ANNOTATED TRANSLATIONS

LOGICAL MATERIALS

(3) Let P, Q and R be sentences in propositional logic.
Ka P, Q, ne R zibe sentensi mu kannansonga w'ebitegeezo.

(4) · P Ssi P or *tekiri nti P*
'not P' 'it is not the case that P'

(5) P . Q *P ne Q, byombiriri*
'both P and Q'

(6) P v Q *P oba Q, oba byombiriri*
'P or Q, or both'

(7) P → Q *Ssinga P, olwo Q*
'if P, then Q'

(8) P↔Q *P ssinga era kyokka ssinga Q*
'P if and only if Q'

(9) 'Let x, y and z be individual variables in the first order predicate calculus'.
Ka x, y ne z bibe ebikyukakyuka ebisonjofu mu mbala y'ebirango ey'eddaala erisooka.

(10) ∀x P *olwa (kulwa) buli x, P*
'for all x, P'

(11) ∃x P *waliwo x, nga P*
'there is an x such that P'

(12) ∃[1] x P *waliwo x kimu kyokka, nga P*
'there is exactly one x such that P'

(13) x = y *x kyenkanankana y*
'x is equal to y'
x ne y biri ekintu kimu
'x is identical to y'

(14) p *kiteekwa okuba nga P or P kikaka*
'it is necessary that P' or 'necessarily P'

(15) ⊄ P *kisoboka okuba nti P or P kisoboka*
'it is possible that P' or 'possibly P'

(16) α_1, α_n 5α α *kikakasika okuva mu)* $\alpha_1, \ldots \alpha_n$
'α is provable from $\alpha_1, \ldots \alpha_n$

(17) $\alpha_1, \ldots \alpha_n$ 5α α *kigoberezo kituufu ekya* $\alpha_1, \ldots \alpha_n$
'α is a valid consequence of $\alpha_1, \ldots \alpha_n$'

(18) 'A tautology has the truth-value T; an antitautology has the truth-value F,'
Kimaddiggano kirina omuwendo gw'amazima T; kimaddiggano kinnakkonta kirina omuwendo gw'amazima F.

(19) 'The valid rule of inference called modus ponendo ponens can be symbolised as follows:
Ekifuzi ky'okugobereza ekituufu ekiyitibwa 'modus ponendo ponens' kisobola okunnabubonerowazibwa bwe kiti:

< ʒα

Πʒα → β
<u Πʒα → β

P > __________ < Q
'Either P or Q (but not both)'
P oba Q (naye ssi byombi)
Or
P ne Q byefeebyagana
(21) Po Q *P ne Q bigaanagana*
'Neither P nor Q'
(22) ιx F(x) *x ekyo nga kirina ekyawuzi F*
'that x such that it has the property F'
(23) P x F (x) *x ebyo nga birina ekyawuzi F*
'those x such that they have the property F'

(Notes on V.2.1 (3)–(23))
"proposition"; *-tegeez-;* "to state"; *ekitegeezo*
"individual"; *-sonjok-;* "to individualise"; *sonjofu*
"calculus"; *-bal-;* "to count"; *embala*
"predicate"; *-lang-;* "to proclaim"; *ekirango*
"tautology"; *-ddiggan-* "to repeat" ; *ekiddiggano*
"antitautology"; *ekiddiggano kinnakkonta*
"consequence"; *-goberer-;* "to follow"; *ekigoberero*
"mutually devalue"; *omuwendo,* "value"; *-wendowolagan-*
"property"; *-(y)awul-* "to differentiate"; *ekyawuzi*

(24a) Text 1:
SUMMARY OF RULES OF DERIVATION
1 Rule of Assumptions (A)
Any proposition may be introduced at any state of a proof. We write to the left the number of the line itself.

2 Modus Ponendo Ponens (MPP)
Given A and AτB, we may derive B as conclusion. B depends on any assumptions on which either A or AτB depends.

3 Modus Tollendo Tollens (MTT)
Given ˙B and AτB we may derive ˙A as conclusion. ˙A depends on any assumptions on which either ˙B or AτB depends.

4 Double Negation (DN)
Given A, we derive ˙˙A as conclusion, and vice versa. In either case, the conclusion depends on the same assumptions as the premiss.

5 Conditional Proof (CP)
Given a proof of B from A as assumption, we may derive AιB as conclusion on the remaining assumptions (if any)

6 &-Introduction (&I)
Given A and B, we may derive A & B as conclusion. A & B depends on any assumptions on which either A or B depends.

7 &-Elimination (&E)
Given A & B, we may derive either A or B separately. In either case, the conclusion depends on the same assumptions as the premiss.

8 v-Introduction (vI)
Given either A or B separately, we may derive A v B as conclusion. In either case, the conclusion depends on the same assumptions as the premiss.

9 v-Elimination (vE)
Given A v B, together, with a proof of C from A as asssumption, we may derive C as conclusion. C depends on any assumptions on which A v B depends or on which C depends in its derivation from A (apart from A) or on which C depends in its derivation B (apart from B).

10 Reductio ad Absurdum (RAA)
Given a proof of B &˙B from A as assumption, we may derive ˙ A as conclusion on the remaining assumptions (if any).

(Notes on V.2.1 (24)]
"rule"; *omufuzi;* "ruler"; *ekifuzi*
"assumption"; *-twal-;* "to take"; *ekitwale*
"proof"; *-kakas-;* "to prove"; *ekikakaso*
"conclusion"; *-fundikir-;* "to conclude"; *ekifundikiro*
"negation"; *-gaan-;* "to negate"; *ekigaano, eggaana*
"premiss"; *omutume;* "messenger"; *ekitume*

(24b) Translation of Text 1
AMATEEKA G'OKUVIISAMU MU BUFUNZE
1 Ekifuzi ky 'Ebitwale (Kifu)
Ekitegeezo kyonna kisobola okuyingirizibwa wonna ekikakaso we kiba kituusibbwa. Ku kkono tuwandiika ennamba y'omusittale gwe nnyini.

2 Modus Ponendo Ponens (MPP)
Nga A ne A → B biweereddwa, tusobola okuviisamu B nga ekifundikiro. B kyesigama ku bitwale byonna A oba A → B kwe kyesigama.

3 Modus Tollendo Tollens (MTT)
Nga ˙ B ne A → B biweereddwa, tusobola okuviisamu ˙ A nga ekifundikiro. ˙ A kyesigama ku bitwale byonna ˙ B oba A → B kwe kyesigama.

4 Eggaana Mirundi-ebiri (Gaana-2)
Nga A kiweereddwa, tusobola okuviisamu ˙ ˙ A , n'akaddannyuma. Mu ngeri zombi, ekifundikiro kyesigama ku bitwale bye bimu nga ekitume.

5 Ekikakaso Kinnakakalu (Kikaka)
Nga ekikakaso kya B okuva mu A nga ekitwale kiweereddwa, tusobola okuviisamu A → B nga ekifundikiro ekyesigama ku bitwale ebisigaddewo (bwe bibaawo).

6 Okuyingizaamu (Kuyi -&)
Nga A kiweereddwa, tusobola okuviisamu A & B nga ekifundikiro. A & B kyesigama ku bitwale byonna A oba B kwe kyesigama.

7 Okuggyamu & (Kuggya-&)
Nga A kiweereddwa, tusobola okuviisamu A oba B ku bwakyo. Mu ngeri zombi, ekifundikiro kyesigama ku bitwale bye bimu nga ekitume.

8 Okuyingizaamu v (Kuyi -v)
Nga A oba B ku bwakyo kiweereddwa, tusobola okuviisamu A v B nga ekifundikiro. Mu ngeri zombi, ekifundikiro kyesigama ku bitwale bye bimu nga ekitume.

9 Okuggyamu v (Kuggya -v)
Nga A v B kiweereddwa, gattako na ekikakaso kya C okuva mu A nga ekitwale era n'ekikakaso kya C okuva mu B nga ekitwale, tusobola okuviisamu C nga ekifundikiro. C kyesigama ku bitwale byonna A v B kwe kyesigama oba C kwe kyesigama mu kuviisibwa kwakyo okuva mu B (nga B kitalizibbwa).

10 Reductio ad Absurdum (RAA)
Nga ekikakaso kya B & × B okuva mu A nga ekitwale, kiweereddwa, tusobola okuviisamu ˙ A nga ekifundikiro ekyesigama ku bitwale ebisigaddewo (bwe bibaawo).

Translated from Lemmon (1965: 39-40)

(25a) Text 2:
A Counter example
Some philosophers have suggested that the conditions which are individually necessary for knowledge as formulated in (iT), (iB), and (iJ) are jointly sufficient for knowledge as well [17]. This would amount to affirming the following equivalance as an analysis of knowledge:

> *S knows that p if and only if it is true that p, S believes that p, and S is completely justified in believing that p.*

In short, knowledge is completely justified true belief. Nevertheless, this analysis has been disputed by Gettier and requires amendment[18].

Gettier argues that a man might be completely justified in believing that F by his evidence, where F is some false statement, and deduce T from F, where T is some true statement. Having deduced T from F, which he was completely justified in believing, the man would then be completely justified in believing that T. Assuming that he believes that T, it would follow from the analysis considered that the man knows that T. He might, however, not know this at all, especially if T is a disjunction of two statements, the statement F and a true statement Q, and the man in question has no reason whatever for thinking that Q is true. In such a case, the belief that T will be true but the only reason the man has for believing T to be true is the inference of T from F. Since F is false, it is a matter of luck that the man is correct in his belief that T[19].

17 Ayer and Chisholm defend similar analyses in works cited above.
18 Edmund Gettier, Jr, "Is Justified True Belief Knowledge?' Analysis, xxiii (1963), 121-3. Bertrand. Russell made a
similar observation in The Problems of Philosophy, 132.
19 Gettier, op. cit.

Notes on Logical Materials (25)
"philosophy, philosopher", *amagezi;* "wisdom"; *kannamagezi*
"become justified for"; ensonga; "reason"; -songawalirw-
"disjunction"; -(y)awukanir- ; "to separate from one another" ekyawukaniro
"defend"; *-taas-*
(25b) Translation of Text 2
Ekyokulabirako Ekikontanyi
Bakannamagezi abamu baaleeta ekirowoozo ekigamba nti obukalu obwetaagisibwa kannakamu kulwa okumanya nga bwe bwasanguzibbwa mu (iT), (iB), ne (iJ) era bwetagisibwa awamu olwa okumanya [17]. Kino kyandikkirizisa ekyenkanonkano ekiddirira nga ekiyungululo kya okumanya:

> *S amanya p ssinga era kyokka ssinga kya mazima, S alowooza nti p, era S annansongawalirwa bukomerevu mu kulowooza nti p.*

Mu bufunze, okumanya kwe kulowoza okw'amazima okunnansonga- wazibwa obukomerevu. Naye ekiyungululo kino kyanenehhanyizibwa Gettier era kyetaaga okulongoosebwamu [18]. Gettier awakana nti omuntu ayinza okunnansongawalirwa obukomerevu mu kukkiriza nti F okusinziira ku bujulizi, nga F ekitegeezo gundi ekitali kya mazima, olwo naviisa T mu F, nga T kitegeezo gundi eky'amazima. Nga amaze okuviisa T mu F, kye yali annansongawaliddwa obukomerevu okulowooza, omuntu yandinnansongawalirwa obukomerevu okulowooza nti T. Bwe kitwalibwa nti alowooza nti T, kyandigoberedde okuva ku kiyungululo ekyekkalirizibbwa nti omuntu, amanyi nti T. Kyokka ayinza obutakimanya n'akamu naddala ssinga T kiba ekyawukaniro ky'ebitegeezo ebibiri, ekitegeezo F n'ekitegeezo Q eky'amazima, era nga omuntu ayogerwako talina nsonga n'emu emulowoozesa nti Q kya mazima. Bwe guba bwe gutyo, ekirowoozo nti T kijja kuba kya mazima, naye ensonga yokka gy'alina okumulowoozesa nti T kya mazima kye kigoberezo kya T okuva mu F. Olwa okuba nti F ssi kya mazima, kya mukisa bukisa nti omuntu mutuufu mu kulowooza nti T[19].

17 Ayer ne Chisholm bataasa ebiyungululo ebifaananako mu mirimu egijuliriddwa waggulu.
18 Edmund Gettier, Omuto, "Is Justified True Belief. Knowledge", Analysis, xxiii (1963: 121-3) Bertrand Russell yakenga kye kimu mungeri efaananako mu *The Problems of Philosophy*, 132.
19 Gettier, omulimu ogujulizibwa.

Translated from Lehrer (1974: 18)