgonethe, kgotsa ka menwana fêla go fitlhêla madi a êma. Fa nthô e le kgolo go ka tamusiwa ka menwana, tšholetsa tokololô go se kae, mme

O tšhophê khai, O bofê letšôgô (kgotsa leoto) gangwê-fêla fa godimo ga fa madi a tšwang gônê, (khai e tšhwanetse go fapiwa fa godimo ga sekgono, kgotsa fa godimo ga lengôlê, jaanong o tsenye thôbane ka fa tlase ga yônê, o nnê o dikolosê thôbane go fitlhêla khai e gagamala go kganêla madi. Tokololô e nnê e tšholetsegile ka lobaka lotlhe.

Moragô ga lobaka lwa metsotšo e le lešomê le metšo e metlhano o tšhophololê thôbane ka bonya. Fa madi a tšwa gapê, gagamatsa gapê, mme O se ka wa lebala go tšhopholola moragô ga metsotšo e le lešomê le metšo e metlhano. Fa motho a ka fapa ka lobaka lo lo telele, nthô e ka nna botlhoko mme gapê e ka utlwiswa tokololô botlhoko ka go kganêla tiko-logô ya madi.

2. Nthô e nnê phêpa. Fa e le lešwê, le fa e ka nna lešwênnyana, ga e kitla e fôla sentlê. O se ka wa tšhwara nthô mo teng, O se ka wa tšhwara matlhôlêla. Fa o na le *iodine* kgotsa *methylated spirit*, O ka phimola dithokô tsa letlalô ka khai kgakala le nthô. Fa dilô tse di seô, phimola letlalô ka khai e e kileng ya tsenngwa mo metsing a a bedileng, mme o e gamolê thata. O tšhapê diatla santlha. O êlêtlhokô gore go se nne thothinyana ya metse e e thologelang mo nthong.

O kopanyê letlalô le le gagogileng, mme O bêê khainyana fa godimo ga nthô, o e gokêlê ka e nngwe fa godimo gore e se šuta-šute, jaanong o fapê ka khai e e fapang, o fapê fa godimo ga tokololô, mme eseng go gagamatsa.

Fa go ka dirêga, a molwadi a e kwa ngakeng

go alafiwa. Fa ngaka e se gaufi, O tlogêlê khapô e o e dirileng, fa ese motlhamongwê o bôna go tšwa boladu.

6. *Marapô a a thubegileng (Fractures).*

Fa go ka nna le nthô fa lesapô le robegileng gônê, alafa nthô ka tsela e e boletšweng fa godimo.

Letšôgô : Fa lesapô kgotsa marapô mangwê a letšôgô a ka robêga ; ôba sekgono. Tlhama-latsa fa go robegileng gônê. Fapa ka dipati, fa O le mo nageng fapa ka dikgonyana tse di thathilweng ka khai, mme O fapê nthô ka tšônê. O fapê sentlé fa godimo le fa tlase ga nthô. O menê tuku kgotsa khai ngwê go thusa go tšholetsa letšôgô ka yônê. O gokêlêlê khai mo thamung. Go dira jalo go bediwa moakgêlô (*sling*).

Leoto le le robegileng : A molwadi a kana-mê. Gôga leoto je le robegileng, o le tlhamalatse. A mongwê a tshegetsê lonaô, menwana e lebile kwa pele. Fapa ka dipati tse di telele, kgotsa ka dithôbane tse di thathilweng ka khai di tle di tšhwarê leoto lotlhe le lonaô ; jaanong O gokêlêlê leoto mo go je lengwe je le itekanetseng. O pataganyê maoto o mabedi ka khai, fa lonaung, le fa lengôleng, le kwa godimo.

O ise molwadi kwa *gasepatala*, kgotsa o mo tsenyê mo tlung ya gagwê ka lepara. Se-tšwalô se segologolo se ka mo tsaya sentlé, kgotsa motho o ka rema ditlhomešô, mme a phakalatsa dikala fa godimo ga dikgong,

tša bofêlêlwa, kgotsa dikgong di ka tsengwa mo mabogong a baki tša banna, ba le babedi le fa ele kobô e ka fapêlêlwa mo dikgonnyeng go tsaya boêmô jwa lepara.

7. Go karalala.

Fa motho a ka wa, mme a karalala, tsenya logong lo lo thata fa gare ga mênô a gagwê go mo kganêla gore a se lomê loleme lwa gagwê. O repisê diaparô tšotlhe tša gagwê mo thamong. Gantsi mokaralalô o tle o fete ka bonakô.

Mokaralalô wa banyana o ka kganêlwa ka go tshegetsa ngwanyana mo metsing a bothithô a le mo sejaneng. Tsenya lušô lwa *mustard* mo metsing fa e le gônê. *Mustard* e thusa go thuthafatsa letlalô. Fa mokaralalô o fetile, nosa ngwana *castor oil*.

Kgaolô ya 3.

MEKGWA E MENTLE LE E E MAŠWE.

Mekgwa e e siameng.

1. Tlhapa leganô moragô ga dijô dingwê le dingwê, O bo O gotlhê mênô ka mošô mongwê le mongwê le maitsiboa. O tlhokômêlê go kgaola dinala, le gore di nnê phêpa.
2. Tlhapa mmele ka letsatsi lengwê le lengwê ka metse a a itshêkileng, mme O dirisê *sesepe* se se siameng.

3. Mongwê le mongwê yo o mo lolwapeng, kgotsa ngwana mongwê le mongwê, a a nnê le seiphimolô sa gagwê.
4. A bana ba sekole ba tlhômaganngwê go bôna gore a ba phêpa. A Titšhere e tlhokômêlê moriri, mênô, dithôkô, diatla, dinala le diaparô.
5. A bana ba jê mo mošông, ba ise ba ye sekolong, mme maši le merôgô e metala e tlhakanngwe le dijô ka malatsi otlhe.
6. Mala a tšhwanêtse go ithoma ka letsatsi lengwê le lengwê. Nakô e e siameng ke moragô ga dijô tsa ka mošô, ebile ke yônê nakô e mala ka tlholêgô a e tlwaêlang. Dirisa ntlwana ya Boithomêlô.
7. O seka wa kgwêla fa fatshe moragô ga kgôtlhólô, mme O gôtlhôtllêlê mo khaing kgotsa mo pampiring, moragô O e tšhubê.
8. O seka wa tšhololêla matlakala mo tse-leng, kgotsa mo segôtlong. A tšhubê, gore a fetogê molôra.
9. Bedisa metse a a nowang pele o ise O a nwe, mme O a lesê a tsidifalê. Dijô le metse a di khurumêlwê gore dintshi di se wele mo go tšônê.
10. Bula marofana a ntlo (*difenster*) bosigo jotlhe, mme O seka wa ikhurumetsa tlhông O robetse.
11. Bolaya matsêtsê, le dintshi tšotlhe, montsane le dipêba, ké tšônê tse di jalang malwetsi.

12. Itshidile (*exercise*) mmele ka letsatsi le ngwê le lengwê.

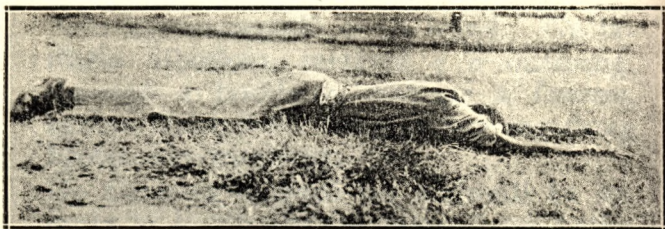
Mekgwa e e mašwê.

1. Go tlhokomologa go tlhatšwa mênô le ganô le dinala. Go dirisa metse a a lešwe le *sesepe* se se sa siamang. Go intsha ditšhōka.
2. Go bisa go tlhapa mmele, kgotsa go apara diaparô tse di lešwê.
3. Go tlhakanêla seiphimolô kgotsa senwêlô le molwetsi.
4. Ntlo kgotsa segôtlô se se lešwê. Go latlhêla dibotlolo, metêmê e e onetseng, maungô a bodileng, matlape a *lamune*, kgotsa dithapô tsa maungô mo segotlong kgotsa mo mmileng.
5. Go tlhatšwa diaparô tsa molwadi ka lolwala lo lo tlhatšwang diaparô tsa batho ba bangwe. Go thololêla mo pontsheng mašwê a molwadi.
6. Go bisa go ja ka nakô e e tlhômameng, bogolo go bisa go ja O ise O ye sekoleng mo mošông.
7. Go lêmatsa mala a thata go bisa go tšwêla ntlê.
8. Go kgwêla fa fatshe, bogolo morago ga kgôtlhōlô.
9. Go nwa metse mo lekadibêng kgotsa mo letamong.
10. Go tšwala marofané a ntlo (difenstere) bosigo jotlhê, lè go robala O khurumeditse tlhōgô ka dikobô.

11. Go letla dintshi go nna mo dijong, le go letla matsetse le digagabi tse dingwe jaaka dinta go aga mo mmeding.
12. Go letla mmele go bopologa ka ntata ya go tlhōga go tšhwara ditirō tse di phuthololang madi.

SCHAFER'S METHOD OF ARTIFICIAL RESPIRATION

1



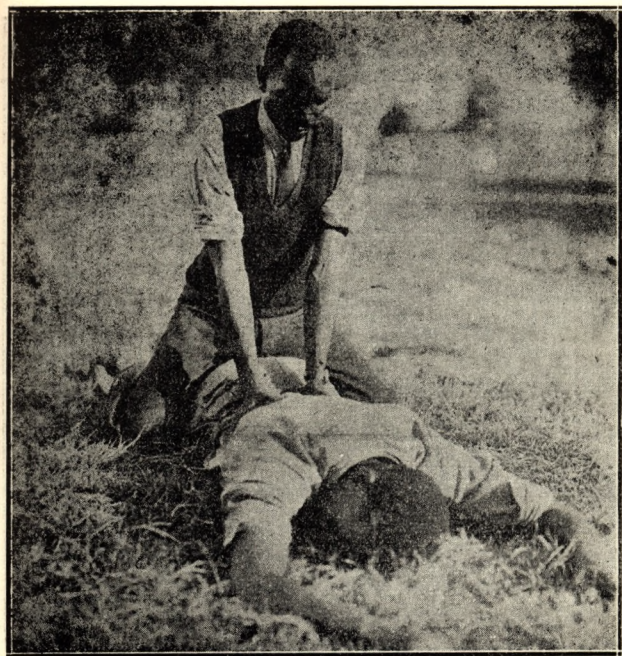
Ditšhwantšhō tse nnē tse di šupa Mokgwa wa ga Schafers wa go hemisa.

Position of Body.
Boēmō jwa Mmele.

Note Position of Head.
Elatlhōkō boēmō jwa tlhōgō

Photographs H. D. Mildenhall

2.



Lemoga ka fa tlhōgō ,le mabōgō le diatla tsa molwetse di ntseng
ka gōnē le maoto le diatla tsa Modiri.

Note Position of Head, Arms and Hands of Patient and Legs
and Hands of the Operator.



Go tamusa go ntsha moya le metsi mo makgwafong le mo di-
phatlheng tsa moya.

Downward Pressure to expel Air, Water, etc. from Lungs
and Air Passages.

4



Neneketsa go gatêlêla, gore moya o tsênê mo makgwafong mme o seka wa tlosa diatla mo mokwatleng.

Relaxing Pressure without moving Hands from Back allowing
air to enter the lungs.

FOREWORD

HOW TO USE THIS BOOK

This book is not only intended for the use of pupils and teachers in our schools but has been written with the aim of helping all people, adults and children, to live healthy and, as a consequence, happier lives.

We want parents to know what is being taught to their children, so that we may have their support and help in what we are trying to do, and we shall only obtain that help if they, the parents, understand and practise what is being taught to their children. This is particularly necessary in the teaching of health work.

Teachers will do much to help their country and their work by arranging for adults to meet once or twice a week for a short period during which portions of this book could be read to them and subsequently be discussed by them. Gradually, other reading material could be used at such meetings. Even if only two or three gather together for that purpose it will be worthwhile.

There must now be a word about how to use this book in the schools. Do not use it merely as a reading book but relate it to what the pupils actually can see and do for themselves. One does not want to see pupils spending time in merely reading about hygiene when such time could be spent in practical

health matters, such as keeping the yard and building clean or building a small wall around the village well to keep out filth.

Then again, when opportunity occurs allow the pupil to practise such things as how to restore breathing and what is known as First Aid : they want to do things for themselves and not only to hear and read about what should be done.

I need hardly say how necessary it is to pay particular attention to what you are told about proper feeding in relation to health.

Our thanks are due to Drs. Macvicar and Shepherd who have compiled the book and to the Principal Medical Officer of the Bechuana-land Protectorate, Dr. J. W. Stirling, O.B.E., who has done much to help with his advice in connection with our particular difficulties and under whose general approval the book is published. The work of translation was done by Mr. Theophilus Gaboutlwelwe. Do your best to make both it and its contents as widely known as possible throughout the length and breadth of our country.

H. J. E. DUMBRELL,
Director of Education.

SECTION I.

THE HUMAN BODY

Chapter 1.

ANATOMY AND PHYSIOLOGY OF THE BODY

The human body is the most wonderful of machines.

When a person tells us of a machine we want to ask two questions: What is the machine like? How does it work? In other words we are asking (1) What is its shape or form? Or, to use a big word which is applied to the body, what is its *Anatomy*? And (2) what does it do? Or, what is its function? Or, to use another big word applied to the body, what is its *Physiology*?

The body is made up of parts all joined together. Some of the parts are called organs and systems. An *organ* is a part of the body which has its own work to do. For example, the heart is the organ which pumps the blood to the various parts of the body. The heart, arteries, veins and capillaries (the capillaries are tiny tubes or vessels which join together the arteries and veins) make a *system*, because they all work together for the carrying of the blood which the heart pumps. This system is known as the circulatory system. There are other systems such as the skeletal, digestive, respiratory, urinary and nervous systems.

SKELETON OR SKELETAL SYSTEM :

(For Illustration see page 2)

The skeleton of the body is for **support** and **protection**. The strong bones of the legs and back hold up or support the body. The bones of the head, chest and hips are wonderfully made for the purpose of protecting the important organs which are contained in them. Three important sections or rooms of the body are the head, chest and abdomen. The head holds the brain. The chest contains the heart and lungs. Tucked up under the ribs, though really in the abdomen, are the liver, spleen and kidneys. The abdomen also contains the stomach, bowels and pancreas. The hip bones protect the bladder and rectum, and the womb in women.

The bones of the head are called the skull bones. The upper part of the head is known as the vault, the lower part as the base. Attached to the head is the back-bone. The back-bone is not only for support but also for protection, since the main nerve of the body—the spinal cord—runs in a tunnel formed by spines of the vertebrae. Other main bones are :

The upper and lower jaw-bones

The ribs and breast-bone

The shoulder blade (scapula) and collar-bone

The arm bones : upper arm = humerus

lower arm = radius, ulna,
wrist and hand bones

The bones of the hips and pelvis.

The leg bones : upper leg = femur
lower leg = tibia, fibula,
ankle and foot bones.

Joints. Where the bones touch each other joints are formed. Some joints are *fixed* like the ribs to the breast-bone. Other joints are *movable* like the elbow and knee joints.

ALIMENTARY OR DIGESTIVE SYSTEM

Running through the body is the food or alimentary tract. The mouth, which is the door of this tract, is a door that can be shut against dust and other harmful things which might enter. In the mouth are organs of taste which test all foods before they enter the body ; and there are teeth which break up the food to make it fit for the body's needs. The food passes through the gullet to the stomach which stores and helps to digest the food, and then passes the food on to the bowels. The bowels digest the food and from the bowels the building, repairing, strengthening and heating juices of the food are carried by the blood to all parts of the body. The bowels are of two main parts, namely, the smaller bowel which is twenty-two feet long—it is called the smaller bowel because it is narrower than the larger bowel—and the large bowel which is much wider, but is only eight feet in length. The remains of the food which has not been taken up by the body is passed along

by the bowel and becomes faeces. The bowel should be opened daily to get rid of such waste products.

The food tract is composed of mouth, gullet (oesophagus), stomach, bowels (and rectum.)

THE BLOOD OR CIRCULATORY SYSTEM :

The heart forces the blood through the arteries and veins. The *arteries* are tubes or vessels which carry the pure blood to every part of the body. In this pure blood are the juices which the blood has taken from the food digested, and these juices make the body strong. The *veins* are the tubes or vessels which carry the impure blood from every part of the body to the heart and lungs.

The main vessels of the body are :

In the chest = the aorta (principal artery of and the body) and the main abdomen veins

In the head = the carotid arteries and the and neck jugular veins

In the arms = the brachial, radial and ulnar arteries. There are also corresponding veins.

In the legs = the femoral, popliteal and tibial arteries and veins.

The heart beats about seventy-two times per minute if an adult person is in good health. If we wish to learn how near to the normal rate

the heart is beating, we put fingers on the radial artery in the forearm, as it is the artery most easily felt in the whole body. This is known as the radial pulse.

THE RESPIRATORY SYSTEM :

The lungs breathe in pure air and breathe out impure air. The pure air is carried to the heart from the lungs, and from the heart the arteries carry it to every part of the body. The impure air is brought back to the lungs from the farthest parts of the body by the blood in the veins. Pure air is very necessary for the health of the body. If we sleep in a room or hut with windows and door tightly closed, then in time the air will be quite impure and this impure air we shall go on breathing again and again, so long as the windows and door are kept closed and no fresh air is allowed to enter. The same thing will happen if we pull the blanket tightly round our head before going to sleep. This breathing of impure air is very harmful to the body.

THE URINARY SYSTEM

The kidneys filter the blood of the body and pass much of what is waste or impure to the bladder. The bladder stores the impure and waste part of the blood—now called urine—and from the bladder it is passed out.

THE SKIN :

Also helps to get rid of waste and impurities by putting out perspiration through the very small holes or pores which are everywhere in the skin. The skin is likewise protective. If the skin is scratched or torn, the break in the skin may allow little carriers of disease (germs) into the body and these in turn may cause sickness.

It should be noted that the waste products of the body are got rid of by the bowels, lungs and kidneys, as well as by the skin. A full-grown man usually passes out 100 ounces of liquid per day in the forms of urine and perspiration. If the weather is cold he passes more urine than perspiration ; if the weather is hot he passes more perspiration and less urine. If the weather is moderate in temperature he passes about 50 ounces of each in a day.

THE NERVOUS SYSTEM :

The brain is like a chief who directs and controls everything. The brain messengers are the *nerves*. The main nerve of the body—the spinal cord—hangs down the back like a long tail from the brain, and from this tail many branches go off. The nerves are of two kinds. Some are messengers which bring messages to the chief, and others are able to cause parts of the body to move as the chief bids them. Some nerves can perform both these functions. The nerves which carry

messages to the brain are called *sensory* nerves. The nerves which make the body act or move are called *motor nerves*. A simple illustration of the working of these nerves is seen when one of our fingers is burned by fire. First there is the pain felt, through the sensory nerves ; then there is the drawing away of the finger by the action of the motor nerves on the muscles of the finger and arm.

The branches going off the spinal cord are called the spinal nerves. These branches join and form large nerves which go to many parts of the body. In many cases these large nerves follow the same courses and are called by the same names as the arteries and veins already described.

In addition to these spinal nerves there are twelve pairs of *brain* or *cranial* nerves. The first pair are the nerves of smell ; the second are the nerves of sight ; the third, fourth and sixth move the eyeballs in different directions ; the fifth are sensory for the skin of the face and for the teeth (the fifth nerve is the nerve that gives us pain in toothache) ; the seventh move the muscles of the face—by them we laugh ; the eighth nerves are the nerves of hearing ; the ninth are nerves of taste ; the tenth is the wandering nerve which goes to the pharynx, larynx, gullet, stomach, bowels, heart, liver and spleen ; the eleventh nerves go to the muscles of the neck ; and the twelfth to the tongue.

These various systems must be in good working order, and work well together, for the body to be healthy and strong.

Chapter 2.

SPECIAL SENSES—USE AND CARE OF

<i>Five Special Senses</i>	<i>Organs of Special Sense</i>
SMELL	= NOSE
TASTE	= TONGUE AND SOFT PALATE
TOUCH	= SKIN
SIGHT	= EYES
HEARING	= EARS

The organs of special sense have been made with special care and they require to be kept with great care.

I. Special Sense = Smell : Organ = Nose.

The sense of smell is said to be the simplest or most primitive of all the senses. Most of the lower animals use this sense much more than human beings. For example, the sense of smell is strongly developed in dogs and they depend greatly on it.

The nerves of smell have their endings under the lining in the upper part of the nose. The nose tests all smells and sends messages to the brain about them.

When a person breathes softly the air mostly passes in by the lower part of the nose. When he breathes more deeply the air is forced into

the upper part of the nose where the nerves of smell are. This is why we breathe deeply when we wish to enjoy the full scent of a flower, such as the rose.

All the air which passes into the body should pass through the nose. It is a bad habit to breathe through the mouth. In the nose are fine hairs which prevent dust and impurities from going further into the body. We must see that the dust so caught is not allowed to stay in the nose. We sneeze at times because the nose is trying to get rid of something which irritates the lining or mucous membrane. A "cold in the head" causes a watery flow to come from the nose ; this again is an attempt to wash out the germs which are the cause of the cold. When we have such a cold the inside of the nose is so swollen that we cannot detect smells, for the nerve endings are buried in the swollen lining and odour cannot reach these nerve endings.

II. *Special Sense = Taste :*

Organs *= Tongue and Soft Palate.*

The organs of taste have little projections, best seen on the back of the tongue in the form of an upturned V. The projections have taste buds in them ; these buds are little bundles of nerve endings. Taste buds are also in the roof of the mouth and some in the back of the throat.

There are four kinds of tastes—*sweet*, *bitter*, *salt* and *sour*—and for each kind there are special taste buds which send messages to the brain.

Since all foods pass through the mouth into the body, and are tasted and tested by the organs of taste, it is important that the mouth be kept clean. It is disappointing to see many people with dirty mouths, including dirty teeth. If a mouth has dirt or pus in it then these are carried into the body and the health of the whole body is affected. It is necessary to keep our mouths clean and to see that the food we eat and the water we drink are also clean and pure. Small particles of food lodge between the teeth and cause decay ; so teeth should be cleaned with a brush or stick twice a day after eating, and the mouth well washed with water.

III. *Special Sense = Touch : Organ = Skin.*

The organs of touch are mostly in the skin. They lie in the true skin which is deeper than the surface layer of the skin. Like the taste buds there are four different kinds of nerve endings in the skin. The nerve endings send messages to the brain about things that *touch*, give *pain*, are *hot* or *cold*.

It is good to keep our bodies very clean. Keeping the skin clean insures that the perspiration pores are not clogged. We keep clean by washing our bodies with *clean* water

and soap. Soap and warm water help to clear away the dust and dirt more quickly. If we can buy good and not cheap soap this will help all the more.

The *nails* are just skin made in a special way for a special use. Particles of dirt are very apt to gather between the fingers and toes, and under the nails. It is not nice to see a black line at the edge of the nails for this tells us that the owner of the nails is allowing dirt to gather there. This may lead to bad health, for where dirt is there are also disease-carrying germs, and germs are very small living things some of which fight against the good health of people, and it is when the germs win the battle that people are ill and may die. We would not keep an enemy in the house if we knew he was there. Now we know where the germ enemies seek to stay, and we must put them away by washing the body and keeping the nails short, and cleaning out all dirt from under the short nails.

After using warm water to cleanse the body thoroughly, cold water may be thrown over the body, since cold water stimulates the skin by bringing warm blood to it, and this gives us the nice warm feeling which is enjoyed after a cold bath.

The skin of the finger tips have more nerve endings of touch—tactile bodies they are called—than other parts.

IV. *Special Sense = Sight : Organs = Eyes.*

The eyes are like windows through which we see. When the eyes are shut all is dark in the body.

We learned in Chapter 1 that special organs of the body are specially protected. The eye is such an important organ that it is contained in a bony cavity or hollow (like a little cave) and the eye has a screen (the eyelid) which can be drawn down quickly to keep a harmful thing out.

It is necessary that the eye is kept moist, so there is a small gland under the upper eyelid which serves as a little tank of water. This little tank is always pouring out water which crosses the eye and thus washes the eye's surface. The water passes by a little pipe into the nose. If dirt or an insect enters the eye the gland puts out much water in an endeavour to wash the dirt or insect out of the eye. This water we call tears.

The eye is wonderfully made for receiving light, though it refuses to receive too much at one time, and the light is centred inside and at the back of the eye where the nerves of sight are. These nerves carry messages to the brain about the pictures which the light shows.

The eye can be moved in different directions by motor nerves acting on the muscles of the eye.

As in the case of other organs, it is important to keep the eyes clean. Inflammation of the

eyes is a common condition and it may lead to much damage of the eyes, and even to blindness. Inflammation is caused by allowing dirt and dust which contain germs to get into the eye.

V. *Special Sense = Hearing : Organs = Ears.*

The ear has three parts : outer, middle and inner.

The sticking-out part and the hole that we see are the *outer ear*.

If we can see into the hole, we see that it is closed at the bottom by a thin white skin, tightly stretched across. This skin is called the drum.

Inside the drum is the *middle ear*. This is a small space with air in it, with three very small bones forming a chain across it.

Still further in is the *inner ear*, from which the nerve of hearing goes to the brain.

Sound is carried into the outer passage, like blowing a horn or trumpet, the motion of the air strikes the drum and makes it vibrate, and sets in motion the three small bones in the middle ear, and the message concerning the sound is carried to the brain by the nerves in the inner ear.

The drum is well inside the ear so that it may be protected. How careful Nature is about things requiring protection ! The drum is easily pierced. Sometimes a hole is made in the drum by pus bursting through

when there is inflammation in the middle part of the ear. Sometimes people foolishly pick their ears with pins or pieces of wood. This is a very bad and dangerous thing to do. If the drum should be pierced a certain amount of deafness will result.

If there is anything blocking the outer passage of the ear, a doctor's help should be sought. If the ear is dirty or full of wax, then a doctor should also be consulted. Wax is the oil or lubricant of the ear, but the amount of wax may be excessive and block the outer ear.

If the outside of the ear is kept clean then there will be less chance of dust or dirt entering it.

All these five special senses require special care in the matter of cleanliness.

Chapter 3.

PERSONAL HYGIENE, CLOTHING, HAIR

Care of the Skin :

The skin is constantly producing sweat and oil and casting off its dead surface. Thus the skin makes its own dirt. Exposed parts, such as the face and hands, get dirt also from the outside. These exposed parts, and places that sweat much, especially under the arms and between the legs, must be washed every day. A daily bath is the ideal. If this is not

practicable, the body should be washed all over at least twice a week.

In places where water is scarce it is quite possible to wash the whole body, one part at a time, beginning with the head and working down to the feet, using one lot of water in an ordinary basin. Young boys and girls should be taught to do this as a regular habit. When water is very scarce, even a cupful in the basin can be used. Wet a small cloth, touch it with soap and rub it over the skin. Then wash the soap off the cloth and go over the skin again. If two cloths are kept, one can be used for the face and head and the other for the rest of the body.

What Soap to Use :

For babies and small children do not use carbolic soap or clothes-washing soaps such as yellow, or bluemottled or sunlight. They are apt to irritate the skin, especially in winter. Use toilet soap, or no soap at all, just plain water and a soft cloth.

Care of the Hands :

The hands should be washed before each meal. The nails should be kept clean and the skin at the roots of the nails pushed up.

Have Separate Towels :

The use of the same towel by all the members of a family is a common cause of the spread of

sore eyes, sores on the skin and even more serious contagious diseases. Each person, each child, even the baby, should have a special marked towel.

Losing the Pleasure of being Clean :

A dirty child with a verminous head cannot get a good night's rest. He turns uneasily in his sleep and scratches his head. His health suffers because his sleep is not the quiet, sound, undisturbed sleep of a clean child. And, day after day, night after night, the discomfort continues.

A clean child is not harassed in this way. He plays and learns and is happy, never even thinking that he has a skin.

Clothing :

The commonest materials of clothing are sheep's wool, cotton and artificial silk (rayon).

Woollen clothing is warm and safe, because it does not burn readily. It is, however, expensive and difficult to wash.

Cotton clothing is cheap, easy to wash and wears well. It is therefore economical, but it is not warm enough for cold weather. Also—and this is a serious drawback—it catches fire easily and burns quickly. Every year in South Africa there are many deaths from burns caused by cotton clothing catching fire. The danger is greatest with small children. Small children, wearing cotton

clothing, should never be left playing beside open fires.

Artificial silk is made from wood pulp, often strengthened with cotton. It washes well and wears fairly well if it is of good quality. It is not warm and, like pure cotton, it burns readily.

Clothing should be *loose* and *easy*. There should be nothing tight round the neck or trunk or limbs. Tight clothing obstructs the circulation of the blood.

Insufficient clothing in cold weather allows of too much loss of heat and lowers the power of the body to resist certain diseases, especially inflammation of the lungs.

Too much clothing is harmful, especially in hot weather, when it prevents the escape of heat from the body, which is necessary.

If small children have their whole bodies covered with clothes—boots, stockings, trousers, coats, hats : some mothers are proud to dress their children like this—it makes the child weak, with soft bones that are apt to bend. Sunshine is needed on the skin of a growing child. In warm weather children should have little clothing ; they should go about with at least bare legs and arms.

Underclothing must be clean. The dirt of the skin gets into underclothing and decomposes, causing the garments to have an offensive odour. As soon as a shirt or other

under-garment *begins* to have a smell, it should be changed. If shoes and socks are worn, the feet should be washed daily and the socks changed at once when they become in the least unpleasant. "Tackies" are unhealthy. They make the feet sweat and smell.

The disease scabies ("the itch") accompanies dirty clothing. When this happens all the underclothing should be boiled, the diseased parts well washed and sulphur ointment rubbed in. In the case of babies mix vaseline with the ointment, equal parts. Do this daily till well.

Lice in clothing. Lice are found on people who do not wash and do not change their underclothing. Clean habits prevent lice. Parents, however, should examine their children's heads and underclothing regularly, as lice may be got when playing with other children.

In many countries ignorant people have believed that lice come out of the skin. This is nonsense. They grow from eggs deposited by parent lice.

Lice cannot stand great heat. This is the reason lice are more common in cold countries than in hot countries and more numerous in winter than in summer. It is a good plan to put bedding and clothing in the hot sun daily, if possible upon a flat rock or on an iron roof. Or, you can boil clothes or iron them with a hot iron, ironing especially along the seams.

To rid the head of lice, the simplest way is to cut off the hair and burn it and then shave the head. Or else, soak the hair in a mixture of paraffin oil and very soapy water, one part of oil to one of the soapy water, mixed well. Cover the head with a cloth and leave it all night. In the morning wash the hair with soap and warm water. Pure paraffin may blister the skin. Naphthalene one part in eight parts of nut oil, or the soft soap called "Pumula" can be smeared over the body, besides cutting off the hair. Both are recommended by the Union Public Health Department.

Scholars must be clean :

In many schools teachers line up their scholars each morning and examine each one with care, looking particularly at the hair, teeth, clothes, hands and nails. In schools which have joined the Junior Red Cross, this inspection is carried out by the scholars themselves.

Care of the Teeth :

Brush the teeth every evening before going to bed, so that you may have a clean mouth all night. Still better, brush them after every meal. (This was the old Bantu custom). Move the brush up and down so as to clean *between* the teeth. A pinch of common salt in the water is as good as any tooth paste. Ash, which some people use, hurts the gums.

Tartar is a hard yellow coating which sometimes forms on the teeth : it should be scraped off.

Teeth which are beginning to decay should, if possible, be attended to by a dentist.

Reasons for the Decay of Teeth :

Formerly African people had excellent teeth and many still have. It is European food that is spoiling so many people's teeth now-a-days—white bread, biscuits, white rice, porridge made of *fine* mealie meal, foods that have lost their strength through milling so that they are almost useless for building bone and teeth ; foods that require hardly any chewing so that the teeth get no proper exercise ; foods that stick between the teeth—sweets are the worst for this—where the sugar ferments and makes acid which erodes and starts holes in the teeth.

The lesson that doctors and dentists teach is : keep your teeth clean and eat plain, even coarse, food. Fruit is good and milk is most valuable. Milk contains lime and this provides material for the growth of strong teeth.

Meals at Regular Hours :

It is good for health to have regular hours for eating. Children should always eat something before they start for school in the morning. If they do not, as the hours pass they become weak from hunger and cannot

learn. They are wasting their own and the teacher's time.

It is a great help to children to get a large cup of milk every day at the eleven o'clock interval. In Britain and America this is the common practice. All teachers report that the milk helps the children to learn. It also helps them to grow and makes them strong.

Regular Habits :

Children should be taught to go at regular hours daily to empty the bowels and this regular habit should be kept up in adult life.

SECTION II.

ENVIRONMENT.

Chapter 1.

HOUSING.

(For Illustration see page 26)

General Principles :

1. A house should not be very small. *Large houses* give the occupants room to sleep separated from each other. This gives them more air and limits the spread of infectious diseases.

2. Dark houses are unhealthy. Sunlight destroys the germs of disease, especially the germ of consumption (the tubercle bacillus). Have good windows.

3. Except when there are dust storms or wind and rain together, windows should never be entirely closed. Even at night they should be kept open as much as possible. People at all times require fresh moving air. Beds should be arranged at the sides of windows, so as to avoid the draught.

4. The house should be kept clean. No spitting allowed. No vermin in the walls or beds.

5. A house should be private to the family occupying it ; separated from other houses either by fences or walls or a space of ground.

This makes it possible to keep children away from others when such infectious diseases as whooping-cough and measles are about. It also makes family discipline possible.

6. If possible, all the rooms of a house should be in one building. It is a bad system having separate huts. Children ought to sleep under the same roof as their parents. Then the parents will know what the children are doing and if they are well and safe.

7. The fire or stove should be at the side of the room in a proper fireplace and should have a good chimney built clear of all wood-work. If it is an open fire, it should have a fire-guard in front, so that small children cannot get close to it.

8. In choosing a site for a house, a place should be chosen which is dry and clean. Surface drains should be made round it to protect the floors and foundations from flooding during heavy rain storms.

9. The walls should be made damp-proof, both from below (by a damp-proof course) and from the outside (by having the outer surface covered with good cement plaster or pebble dashed).

10. Thatched roofs are warm in winter and cool in summer, but are liable to catch fire and are useless for collecting rain water. Iron roofs are cold in winter and hot in summer but useful for getting rain water. They need ceilings.

VENTILATION.

Ventilation means changing the air in a room to keep it fresh and moving. In a closed room the air is not moving and, the breathed-out air being warm and moist, people in the room become hot, headachy and uncomfortable. Waking like this in the morning, they have no appetite and may even feel inclined to vomit.

Open windows are the best ventilators. Perforated (metal) bricks are also useful. They are built into the wall just below the ceiling. They allow of the escape of unclean air which, being warm, rises and collects below the ceiling.

Air passes through the cracks of wattle and daub or mud walls. It is when brick walls are built and ceilings put into rooms that it becomes necessary for the occupants to give careful attention to ventilation. The windows must be kept open.

A dangerous thing to do :

In a certain town a man and his wife went one cold night into a small room to sleep. The room had brick walls and a ceiling. It had a window and a door but no fireplace. As it was so cold, the man made a coal fire in an old paraffin tin with holes in it, and, after it had stopped smoking, he carried the tin into the room, placing it on bricks standing on a piece of iron. Then the man and his wife

shut the door and the windows tightly and lay down to sleep. In the morning they were found dead. What was the cause?

When coal is burning in a closed place where it does not get enough air to burn properly, the fire makes a poisonous gas, and when the people breathe this gas they die.

If the people are not asleep at the time, or if they wake, they first feel giddy and breathe very fast and they may vomit. If then they are able to go outside, they may recover. But if they are asleep and do not wake, they will die. Doctors call this poisonous gas, *carbon monoxide*.

If the room has no ceiling, or if there is a wide space under the door, or a hole in the window, enough air may get in to supply the fire and prevent it making carbon monoxide. But remember the danger of putting a fire in a closed room.

Motor exhaust gas is dangerous because it contains carbon monoxide. A motor engine should never be started in a garage with the door closed.

The Benefits of Fresh Air :

Tuberculosis is a house disease and the smaller the house the worse it is. We must enlarge our houses and open them up to the sun and air.

People who make a habit of sleeping in the open air, on verandahs, feel fresh in the morning and fit for their work. Many people

with consumption (lung tuberculosis or phthisis) have got better by sleeping in the open air and eating good food.

It is the same with work. People with out-door occupations such as gardeners, farm labourers and chauffeurs have better health than people working in rooms such as printers, tailors and clerks.

Open-air Schools :

Open-air schools, that is schools with classes on verandahs protected from the wind and sun, are much better for the health of both teachers and scholars, than schools with classes in rooms. Even in cold countries this has been proved to be the case. Such schools are also cheaper to build.

Infected Houses :

If a person with consumption lies in a house he is apt to infect that house so that people living in it afterwards may get the disease. If it is an old hut, the best plan is to destroy it. If it is a good house the walls and floor should be soaked, made very wet with disinfectant solution. The walls should then be scraped and the floor, if an earthen floor, lifted and relaid. Sprinkling with disinfectant is useless.

Chapter 2.

SANITATION.

In learning the subject of Hygiene it is not enough to know many rules and try to memorise them. The many rules of good health are built on a few good foundations and these foundations are known as principles or foundation truths.

In considering the subject of sanitation we find it built on a principle which was given to the world long, long ago. Moses laid down many laws of health, and in regard to sanitation he said :

“Thou shalt have a place also without the camp, whither thou shalt go forth abroad : and thou shalt have a paddle or shovel among thy weapons ; and it shall be, when thou sittest down abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee.”

(Deuteronomy 23 : 12, 13.

Revised Version)

The principle put forward here is that all excreta (that which comes out of the bowels) is to be covered with earth, and that for two reasons :

1. That flies may not get at the excreta and carry any part of it elsewhere.
2. When the excreta is covered with earth, the earth dissolves the excreta.

Nowadays people would not go about with a paddle or shovel as Moses told his people to do, but people still carry out the principle although the method is different from that of the old days. Instead of having a place a long way off, as outside the camp or village would be, there are built places near at hand, and these places are called latrines. Instead of ~~going anywhere in the bush or veld~~, as so many people do, all the people connected with a house or village or school are expected to go to latrines. When people do this the ground around the houses is kept clean, and flies do not find much to feed upon, nor much to carry germs from.

Latrines are of different kinds :

A pit is dug which is about ten feet deep or more. The pit is covered over and a hole left for the excreta to be passed through. Over the hole a lid or cover is laid and this cover must always be in place when the latrine is not being used. A fire may be put into the pit every week, for fire is the best of all cleansers. Sometimes a house is placed over the pit and outside the little building there is a fireplace with a pipe which leads smoke into the pit and this smoke goes out by a chimney on the other side. In this way all flies which seek to live in the latrine are killed. When the pit is two-thirds full of excreta, the earth, which was dug out of the pit when it was made, is used to fill the pit again. A new pit is then made.

If many people are to use the latrine, a number of such pits are made—either beside one another as for a school, or at different parts as in the case of a village.

It is important that the inside of the latrine be kept dry from rain. For this purpose the latrine house walls must extend at least two feet each way beyond the latrine pit or trench.

The latrine may be a trench.

In this case a trench is dug which is three or four feet deep and about eighteen inches across. The excreta is passed into this trench, the person using the trench having one foot on each side. He then covers up the excreta by shovelling some of the earth, which was dug out when the trench was made, back into the trench.

The latrine may be a pail.

If a pail is used it must be emptied often—at least once a day. When emptied it must be emptied into a pit or trench and the contents of the pail covered up. This is a method suitable for use by a family.

A pit or trench latrine must not be made near a well or a river, for if near a well or river the excreta may sink into the water and much sickness come upon those who use water from such sources.

The main thing for boys and girls to learn is to use the latrine and to give up the uncleanly habit of going to any place in the bush

or veld near the house. The ground around the latrine must be kept very clean and no particles of motions left exposed, for if they are left exposed the sun and the wind dry them and the germs which were in the motions may be blown about in the dust.

It is not enough to sprinkle disinfectants (medicines which cleanse from infection) about such places : it is ~~better to keep~~ such places free from ~~what~~ might infect.

Burning of Rubbish or Incineration :

It is not for boys and girls unasked to tell older people what they should do to keep the village or town clean, but boys and girls can do much to prevent places from becoming dirty. They can refrain from throwing down in the village or around their huts useless or dirty things, such as old corn cobs, bad fruit, melon skins, useless parts of slaughtered animals (e.g. horns and hoofs), old tins and broken bottles. Broken bottles, battered tins, bad fruit, or stone of fruit with pieces of fruit still sticking to them are specially to be remembered, for broken bottles and old tins may cut the feet, bad fruit or fruit stones bring swarms of flies and flies often carry diseases.

If a person has a sore on his body and a soiled dressing is taken off and a new one put on, the old dressing should be burned immediately, for in the pus of the dressing are many germs, and flies come quickly to such

dressings—they love them as boys and girls love sweets—and the flies carry the pus and germs to other people.

Not only can we stop making a place dirty but we can make a clean place more clean. We can help to sweep and wash and so make everything around us look nice.

We know that germs live and grow in old and dirty things such as old and dirty clothes ; germs live also in dust. So old things which are of no use should not be kept—they should be burned. Huts should be swept out every day and the sweepings of huts and yards should also be burned.

Every village should have a place where all rubbish is burned. In large towns fireplaces—called incinerators—are built for this purpose. Meantime, in a village where there are none of these special fireplaces, a fire in the open will serve the purpose.

If the principles mentioned in this chapter are carried out, proper sanitation will be maintained and better health for people will be the result.

*Chapter 3.***WATER***(For Illustration see page 38)**Sources of Water Supply :*

1. Rain.
2. Surface water, in pools, dams, surface springs, shallow wells, streams, rivers.
3. Deep water, coming up to the surface from a great depth as springs or got by boring down through rock.

1. *Rain water*, is clean, except in smoky towns. If collected on a clean roof, with clean gutters and stored in clean tanks, it will remain clean. Pigeons sitting on the roof are apt to foul tank water. It is important to keep gutters clean. They should be frequently examined and cleared of leaves and dirt as often as necessary.

Tanks should be cleaned yearly if possible. This is difficult because of the uncertainty of the rainfall, but should be kept in mind and the chance seized when a tank is empty.

Tanks should have close-fitting lids to prevent mosquitoes getting in. Mosquitoes breed in tanks and may become a nuisance in the house.

2. *Surface water*. Rain, on reaching the earth, immediately becomes mixed with impurities. Surface water, such as collects in pools or dams, is often very unclean, being

fouled by the excretions of both animals and people. Streams are often similarly polluted.

3. *Deep water.* Springs that come out of rocks and that continue running even in times of drought are coming from a great depth. If the water is warm we know that it is coming from a very great depth.

~~In dry places it is often possible by boring a hole down through the rocks under our feet to reach deep underground water which can then be pumped to the surface by means of a windmill or a hand pump.~~

Water from deep springs or bore holes is clean water.

Hardness in water :

Water which has soaked through lime-stone rocks contains lime and is said to be "hard." The water from deep springs or boreholes may be hard, also the water of streams coming from lime-stone hills.

Hard water is very troublesome for washing. It will not lather and so wastes soap.

One kind of hardness can be removed by boiling the water. The lime sticks to the kettle. This is called temporary hardness. There is another kind which is not removed by boiling. It is called permanent hardness.

Temporary hardness is not harmful in drinking water ; indeed it may be useful supplying lime for growth of bones and teeth. Permanent hardness may cause pain and diarrhoea.

Rain water is " soft " and good for washing.

Many towns take river water and purify it. Others bring pure water in pipes from mountain streams.

The Uses of Water :

Water, as we all know, is an absolute necessity for both people and animals. We cannot live without water.

Water is required in the stomach and bowel to make possible the digestion of food. Water forms a great part of the blood and of the juice (lymph) that soaks the body tissues. The blood and juice convey to all parts of the body the digested food, also air from the lungs. They also convey waste substances from all parts of the body to the kidneys, skin and lungs. Finally, water is required to carry these waste substances out of the body in urine and sweat.

Our bodies are largely made of water, and as we are continually losing water, we must be continually taking in more. The water in all parts of the body, that is in the blood and juice, is always moving. We cannot allow the stream to dry up, it must be kept moving.

We get a good deal of water in porridge and other foods, as well as in what we drink. It is not wise to drink much when eating, and it is quite wrong to take food and drink into the mouth together. Solid food, such as bread, should be chewed and swallowed without tea or any other liquid being mixed with it. The

water of the mouth (saliva) both softens and digests the bread. Bread swallowed hastily with tea is not digested properly and ill-health results from this way of eating.

The best time to drink water is a short time before meals, when the stomach is empty.

Other Uses of Water :

We need water for cooking and dish-washing and for washing our bodies and clothes.

Water for washing is not necessary for life, but it is necessary for civilized life. I once knew a Bantu gentleman who was often in the houses of cultured White people and was liked by them : he was always courteous and always clean. He once said to me : " When I was young I began the habit of taking a bath every day and I still do so."

SECTION III.

(For Illustrations see pages 44, 45, 46)

FOOD

Chapter 1.

The uses of Food;

The eating of food is one of our chief pleasures, yet we eat that we may live, and we do not live that we may eat.

To live means that there are certain processes constantly going on in the body. These processes are :—

1. GROWTH
2. REPAIR
3. HEAT
4. ENERGY

1. *Growth :*

A wise mother has her baby weighed at least monthly. If the child is healthy its weight will increase each month, for a healthy child is always a growing child. Growth implies that not only are the three other processes being maintained but that there is something over which is added to the body and so increases its weight. The reason that boys and girls are often hungry is that they are growing ; they are still building up their bodies for their bodies are not full grown. A boy of six years is only about one quarter of the weight he will be when he becomes a

full-grown man, and yet a boy of six eats half the quantity of food that a man eats. A boy of twelve years is half the weight he will be when he is a man, and yet he eats three quarters the quantity that a man eats. This extra food he requires for growth.

2. *Repair :*

The body is always working, even when a person is asleep. The heart goes on pumping the blood to every part of the body; the lungs breathe air in and out; the stomach and bowel never cease to digest food; the bowels, skin and kidneys are dealing with the waste products of the body—in short the whole body is working, though it might be said that it is working at low speed.

The constant working of the body causes wear of the cells of which the body is made up, so that cells are ever requiring to be repaired and then, when they can no longer carry on their work, they must be replaced.

When the body is awake there is greater need for repair, for instead of working at low speed it then works at high speed—the heart beats faster; the lungs are more active in breathing and require to take in more oxygen and give out more impure gases; the kidneys and skin discharge more waste materials; the muscular movement is greater and the muscles require repair of their tissues; and even the brain calls for extra food in its work of directing the body's actions.

3. *Heat :*

If the body is in good health it remains near to a certain definite standard temperature. The temperature standard is described as 98.4 degrees Fahrenheit scale. This standard, and any changes above and below it, can be measured by an instrument known as a thermometer, which was invented by a scientist called Fahrenheit. The day is very warm when the temperature of the atmosphere around us reaches 98 degrees Fahrenheit. When the temperature of the atmosphere is moderate or cold the body is kept busy maintaining temperature at the needed level. For this reason we eat more food in winter than at other times of the year. If a person travels to a country with a very cold climate he requires more food, and particularly certain kinds of food which generate more heat than other foods.

How necessary it is to keep up the standard of temperature is shown by the fact that if the body's temperature falls at 95 degrees Fahrenheit the person dies.

In many sicknesses the temperature is higher than the standard because the body is doing extra work in an attempt to throw off the sickness which has entered it.

4. *Energy :*

Part of the food eaten is used up by the movements of the muscles of the body. A person who does hard muscular work requires

more food than person who sits at his work most of the day.

Boys usually eat more than girls, for boys, on the whole, play more active games than girls. It must be remembered that every movement of the body can only be produced from food eaten.

DISREGARD OF THE TRUE USES OF FOOD INJURES THE HEALTH

(For Illustration see page 52)

Insufficient food :

When one eats too little food the health is affected. If the food is not enough in quantity there will be a loss in the body's weight, for there will not be sufficient for growth and repair, and heat and energy will also be lessened.

Ill balanced food :

When the food is not well balanced, though it may be sufficient in quantity, good health is affected. We shall see in the next chapter that there are essential foods, for all foods are not of the same value in regard to what they contribute for growth, repair, heat and energy.

Over feeding :

When too much food is eaten the organs of the body become clogged and are prevented from working smoothly.

Food is therefore necessary to the body, and

quality and quantity of foods, and the balance between quantity and quality, are important aids to growth and health.

Chapter 2.

ESSENTIAL FOODS

1. *Food for Growth :*

Milk is the best of all foods for building the growing body and for repairing and renewing it in later life.

For growth, milk contains, besides other things, casein (from which cheese is made) and lime in a form specially suitable for the growth of bones and teeth.

For producing the body's heat and supplying energy for work, milk is also useful. For these purposes it has milk fat (from which butter is made) and milk sugar. Milk also contains a number of other food substances, including those known as vitamins which are required to maintain health.

A mother's milk has everything that a small infant needs, and, whenever possible, a baby should be fed upon its mother's breast milk and nothing else for at least the first six months of its life. Babies fed on other foods are often ill and many of them die, but babies given breast milk only have good health and few die. They also grow bigger than the others. The baby's mother should take cow's

milk to give her strength to nurse her baby efficiently.

Growing children, if at all possible, should be given milk, three or four large cupfuls every day. It may be sweet or sour. Both are good.

Cheese and butter, which are made from milk, are most valuable foods. So is separated milk. Separated milk, though it has lost the fat, still has in it the casein, the lime, the sugar and other valuable parts of the milk. If a family have no cows and cannot afford to buy whole milk, they should try to get separated milk for the children every day.

Eggs, meat and fish resemble milk as body-building foods, but milk is the best for children. If milk cannot be got, eggs are the best substitute. Meat is not good for small children. It is apt to make them cross and ill.

It is not wise to eat the meat of animals that have died of disease.

A considerable amount of material for growth is present in beans, peas and ground nuts (monkey nuts) and some also in mealies, kafir-corn and other cereals. The growth-material, however, which is got from beans and cereals cannot all be used by the growing body. Some of it is not suitable. A child therefore who is fed on a cereal alone, such as mealies, has to eat large quantities till his stomach is distended, and even then he will not be growing well. The addition of beans

to the daily diet helps considerably, but the child getting milk every day will grow best.

2. Food for Work and Heat Production :

The foods that are best for growth, namely, milk, meat, eggs, beans and ground nuts, can be used also for heat and energy production, but—except for small babies who are not able to digest them—cereals serve this purpose just as well, and are much less expensive.

Cereals are all those food plants that are like grass. They are oats, wheat, rice, kafir-maize and others.

Cereals are the great foods for giving people strength for work.

The cereals that grow best in any country are probably the best for the people of that country. Maize, where there is a good rainfall, and kafir-corn, where the rainfall is not so good, are the chief cereals in the Bechuana-land Protectorate. Wheat and oats are also grown in some parts. Note that red or yellow maize is more nourishing than white maize.

Of recent years a very important fact has been learned about cereals. The more they are milled and refined, the less valuable they become. Milling takes from them the outer most nourishing parts. Fine mealie meal (though it may be advertised as being the best) is not nearly so good as home ground or lightly milled "straight-run" mealie meal.

It is the same with all the cereals. White rice is poor food : it has lost its best parts. White bread is poor food compared with brown bread made with unsifted Boer meal (No. 1 whole meal).

A Complete Diet :

A plentiful daily supply of milk, a good cereal such as yellow mealies or kafir-corn, eaten whole or home ground, and a daily supply of wild green vegetables or bulbs—on such a diet children will grow, grown-up people will work, and, as far as food is concerned, all will enjoy good health.

But, if milk is not to be got and wild green vegetables and bulbs are scarce or unobtainable, people cannot long maintain good health upon the cereal alone. Other foods must be got to make up the deficiencies—eggs, meat, beans or perhaps cheese, for growth, and cultivated vegetables or fruits to take the place of the wild ones. These may be green vegetables such as cabbages, spinach, lettuce, (lettuce is washed and eaten raw), tomatoes, (eaten raw), onions, (cooked or raw), potatoes, common or sweet, or fruit such as oranges, naartjes, lemons, peaches. All these supply the substances needed for health. Potatoes, which are often quite cheap, are a valuable part of the daily diet, good for health, good for work, of value also for growth.

The best plan, where it can be managed, is to have both cows and gardens near where

people are living ; and, if this is impossible, serious thought should be given to the question of the people changing their place of residence. People who are not getting fresh food may not be lying down sick ; they may be walking about, but they are weaker than they should be ; and children who are not getting milk are smaller than they should be. It is not enough to get milk only during three or four months of the year ; children should have milk the whole year.

It is not much use talking to people about health if they go on living in a place where the foods necessary for health cannot be got. Large towns are only justifiable in places where supplies of fresh food, milk, vegetables and fruit can be got every day.

Chapter 3.

COOKING AND CARE OF FOOD

Cookery has to be learned by practice, that is, by doing the cooking, under the direction of mothers, instructors or other people with experience. All that the writer of this chapter can do is to put down for the reader's information and *guidance* certain facts that have come to the knowledge of doctors from their study of the nutritive qualities of different foods.

Milk is so rich a food that infective disease germs grow readily in it. Disease infection

may enter milk from a diseased cow or a diseased person milking or handling milk in any way. Milk from a cow that is coughing, or has sores on the udder, or *is sick with diarrhoea* or any other disease should not be used; and no person sick with fever, diarrhoea, sore throat or cough should be allowed to milk cows or handle milk afterwards.

In country places, if milkers and cows are healthy, the best way in hot weather is to let the milk go sour and drink it while the curd is still soft. Sour milk, with soft light curd, is an easily digested and wholesome food for old and young.

When milk is bought in a town it is wiser to heat it sufficiently to destroy any disease germs that may possibly have got into it. Put the milk into a clean pan and heat it over a hot (not smoky) fire. Watch the milk closely and as soon as you see three or four tiny bubbles appearing on the surface, take the pan off the fire and pour the milk into a clean jug. When it is cool, cover the jug with a lid or, clean cloth. It is well to hasten cooling by standing the jug in a small basin of cold water. Keep it in a cool clean place. In cold weather milk so treated will keep good for a day; in hot weather use it within six or at the most twelve hours.

In times of drought, sweetened condensed milk or, still better, dried milk (milk powder) can be used.

Meat is best cooked by slow stewing. Boiling hardens it unnecessarily and roasting is not thorough enough.

Cooking softens the fibrous parts of meat and destroys any young worms that may be in it.

In hot weather do not keep meat long. Keep it dry. Meat soup and meat pies are very apt to become germ-infected and dangerous, causing serious illness and even death. The flesh of calves is apt to be dangerous, especially if the calves have been sick.

Eggs are cooked in a variety of ways, either by themselves or mixed with cereals or other foods, as in puddings. It is all a matter of taste.

Cereals should be thoroughly cooked. Mealies and mealie meal take a specially long time. Half cooked cereals are very indigestible.

Beans and *peas* should be cooked till they are soft. The soya bean is the richest in food value of all the beans. Soya meal can be got, mixed with other meals, a good mixture.

Potatoes should be cooked until they are soft, not longer. Potatoes boiled or steamed in their skin (just washed to remove the earth) and then allowed to dry in the pot, can be peeled at table. In this way the juice is retained. If potatoes are pared and then

boiled much of the juice—which is a valuable part of the potato—is lost in the water.

It may be added here that this rule applies to other foods besides potatoes. *White rice*, for instance, has already lost much of its value in the mill. If it is washed before being cooked it loses still more of its value, and the more it is washed the poorer it becomes.

When fish is boiled, part, an important part, of its nutritive qualities passes into the water and is lost.

There are some foods which contain poisons (for example some kinds of cassava) or substances having an unpleasant taste, and these foods may have to be boiled in water and the water thrown away. With these rare exceptions, it may be taken as a sound rule not to throw away water in which food has been cooked. From the health point of view the losses incurred in this way are serious. Unless soup is being made, only enough water should be used to cook the food, without leaving any over.

Another important lesson has been learned. Soda should not be added in cooking vegetables. It destroys the very substances which make vegetables valuable for health, the substances which protect us from scurvy and other diseases. Prolonged cooking also destroys these precious health-maintaining substances, therefore it is another rule to cook vegetables as short a time as possible. Some are best eaten raw, as lettuce, tomatoes,

carrots. They must first be washed in clean water. Carrots can be grated and spread on bread and butter.

In times of drought, when fruits and green vegetables cannot be got, a useful substitute can be made by causing kafir-corn or beans to sprout before cooking them. In this case shorten the time of cooking. Wild bulbs should, if possible, be got and eaten daily.

Vegetables straight from the Garden are best :

It has been found that green vegetables quickly lose their value when left lying in the sun after being cut. Wilted cabbages, for instance, are not half as good as fresh cabbages just brought from the garden. This teaches us, if we have enough water, that we should use every little bit of garden we possess for growing vegetables. Flowers are beautiful and may be given a little space in front of the house, but vegetables are a matter of health and life and should be given the best of the land, all that can be kept watered.

Potatoes also are best straight from the garden, freshly dug.

The Danger of Flies and Dirt :

All food should be carefully protected from dust, from flies, from animals and from unclean hands.

To store Cereals :

Mealies or kafir-corn should be dried thoroughly and then stored in containers

filled full and sealed as tight as possible to keep out air. Weevils cannot live without air.

(For Illustration see page 63)

SECTION IV.

COMMUNICABLE DISEASES

Chapter 1.

INFECTIOUS AND CONTAGIOUS DISEASES

Communicable diseases are spread in different ways and they are grouped in sections which indicate how they are passed from person to person.

1. *Infectious Diseases :*

An infectious disease is a disease which is passed from one person to another without these persons having direct touch with one another ; and without the disease being insect or water borne.

2. *Contagious Disease :*

A contagious disease is a disease contracted by a healthy person touching the body, clothing or discharges of a sick person.

We have learned that germs are often the carriers of disease. All germs are not disease carriers and therefore all germs are not harmful to health. But disease-carrying germs when they enter the body are the cause of much sickness.

Sicknesses are of definite and different kinds. A man who knows peoples never confuses an African with an Indian. A doctor who knows sicknesses never confuses tuberculosis with syphilis. And just as diseases are different, the germs of diseases are different—different in shape and different in what they do.

The Shapes of Germs and the Actions of Germs:

The germ of tuberculosis is rod-shaped, and usually attacks the lungs and joints. The germ of syphilis is like a curly hair and attacks the skin and underlying tissues, and in time the bones and internal organs. The germs of boils may be either small rods or oval in shape.

The germs named are so small that they can only be seen with the aid of a powerful microscope.

(For Illustration see page 65)

INFECTIOUS DISEASES—MODES OF INFECTION :

How are infectious diseases carried from person to person? They are transmitted principally by breathing, but also by spitting and by the exudations (that which oozes out) from the bodies of the sick. The common cold, influenza, whooping cough, and pneumonia are conveyed in the breath of the sick person. Measles, chicken-pox and small-pox are from the exudations of the sick. Tuberculosis may be conveyed by breathing, for

example by a healthy person sleeping in the same room as a person suffering from tuberculosis of the lungs (phthisis). But tuberculosis is chiefly conveyed by spitting. A patient with tuberculosis may have the germs in his lungs—he will have if he has phthisis. He coughs and spits. What he spits dries in time, but the germs still live in the dried spittle or expectoration and the wind blows these germs about, and they are breathed into the lungs of healthy people.

CONTAGIOUS DISEASES—MODES OF INFECTION :

Syphilis, leprosy, gonorrhoea, ringworm and conjunctivitis (inflammation of the conjunctiva of the eye) are all contracted by healthy persons touching the bodies, clothing or discharges of those with such sicknesses.

The common cold can also be taken from one person by another through contact. A common example of such a mode of transmission is that of kissing.

A person attending the sick may carry the sickness from one to another by lack of the care that is necessary to avoid doing so. All discharges of a patient suffering from a contagious disease should be disinfected or burned.

PROTECTION AGAINST INFECTION:

It is the duty of a person with an infectious or contagious disease not to do anything that

may help to spread the disease. It is also desirable that a healthy person should not put himself unnecessarily in the way of catching infection.

For example, a person with tuberculosis of the lungs should cough the sputum into a clean rag and immediately burn the rag. Spitting is a very bad habit, and in a person with disease of the throat or lungs it is a dangerous one. A notice once seen in public offices was as follows : " Gentlemen will not spit : others must not ! "

One should never use another person's comb, brush or towel.

Vaccination is a good preventive against small-pox, and the opportunity to be vaccinated should always be taken advantage of by boys and girls, as well as by older people.

Sunlight, fresh-air, soap, water and general cleanliness are great aids in the prevention of the spread of disease.

Disease germs may and do enter the bodies of many people who do not become sick with the particular disease the germ is carrying. The reason why the germ fails to convey the illness is that the body is strong enough to fight and cast out the sickness before it gets a hold. Therefore the more fit we keep our bodies the less likelihood there is that sickness will overtake us.

Chapter 2.

WATER-BORNE DISEASES.

The infection of *Enteric Fever* enters the body by the mouth.

Suppose a sick person with enteric fever goes out to relieve himself somewhere near a stream or well. In that place he has left the germs of his disease. Now, suppose rain comes and washes what he has passed into that stream or well. People drawing water there are taking with it the infection of enteric fever. They do not see the germs; they are far too small to be seen. If these people drink that water they get the disease germs into their bodies. The germs swallowed may be few. They multiply in those people's bodies until—after a week or it may be as long as three or four weeks—they are numerous enough to start the fever. Many people may get the infection from one sick person and some of them may die. It is a very serious matter.

Suppose again that the person with this fever is lying very ill and weak in his house and his wife takes what he has passed and throws it out, or takes his soiled blanket and washes it beside the stream. The same thing happens. The stream is infected and others drinking the water get the fever.

These things of course ought not be done. A person with enteric fever should not walk

out, and his wife should mix disinfectant with what he passes by the bowel and with the urine and, after leaving them for two hours, should empty the utensil into a hole dug in the ground far from any well or stream. Also she should soak his clothes and bedding in disinfectant all night before washing them and not wash them near a stream either. The trouble is that so few people know that they ought to do these things, and streams and wells, pools and dams get infected and the fever goes on spreading.

There is danger of other diseases also being conveyed by infected water. *Dysentery* may be got in this way, although it is probably more often conveyed by flies. *Diarrhoea* too is sometimes got from drinking water which has been infected by a previous case.

In water fouled by human excreta there may be eggs—they are very small—of *worms*. If people drink such water the eggs grow into worms and give them trouble.

From all this we learn how necessary it is to give attention to our drinking water.

In cities and most towns water is laid on in pipes. It has either been derived from a safe source or has been made safe by chemical treatment. We can drink it without fear.

In small villages, however, that have no such good water supply and in most country places it is a common thing for people to get enteric fever from drinking water. The only way to avoid this danger is to boil all the water

we drink. In each house there should be a good-sized jug with a lid or cover and this jug should be filled every day with boiling water. When any member of the family wants a drink he takes a cup and fills it from this jug. The housewife should make it a daily habit, at the same hour each day, to fill the jug with boiling water. Boiled water should also be used for washing dishes.

It may be useful to mention here that injections can be given by doctors to prevent people taking enteric fever. These injections give protection in most cases for about two years.

Bilharzia Disease, which causes blood in the urine, is got either from bathing in or drinking the water of certain streams which contain the small young worms of this disease. Streams that have these worms are generally known. Bathing in them should be avoided. If water drawn from one of these streams is kept for two whole days, it will be safe to wash in on the third day. The young worms do not live so long. Boiling makes the water safe at once for drinking.

(For Illustrations see pages 73, 74)

*Chapter 3.*INSECT AND ANIMAL-BORNE
DISEASES.

Insects and animals play a large part in the spread of disease. The history of Medicine during the last fifty years is largely the story of tracking down the carriers of sickness. Sixty years ago germs were unknown. The finding of germs and tracing the part played by insects and animals in carrying germs have changed men's thoughts about disease and about the way diseases should be attacked.

Dr. Livingstone wrote : " I would like to devote a portion of my life to the discovery of a remedy for the terrible disease, the African fever. . . . When our posterity shall have discovered what it is which causes fever they will pity our dullness of perception. . . . Myriads of mosquitoes showed, as probably they always do, the presence of malaria." But it was left to Dr. Ronald Ross very many years later to show that the mosquito after biting a person who had malarial fever, carried and developed the germs in its body, and by biting another person infected that other one with malarial fever.

Man now wages war against these small carriers and endeavour to kill them, or at least to keep them in their own place. The following tables give a list of those carriers,

the disease they carry, and the measures to be taken against them :

*Insect or Animal
Carrier*

Diseases Carried

Measures of Prevention and Protection.

FLIES

DIARRHOEA

Flies carry disease by walking over rubbish, filth, faeces, sores or ulcers. Their hairy legs take up germs with the dirt and carry these germs to where the flies go next—it may be to food, milk or water. The preventive measures are to keep flies from food, milk and water.

Good latrines regularly used are great aids in reducing the number of flies. Flies love faeces and rubbish to breed in, so the latrine and the incinerator are valuable weapons to be used against them.

FLIES

DYSENTERY

This is a more severe form of diarrhoea. The preventive measures to be taken are the same as in diarrhoea. Milk and water should first be boiled as this will kill any germs in these liquids. The milk and water should then be allowed to cool and be covered till used.

Carrier
FLIES
ENTERIC
FEVER
(TYPHOID) Diseases

Measure of Prevention and Protection

The killing of green metallic flies and ordinary houseflies is a protection against enteric fever.

Cleanliness and the boiling of milk and water—as insisted on under diarrhoea and dysentery—help to prevent this sickness.

FLIES
CONJUNCTIVITIS

The killing of flies, which seek so persistently to alight near the eyes of children and older people, is necessary for the prevention of conjunctivitis. Flies carry this disease also by their habit of feeding on sores and ulcers.

A piece of gauze netting, placed over the head of a child when asleep keeps flies off the child's face.

TSETSE
FLIES
SLEEPING
SICKNESS

War must be waged on the tsetse fly. Tsetse flies require shade near water, so cutting down the bush along river banks helps to eradicate the carriers of this disease. The recent outbreaks of this dreadful malady in Ngamiland makes this sickness of special interest to Bechuanaland Protectorate.

MOSQUITOES Carrier
Diseases
MALARIAL
FEVER

Measure of Prevention
and Protection

Mosquitoes require water in which to deposit their eggs and develop the larvae which in turn become mosquitoes. Mosquito larvae—"wrigglers" as they are called from the wriggling movements they make in the water—are easily seen by inspecting a sample of water in which they are. The drying of pools, or pouring oil on the water will prevent the larvae from developing. When mosquitoes are found round a house it is a good rule to seek a source near by.

MOSQUITOES
YELLOW
FEVER

There is no yellow fever in Bechuanaland Protectorate or South Africa. But in a district such as Mochudi, B.P., there are many of the mosquitoes which carry yellow fever. So far these mosquitoes are not infected thus meantime they are harmless. We should, however, wage war on these stegomyia mosquitoes until they are exterminated.

MOSQUITOES
FILARIA
(Elephantiasis)

This is another sickness which is not prevalent in Bechuanaland but the ridding of the Protectorate of mosquitoes will more surely keep it away.

(For Illustrations see pages 79, 80, 81)

Carrier

Diseases

Measures of Prevention and Protection

FLEAS

PLAGUE

Rats and mice (field mice are called gerbiles) have fleas in their fur. These rats or mice may become infected with Plague from these fleas. If a rat or mouse dies from plague, the fleas carrying the plague germs will seek another body to live on—this other may be a human body.

To prevent the possible spread of plague the extermination of rats and mice is called for.

LICE

TYPHUS
FEVER

If lice infected with typhus fever germs bite a healthy person then the person so bitten may also become infected with typhus fever. There can be no spread of disease if people keep themselves and their houses free of lice.

When anyone has been overcome by any of the above-mentioned sicknesses then a doctor should be consulted as to the best means to cure the patient. It will still be necessary, however, to employ the preventive measures already emphasised to keep the illness from spreading to others.

(For Illustration see page 84)

SECTION V.

GENERAL.

Chapter 1.

EXERCISE AND REST.

Benefits of Physical Exercises :

In watching a small child one notices that, unless asleep, the child is never at rest. Its body is in constant motion and the arms and legs are specially active. We might think that such movements are without purpose and without benefit, but it is not so. These constant movements of the various parts of the body are necessary for the child's growth.

Some children, unfortunately, are paralysed in a limb or limbs. The paralysis makes it impossible for the child to move the limb properly—the limb, if it is a leg, is dragged in attempting to walk. When we look at such a limb we notice that besides not moving freely, the leg is thin and flabby. This is what would happen to the whole body if physical exercise was not indulged in : the muscles would become thin and flabby and lack tone.

Exercise is of benefit for the following reasons :

1. Exercise, by helping to send blood to every part of the body, *strengthens the muscles*,

develops the brain, improves the lungs, and causes the skin to perspire.

2. *It causes the muscles to give off heat.* This is the reason we wish to walk quickly and throw our arms about in cold weather.

3. *Exercise keeps the body in good condition.* Note how the heart beats more strongly and quickly when we are active. We should, however, avoid over-straining the heart.

4. Exercise tends to remove superfluous fat from the body. The combustion in the body burns up the fat.

Good Forms of Exercise :

1. *Drill.* When we sit for a long time in school or elsewhere our bodies become cramped and stiff and are not so fit, and they then require exercise such as drill. The best kind of drill is that which brings into action as many as possible of the two hundred or more muscles which are in the body. It is a good practice to do physical exercises soon after getting out of bed in the morning.

2. *Games.* Outside of school hours we require to play games, and again, the best kind of games are those which exercise most muscles, and which entail the alert use of brain, eye and limb. Organised school games and school sports including running, football, basketball, tennis are good forms of exercise. We should learn to play games ourselves and not merely watch others playing.

Games should teach us to be smart, to take a beating in good spirit, and to play "fair."

3. *Walking*. This is one of the best forms of exercise and should be indulged in daily.

4. *Cycling* is also a good form of exercise and one which is becoming increasingly popular.

5. *Swimming* is one of the very best of recreations, but unfortunately there are few opportunities for swimming in such dry countries as Bechuanaland Protectorate and many parts of inner South Africa.

6. *School Gardening*. This is also very good exercise since it involves working in the fresh air and using many muscles. Incidentally it also provides fruit and vegetables which are so often lacking in the food of Africans, and yet fruit and vegetables are so necessary to the building and repairing of a healthy body.

It is important that we have daily exercise and, as in everything else, it should be regular and well-ordered.

After exercise, particularly in which we perspire, we should see that we put on an extra garment, such as a jersey or pullover, so that we are not chilled.

The drills and other exercises required of those who are members of such Organisations as Pathfinders, Boys' Brigade, Girls' Life Brigade and Wayfarers are all good for the

body, and these Youth Organisations are worthy of all support.

REST AND SLEEP.

After a day of active exercise—be it of mind or body—rest and sleep are essential so that the body may be restored. Sleep is necessary to life : to be healthy we require regular and sufficient sleep.

Young people require much more sleep each night than adults.

Small children should sleep twelve hours each day.

Young lads and girls should sleep about nine hours.

Adults require six to eight hours sleep.

Night is the time to sleep. A doctor has written "All-night and even late concerts and meetings are exceedingly bad for children, and should never be allowed."

Chapter 2.

FIRST AID IN ACCIDENTS.

Poisoning.

Dip, disinfectants such as carbolic acid and lysol, and caustic soda (used for making soap) are examples of common poisons. People should be careful to keep such things out of reach of children, and tins or bottles in which they have been kept should never be

used afterwards for holding water or food. Washing may not remove all the poison. Ordinary medicines also, such as tablets, should be kept in a locked box or cupboard.

What to do if poisoning occurs.

Send for a doctor if one is within reach, mentioning the name of the poison if known, or, carry the patient at once to the doctor.

At the same time try to get the patient to vomit. Push a finger into the back of his throat. If this fails, give him a large spoonful of common salt in a pint jug (that is one holding four or five cups) full of luke-warm water. (If the poison is caustic soda do not make him vomit but give him cups of water to each of which a large spoonful of vinegar or lemon juice has been added, or give him the thin part of sour milk. Keep him warm).

This note is about *real* poisoning. Sometimes people *think* they have been poisoned (in a magical way) when the truth is they are just very much frightened. Education stops this foolishness.

2. *Snake-bite.*

Tie a cloth tightly round the limb above the place bitten. Make an H shaped cut over the bite and raise the cut edges of skin. If you have it, rub in permanganate of potash. If not, suck the place and spit out the poison. But if you have a sore lip or mouth do not suck; just squeeze the blood out with your

fingers. Give the person strong tea or coffee and take him quickly to the nearest doctor.

3. *Burns.*

If a woman's dress catches fire make her lie down at once with the flames uppermost to keep them away from her body. Splash water on the flames or lay over her a woollen blanket or man's overcoat.

The worst thing to do is for her to run out of the house crying for help. The wind blows the flames up the body and a widespread burn is caused which is apt to be fatal.

If the woman is working in a field let her lie down and either beat out the flames or quickly cover them with earth.

If the burnt surface is large (even if it is not deep) and a hospital is within reach take the person there at once, or to any doctor.

1. If far from a doctor keep the person in a warm room. A person with large burns suffers severely from cold and this increases greatly the risk of death. Keep the room warm day and night. The person must not leave the house.

Dress the burnt places with strips of clean handkerchiefs or other soft cloths which are either soaked in cod liver oil or spread with vaseline (boil the knife before using it to spread the vaseline). Change the cloth every second day.

If you have not got any of these things, gently pour over the burnt surfaces warm

strong tea (boil the tea to make it strong), and leave the burn without a dressing. Cloths would stick and cause much pain. Repeat the tea application twice a day. Leave blisters alone. Keep flies away.

3. While the burn is being attended to, get some one to give the patient a drink of warm milk, or, failing that, tea or coffee. Continue giving milk if possible every day and whatever other light but nourishing foods are available.

4. *Lightning Stroke : Drowning : Carbon monoxide poisoning.*

If a person has just been struck by lightning, or has been pulled out of a river apparently dead, or dragged out of a room or garage suffering from carbon monoxide poisoning, he may be lying still, not breathing, but yet not dead. If he does not quickly get fresh air into his lungs he will die. Try to save him.

Act quickly. (a) Lay him on his face ; loosen the clothes around his neck, and turn his head to the side ; carry the arms forward, so that one rests on each side of the head.

(b) Kneel astride the patient, facing his head.

(c) Place your hands flat over the lower part of the back (on the lowest ribs), one on each side, thumbs directed inwards and close to the spine.

(d) Lean forward, keeping the arms stiff, and *press* steadily and firmly. By this means air (and water, if the case is one of drowning) will be driven out of the patient's lungs.

(e) Keeping your hands in position, relax the pressure, and fall back towards the heels. Air will now enter the lungs.

These swaying movements must be repeated 15 to 18 times a minute. This can be regulated by counting "one, two, three, four, five," while the First Aider carries out (d) and (e).

Go on for an hour or even two hours before giving up hope.

There is no danger to yourself in handling a person struck by lightning. The electricity has passed through the person and is gone.

Boys should practise artificial respiration on each other. Some day a life may depend on your being able to do it promptly and correctly.

5. *Wounds.*

1. If there is much bleeding and the wound is small, press your finger or thumb firmly on the wound till the bleeding stops. If the wound is too large to be covered by a finger keep the limb raised, fold a large handkerchief or other small cloth into a narrow strip ; tie it loosely once round the arm (or leg) above the bleeding place (it must be tied above the elbow

or knee) ; push a strong stick under it and turn the stick round and round until the cloth is tight enough to stop the bleeding. Keep the limb raised all the time.

After a quarter of an hour gently and slowly untwist the stick. If bleeding begins again tighten it again, but do not fail to untwist it every quarter of an hour. If it is kept on long it becomes very painful and it may seriously injure the limb by stopping its supply of blood.

2. Keep the wound clean. If dirt gets in, even a very little dirt, a wound will not heal well. Do not touch the inside of a wound. Leave blood clots alone. If you have iodine or methylated spirit you can wipe the skin with it along the edge of the wound and for several inches around. If you have not either of these, wipe the skin with a boiled rag, squeezed dry. First wash your hands. Be very careful not to allow even the smallest drop of water to enter the wound.

Push the edges of the wound together. Apply a pad of clean dry cloth and secure it with another cloth, a strip applied firmly, but not tightly, round the limb.

If possible take the patient to a doctor for stitching and further treatment. If no doctor is within reach leave alone the dressing you have applied, unless blood or other discharge comes through.

6. Broken Bones (*Fractures*).

If there is a wound at the place where a bone is broken treat the wound in the way just described.

Arm : If one or more of the arm bones is broken : bend the elbow. Straighten the broken part. Apply planks (or in the veld, sticks) wrapped with cloths and bandage them to the arm, securing them above and below the broken place. Fold a large handkerchief or other cloth and support the forearm with it, bringing the ends together round the neck and tying or pinning them there. This is called a sling.

Leg broken : Lay the patient flat on his back. Straighten the broken leg. Let someone hold the foot steady with the toes pointing forward. Apply long planks (or sticks) wrapped in cloths and bandage them on, so as to fix the whole leg and foot. Then tie the broken leg firmly to the other, the sound leg. Tie cloths round both legs, at the foot, at the knee and high up.

Carry the patient to hospital or to his home on a stretcher. An old door will do, or two poles can be cut and branches laid across and tied to them or the poles can be pushed through the sleeves of two men's jackets, or a blanket can be pinned round the holes to serve as a stretcher.

7. *Convulsions.*

If a person falls down and jerks his body, put a hard stick between his teeth to stop him biting his tongue. Loosen any collar or other tight thing round his neck. The fit usually soon passes off.

Convulsions in a baby can often be stopped by holding the baby in warm water in a basin. Add a spoonful of mustard to the water if you have it. It warms the skin. When the convulsion is over give the baby castor oil.

Chapter 3.

GOOD AND BAD HABITS.

Good Habits.

1. Wash the mouth after every meal and brush the teeth morning and evening. Attention should also be given to keep the nails clean and short.
2. Wash the body daily with clean water, using good soap.
3. Every member of a household or family should have his or her own towel.
4. Lining pupils up at school for Hygiene Inspection. The condition of hair, teeth, eyes, hands, nails and clothing to be specially noted.

5. To take food before setting out to school in the morning. Milk and green vegetables should be part of our food daily.
6. The bowels should be emptied every day. After breakfast is a good time and one to which the bowels naturally respond. Use a latrine.
7. Refrain from spitting on the ground after coughing. Cough into a piece of rag or paper, and then burn the rag or paper.
8. Never throw down rubbish in street or yard. Burn it in a fire or incinerator.
9. First boil all drinking water and allow it to cool. Keep all food and water covered so that flies do not reach them.
10. Keep the windows open all night and the head uncovered while sleeping.
11. Kill flies, fleas, mosquitoes, rats and field mice—carriers of disease.
12. Do physical exercises every day.

Bad Habits.

1. To neglect to clean teeth, mouth and nails
To use dirty water and cheap soap for washing. To pick the ears.
2. To have a dirty body or to wear dirty clothes,

3. To use the same towel or cup as a sick person.
4. To have a dirty house or yard. To throw down in a yard or street bottles, old tins, decayed fruit, orange peel or fruit stones.
5. To wash a sick person's clothes in a stream used by other people. To throw in a public place the discharges of a sick person.
6. To be irregular in taking food, particularly to neglect to take food before coming to school in the morning.
7. To allow constipation to become a fixed habit.
8. To spit on the ground, particularly after coughing.
9. To drink water from a dirty pool or dam.
10. To close all windows at night and to sleep with the head covered by a blanket.
11. To allow flies to alight on food, and fleas and other vermin to remain on one's body.
12. To allow the body to become soft and flabby for lack of physical exercise.

(Artificial Respiration. For Illustrations see pages 100, 101, 102, 103)

JUNIOR CERTIFICATE

St. John's Ambulance Association.

Arrangements have been made for African teachers and pupils in Bechuanaland who have passed Std. V to study for the Junior Certificate and Badge of the St. John's Ambulance Association. This certificate and badge can be obtained, after examination, by a thorough knowledge of the courses as set out in the two books "A Preliminary Course of First Aid to the Injured" and "Preliminary Course of Home Nursing." When the teacher in charge considers the candidates possess sufficient knowledge in these two courses to justify entrance to the examination, application may be made to the Director of Education and a Medical Officer will be appointed to undertake the examination. Candidates for the examination must pay an entrance fee of 1/-. It may be sent to the Director of Education, Mafeking, before the examination.