

教育部 97 年度人文社會學科學術強化創新計畫
【A Fundamental Selection of Quine's Works 蒯因經典選讀】

期中報告

年度成果總報告

補助單位：教育部

計畫類別： 經典研讀課程

經典研讀活動

執行單位：中正大學哲學系

計畫主持人：侯維之

執行期程：97 年 8 月 1 日至 98 年 7 月 31 日

日期：中華民國 98 年 7 月 23 日

目 次

計畫總表.....	1
內 容.....	2
一、計畫名稱.....	2
二、計畫目標.....	2
三、導讀.....	2
四、研讀成果.....	3
五、議題探討結論.....	3
六、目標達成情況與自評.....	3
七、執行過程遭遇之困難.....	4
八、經費運用情形.....	4
九、改進建議.....	4
十、統計表.....	5
附 件.....	6

撰寫內容

一、計畫名稱

A Fundamental Selection of Quine's Works 蒯因經典選讀

二、計畫目標

本計畫於上學期課程中將採用的教科書—From Stimulus to Science—是蒯因最後一本書，也是他針對本身哲學所親自撰寫的提要，非常適合作為介紹蒯因哲學的教材，可以提供第一手的鳥瞰性瞭解。為配合下學期的教學，上學期尤為注重第一(Days of Yore)、三(Reification)、四(Checkpoints and Empirical Content)、六(Denotation and Truth)、七章(Semantic Agreement)。

在對蒯因哲學有基本瞭解之後，下學期將針對蒯因的經驗內容理論(empirical theory of content)，挑選五篇經典來導讀，希望針對蒯因的意義懷疑論，進行初步的探討。首先由“Five Milestones of Empiricism”這篇文張，來瞭解蒯因對經驗主義發展的觀點。接下來四篇則包括蒯因經驗內容理論的幾個重點：反對分析綜合句的區分(against the distinction between analytic/synthetic sentences)、整體論(holism)、翻譯的不確定性(indeterminacy of translation)等等。另一個重點是蒯因對觀察語句和科學理論之經驗內容的說明—包括觀察語句(observation sentences)、不可限定說(under-determination thesis) 等等。

三、導讀

Quine 是二十世紀後半葉分析哲學最富影響力的大師之一，在語言哲學、存有學、知識論、與科學哲學等等，都具有深刻的洞見。其哲學的核心，環繞著他對意義概念的批判，進而連結到他在存有學(ontological relativity)、知識論(naturalistic epistemology)、與科學哲學(the thesis of under-determination)上的種種理論。

Quine 以反對分析／綜合語句的區分(the distinction of analytic/synthetic sentences) 聞名，伴隨其意義懷疑論所發展的語意理論，以語意是不可確定(indeterminate)為核心，以對語言表式經驗內容(empirical content) 的討論，來取代傳統上對意義問題的探究。

為了讓大家對這一套影響深遠的語言哲學理論，能夠有細緻的瞭解，本計畫於課程中將講授第一手的 Quine 著作。於上學期中，將逐章逐段地講解蒯因的精華小書—From Stimulus to Science。於此書中將涵蓋以下主題：「經驗內容與知識的基礎」、「經驗主義」、「自然主義」、「實體化」(Reification)、「科學理論經驗上的檢查點」、「邏輯與數學」、「指稱與真理」(Denotation and Truth)、「語意一致性」

(Semantic Agreement)、「心靈中的事物」(The Things of the Mind)等。

於下學期中，則將逐一介紹五篇經典。首先藉由 Quine 夫子自述，來介紹經驗論發展的階段（“Five Milestones of Empiricism”）。其後是他對分析/綜合語句的著名批評，以及他重要的整體論立場的揭諸（“Two Dogmas of Empiricism”）。另一個重點是 *Word and Object* 的第二章，讓大家對“翻譯的不確定性” (indeterminacy of translation) 這項理論的基本論述，能夠有完整的認識。Quine 哲學另一個重要的理論是不可限定說 (the thesis of under-determination)，這是在 “On Empirically Equivalent Systems of the World” 之中。Quine 對觀察語句和科學理論之經驗內容的說明，是他哲學理論中一個重要的部分，由此可以來理解在意義懷疑論的大蠱之下，Quine 如何提出一套替代理論，並將經驗內容與證據合流（“Empirical Content” & “In Praise of Observation Sentences”）。最後則是他對知識論自然主義轉向的說明（“Epistemology Naturalized”）。

四、 研讀成果

課程講授所使用之投影片資料，以及期中、期末考試之內容請參考附件一、二。

五、 議題探討結論

在各章中，逐步探討了蒯因的幾個重要的學說。在「實體化」(Reification) 中，介紹了蒯因著名的本體論承諾 (ontological commitment—to be is to be a value of a bound variable)，以及蒯因對實體這個概念的看法—沒有等同即沒有元目 (no entity without identity)，另外就是蒯因基於何種理由僅僅承認集合作為唯一一種抽象事物。在「科學理論經驗上的檢查點」中，詳細的說明蒯因對觀察語句的理論變遷，以及基於這個概念所發展出的觀察條件句 (observation conditional) 與觀察範疇句 (observation categorical)，另有蒯因由此提出關於科學理論與經驗證據的關聯。在「指稱與真理」(Denotation and Truth) 中，包含了對指稱悖論與真理悖論的介紹，以及蒯因著名的指稱的不可測度學說 (the thesis of inscrutability of reference)，與存有學相對性 (ontological relativity)；同時說明了蒯因的去引號真理理論 (disquotational theory of truth)。在「語意一致性」(Semantic Agreement) 中，則是簡單說明了蒯因如何反對分析/綜合 (analytic/synthetic) 語句的區分，以及他的翻譯不確定性理論 (the thesis of indeterminacy of translation)。

六、 目標達成情況與自評

上學期課程「蒯因」在逐章逐段講解下，雖未完成 *From Stimulus to Science* 一書之全部內容，然亦已完成全部八章中之前七章內容的講授。課程共計 16 位同學修課。下學期課程「蒯因名著選讀」，完成 “Five Milestones of Empiricism”、 “Two Dogmas of Empiricism”、 *Word and Object* : Section 7: First Step of Radical Translation 等內容的講授。課程共計 18 位同學大學部同學修課。多數同學皆用

心聽講，課堂討論亦顯活絡。雖然教材內容相對而言較難理解，但從同學上課及考試之表現，可見其對於此教材及 Quine 的基本主張已產生興趣，並有大略掌握。

七、執行過程遭遇之困難

蒯因著作的閱讀是困難出名，所以概由老師講授。也因為是大學部課程，所以在介紹中，授課教師針對每一章節，進行多方面的補充說明，以期達到幫助學生理解的目的。上學期或許因為教材內容過於艱深，同學對於教材內容的吸收情況及考試成果並不是很理想。下學期教材則稍易理解，同學亦已逐漸對蒯因理論產生興趣。

八、經費運用情形

教育部補助推動人文社會學科學術強化創新計畫		
1.本年度核定經費(單位：元)	人事費	144,000
	業務費	59,000
	印刷費	
	合計	203,000
2.實際執行數(單位：元)	人事費	144,000
	業務費	59,000
	印刷費	
	合計	203,000
3.執行率(%)	人事費	100
	業務費	100
	印刷費	
	合計	100
4.學校配合款	核定經費：40,600 實際執行數：40,600 執行率：100 %	
5.備註		

九、改進建議

經費方面，由於課程教學與研究之實際所需，建議將業務費之雜支比例從5%提高為10-15%；「教材資料影印」實際上並不需要用到業務費之95%。

十、統計表

- 說明：1. 經典研讀活動請填表一，經典研讀課程請填表二。
2. 年度成果總報告再填報此表格，期中報告不必填寫。

表一 經典研讀活動填報

計畫主持人：				
計畫名稱：				
研讀經典	研讀次數	教師參與人數	學生參與人數	計畫助理
<input type="checkbox"/> 中文經典 <input type="checkbox"/> 外文經典	__次	男__人 女__人	男__人 女__人	<input type="checkbox"/> 兼任助理 (男__人 女__人) <input type="checkbox"/> 無

表二 經典研讀課程填報

計畫主持人：侯維之				
計畫名稱：A Fundamental Selection of Quine's Works 蒯因經典選讀				
研讀經典	開課對象	參與授課教師數	修課學生數	計畫助理
<input type="checkbox"/> 中文經典 <input checked="" type="checkbox"/> 外文經典	<input checked="" type="checkbox"/> 大學部 <input type="checkbox"/> 碩士班	男__1人 女__人	男__20人 女__14人	<input checked="" type="checkbox"/> 博士生教學助理(<input checked="" type="checkbox"/> 男 <input type="checkbox"/> 女) <input type="checkbox"/> 兼任助理(<input type="checkbox"/> 男 <input type="checkbox"/> 女) <input type="checkbox"/> 無

Ch. I Days of Yore error

- why "we and animals notice what goes on around us"?—instincts and basic capacity
- knowledge of expecting what will happen and even how prevent its happening
- **the problem of error**
why we think that we have correct expectation and countermeasure?
- what is the significance of this?
knowledge of knowledge
- we and even animals have knowledge
- why we and animals can do the right thing?
- so we need to inquire knowledge of knowledge
- since Socrates or even Thales
errors, paradoxes, the Sophists and the Sceptics
- error concern is the focus of the reflection
- Zeno's two paradoxes
Achilles and the turtle
flying arrow does not move
- Eubuildes 7 paradoxes
The Liar: I am lying.
Vagueness: heap and bald
- The Sophists and the Sceptics
knowledge and ideas for Plato
- knowing things by apprehending *ideas*—or form—the essences of things
- "thinking about mathematical argumentation from self-evident truths"
- and somehow for observation too—"Save the appearances"
- **the analogy**→from appearances to (abstraction of) ideas or essences
→from observations to theorising
Aristotle and syllogism
- the **ways** of knowing—mathematical argumentation
- the enthusiasm of natural history
"knowledge itself, however, outpaced knowledge of knowledge"
the dark age
- the middle age—the Scholastics
- ways of knowing dwindle to one: higher authority
- some remnant of Aristotelian philosophy were deemed to be authoritative
- "but how had *he* known?"→why infinite regress?
supernatural revelation
- the answer of the infinite regress
- why this position so stubborn, why "we cannot then question divine revelation"

without begging the question?”

the uprising of science

- Roger Bacon (1290) did beg it—espousing observation and experiment
Galileo’s two examples
- Copernicus challenges Ptolemaic astronomy
- put science on the upward track

the embarrassment of intellectuality

- Francis Bacon—take up the old question of the ways of knowing
- **the embarrassment**
the traditionalists fought back—prosecuted Galileo for embracing the Copernican heresy and put him life imprisonment

- **Then Newton’s era has come**

Hobbes

- utter materialism—indeed mechanism
- there is nothing but motion—thought is motion in the brain
- **But *motion* of what?**

Hobbes’ view of knowledge

- **strikingly modern**
except effects upon us from the material world—our sensation—there is no other way to know the world
- **sensations are the base of our ideas about the world**
- knowledge is just the meshing of the ideas
idea, idea
- for Hobbes, ideas are what we think of thoughts or concepts
- **the total opposite of Plato’s usage**
- for Plato, ideas are the perfect beings, and things of the material world on the other hand are imperfect counterfeits
- for Hobbes and us, ideas are our attempt to encompass material reality

Descartes

- dualist—recognise both mind and matter
- taking the question of how we know seriously
- the thought experiment of **the method of doubt**
- one could not doubt that she is doubting—as a mind

- then the existence of God—four proofs
- For instance, the ontological argument—one naïve interpretation is similar to the argument of St. Anselm
God is perfect; perfection includes existence; therefore God exists.
- the existence of matter
“We have a clear and distinct idea of matter, and since God is by definition

good, He would not give us a clear and distinct but false idea.”

Descartes' version of how we know

- clear and distinct ideas are knowledge, and God-given
- “echoes of Plato's doctrine of innate knowledge and reminiscence, and of the Hebrew and Christian doctrine of divine revelation”

Locke

- similar to Hobbes—he saw knowledge in the coherence of ideas
- material world is real—but only known tentatively by *conjecture from ideas*—and our “sense impressions, cause by the material world, implant our simple ideas”
- different from Descartes—repudiate innate ideas

Locke and complex ideas

- how to form complex ideas in terms of simple sense impressions? No answer of that
only mention three basic principle of the association of ideas: **contiguity, succession, and resemblance**
- without any explanation of the identity of intermittently observed bodies
the change of the same body over time or the difference between similar bodies

Berkeley

- disagree with Hobbes and Locke's conjecture of a material world—“Nothing exists...but what is directly perceived”
- only sense patterns exist? No, Berkeley admits souls, for we perceive ours
- and God too—then the persistence of things is done

Hume

- “there simply is no evidence for the continued existence of an object between one occasion and another of our perceiving it”
- it is only a confusion of identity with similarity
- We wrongly take an interrupted series of resembling impressions to be just like an uninterrupted series.

- (1) AAAAAAAAAAAAAA
- (2) AAAAABBBBAAAAA

- But in order to make that mistake we would already have to have the idea of ‘the same object’. We must understand what it is for a thing existing at one time to be identical with itself existing at another.
- This idea cannot come from senses, for the experience is in fact nothing but a sequence of momentary, internal impressions.

British empiricism

- Locke, Berkeley, and Hume
- “our lore about the world is a fabric of ideas based on sense impressions”

- **the problem: the idea *idea* is not fully and genuinely explained
it is public language**
- **“as Wittgenstein observed, even a simple sense quality is elusive unless
braced by public language”**
- compare to Hume’s account, the idea of ‘the same object’ or ‘perfect
identity’ is indeed not coming from senses but public languages
- **“public words anchor ideas”**
idea *idea*
- the idea *idea* is still largely in use, though misleadingly in most of the times
- in other words, don’t get mundane and amateur, get philosophical
- **“words and observable behaviour are all we have to go on, and the idea *idea*
provides only the illusion of an explanation”**
the first milestone, the linguist turn—from ideas to terms
- **all of Locke’s uses of the word ‘idea’, and all the abstraction, complexity,
and generalisation of them, can be substituted by ‘term’—Tooke**
- Tooke’s is a major step toward what Richard Rorty has called the **linguistic
turn**
- **“words, unlike ideas, are out where we can see what we are doing”**
the second milestone—from terms to sentences
- a further move was achieved by Bentham—theory of fictions
- **contextual definition: to explain a term we only need to explain all sentences
in which we propose to use the term but not to find a synonymous phrase**
- the motive—**ontological**
finite amount of words and infinite amount of sentences
- **“a systematic guide of a language must consist of a dictionary of words and a
grammar for building sentences from them”**
- sentences come first and words come second—explained in the dictionary by
their use in illustrative sentences
contextual definition and sentences coming first
- how do we learn language?
- learning short sentences as a **whole** first, mostly one-word sentences such as
“Red”
- then “project a component word of it by analogy into the construction of another
[more complicated] sentence”
- contextual definition lends support to the view of sentences as the primary
vehicles of meaning
Frege’s espousal?
- one way to explain Frege’s notion of sense is to employ the descriptive theory
- “ $a = a$ ” and “ $a = b$ ”
- Frege proposes the distinction between senses and references of proper

names

- but what are the senses of these names—definite descriptions
- but this interpretation of Fregean notion of sense is debatable

Russell's analysis of definite description

- The present King of France is bald.
 $G(\dot{O}x)Fx \rightarrow \exists y(Gy \ \& \ \forall x(x = y \equiv Fx))$
- Based on: $(\dot{O}x)Gx \rightarrow \exists x \forall y(x = y \leftrightarrow Gy)$
- $(x)(G(x) \ \& \ (y)(G(y) \rightarrow y = x) \ \& \ F(x))$
- “a singular description can be useful in a sentence even when we are not yet sure of the existence of one and only one such object”—kind of shorthand

Whitehead and Russell's heroic contribution

- to clarify the whole intricate structure of classical mathematics
- it is because of the advance of logic that the reduction or economisation of classical mathematics can be done
- the purpose of doing this?
“the whole conceptual scheme of classical mathematics boils down to just that”

the motivation behind

- for Whitehead, Russell, as well as Frege, the motivation behind is a philosophical concern of mathematical knowledge and the basis of mathematical truth
- conclusion: mathematics is **translatable into pure logic**—mathematical truth is deducible from logical truth, if membership is counted as logic
- Gödel's incompleteness theorem

the merit of Russell and Whitehead's work

- the deeper understanding of the central concepts of mathematics and their basic laws and interrelations
- behind all these is contextual definition
- **the empiricist epistemologist's dream**
the explicit construction of the external world from sense impressions, plus modern logic of course

Carnap: unorganised elementary experiences

- the building blocks of Carnap is sensory elements
- the Gestalt psychologist
- Carnap's circumvention: unorganised global experiences of a given individual
- the total experience at the moment—this is what he called elementary experiences

the only basic relation between elementary experiences

- **remembering as similar—*R***
- definition: “one elementary experience, *x*, bears *R* to another, *y*, if *x* includes a memory of *y* as partially resembling *x*”

part similarity

- utilising only logic, mathematics, and the two-place predicate, R
- definition of elementary experiences in terms of R and logic: “an elementary experience is anything that bears R to anything, or to which anything bears R ”
- definition of part similarity of elementary experiences:
“it holds if one of them bears R to the other, forward or backward”

similarity circles

- definition: “a similarity circle is any largest class of elementary experiences each of which is part-similar to each”
- ‘largest’ means that no elementary experience outside the circle is similar to any member of the circle

sense quality

- It is about the construction of physical reality in terms of sensory elements, so sense qualities are naturally important
- Carnap’s ingenuous definition:
“a quality class being the class of all the elementary experiences that represent a given quality. All the elementary experiences in a quality class are part-similar, by virtue of sharing the quality”
- the difference between the sense quality classes and the similarity circles
“the members of a similarity circle need not all share any one quality”
a similarity circle C : { $abcd$, $abdf$, $acdg$, $adef$, $adhk$...}—they are not necessarily sharing **one** sense quality
- if a sense quality class overlaps more than half of the members of similarity circle classes, then it is the common part of all these circle classes
- Carnap argues that as far as experience is reasonably varied and random then this will work out.
- finally, Carnap identifies qualities with the quality classes
→ What those elementary experiences of the class are part-similar to each other is the sense quality that they share

similarity of qualities

- he manages to define the five senses:
“each sense is the largest class of qualities that are connected each to each by chains of similarity”
 - the difference between these five senses are by breaks in the chains
 - five senses can be separated by their dimensionality
- ### the project of building our full system of physical reality
- “Carnap wanted to identify the minimum essential determinants of sense experience... Given this full sensory foundation, then, he would undertake the great project of somehow building upon it our full system of physical reality.”
 - the reduction of physical reality to sensory experiences

- **Carnap's construction**

- *R*—remembering as similar

- part similarity → similarity circles

- ↓

- ↘ sense quality classes

- five senses: part similarity between

- elementary experiences

- as members of each

- quality class sharing the

- same quality

- how does it work?—considering the case of sight**

- \Rightarrow

- from each point of the two-dimensional visual field, there is a line projecting from it to the three-dimensional space

- the colour of the point on the visual field is determined by some point on the line projecting from it in the three-dimensional space

- but how far out on each of those lines?

- distance adjustment and simplicity**

- the adjustment of distances depend on the minimisation of the variegation of colour in the resulting three-dimensional space

- minimising or retarding the change of colour over time at each outer point

- **a law of least action**

- simplicity

- to much to ask**

- a successful total reduction?

- “[colour] minimisation requires us to go back and reconsider past spatial allocations of qualities in the light of later ones.”

- minimising colour changes means comparing new pieces of information with old ones and do a **holistic** adjustment

- what **holistic**?

- the inheritance and Carnap's motivation**

- the motivation behind Carnap's construction is not about **certainty**

- that is, the answer to the Sophists and the Sceptics, the search for a higher authority—divine revelation, and Descartes' method of doubt

- constitution system**

- Carnap construct a constitution system to give a systematic integration of our scientific concepts of mind and nature

- accepting logic and mathematics as a finished tool

- Carnap claims that his choice of experiences rather than physical objects as his foundation is a matter of strategy

- rational reconstruction**

附件 1-0 講授投影片

- partially Russell's work on mathematics and logic, partially Russell's epistemological project
- Carnap called it the rational reconstruction of man's conceptual development

Ch. II Naturalism physicalism instead of phenomenalism

- self-sufficient language as a foundation of science?
- “The memories that like our past experiences with present ones and induce our expectations are themselves mostly memories not of sensory intake but of essentially scientific posits, namely things and events in the physical world”
- methodological?

phenomenalism and dualism

- for Carnap, phenomenalistic orientation, as his ‘rational construction’, represents a **pragmatic choice without metaphysical significance**
- remember at the end of the last chapter, it was mentioned there that the choice of sensory experiences over physical objects is just a matter of **strategy**
- but what **strategy**?

- in order to demonstrate the interlocking and structural nature of our system of empirical concepts, a system that exhibited unity and afforded objectivity is what concerns Carnap
- **Cartesian dualism of mind and body?**
- experiences presuppose a mind or a consciousness within which they are operating—and for this reason it could be simply a mentalistic monism
- physicalism on the other hand is thorough materialism
conceptual economy or naturalism
- Carnap is not after the above mentioned physicalist approach—“if it were to be pursued, two directions suggest themselves”
- **conceptual economy and clarity**
in the spirit of *Principia Mathematica*, and “what physicists at the theoretical pole have long been up to”

- **naturalism**
- “rational reconstruction of the individual’s and/or the race’s **actual acquisition** of a responsible theory of the external world”
- **from the meagre input to the torrential output**
epistemology naturalised
- searching for an actual acquisition of a responsible theory of the external world is the main purpose of empirical scientific study
- the motivation is still **philosophical**—in the sense that the boundary between science and philosophy is disregarded
- “unlike the old epistemologists, we seek no firmer basis for science than science itself; so we are free to use the very fruits of science in investigating its roots”

a physical analogue of phenomenalistic groundwork

- Carnap's ground elements are his elementary experiences
- **the physical analogue:** "the class of all sensory receptors that were triggered at that moment; or, better, **the temporally ordered class of receptors** triggered during that specious present"
- the distinguishment between one from the other is just what receptors were triggered and in what order
- sensory experience ↔ physical correlate—**global stimulus—ordered sets of receptors**
that is, members (receptors) of the set is in a temporal order
perceptual similarity
- the physical analogue of the sole basic relation, *R*, of remembered part similarity
- to allow the physical analogue rolling—drop the memory factor but settle for just part similarity
- **the analogue is "perceptual similarity, seen as a relation between global stimuli"**
receptual similarity
- considering the subject's total set of firing nerve endings, "each global stimulus is an ordered subset of [it], and two such subsets are more or less similar
- perceptual similarity is not to be confused with this more obvious kind of similarity between global stimuli, **receptual similarity**
a question of reaction
- "perceptual similarity... is a matter rather of effect on the subject: a question of reaction"
- **receptual similarity is the sufficient condition of perceptual similarity but not the necessary condition**
- "for many of the receptors triggered on a given occasion are indifferent to the response"
the testability of perceptual similarity
- "an individual's standards of perceptual similarity, at any given stage of his development, are in principle objectively testable"
- the subject has some global stimulation—based on that he makes some move—reward it—later stimulate him in a receptually similar way—penalise his move this time—then simulate him in between—if he make the same move, then the third stimulation is more perceptually similar to the first
salience
- **the difference between Quine and Davidson:** "My purpose in focusing on nerve endings, rather than more distant features of the physical world, is of course to narrow our sights to the limited physical contacts on which our theory of the world is based."
- global stimuli are excessive: "most of the receptors triggered on any occasion

are perceptually ineffective”

- **salience**: “What matters are the *salient* ones... salience is definable in terms of receptual and perceptual similarity. The receptors that make for salience within a global stimulus are the ones that the stimulus shares with other global stimuli to which it is perceptually similar but receptually dissimilar.”

- It is ‘perceptually similar but receptually dissimilar’ because otherwise they are receptually similar and thus perceptually similar.

experimentally and definitionally

- “**experimentally and definitionally**, it is the perceptual similarity and receptual dissimilarity of the global stimuli that constitute the shared salience”

- **salience is used to explain why and how people under the same occasion would make similar responses**

salience and ostensive definition

- **ostensive definition**: the attempt to provide a non-linguistic definition of a term by pointing at something to which it applies.

- “Motion enhances salience, and sweeping or pointing gestures in the vicinity or direction of the intended portion of the scene thus implements the desired association with the spoken word.”

sense modalities

- “a global stimulus is visual or auditory according as its salient receptors are in the retina or cochlea”

- so what is a sense modality?

- To what is the modalities to be assigned? Global stimuli, according to where the salience lies

associating perspectives

- “perceptual similarity diverges from receptual similarity not only on the score of salience.”

- the example of seeing a rectangular from different angles

- **different classes of receptors are triggered or are triggered in different temporal orders**

- even though the classes of receptors are so different, these global stimuli are still perceptually similar—for they would elicit similar responses

- why we still see them as perceptually similar?

because of our learned or instinctive propensity of associating perspectives

- the reason of using the word ‘propensity’—it is *not* about **rational judgements** but something more primitive, more **responsive**

the humble physical mimicry

- the physical mimicry of phenomenalistic epistemology does not depends on invading the percipient organism more deeply, although psychoneurology has a illuminating progress

- “All that has mattered is the individual’s distinctive responses to their activation”
perceptual similarity as the basis
- the basis of all expectation, all learning, all habit formation
- “It operates through our propensity to expect perceptually similar stimulations to have sequels perceptually similar to each other.”
- why this is primitive induction?
innateness of perceptual similarity
- learning hinges on perceptual similarity
- perceptual similarity is thus not learnable—at least not all of it
- therefore some perceptual similarity is innate
- “One’s standards of perceptual similarity change radically, however, and perhaps rapidly for a while, in consequence of experience and learning.”
primitive induction
- “the survival value of primitive induction is anticipation of something edible”
- “Thus it is natural selection has endowed us with standards of perceptual similarity that mesh pretty well with natural trends, affording us better than random success in our expectations.”
- “the future is as may be, but we persist hopefully”
sharing of information
- some animals—birds, apes, humans...—fall on their feet with further blessing
- sharing information widen the horizons
- For example: apes have all kinds of distinct signals for distinct purposes
- warning for the approach of a lion or leopard or an eagle another for food while the troop is ranging through the forest
information, signals, and stimulations
- Continue the example:
“each distinctive cry has become keyed to some distinctive range of stimulations, whether by instinct or conditioning”
- why *distinctive*?
- by instinct or conditioning?
privateness
- global stimuli are private—each is a temporally ordered set of some one individual’s receptors
- perceptual similarity, innate or learned, is thus private too
- how does this corporation across the tribe work?
same for signals
- it is necessary for one witness’s global stimulations under two occasions to be qualified for him as perceptually similar and the same thing for the other witness.

- the same thing is required for the signal
- “Recurrences of it must activate, in each individual, global stimuli that are perceptually similar for that individual.”
preestablished harmony
- “If two scenes trigger perceptually similar global stimuli in one witness, they are apt to do likewise in another.”
- so it is this preestablished harmony that explains how people with their own private stimulations can respond similarly under a given occasion
public harmony of private standards
- “The public harmony of private standards of perceptual similarity is accounted for by **natural selection**. The individual’s initial standards of perceptual similarity are inculcated...by natural selection, and so, thanks to shared ancestry and shared environment, will tend to harmonise across the tribe.”
- why ‘the public harmony of private standards’ is accounted for by natural selection?
It is not that natural selection causes the public harmony of private standards but that the public harmony of private standards is the cause of why we pass the test of natural selection and prevail.
- “The changes in standards to birth will also tend to harmonise, because of the shared society and environment”
dispositions
- disposition just as another physical property
- “We do so when we say what one **would** do, or what **would** happen, if.”
- the seeming difference between dispositions and other physical properties—the way of specifying them
- a physical property is a disposition if it is specified by citing a symptom, or test
- a thing is soluble if “it will dissolve on immersion”?
- why putting ‘would’ then?
- dispositions are physical properties specified only when some conditions to be satisfied are given
- the broadcasting of the appropriate signals as dispositions of an ape or bird—a physical trait, something to do with the organisation of the creature’s **neural network**
observation sentences
- the human counterpart of ape cries and bird calls: observation sentences
- examples: “It’s raining,” “It’s red,” “Dog!”
- occasion sentences: sentences true on some occasions, false on others
- the major function of it: reporting intersubjectively observable situations, observation outright

- **definition:** “all members of the language community are **disposed** to agree on the truth or falsity of such a sentence on the spot, if they have normal perception and are witnesses to the occasion.”
- the if-clause
language community—the *definition* of it has to be given beforehand and not dependent on the notion of observation sentences
why 'disposed'?
technicality of defining observation sentences
- 'language community [as] a parameter that we may take more broadly or narrowly according to the purpose of our study'?
- specialist languages or branch languages
- **stimulus modulus:** put simply, “how many seconds of reflection does 'outright' permit?”
- the meaning of 'outright'
preestablished harmony again
- for an individual, the observation sentence is keyed to a range of perceptually similar global stimuli
- because of preestablished harmony again, **observation sentences are qualified across the (language) community**
the entering wedge into cognitive language
- why 'cognitive'?
- “[observation sentences] are the expressions that can be conditioned to global stimuli without the aid of prior language”
- **without the thought of reification and reference**
- for children, the two sentences and the like “are on a par with 'It's cold' and 'It's raining': just things to say in distinctive circumstances. Hence I call them sentences”
- 'distinctive circumstance'?
- why 'call them sentences' means something?
ostension and connectives
- The child learns its first observation sentence, we see, by ostension, in a somewhat extended sense of the term; that is, under global stimulations having appropriate salient features or traits that are not verbal in turn
- learning connectives
learning 'not' first, then 'and'
the combination of them is the new connective 'not both'
a bit of logic
- learning 'not' and 'and' is already the internalisation of a bit of logic
- “for to affirm a compound of the form '*p* and not *p*' is just to have mislearned one or both particles”

further connectives

- above, beneath, before, after, in, besides
→ combining observation sentences two by two into a compound observation sentence
- learning component observation sentence outright as a whole by direct ostension, then catching on to the trick of compounding them to form further complex observation sentences

observational predication

- primitive grammatical constructions and reification of bodies
- combining simple observation sentences “Black” and “Dog” we get “The dog is black” or “Black dog”
- terms are not yet recognised as denoting
- what is the difference between this and the mature predication?

mere conjunction or predication

- conjunction “Black and dog” requires salience of both of them at any scene
- observational predication “Black dog” requires the salient parts of black and dog overlap
- “The predication expresses the compact clustering of visual qualities that is characteristic of a body”

bodies

- “What sets them apart from other sources of stimulations?”
- a body contrasts with its visual surroundings in colour and in movement or **parallax** and typically it is fairly **chunky** and **compact**. If it is animate and seen full face, it is **bilaterally symmetric**. If we make contact, it **resists pressure**.”
- the underlined phrase is about **other sources of stimulations**
- the black letters are the traits distinguishing bodies from what are not
- “The mode of compounding observation sentences that I have called predication, then, is a step toward reification of bodies, in its stress on spatial clustering.”

observation categoricals

- a generalised expression of expectation—**observation categoricals**
- “It is a way of joining two observation sentences to express the general expectation that whenever the one observation sentence holds, the other will be fulfilled as well.”
- **they are our first faltering scientific laws**
inductive expectation and vicarious habituation
- “observation categoricals are the direct expression of inductive expectation, which underlies all learning”
- observation categoricals→vicarious habituations, vicarious inductions
- they can be passed down from generations to generations

concomitance or close succession

- “The observation categoricals just assert concomitance or close succession of separately specified phenomena.”
- for the child, observation sentences still merely register repeatable features of the passing show
- any difference here is only **qualitative**, not **ontological**
naturalism’s modest simulation
- what is the old epistemological quest?
- naturalism’s modest simulation: “a sketch of a causal chain from the impacts of rays and particles on our receptors to a rudimentary theory of the external world”
- What is the rudimentary theory?
- “For the observation categoricals are indeed a theory of the world, complete with empirical checkpoints subject to the experimental method”

Ch. III Reification all ravens are black

- all ravens are black→almost get it with the observation categorical:
Whenever there is a raven, there is a black raven.
- changing 'there' to 'it'
"Whenever there is a raven, *it* is a black raven";
"Whenever there is a raven, it is black";
"All ravens are black."

pronominal construction

- pronoun 'it'—new link between two observation sentences "Raven" and "Black"
- **focal** observation categorical: "Whenever..., *it*..."
free observation categorical: those mentioned in the last chapter, for instance, "When smoke, fire".

essential pronoun

- Peter Geach: pronouns of laziness to essential pronouns
- "I bumped my head and it hurts"—'it' can be supplanted by its grammatical antecedent, 'my head'—free categoricals
- by contrast, replacing 'it' in "Whenever there is a raven, it is black" similarly with 'a raven', a **focal categorical become a free one**
- **the essential pronoun means reification**
multiple presentation and indefinite singular terms
- "but multiple presentation of a black and a possibly albino raven is what made out free categorical fall short of 'All ravens are black'."
- **solitary** presentations could be managed with 'the raven'—free categorical—"it" can be replaced by its grammatical antecedent
- **multiple** presentations—**indefinite singular terms**—**essential pronouns**
→compare 'my head—it' and 'a raven—it'

happy confusion

- How does it happen?
Happy neglect of the difference between essential pronouns and pronouns of laziness?
- why "serendipity and opportunism are laws of nature"?
survival is not because of ingenious decision but result of coincidence or pure luck—so is happy confusion

indispensible reification

- "reification proved indispensable in connecting loose ends of raw experience to produce the beginnings of a structured system of the world"
- "the **advance** from concomitances of disembodied phenomena such as... 'Whenever raven, black raven' to a generalised predication: 'All ravens are black'"
- linguistically, it is 'it' that does the job

pronoun

- it is normal to think that terms are our means of referring to objects
→ definite singular term: 'Taj Mahal' to Taj Mahal
→ general term: 'raven' to ravens
- but similar to Peirce, Quine takes pronouns as primarily responsible for referring

quantifiers

- essential pronouns—their grammatical antecedents are indefinite singular terms, such as 'every raven', 'some raven'
→ relegating the qualifying predicate 'raven' to "a component clause of the ensuing text" in order to get logical economy
- employing two indefinite singular terms 'everything (-one)' and 'something (-one)':
 - Every raven is black.
Everything, if it is a raven, is black.
 - 'it' here is essential pronoun confining our talking to **the same thing**
→ finally be frozen into two fixed quantifiers: 'everything is such that' and 'something is such that'

ambiguity ensues

- "Tom got Dick to paint his fence"
→ whose fence?
→ pronoun of laziness
"Tom got Dick to paint Tom's (Dick's) fence"
- what about essential pronoun?
Someone is such that someone is such that he got him to paint his fence. (??)
- the only recourse—applicable to both
→ Someone x is such that someone y is such that x got y to paint x 's (y 's) fence
- $\exists x \exists y (x \text{ got } y \text{ to paint } x\text{'s } (y\text{'s}) \text{ fence})$

universal and existential quantifiers

- in focal observation categoricals we see universal quantification
→ $\forall x (x \text{ is a raven} \supset x \text{ is black})$
- normally in extralogical practice, it arises over a conditional or biconditional
→ $\forall x (Fx \supset Gx)$ or $\forall x (Fx \equiv Gx)$
- notational difference → Peano — $Fx \supset_x Gx$
→ or **unrestricted quantification**
 $\forall Fx \rightarrow (Fx \supset Fx) \supset_x Fx$
→ taking 'Fx' as the variable

an variant approach

- reminiscent of Peano
→ $\exists x Fx$ — not as $(\exists x)(Fx)$ — but as $\exists(x(Fx))$
- "not as the application of a quantifier ' $\exists x$ ' to an open sentence 'Fx', but as the

application of '∃' to a **complex predicate** 'xFx', 'x such that Fx'
→not (something x)(is such that Fx), but (something is)(x such that Fx)
predicate abstraction

- "in Peano's notation 'x∃', for encapsulating in a self-contained complex predicate all that a sentence affirms of an object"
→"x is F" is encapsulated in 'x∃Fx'
→sentence vs. complex predicate
"x is courageous" vs. 'x that is courageous'
- if Tom is the object in question
→substitute 'x' for 'Tom'
→Fa→x∃Fx
- "the complex predicate thus formed, which predicated of anyone, will say of him what the original sentence said of Tom. This is our familiar 'such that' idiom, which is mathematical pidgin English for our indigenous relative clause"
- *The rationals can be defined as "the set of all m/n such that n is nonzero and m and n are integers."
*Take x to be a real number such that x^2+1 is greater than 4.
 $\forall xFx$ and $\forall(xFx)$
- "Our choice between the two attitudes to quantification is indifferent to its use and its logical laws, except that this variant way casts new light on our schematic letters 'F', 'G', etc. We always called them predicate letters anyway, but from this variant angle they become just that"
→'∃xFx'→'∃(xFx)' or '∃(x∃Fx)'→exposes the complex predicate 'xFx' or 'x∃Fx'
→the two occurrences of 'x' cancel out→the predicate itself→ '∃F'
the true colour of 'variable'
- for simplicity and symmetry of logical theory
→notation: '∃' and '∃'→as '~∃~' and '~∃~'
- "the variable comes to appear in its true light as purely a means of identifying and distinguishing **the referential places** in a sentence, and nothing to do with 'all' or 'some'"
- the **etymology**? Mathematical metaphor?
predicational completeness
- *dummy variable* (1957): an arbitrary mathematical symbol or variable that can be replaced by another without affecting the value of the expression in which it occurs
- 'such that'→relative clauses→confers predicational completeness
→"whatever we can say about a thing can be said about it by predicating a predicate to it"
→black dog→the dog is black
variable, general term, and denoting
- reification—essential pronoun or the variable of quantification
- but also as good is the perspective—"the basic role of variable as the

abstraction of predicates or, what are for me the same, general terms”

- $x \exists Fx \rightarrow$ the pertinent value of the variable ‘x’ are the things that fulfil the predicate—the things denoted by the general term
- why “most things are not individually specifiable by name or description”?
- As a consequence of Cantor’s proof that the real numbers are uncountable (and the rationals countable) it follows that almost all real numbers are irrational—so there is no way to specify them
→ therefore, most things are not specifiable in principle in this case
- but “all things are denoted by general terms, by ‘thing’, indeed, among others
**to be is to be a value of
a variable**
- why *parochial*? → this criterion of ontological commitment only applies to theories constructed in terms of classical quantification theory or, in other words, predicate logic
- if it is not, then “failing translation into my adopted standard, I can only say that the word ‘exists’ has a different usage”
- ontological commitment—assigning a value to a variable means to commit to its existence

**to be is to be denoted by
a one-place predicate**

- “any value of a variable is denoted by some predicate or other—indeed by ‘ $x \exists (x = x)$ ’—and vice versa”
that is, $\forall x(x = x)$ or $\forall (x \exists (x = x))$
 - singular terms can be converted into predicates—for instance, ‘Socrates’ to ‘socratesised’
 $\exists x(x \text{ is Socrates})$ or $\exists (x \exists \text{socratesised}x)$
- from bodies to reification**
- “Long before reification in our clean-cut sense, bodies command the special attention of our remote ancestors, as they do that of modern man from early infancy.”
→ because of natural selection
 - the process of language learning and the mastering of reification
 - “In the inchoate speck of early man and modern young children, bodies come to be hinted in the combining of observation sentences by observational predication (Chapter II). In the fullness of time we have the focal observation categorical, and eventually the relative clause or predicate abstraction. Our stock of predicates will meanwhile have grown with budding scientific theory, and now predicate abstraction offers us predicates for everything we can say about anything”

identity

- the transcending of the specious present

- at the point of specious present—time dimension is the problem—make no sense to say that something is or is not the one that is sensed before
- a stage of language limited to the specious present and to short-term memories and expectations
- the next big step—to distinguish a body from an highly **similar** one, for the distinct traits are supposed to be shared by them
- “It requires acquisition of our whole schematism of space and time and the unobserved trajectories of bodies within it.”
body, space, time
- recognising a recurrent body only by strong **perceptual similarity**
- **next, fixed bodies** are distinguished by our locomotive effort
→disappearance and recurrence of a fixed body
→become tentative landmarks in a dawning conception of geography
identity and qualitative indistinguishability
- perceptual similarity is out of the picture very early
- for as a sufficient condition of recurrence of the same body it is not always successful—two qualitative indistinguishable things side by side
- “Identity or distinctness over time, in the absence of qualitative differences, then becomes a matter rather of conjectural trajectories of objects between observations.”
- science
→**qualitative indistinguishability is neither necessary nor sufficient for identity**
→a body can grow, shrink, or discolour
from the specious present into the diachronic
- “But **saying** it is another story. Let’s suppose you try. Since you have nothing approaching embedding, there is no way you can use a relative clause to let the others know which bear you are thinking about.”
- “Since you have no articles or any comparable device, there is no way you can let the others know that you are talking about a bear that they know about too.”
- “Since you have no way of marking **relative time** by automatic tense assignment or even adverbs, there is no way you can let the others know that the bear you want to talk about is one that is not here anymore.”
- “Since you have no verbs of psychological action...there is no way you can use the verb form itself to inform the others that you are speaking of a past time (*remind, recall, remember, etc.*)”
- the same leap re-enacted in modern times in the transition from pidgin to creole?

- “pidgin is the faltering jargon that comes of the spontaneous efforts of heterogeneous groups to communicate; creole is its development in succeeding generations.”
identity and the choice of a governing predicate
- identity of a body—generally depending on conjectured trajectories and causal chains
- but apart from the choice of a governing predicate, the question of identity of a body is generally meaningless
- a body is the content of a portion of a four-dimensional space-time
→ ①tadpole + ②four-legged frog = ③lifelong frog
relativising sameness of object to kind of object
- fail to do this has engendered bad philosophy
→the instance of person: “am I the same person I was in my youth? or in my mother’s womb? Will I be the same person after my brain transplant?”
→this is not about **the concept of identity** but about the concept of person
→**the difference between the same object and the same kind of object from physical to abstract**
- new sorts of objects and new quantified conditionals tighten the logical structure
→ $\forall x\exists y(Fx \rightarrow Gyx)$ —‘y’ is the newly added entity type that constitutes, for instance, entities that ‘x’ stands for
- an **analogy** of doing this—a stone
- **first abstract objects assumed**—properties

- why again the **happy confusion**
- for instance, the colour of my clothes matches the event I am going to attend, *it* fits in the festal atmosphere of the event
the example
- zoologist—peculiarity in the life-style of a strange invertebrate
→then adds “It is true as well of the horseshoe crab.”
→‘it’ is a pronoun of laziness, saving him the trouble of repeating himself
→‘being in such and such peculiar life-style’ is true as well of the horeshoe crab.

- ‘**true of**’ indicates that ‘it’ replace a **predicate**—about denoting
→‘being white’ is true of snow—that is, “snow is white” is true
- the conflation (of two pronouns) helps them dream up “a **second-order predicate such as ‘property’ or ‘attribute’** to denote objects of a new kind, abstract ones, quantified over as values of variables”
happy confusion
- hard science cannot function without abstract objects, and mathematics subsists on them

- no abstract objects—no serious mathematics—then not hard science
entia non grata
- entities that are not acceptable or welcome
→for Quine, properties are like this
→**no entity without identity**
- either appealing to more properties to make the distinction or if to appeal to concrete objects then there are many properties are of entirely the same things
- “the utility that made properties such a boon can be retained by deciding to equate properties that are true of all the same things, and to continue to exploit them under another name: classes”
→equating properties in terms of their extensions
→**class**: can best be described by saying that classes are associated with monadic propositional functions
- $x \in a$ iff $A(x)$, where ‘a’ is a class and ‘A’ is a propositional function
number
- then numbers are reified
→saying that there are nine planets does not reify number nine but the class of planets
→however, stating the laws of computation or asking whether nine is prime does
a physicalist ontology
- “adequate to all reality **consists of just the physical objects, plus all classes of them, plus all classes of any of the foregoing, plus all classes of any f this whole accumulation, and so on up**”
- Quine’s extensionalism—refuting the existence of intensional objects, only accepting physical objects and classes
- “For example, physical objects are identical if and only if they occupy the same space-time regions, while sets are identical if and only if they have the same members.” (Roger Gibson, Jr.)
- this is why saying “Suitable versions of numbers, functions, and other mathematical objects get identified with denizens of this ontology, in the course of the **glorious reduction of mathematics to logic and membership**”
- “Quine is obliged to admit these abstract objects into his physicalist ontology because science cannot proceed without them. Accordingly, Quine represses his nominalistic scruples and, somewhat grudgingly, embraces a bifurcated ontology: physical objects and abstract objects. Bifurcated, yes, but singularly extensional; suitable objects all as values of the bound variables of a formalized version of the best scientific theory we can muster at the time.”
(Roger Gibson, Jr.)

physicalism all the way

- “Better simply to admit as a physical object the content of any portion of space-time, however irregular, indeed however discontinuously scattered.”
- this simplification—the accommodation of substances, each as the single scattered designatum of a mass term: ‘water’
“the one and only water, is the whole scattered aqueous portion of the spatiotemporal universe”
the diminishment of the need of classes?
- the class of human being?—classes is no longer needed for biological taxonomy to do the assortment of each taxon—taxon “can be identified with the spatiotemporally scattered physical object that contains as parts all the organisms [, in this case, humans,] belonging to it and that is exhausted by them.”
- “But *belonging* to a species is analysed, under this approach, as being an organism *and* part of the species. It is the overarching individuative predicate ‘organism’ that makes the reduction work”
the discreteness of organism
- if organisms are not discrete, if we count fetus or mitochondrion both as organism and as part of its host, then organisms are no longer not overlapping or no containment of one organism as part of another
not always
- the example of United States
→the class of counties has some 3100 members and for the class of states it is 50
- “the reason we have to indulge in the abstraction of classes at all, at the level of classes of extended objects in space-time, is that some such objects overlap”

Ch. IV Checkpoints and Empirical Content

observation categoricals as miniatures of scientific theories

- observation sentences and observation categoricals come before reification of reference
- a miniature of scientific theory: the antecedent clauses of observation categoricals are experimental condition and their consequent clauses are the prediction

the two traits of observation sentences: private and public

- observation sentences change and develop as scientific knowledge grows
- primitiveness is not what it takes to be an observation sentence
- the two traits of observation sentences
 - private to the individual: “the sentence be keyed directly to a range of perceptually fairly similar global stimuli”
- → public to society
why observation sentences are not in terms of the trait of primitiveness
- “an observation sentence can be acquired indirectly in later years through the intervention of sophisticated theory”

the public requirement

- the unhesitating concurrence by all qualified witnesses
it comes to hinge increasingly on one or another narrowing of pertinent linguistic community
- “the pertinent society, like the subject, becomes a parameter; an occasion sentence is an observation sentence with respect to a given individual and community, and [not so] with respect to that individual and a wider community”

final checkpoint of science

- “they are not just miniature scientific theories individually, but as the ultimate empirical checkpoints of science generally”
 - if an observation categorical fails, so is the theory implying it
- ### two vital roles played by the social requirement
- first, it enables the child to learn the use of them from society
second, it renders science objective, or anyway intersubjective
 - the checking of a scientific hypothesis could in principle tracked back to the laymen’s level—a matter of eliciting a résumé of antecedent experimental developments

testing the observable results

a theory implies

- Quine “merely combining the observable condition and observable result in a single sentence, a universal conditional, and calling upon the theory to imply the whole conditional. [He] thus simpl[ies] the logic”

analytic and synthetic observation categoricals

- An observation categorical is analytic for a speaker if the affirmative stimulus

meaning of the antecedent clause includes all the affirmative stimulus meaning of the consequent clause. It is thus trivially true
→Otherwise, it is synthetic.

- the stimulus meaning of a given utterance is the ordered pair of affirmative and negative stimulus meanings. The affirmative stimulus meaning of a given sentence is the class of all stimulations, for a given speaker, which *would* prompt his assent to the sentence, and the negative stimulus meaning is the class of all the stimulations that *would* prompt his dissent from it.
- the analytic-synthetic distinction is dubious if applies to theoretical sentences across the board, but it is defined here by applying to observation categoricals
holism, preliminary explanation
- testing a new hypothesis
→it by itself normally do not imply any synthetic observation categoricals outright
→jointly with other already held true hypotheses
- **revising related tenets**
→some basic points of holism
→revising other hypotheses is a not simple matter
holism, revising theory, and scientific good sense
- different revisions bring forth different new theories
→but they are not equally good in withstanding future tests
- There is no unique choice of revising one and only given tenet.
backtracking adjustment
- “the simple schematism of observation categoricals and implication is remote from the experimental scientist’s overt or conscious practice”
- when a false categorical is implied, scientists normally backtrack along the way to the rough physical generalisation (within the vein of *ceteris paribus*) among the premises
→after the adjustment of it and do the experiment again
current testimony of past events
- “there is some ongoing input of information from the outside world that is not limited to the specious present and hence is not directly accessible to observation sentences”
- the instance of discomfort or other delayed effects caused dyspepsia
→such data do not go into observation sentences, for lack of intersubjectivity
- but “an antecedently developed scientific theory links these manifestations both to their present presumed cause, dyspepsia, and to the remoter causes that we indeed intersubjectively observed the night before. Even these latter are no longer observable, but they are known through current testimony”
→“the causal links between current observable testimony and the past events testified to are again part of the network of scientific theory”
the merit of testing some substantial fragment of science

- for instance, Newtonian mechanics
→by go through all the details, myriad tacit logical steps and platitudes and formulating adequate observation categoricals, hence plausible corroboratory experiments, across the board.
empirical content of a theory or a critical mass
- a sentence is meaningless unless it has empirical content
- observation categoricals suffice to be the empirical content of a theory or at least a critical mass
- **empirical content of a non-observation sentence?**
- “We had now accounted for empirical content for a sentence or set of sentences with critical mass”
→why ‘a sentence’?
- a (non-observational) sentence can be counted as having empirical content in a participatory way if it is a supporting member of a set with critical mass?
the above is fallacious
- any sentence can have empirical content by being a supporting member
→Russell’s “Quadruplicity drinks procrastination”
- take it as ‘q’, and ‘c’ as an observation categorical, “q” jointly with “q→c” implies “c”, but not by “q→c” alone
which sentences with empirical content?
- “[the sentences] are supporting members of *interesting* sets with critical mass, sets that are not only testable but worth testing; hence sets whose members either are adjudged true or are up for consideration, unlike ‘q→c’”
→but this cannot be a rigorous standard
having empirical content as a condition of meaningfulness?
- a hypothesis, although does not have its own empirical content, and “remote from all checkpoints[,] suggests further hypotheses that are testable”
→“this must be a major source of hypotheses worth testing.”
- “Positivistic insistence on empirical content could, if heeded, impede the progress of science.”
softer science
- from psychology and economics through sociology to history, checkpoints are sparser and sparser
- “observation categoricals are implicit still in the predicting of archaeological finds and the deciphering of inscriptions, but the glories of history would be lost if we stopped and stayed at the checkpoints”
the art of science
- “a normative domain within epistemology survives the conversion to naturalism...and it is concerned with the art of guessing, or framing hypotheses”
- the most general norms—which makes this art of science normative—are

conservatism (or the maximum of minimum mutilation), and ***simplicity***

- but there is no general calibration of both of them
- for this reason alone, there is no hope of a mechanical procedure for optimum hypothesising
- “creating good hypotheses is an imaginative art, not a science. It is the art of science”

for rational belief generally

- “normative epistemology is the art or technology not only of science...but of **rational belief generally**”
- “the technological correctives of bad side effects of natural selection, and such also in essence is normative epistemology in its correcting and refining of our innate propensities to expectation by induction”

subjective probability and degrees of belief

- for Quine, the main part of normative epistemology is a branch of applied mathematics—statistical theory, correction of the above sort of error is its therapeutic side
- rational beliefs? Subjective probability is degree of belief

- a brief introduction of how normative epistemology interacts with other new thriving theories—for instance, decision theory and game theory, and also radical interpretation
- “Davidson’s semantic program of interpretation involves playing each of these three variables—probability, preference, and interpretation—against the other two.”

Ch. V Logic and Mathematics implication

- the lifeblood of theories
→relating a theory to its observation categoricals
- waiting for the maturity of mathematics to encapsulate this logic in a complete formalisation
- example
“To prove that a given set of premises implies a contemplated conclusion, prove that the premises are inconsistent with the negation of that conclusion. Do so by putting the premises and the negated conclusion into prenex form and then accumulating a truth functional inconsistency by persistent instantiation of the universal and existential quantifiers...”

logic and set theory

- the difference between them is profound
- logic has no objects it can call its own
- logic has no predicates and hence no sentences it can call its own
→unless the identity predicate is counted logical
- if the set of predicates is finite in number, then the identity predicate is gained for free
→that is, “ $x = y$ ” can be defined in terms of the primitive predicates ‘ P ’, ‘ Q ’ and dyadic predicate ‘ R ’ as

$$\forall z(Px \equiv Py \ \& \ Qx \equiv Qy \ \& \ Rxz \equiv Ryz \ \& \ Rzx \equiv Rzy)$$

the third difference

- it is that logic admits of complete proof procedure that set theory lacks
- **Gödel’s incompleteness theorem**
→“Any effectively generated theory capable of expressing elementary arithmetic cannot be both consistent and complete. In particular, for any consistent, effectively generated formal theory that proves certain basic arithmetic truths, there is an arithmetical statement that is true, but not provable in the theory.”

- Roughly speaking, for each theory T the corresponding Gödel sentence G asserts: “ G cannot be proved within the theory T ”. If G were provable under the axioms and rules of inference of T , then T would have a theorem, G , which effectively contradicts itself, and thus the theory T would be inconsistent.

the difference between mathematics and natural science

- the background: Quine famously claims that mathematics and logic have empirical consequence
- Quine changed his mind after approximately four decades

- but still, Quine would like to lighten the obvious contrast between mathematics and natural science

Quine's converting

- first, this converting is not contradict to the fact that mathematics participates the implying of observation categoricals
→for empirical contents do not belong to any member of the implying set but the set itself—holism
 - so Quine says “I accept the accepted wisdom [that mathematics lacks empirical content]”—none of any mathematical sentence or any given set of them
 - “No conjunction or class of purely mathematical truths, however large, could ever imply a synthetic observation categorical”
similar trait applies to some class of scientific truths
 - “It is just a malicious mixing. Any random handful of scientific truths is likely to fail to imply any synthetic observation categoricals. Amassing any number of such sterile sets, then, and taking care to avoid any cross-fertility between them, we can surely amass a class of truths of natural science without limit of size and without empirical content.”
 - what is needed to know is that, first, this is a **deliberation** to avoid producing any set like this to produce any empirical content and second, in some cases this might be the actual case
 - the difference is that mathematical truths are all of a kind. Somehow? How?
formalised languages
 - the distinct feature of mathematics
→what Tarski called formalised languages
→“Such a language comprises the sentences built from a fixed finite lot of basic predicates by predication, truth functions, and quantification”
 - for instance, elementary number theory
two basic three-place predicates ‘ Σ ’ and ‘ Π ’
“ Σxyz ” means that $x = y + z$
“ Πxyz ” means that $x = y * z$
 - $x = y \rightarrow \forall z (\Sigma zxx = \Sigma zyy)$
 - with the help of identity, following Russell's contextual definition the notation ‘ $\dot{O}xFx$ ’ can be defined and thus recover the familiar arithmetical notations
 $y + z = \dot{O}x \Sigma xyz$, $1 = \dot{O}x (\Pi xxx \ \& \ \sim \Sigma xxx)$
 $y * z = \dot{O}x \Pi xyz$, $2 = 1 + 1$
 $0 = \dot{O}x \Sigma xxx$, $3 = 2 + 1$.
- set and the definition of kinship**
- ‘ Σ ’ and ‘ Π ’ can be defined in terms of ‘ \in ’ in any of the known ways
→all classical mathematics can be thus defined (Ch. 1—logic plus set theory)

- kinship
→two basic predicates, one-place predicate 'F' ('female') and two-place predicate 'P' ('parent')
- 'x is male' = ' $\sim Fx$ ';
'x is half or full sibling of y' = ' $\exists z(Pzx \ \& \ Pzy)$ ';
'x is mate of y' = ' $\exists z(Pxz \ \& \ x \neq y \ \& \ Pzy)$ '; and so on...
- “typical truths in this language are the symmetry of sibling, mate, and cousin, the asymmetry of parent, and the transitivity of full sibling”
formalising is not enough
- the essence of mathematics cannot be fully captured by the notion of formalised language
→perhaps it is lack of primitive predicates induces mathematical flavour
- variables—taking abstract or concrete objects as value are not substantial
→for instance, ' \in ' takes concrete objects (physical objects) as its first argument
uninterpreted and interpreted mathematics
- if geometry is seen not as uninterpreted but interpreted mathematics—that it is not about abstract relations
- its predicates denote points, surfaces, and curves...
→with a empirical subject matter
- why consider it as uninterpreted mathematics?—because of **the fifth postulate of parallel**
If a straight line falling on two straight lines makes the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, will meet on that side on which are the angles less than two right angles
- because of this postulate, different alternatives have been designed, such as Non-Euclidean geometry
disinterpretation and uninterpreted
- since “Einstein established that space itself, as defined by the paths of light, is non-Euclidean,” Euclidean geometry lost its old empirical status
- in general—that is, not just about geometry—“disinterpretation came to play an indispensable role in proof theory”
- Exaggeration? But why?
uninterpreted mathematics
- “Uninterpreted mathematics is of course devoid not only of empirical content but of all question of truth and falsity”
→but for the theory that treats of these uninterpreted systems, including abstract algebras, it is part of the theory of relations and hence is interpreted mathematics, covered by set theory
the higher reaches of set theory

- when the relations got more and more abstract all the way up, it is no longer possible to apply them to natural science
 - when joining mathematical truths with scientific ones to imply observation categoricals, these abstract set-theoretic relations cannot help
 - the thing is how do empiricists should view them
- truth values**
- “They are couched in the same vocabulary and grammar as applicable mathematics, so we cannot simply dismiss them as gibberish, unless by imposing an absurdly awkward gerrymandering of our grammar.”
 - now the problem is their truth values
 - “Cases arise, however (notably the axiom of choice and the continuum hypothesis), that are demonstrably independent of prior theory”
 - follow the maxim of natural science—simplicity? Economy of structure and ontology?
 - Historically, mathematicians who favored a “rich” and “large” universe of sets were against CH, while those favoring a “neat” and “controllable” universe favored CH.

you never know

- “from Gödel’s incompleteness theorem, every proof procedure is bound to leave infinitely many closed sentences of classical mathematics indemonstrable and irrefutable”
 - stronger proof procedure does not help
 - can we banish them by a heroically complex gerrymandering of grammar?
 - meaningful but neither true nor false?

conceding

- “concede that every statement in our language is true or false, but recognize that in these cases the choice between truth and falsity is indifferent both to our working conceptual apparatus and to nature as reflected in observation categoricals”
- “It is like Kant’s thing in itself, but seen as a matter of human usage rather than cosmic mystery”

a parallel in vagueness

- a desk vs. countless almost coextensive aggregates of molecules—molecules are not stable
 - but we refer to it (the desk) as a unique one of them, and we do not and cannot care which
- “Our standard logic takes this also in stride, imposing a tacit fiction of unique though unspecifiable reference”

Ch. VI Denotation and Truth reference and meaning

- semantics is concerned with linguistic expressions in two respects: reference and meaning
 - singular terms: 'Boston' designates Boston
 - general terms or predicates: 'rabbit' denotes each rabbit
 - meaning is different
 - 'the morning star' and 'the evening star' designate the same planet but mean differently

denotation

- designation can be reduced to denotation
- "singular term can be recast as a predicate that happens to denote just one thing if any"
- "The singular term 'Boston', *designating* Boston, can be reconstrued as a predicate 'is Boston', *denoting* only Boston"
Poe was from Boston
 $\exists x(x \text{ is Boston} \ \& \ \text{Poe was from } x)$, or
 $\forall x(x \text{ is Boston} \supset \text{Poe was from } x)$
- the usual and more convenient idiom of singular terms by singular description:
Boston = $\hat{O}x(x \text{ is Boston})$
→"The convenience of singular terms, however, is indispensable in practice. Mathematics would be paralysed without the direct substitution of singular terms for variables and of equals of equals."
→for instance:
'x is mate of y' = ' $\exists z(Pxz \ \& \ x \neq y \ \& \ Pyz)$ '
what do terms denote?
- people might think that, because a singular term designate one and only one object, a predicate denotes one single object too
→such as a class of all the things that it is true of, or a property shared by them
→'true of'—for instance, in Quine "Notes on the Theory of Reference" (1953)
'__' is true-in-L of every __ thing and nothing else.
- in Quine's usage, as in J. S. Mill, "a predicate denotes rather **each separate thing** of which it is true. The class or property is not involved."
some caution on 'predicate'
- "Some logicians take a predicate as a way of building a sentence around a singular term or, more concretely, as what Pierce called a *rheme*, a sentence with blanks in it..."
- "this version covers, implicitly, the potential output of predicate abstraction or predicate functors."
→' $\forall(xFx)$ ' or ' $\forall(x\exists Fx)$ ' or ' $\forall F$ '—no variables
many-place predicate
- "Two-place predicates, such as transitive verb, may be said to denote ordered

pair, and n -place predicates denote sequences of length n "

- **ordered pair and two-membered class**
the difference lies in that "the pair must determine x uniquely and y uniquely"
→ If $\langle x, y \rangle = \langle z, w \rangle$, then $x = z$ and $y = w$
instance, and predicates for three-place and more
- for the two-place predicate 'father (of)', its denotation is, for instance, $\langle \text{James Mill, John Stuart Mill} \rangle$
- predicates for three-place and more—using iteration of the order paired
→ $\langle x, y, z \rangle = \langle \langle x, y \rangle, z \rangle$, $\langle x, y, z, w \rangle = \langle \langle x, y, z \rangle, w \rangle$
unbridled denotation
- even for one-place predicate, it is prey to paradox—Grelling's paradox
→ for the word 'heterologous'—that is, 'not denoting self'
→ "the predicate 'heterologous' itself... qualifies as heterologous iff it does not
- homological → words denote themselves
heterological → words do not denote themselves
- 'heterological' is either homological or heterological.
(1) If 'heterological' is homological, then it denotes itself.
→ But 'heterological' only denotes words that are heterological.
→ Since 'heterological' denotes itself, and itself only denotes heterological words
→ So this means that 'heterological' is heterological.
→ This contradiction proves that 'heterological' is not homological.
- (2) If 'heterological' is heterological, then it does not denote itself.
→ But what the words which 'heterological' does not denote is not heterological.
→ Since 'heterological' does not denote not heterological words, so itself is not heterological
→ This means that 'heterological' is homological
→ This contradiction proves that 'heterological' is not heterological either.
Russell's paradox
- A set containing exactly the sets that are not members of themselves. If such a set qualifies as a member of itself, it would contradict its own definition as a *set containing sets that are not members of themselves*. On the other hand, if such a set is not a member of itself, it would qualify as a member of itself by the same definition.
- "That one was what imposed limits on the reification of classes, by showing that not all predicates, or open sentences in one variable, can determine classes. [self-referring] Nor could the inconsistent cases be rounded up one by one and banished; for it turned out that countless further cases are self-consistent one by one but jointly incompatible."
- first creating a hierarchy of types, then assigning each mathematical (and

possibly other) entity to a type. Objects of a given type are built exclusively from objects of preceding types (those lower in the hierarchy), thus preventing loops.
→so it is illegitimate to ask whether there is a class of all classes not members of themselves, for no such class and classes respectively could be found

the significance of Grelling paradox

- for all its kinship to Russell's paradox, it does not depend on untenable reification—Russell's is, namely, classes
→what is guilty is apparently the word 'heterologous', despite its clear definition as *not denoting self*
→the blame rests on all the words alike to 'heterologous', and ultimately on the word 'denote'

denotation and disquotation

- just "the *disquotational* paradigm: 'rabbit' denotes a thing if and only if the thing is a rabbit. It is disquotation, and it alone, that makes the predicate 'not denoting self' denote self if and only if it does not."

a consistent version of denotation?

- Tarski in 1935 proposes to solve it for formalised languages
→note 3: "Where I treat of denotation of sequences by predicates, Tarski treated of satisfaction of open sentences by sequences of values of their free variables. But it comes to the same thing."

- two things to be noticed: first, the responsible feature employed by the definition is **disquotation**; second, the whole construction is to constitute an inductive or, in other words, recursive definition of denotation

what the inductive definition can and cannot do

- "our inductive definition only explains denotation on the part of predicates constructible from the basic ones by predicate functors—hence by truth functions and quantification"
- Grelling's paradox indicates that 'denote' is not among these, or better not be—because it causes paradox

hierarchy

- "We can cover this further ground by repeating our whole inductive definition, but now treating our newly defined 'denote' as one of the basic predicates, labelled 'denote₁'."
- "In this way we define 'denote₂'. It proves disquotational in application to all the basic predicates and to 'denote₁' and to all predicates constructible from all these by predicate functors (or by truth functions and quantification)."
- the first level of the hierarchy:
(basic predicates) $p_1, p_2, p_3 \dots p_n + \text{denote}_1$
the second level of the hierarchy:
 $(p_1, p_2, p_3 \dots p_n + \text{denote}_1) + \text{denote}_2$
the third level of the hierarchy:
 $((p_1, p_2, p_3 \dots p_n + \text{denote}_1) + \text{denote}_2) + \text{denote}_3$

...

→for now **denotation₁** is sufficient

the lesson

- in ordinary language things are not so organised as Tarski's formalised languages do—no fixed distinction between what is basic and what derivative, what is primitive and what defined
- “The lessons are that denotation comes in levels and that a denotation predicate of any one level cannot be trusted to operate in normal disquotational fashion when applied to another denotation predicate unless the latter is of lower level”

vertical, horizontal and zero-place predicate

- denotation has two different relations
 - vertical, stretching from one level of denotation to the next or the previous level
 - horizontal, an n -place predicate denotes sequences of length n
 - the mathematician's reflex: what about zero-place or no-place predicates?
 - closed sentences

true of and closed sentence

- an n -place predicate denoted a given n -place sequence iff it was true of it
 - the degenerate case: in the zero case, “there being nothing for the no-place predicate to be true of, denotation reduces simply to **truth** outright. The zero case of denotation by predicates is truth of sentences. **Truth, one might risk being quoted as saying, is just a degenerate case of denotation.**”

T-sentences

- ‘Between’ denotes (is true of) $\langle x, y, z \rangle$ iff x is between y and z
- ‘Father’ denotes (is true of) $\langle x, y \rangle$ iff x is father of y
- ‘Rabbit’ denotes (is true of) x iff x is a rabbit
- So, “Snow is white” is true iff snow is white
 - the underlined sentence is an instance of Tarski's famous T-sentences

truth and paradox

- “Truth shares the infirmity of the rest of the denotation family: the susceptibility to paradox”
 - the liar paradox: “This sentence is false”
- This sentence is false→“This sentence is false” is false
- resort to self-predication (same as self-referring)
- “The self-predication of an open sentence in one free variable is what we get by taking that open sentence itself as the value of its variable”
- The self-predication of the open sentence:
 - The self-predication of x is false
 - is the closed sentence
 - The self-predication of “The self-predication of x is false” is false
- solution again rests on going hierarchical

→“At each level truth is simple denotation by no-place predicates, or sentences.”

the first level of the hierarchy: (closed sentences) $s_1, s_2, s_3 \dots s_n + \text{truth}_1$

the second level of the hierarchy: $(s_1, s_2, s_3 \dots s_n + \text{truth}_1) + \text{truth}_2$

the third level of the hierarchy: $((s_1, s_2, s_3 \dots s_n + \text{truth}_1) + \text{truth}_2) + \text{truth}_3$

...

disquotation

- Ramsey takes the disquotational feature as trivial, calling disquotation the disappearance theory of truth
→ **disquotation determines truth uniquely**
- “If two predicates ‘true’ and ‘True’ both fulfil disquotation, they are coextensive; for where ‘p’ stands for a sentence
‘p’ is true iff p iff ‘p’ is True.

Ch. VII Semantic Agreement reification

- the function of identity—discourse—the part of the clauses of a focal observation categorical—whenever..., *it*...
→join forces with the schematism of space and time—forge the identity of an object from one place and time to another
- reciprocal: recurrences of enduring bodies and place-times link up each
**the third kind of
sameness of reference**
- not a problem for bodies, intersubjective agreement established in primary cases of ostension
- indirectly by reduction in other cases to those primary cases through causal chains established or conjectured in our growing science
abstract object
- no such recourse for abstract objects
→who is to say that we refer to the same thing while using the phrase of the number nine?
- *it* is the size of the class of planets? —now who is to say that we use the phrase ‘size of’ to refer to the same thing, even if we agree on each planet?
- our classes of planets have the same members? In yours and my sense of ‘member’?
- “I submit that intersubjective sameness of reference makes no sense, as applied to abstract objects, beyond what is reflected in successful dialogue.”
- remember that Quine reduces abstract objects to classes
class: can best be described by saying that classes are associated with **monadic propositional functions** (in intension -- i.e., properties) in such a way that two propositional functions determine the same class if and only if they are formally equivalent.)
- $x \in a$ iff $A(x)$, where ‘ a ’ is a class and ‘ A ’ is a propositional function (ch. 3)
- in Quine’s usage, as in J. S. Mill, “a predicate denotes rather **each separate thing** of which it is true. The class or property is not involved.” (ch. 6)
similar for theoretical concrete objects
- concrete but beyond the reach of ostension
→the old example: “picture two physicists pondering a crisis in particle physics. Each of them proposes a new particle. One proposes a particle without rest mass, and the other a particle with rest mass. Both of them apply the same new word, ‘neutrino’”
- →are they disagreeing with each other about the mass of the same particles? Or they posit different particles under the same name?
- why this is an empty question?

- unless there are ways to determine what they actually are
→the presupposition is that both of the positing solve the crisis
gross bodies
- no *evident* problem—in paragraph 2
→the scientific philosopher seeking a close-knit and economical system of the world
→identifies bodies with the portions of space-time that they occupy—四維時空線—similar for substances
 - “Sense qualities of the bodies and substances simply carry over to these four-dimensional regions”
 - “We would say not that bodies have given way to space-time, but that they have been identified with or interpreted as space-time”
a space-time point and the quadruple numbers
 - further identifies a point of space-time with the quadruple of numbers that are its coordinates in some arbitrary frame of reference
→a matter of **economy**
 - “a body then becomes a **class** of quadruples of numbers—what I shall call a *number table*”
 - “our sensory associations now carry over to these abstract number tables”
 - for economy purpose
bodies—space-time regions—classes of quadruple numbers—number tables
→the connection between bodies and their sensory associations recast accordingly
what we normally do we normally do
 - the economy of science poses nothing to the former way that we normally learn names and predicates for things by ostension
→“As always, the pointing just serves to enhance the salience of the features of our sensory input that are to be associated with the object”
→for this purpose, we need not know any numbers
inscrutability of reference
 - “we might reinterpret every reference to a physical object arbitrarily as a reference rather to its cosmic complement, the rest of physical universe”
→‘rabbit’ denotes not each rabbit but the cosmic complement of it—that is, the physical universe without this rabbit—or the universe of space-time regions minus the points occupied by the rabbit
 - “Saying that rabbits are furry would thus be reinterpreted as saying that complements-of-rabbits are complements-of-furry”
 - “The old names and predicates would be reintroduced by ostension as usual, but it would be deferred ostension: pointing to what was not part of the intended object.”—‘deferred’ should mean shifting something to something

- else—“**The two sentences are obvious equivalent**”
→what equivalent? Logically equivalent
- the consequence is the **inscrutability of reference proxy function**
 - “Cosmic complement of ‘ and ‘number table of’ express what I called **proxy functions: one-to-one reinterpretations of objective reference**. They leave the truth values of the sentences [containing them] undisturbed... It is a matter of reconstructing all terms and predicates as designating or denoting the proxies of what they had designated or denoted”
 - for any given theory in which a name refers to an object x according to its reference scheme, one can produce a proxy function, say, φ to map x on to $\varphi(x)$ in the reference scheme of the background theory; similarly, if a predicate refers to (is true of) each thing x such that $F(x)$ in the object theory, it refers to each thing x in the background theory such that $F \varphi(x)$
 - “we can proxying both sides of predication, and it cancels out”
 - for instance, φ mapping “Rabbits are furry” on to “rabbit- $\varphi(x)$ are furry- $\varphi(x)$ ” or “complements-of-rabbits are complements-of-furry”
one-to-one reinterpretation only
 - many-place predicates?—likewise
→“any object that is not given a proxy must take itself as proxy, lest it be reused as proxy of another object; that would mar the one-to-one character of the global reinterpretation”
 - for instance, you cannot find a cosmic complement of the universe itself
 - “The reason such reinterpretations preserve truth values is that they preserve sameness of reference from mention to mention throughout discourse. Sameness of reference is what variables mark, and it is all that ontology contributes to science and truth”
 - the proxy function φ is mapping actually **mentions** of words to another set of **mentions** of words—from x to $\varphi(x)$ or from rabbits to their cosmic complements—using ψ to map $\varphi(x)$ on to $\psi(\varphi(x))$ and $F \varphi(x)$ on to $F \psi(\varphi(x))$...
 - all ‘ x ’, ‘ $\varphi(x)$ ’, ‘ $\psi(\varphi(x))$ ’...and so on are **mentions** of what they are supposed to refer to or denote relative to **different theories or reference schemes**—that is, in using the proxy functions we are talking about the relations between terms instead of that between terms and their referents or denotations
→this is because variables only mark the places of referring terms but not references themselves
→so what ontology contributes to science and truth is just a framework or a structure of reference without enlightening any clue on what terms **genuinely**

refer to or denote

permutation

- “Spatiotemporal objects are permuted with their complements, and nonspatiotemporal objects [—numbers, for instance—] are permuted into themselves”

ontological relativity

- “So we found that a set of sentences can be reinterpreted in any one-to-one way, in respect of the things referred to, without falsifying any of the sentences.”

→“lurking since Chapter III, for we saw there that variables are the bearers of reference and that they only mark sameness thereof”

the reconstruing of the membership predicate

- physical objects are reinterpreted as their complements
→how about the class of physical objects?—reinterpreting the membership predicate ‘ \in ’ too

another way to reconstrue the membership predicate

- “reconstrue classes themselves across the board, supplanting each by its logical complement and leaving individuals alone”—preserving the truth values of all the sentences—“reconstrue [membership] as nonmembership”
- the logical complement of $\{a, b\}$ is the rest objects that are not a or b

- the less trivial example at the abstract level is the use of Gödel numbers for strings of signs

- In order to encode an entire formula, which is a sequence of symbols, Gödel used the following system. Given a sequence $x_1x_2x_3...x_n$ of positive integers, the **Gödel encoding** of the sequence is the **product of the first n primes raised to their corresponding values** in the sequence:

$$\text{enc}(x_1x_2x_3...x_n) = 2^{x_1} \cdot 3^{x_2} \cdot 5^{x_3} \cdot 7^{x_4} \dots \cdot p_n^{x_n}$$

what each of ‘ $x_1x_2x_3...x_n$ ’ stands for can be numbers, functions, brackets...and of course letters, hyphens, spaces...

Ramsey sentences and the indeterminacy of reference

- for abstract objects: Ramsey sentences—which capture the empirical/factual content of a theory
- T: the theory, including theoretical sentence $T_1, T_2, T_3...T_n$
t: theoretical predicates, including $t_1, t_2, t_3...t_n$
C: correspondence rules or dictionary linking theoretical predicates/sentences to observable ones, including $O_1, O_2, O_3...O_m$
o: observable predicates, including $o_1, o_2, o_3...o_m$
- the theory: $T + C = TC(t_1, t_2, t_3...t_n, o_1, o_2, o_3...o_m)$
Step 1 (empirical theory, assumed true): $TC(t_1, t_2, t_3...t_n, o_1, o_2, o_3...o_m)$
Step 2 (substitution of variables for T-terms): $TC(x_1, x_2, x_3...x_n, o_1, o_2, o_3...o_m)$
Step 3 (-quantification of the variables): $\exists x_1\exists x_2... \exists x_n TC(x_1, x_2, x_3...x_n, o_1, o_2, o_3...o_m)$

→Step 3 is the complete Ramsey sentences, expressed “^RTC”, and to be read: There are **some (unspecified) relations** such that TC ($x_1, x_2, x_3 \dots x_n, o_1, o_2, o_3 \dots o_m$) is satisfied when the variables are assigned these relations.

- “The underlying thought is that abstract objects serve natural science only through *formal laws* that we can set down... The laws needed for either context might not determine those abstract objects *uniquely*”
- “Ramsey’s idea, in the case of natural numbers, is to waive the choice of interpretation and just write an existential quantification to the effect that there is a sequence of abstract objects fulfilling such and such arithmetical laws and functioning thus and so in the desired application.”

without ordered pairs?

- a less cumbersome case: ordered pairs
→“Let us assume (unrealistically) that we have somehow reached the point of quantifying over functions without taking up ordered pairs. Then occasion arises to affirm something about a pair $\langle u, v \rangle$, and do so without choosing any one of the various adequate ways of construing ordered pairs”
→referring back to p. 61, the stipulation (1)
 $\langle x, y \rangle = \langle z, w \rangle$ iff $x = z$ and $y = w$
- take the sentence about $\langle u, v \rangle$ as ‘ $P\langle u, v \rangle$ ’
The Ramsey sentence of it is:
 $\exists f(\forall x \forall y \forall z \forall w (fxy = fzw$ iff $x = z$ and $y = w$) & $P(fuv)$)
- if it is about the ordered pair $\langle u, v \rangle$, normally we illustrate **what** this ordered pair **is**, but without doing so we use the illustration of what the function, fuv , **is**
→in this case, $\langle u, v \rangle$ is the abstract object and the function, f , is the variable used to replace the theoretical term, that is, ‘ $\langle u, v \rangle$ ’; ‘ $fxy = fzw$ iff $x = z$ and $y = w$ ’ is a paraphrase of the original stipulation of ordered pairs and fuv is what ‘ $\langle u, v \rangle$ ’ refers to.

the sweeping indeterminacy of reference

- “Ramsey’s treatment thus brings out indeterminacy of reference not by reinterpretation, but by waiving the choice of interpretation”
- “each Ramsey sentence is a fresh existential quantification; consequently there is no assurance of sameness of object from sentence to sentence”
- “But for concrete objects—gross bodies, particularly—**endurance and identity over time** are essential to the very fabric of our spatiotemporal account of things”
- “My simple argument for indeterminacy of reference is more sweeping, applying as it does to objects indiscriminately, I conclude from it that **what matters for any objects, concrete or abstract, is not what they are but what they contribute to our overall theory of the world as neutral nodes in its logical structure**”

what we end up as we began is not really what we began

- bask in paradox?
- “The very freedom vouchsafed us by the indeterminacy of reference allows us to adopt ostension as decisive for reference to observable concrete objects”
- we end up as we began? ‘rabbit’ denotes rabbits for all concerned?—remember the **disquotational** conception of reference in the last chapter

- disagree only on the deep nature of rabbits: spatiotemporal regions, number tables, sui generis (for most people)
 - “Adaptation of our usage must not, however, be allowed to obscure the lesson of proxy functions. Namely, a language wide one-to-one reassignment of values to our variables has not effect on the truth or falsity of our statements”
- the freedom**
- no empirical sense can be made of intersubjective identity of unobservables, concretes or abstracts—this is the case before proxy function comes into picture
 - the indeterminacy of reference **frees us to legislate a criterion?** Of what? What makes sense is not the empirical sense of intersubjective identity of unobservables but, by holding proxy functions, the smoothness of dialogue and concurrency in conclusions

now turn to meaning

- agreeing with Frege, settle on whole sentence as the primary vehicles of meaning
→the indeterminacy of reference should not interfere with equating of sentence meanings, for it leaves the truth conditions of sentences unaffected

sameness of meaning

- defining the notion of meaning may appeal to “specifying the circumstances in which two sentences have the same meaning”
→for no entity without identity; no meaning without sameness of meaning
- “the meaning of a sentence by ‘quasi-analysis’ à la Carnap (Chapter I) as the class of all sentences like it in meaning”

occasion sentences

- “they all offer what John Stuart Mill called concomitant variation”—sameness of truth value occasion by occasion is the **necessary condition** of sameness of meaning
- “Sameness of meaning of two occasion sentences, then, for a given speaker at a given stage of his development, consists in his then having the *disposition* (Chapter II) to give the same verdict (assent, dissent, abstention)] to both sentences on any and every occasion. This is perhaps the most we can require.”

detecting disposition

- “The disposition...is a present passive physical state of the subject's nervous system, however little understood, and whether or not activated or otherwise

- detected.”
- the subject is induced by our querying of the two sentences “in his imagination that state of mind in which either sentence would come naturally, and he finds both sentences prompted equally.”
→ ‘having the same meaning’ for this form of introspective experience
no clean-cut idea of sameness of meaning for standing sentences
 - “Various pairs of words are found to be interchangeable in occasion sentences without disturbing sameness of meaning, so their interchange is taken also to preserve meaning of standing sentences. This goes pretty far in equating standing sentences.”
 - what *interchangeable*? And why *interchangeable*?
 - it is a total different story for standing sentences—although some standing sentences are locked together by causal regularities, words might seem to be interchangeable in standing sentences while the sameness of meaning is insecure, due to their lack of close connection to stimulus meaning
propositions?
 - “But this is the very locus of the philosophical notion of *proposition*: the meaning of a sentence of fixed truth value. Many philosophers have seen propositions as abstract objects that statements served to express. They have seen them as the bearers of truth values; sentences were true and false only in the sense of expressing true and false propositions”
utterances or sentences
 - shift the burden of truth values to the sentences, or, more strictly, to the events of uttering them
 - why “it is the individual utterances that matter for occasion sentences—indeed for most of our sentences, where personal pronouns, tensed verbs, and the adverbs ‘here’, ‘there’, ‘now’, and ‘then’ can make truth value vary with the circumstances of utterance”?
 - treating sentences instead of utterances as truth vehicles is more convenient in logical and philosophical contexts—sentences are what we can mutually discuss *about*
 - “The fixity restores the convenience that had made propositions attractive”—specify time, place, and person insofar as needed to freeze their truth value
bilingual
 - from sameness of meaning of two sentences for one speaker to the purported sameness of meaning between a sentence of a wildly exotic language and its English translation
→ the second one is reducible to the first one as far as we can make our field linguist a bilingual
indeterminacy of translation or meaning
 - untranslatability is never a problem: no matter it is such as “Neutrinos lack

mass” or is such as multiple translation

- the latter is more essential—indeterminacy of translation, especially for standing sentences: for any given language, there are infinitely many translation manuals compatible with all linguistic dispositions of the speakers of the language but mutually incompatible with each other
→more importantly, **this applies to home language too**

“Gavagai”?

- an indigenous utterance “Gavagai”—explain the custom of your usage of quotation marks—while something salient has occurred, perhaps a scurrying rabbit—the method: conjuring up the English sentence “Rabbit” and taking it as the tentative translation—“his conjecture is that if he takes to say ‘Gavagai’ in circumstances where he would habitually have said ‘Rabbit’, it might contribute to his command of the language.”

the instance

- showing a big and a small *leafs*, a long and a short *sticks* to an obliging indigenous informant
→hoping to find what her utterances denoting the displayed objects and their contrast—the *italics* and the underlined respectively
→“He amasses observation sentences apace: nouns and adjectives, as he puts it, for he applies familiar grammar where he can”

analytical hypotheses

- “Observation sentences are thus the entering wedge for the linguist as they were for the child. Further occasion sentence, not observational, would probably be the next in line. They lack the advantage of concurrently observable subject matter, but they retain the advantage of variation under varying conditions”
- “Standing sentences are the stubborn ones: impassive, inscrutable.”
→how to do the opportunistic and unsystematic analogies, bold extrapolations, wild guesses and grasping at straws?—**analytical hypotheses**
→“His ascent into the thick of language must resemble the child’s, but his groping is less blind because his own language and others in his command afford structures for him to try”
- now perhaps you can see why the same thing applies to home language
universally quantified conditionals
- “observation categoricals would no doubt to be the first of the standing sentences to yield”
- “the...idiom for them would no doubt extend directly to the **universally quantified conditionals** without regard to observability”
- a generalised expression of expectation—**observation categoricals** (Ch. 2)
- *focal* observation categorical: “Whenever..., it...”
the essential pronoun means reification (Ch. 3)
- valuable in suggesting translations of further sentences because “each

universal conditional affirms an invariable truth link between two open sentences, one of which may already have been conjecturally translated”

local folkways

- the linguist rely on observation of the local folkways
→similar to the child but the linguist is more seasoned, not accepting everything said by her indigenous informant—assume sincerity, barring evidence to the contrary
- “but he will try as an amateur psychologist to fit [her] interpretation of the [indigenous informant’s] sentences to [indigenous informant’s] likely beliefs rather than to the facts of circumambient nature.”

interpretation vs. translation

- “translation is the narrower project, pertinent specifically to [Quine’s] concern over the fancied concepts of proposition and sameness of meaning”
- “An untranslatable sentence, such as the one about neutrinos, can still be interpreted, and that indeed is how we have learned it ourselves. For broadly semantic purposes, as Donald Davidson appreciates, interpretation is the thing.”

ideas wedded to words

- sameness of meaning for one bilingual sufficed as a challenge to propositions
→but there is a more popular resort—in the conception of dialogue as **communication of ideas**
- “but ideas lingered on in the guise of meaning. Meaning is the idea wedded to the word, and as such it is up again for exorcising.”

for speakers

- no problem for intersubjective sameness of meaning in the case of observation sentences, for “concurrence of witnesses is already a definition condition of observability”
→occasion sentences are not in a too bad shape, for they still vary concomitantly from occasion to occasion for people

- but not that clear for two speakers—“for two speakers might disagree on the truth of an occasion sentence because of a difference in belief rather than meaning (granted the reality of that distinction)”

one way to diagnose the disagreement—meaning or belief

- two speakers disagree on the truth of one occasion sentence, *O1*
→one speaker switch the sentence to another occasion sentence, *O2*, that has the same meaning for him—if the other speaker agree with the truth of *O2*, the earlier disagreement is semantic
→For the second speaker, *O1* and *O2* mean differently. Otherwise they should have had no disagreement
- “Often the discrepancy can be narrowed down to a word, by hitting on a substitute that restores agreement.”
- that is, a substitute of one word for another which do not have the same

meaning, so the disagreement is about beliefs but not meanings

**impossible to define for
standing sentences**

- “Such probings pinpoint local divergences in our speech habit without suggesting any coherently definable relation of sameness and difference of meaning between one speaker’s sentence and another’s”
- agreement with the truth value is just the *necessary condition* of assigning the same meaning to the sentence

- it is even worse for standing sentences than it was for sameness of meaning of them for a single individual
→ “It is as hopeless as our earlier question of intersubjective identity of abstract objects”—no entity without identity (Ch. 3)

another version of indeterminacy of translation

- the bilingual case can help reducing intersubjective to intarsubjective sameness of meaning
- “Would they agree...on sameness of meaning between [indigenous] standing sentences and English ones?”
- suppose both manuals are successful—each produce coherent English translations
- when translating, say, some long indigenous monologue, sentence by sentence by using two manuals alternately? Is the result still coherent?
→ if not, then a perfect case of indeterminacy of translation is produced
- inculcating us of fluency and effectiveness in the indigenous language
→ “The instruction would proceed recursively, for the most part, beginning with the ad hoc pairings of [indigenous] words with English words and phrases and then explaining grammatical constructions for generating sentences from the words”

he holistic objective of communication

- for the most part? “Translations of most [indigenous] sentences would be implied and interpretations of untranslated ones would be provided less systematically”
- the whole explication is not that precise—actually, the recursive part is our linguist *analytical hypotheses*, adding that she needs to find a way to segment utterances, such as “Gavagai”

**no difference to lexicography
at home**

- “Though the word ‘meaning’ is ubiquitous in lexicography, no capital is made of a relation of sameness of meaning...but only ad hoc to explain how to use a word in various dissimilar situations. When a word is partly explained by paraphrasing a sample context, as is so often the way, the paraphrase is meant only for typical circumstances, or for specified ones; there is no thought of

sameness of meaning in any theoretical sense.”

- for instance: MSN online dictionary
u·biq·ui·tous:
adjective
Definition: existing everywhere: present everywhere at once, or seeming to be
- “Nor does a practical dictionary observe a distinction between linguistic information about a term and factual information about its denotata. The goal is simply the user’s success in plying the language”
- “The word ‘meaning’ is indeed bandied as freely in lexicography as in the street, and so be it. But let us be wary when it threatens figure as a supporting member of a theory. In lexicography it does not.”

Five Milestones of Empiricism The five milestones

- 從idea到word
- 語意學的重心從terms到sentences
- 語意學的重心從sentences到systems of sentences (一組或一群語句)
- 方法學的一元論(methodological monism)
- 自然主義，放棄對自然科學之上還有第一哲學的追求
from ideas to words
- ideas—linguistic expressions—empirical data
- 中世紀唯名論 (nominalism) 即開始，但Quine認為直到1786年 (Tooke—philologist) 才進入經驗主義討論的核心。
nominalism? →即認為觀念、共相 (universals) 或數字等等並不存在，它們只是我們發明出來得工具而已。
- John Horne Tooke認為，Locke所以為觀念間的各種關係，其實都只跟語言有關。
- Empiricist position: only sense makes sense
→ideas 必須立足在感官印象上才能被接受→but the idea of idea cannot measure up to this standard (不是基於sense impressions)
- For Tooke: words make sense only when they are definable in terms of sensory terms
grammatical particles
- 並非每一個字詞都可以如此定義，介系詞、連接詞等等都有問題。
- Tooke在字源學 (etymology) 的驚人設想，是把這些字詞當作某種英文用法的變形，譬如說 'if' 是 'give' 的變型。
- Quine認為另一種比較合理的作法，是將上述詞種視為syncategorematic 它們無法單獨被定義，必須在某個脈絡下才行。
second milestone
- 中世紀對上述觀點已有認識，但直到Tooke同時期的人—就是Jeremy Bentham—才提出了contextual definition。Bentham不僅對文法辭 (categorematic) 使用 contextual definition，還對真正的語詞 (categorematic) 如法炮製。
- 如果某些字詞有使用便利的價值，但是在存有學上令人不安，contextual definition 可以維持我們繼續使用這個字詞的便利，保留其文法上的外觀 (即categorematic terms)，消除這個字的指涉。
- contextual definition的推廣解釋：如果任何語詞，包含文法辭在內，是以作為一個有意義語句的一分子而有意義，如果任何包含某一個字詞的語句可以被改寫成另一個不包含該詞但仍有相同意義的語句，我們夫復何求。
abstract ideas/terms

- Berkeley & Hume對抽象觀念相當感冒，由Tooke的第一個里程碑可以看出這種不舒服，對象轉換成抽象語詞。
- 現在第二個里程碑中Bentham的作法可以把部分或大部分這些語詞轉換，所以不用擔心抽象語詞在存有學上的問題。
- 當然，科學是一串抽象語詞的組合物

- 我們不可能也不必要把所有抽象語詞全部消除，但用contextual definition予以轉換，我們可以更有效並更合理地把唯名論再更推進一步
- in last semester we discussed Quine's method of doing this—only admitting the existence of one kind of abstract objects, classes, and further define other abstract terms in terms of classes

the Copernican shift

- 字詞不再是語意的基本單位，語句的意義不再是由字詞所決定—brick building theory。
- 字詞的意義端賴其對整體語句的意義的貢獻而定 (來臺北的人與臺北來的人)。
- 這個轉變並不明顯，因為brick building theory的好處是符合常識，因為語句的數量無限，我們似乎必須藉由先瞭解字詞的意義，再瞭解語句的意義。
- Quine的看法是，我們是以單字 (詞) 語句來學習簡單的字詞，而非以單字 (詞)，較複雜的字詞只能嵌入一個短語句的脈絡來瞭解，以此類推。這就是他在*Word and Object*裏所要論證的。
- 我們很容易誤以為我們會得到一份字典，但實際上字詞的意義是藉由語句的真值條件 (truth conditions) 所萃取而出。

it is Bentham

- 語句優先的認知帶來了contextual definition，反之亦然。雖然二十世紀之交，Frege與Russell爲了不同的理由視語句爲優先於語詞，Quine依然將此歸功於Bentham。

the shift in epistemology

- 語句優先亦影響到知識論。知識論的優先課題不再是關於概念(concepts)，而是關於truth與belief
- 由此，Vienna Circle的verification theory of meaning就以語句的意義作爲核心，但他們所重視的是語句的經驗意義
- 英國的自然語言學派亦然，代表人物是G. E. Moore。他們都受到早期與後期Wittgenstein的影響。而Bentham的教導貫串其中。

the third milestone

- 個別語句作爲經驗意義 (empirical meaning) 的基本單位，還是太小了。個別語句在觀察上或實驗上沒有獨立的經驗後果 (這也就是the verification theory of meaning所謂的經驗意義)。一個廣泛的科學理論則不然，它會隱含了許多Quine所謂的觀察條件句 (observation conditionals)

- 如果上述 **observation conditionals** 有任一個被證明為假，那該科學理論即為假，而且根據語句邏輯，我們無從知道是該理論的哪一個語句或許多個為假。這就是整體論 (holism)。
- $S_1, S_2 \dots S_n \rightarrow OC_1, OC_2 \dots OC_m$
If one of $OC_1, OC_2 \dots OC_m$ is false, then at least one of $S_1, S_2 \dots S_n$ is false, except we do not know which one or ones it is or they are.

- 請注意，這第三個轉變，是由對語句經驗意義的重視所推論而來。意即，如果語句的經驗意義和它在經驗上所隱含的某些驗證條件有關 (譬如“雪是白的”的經驗意義，就在於經驗如何肯定或否定這個語句)，那 **Quine** 論證說，絕大部分的語句無法真正獨立隱含其本身的驗證條件，所以整體論，這就是為何是證實整體論了，再配上 **verification theory of meaning**，就變成意義整體論。

testing one single hypothesis?

- 科學家的確會利用 **observation conditionals** 測試單一語句。但這僅僅發生在他對其餘假設信心十足，想要藉由這麼做來測試一個新的假設，並試試看是否能將其納入原有系統。
- 這是意義理論與科學實踐的不同。

how broad is a scientific system?

- 整體科學，還是某一種學門的理論？
- **Quine** 認為這只是程度上的差別而已，過了某種程度就是報酬遞減—即效益降低。不同 **branches** 的科學再分歧，仍然共享一套邏輯，還有大部分的數學。但我們沒有理由認為科學必須作為一個整體在各方面同時演變，大到一個程度也就夠了。

degrees of observability

- 單一語句也可能有經驗意義，從理論語句 “ $E = (mc^2)$ ” 到觀察語句 “這裏有一張桌子”，觀察性 (observability) 是程度的差別，換言之，是對立即目擊下予以同意或不同意的程度差別而已
- 而且連觀察語句都可能因為保護一個理論而予以放棄。還好這種極端並不是常態，也不是觀察語句的特性。
第四行後半 (‘namely’ 之後) 到第六行最前面，是一個簡明版的觀察語句定義。
- 另一種極端是理論語句，一個超長的連言 (conjunction) 可以把該理論的每個理論語句包括在內，因此該連言就有經驗意義了。
- 重點是，語句之間的變化是程度的差別，而不是種類上的差別—**observability**。**Quine** 在這點上其實並不是很一致，根據他對 **observation sentences** 的定義，它們跟 **theoretical sentences** 應該是截然不同的。這點我們會慢慢談到。

moderate holism

- 所以上述的整體論應視為溫和的或相對的整體論 (moderate or relative

holism)。然而重點在於，我們不再期待每個科學語句都有其個別的經驗意義。

the fourth milestone

- 整體論模糊了綜合句與分析句間的區別—方法論的一元化。
- 傳統認為Synthetic sentences有其個別的經驗內容 (empirical content經驗意義)，analytic sentences則毫無經驗內容。分析句因此擁有特殊的地位，它對任一語言或甚至所有語言具有組織的功能，因為理論上，分析句應該是放諸四海皆準的。但是整體論抹去了這項區分。

the fifth milestone: naturalism

- 自然主義 (naturalism) 使我們放棄了對第一哲學的追求。傳統上，我們一直認為哲學是比科學研究更為基本的東西，像是科學只研究存在物，哲學則探討為何存在物存在，以何種型態存在等等，或者知識論說明了科學研究與其方法學。
- 但是自然主義視自然科學為對reality的研究，儘管會錯、會修正，它不需要對超科學的法庭負責，其所使用的方法也不出觀察與假設演繹法 (hypothetico-deduction) 的範圍。
- 自然主義有兩個根源。其一是對還原主義與現象主義 (phenomenalism，非 phenomenology) 的絕望。整體論則反駁此點，至少理論語詞無法被如此定義，理論語句不可能有獨立的經驗意義。
- 第二個根源是與實在論的衝突，科學家並不會對理論系統中某些不可避免的不確定性感到不舒服，所以根本不需要所謂的第一哲學。反形上學的孔德(Comte)，在十九世紀上半葉提出實證哲學(positive philosophy)，認為哲學與科學所使用的方法並無不同。

naturalised epistemology

- 自然主義並未排除知識論，它把它吸納進經驗心理學之中。自然科學告訴我們，我們關於外在世界的資訊，來自我們表皮組織與器官所受到的刺激。知識論的問題由此變成科學內部的一個問題：我們如何從如此有限的資訊，得出整個科學系統。我們在第三個里程碑—整體論—中談過。
- 科學知識論者持續研究，就會得出我們如何學習語言，以及知覺的神經學等答案。他會談到人們如何設定 (posit) 了物體與假想中的微粒子，但不會進一步否定它們的存在。如果在回答這些問題時有所機會，他無疑會應用物理學。
- 關於設定物的存在與否，取決於Quine對存有學的看法，即前述第二個里程碑中提到過的“On What There Is”。“to be is to be a value of a variable”

There is Pegasus → There is something pegasusised → $\exists xF(x)$

Neurath's naturalistic sailor

- Quine認為自然主義者必須相信他手上最好的理論，然後隨著發展逐步修正。這種修正不是來自於像船塢的外在，而是像海上水手般來自於船的內部 (from within)。
- 科學的修正沒有第一哲學從上而下的光照，只能在理論系統中與時俱進。

Two Dogmas of Empiricism two dogmas

- 兩大獨斷—(一) 相信分析 (analytic) 真理，或說獨立於事實之外而依賴意義為真的語句，與綜合 (synthetic) 真理，或說依靠事實為真的語句之間，存在一種基本的分歧。(二) 化約主義 (reductionism)，相信每一個有意義的語句，等同於對某些與立即經驗相聯結的語詞的邏輯建構。
- 放棄的後果有二，一是模糊了思辨形上學與自然科學之間的界線，二是轉向實用主義。

1. Background for Analyticity two kinds of analytic sentences

- 第一種是邏輯真語句—tautology：
 - (a) 單身漢是單身漢。
- 第二種是利用同義詞代換而形成邏輯真語句的分析句：以‘沒有結婚的男人’來代換‘單身漢’，(a) 就變成
 - (b) 沒有結婚的男人是單身漢。
- 包含二者為廣義分析性，只有後者的是狹義。Quine針對的當然是第二種分析性

the background

- Kant's cleavage between analytic/synthetic truths
- Hume's distinction between relations of ideas and matters of fact
- Leibniz's distinction between truths of reasons and of facts
- 分析語句則以同樣的方式，可被定義為其否定句是自我矛盾的 (self-contradictory)。 (Carnap)

Kant

- **Kant**認為分析句是述詞所歸諸於主詞的東西，已經在概念上包含 (contain) 在主詞之內
- 問題有二：1. 語句形式被限定在主詞—述詞；2. ‘包括’這個概念並未受到哲學解釋。
- 獨立於事實之外而依賴意義為真的語句
- 釐清這個定義所預設的概念—意義

Examples

- 1. People who run move their bodies.
- 2. Lead is metal.
- 3. Siblings are not cosins.
- 4. Bachelors are unmarried or Bush is a moron.
→How to explain the predicates of (4) to be *contained* in the subjects?

Kant's idea

- Appealing to some psychological contemplation of the containment relation → I need only to analyse the concept, i.e., become conscious of the manifold that I always think in it, in order to encounter this predicate *therein*.
→cannot be explained in terms of the principle of contradiction—that is, the

analytic are those whose denials are contradictory—for the two explanations do not have the same extension.

meaning and naming

- Frege的例子 'evening star' 與 'morning star'
Russell的例子 'Scott' 和 'the author of *Waverley*'
顯示字詞可以命名同一個東西，但有不同的意義。
- 這在抽象語詞上並無不同，'九' 與 '太陽系的行星數目' 命名的對象是同一個抽象實體，但是它們的意義一定不同
- Mill：單稱詞有指涉無意義，一般名詞二者皆有。
問題一：無法區分 (by Frege)
 $a = a$
 $a = b$
問題二：在模態 (modal) 或內涵 (intensional) 脈絡中，Mill的理論形成錯誤的推論。
It is true that necessarily $9 = 9$, but it is false that necessarily $9 =$ 行星的數目

general terms

- 一個general term是對某一個或一種實體為真，即true of。
一個集合裏所有能讓包含一個general term的語句為真的實體，就是它的外延 (extension)。
- 有心臟的生物與有腎臟的生物具有相同的外延，但意義不同。

Aristotle's notion of essence

- Aristotle的本質 (essence) 概念是內涵或意義的先驅。
- 理性被視為人的本質，擁有兩隻腳則被視為偶然
但是兩足動物具有兩隻腳是必然的，擁有理性卻是偶然的。
- 就意義理論而言，就算讓步說理性是 '人' 的意義的一部分，有兩隻腳則不是；兩足性是 '兩足動物' 的意義的一部分，理性則不是。
- 但就本質面來說，每一個個體的人既是人又是兩足動物，說這個人的本質是理性而非兩足性，反而是說不通的。
- 意義就是本質脫離被指涉事物時，與字詞結合後的結果。
- →理性←
人→本質↗ →兩足動物 ←↖ 意義← '人'

meaning entity?

- 意義理論的首要問題之一，就是何謂意義？一旦意義與指涉分離，意義就不能藉由清楚的指涉理論來混淆視聽。
- 意義理論的首要之務，就在於探討語言表式間的同義性 (synonymy)，以及語句間的分析性 (analyticity)。意義作為難解的中介物，就可以被放棄。

logical truths

- 分析語句一般被區分為兩類 (這回應我們一開始的介紹)，第一種是邏輯真語句，像是

No unmarried man is married.

如果我們設定了所有邏輯語詞或說邏輯常元，那麼一個邏輯真語句，就是對所有非邏輯語詞予以重新解釋 (reinterpretation) 或說替換，不會影響到它的真值。

the second kind

- 第二種所謂的分析句是
No Bachelor is married.
這種語句的特性，在於可以經由用同義詞替換同義詞而變成一個邏輯真語句。
- 但是現在說明分析性的負擔，轉移到對同義性的說明上。(意義—同義性—分析性)

• Frege's idea of definition

The example: All Great Danes are dogs

→not a logical truth, for substituting something else for the first and the second places do not end up with a logical truth.

→Here Frege appeals to the notion of *definition*, or *synonymy*: the non-logical analytic truths are those that can be converted to (strict) logical truths by *substitution of definitions for defined terms, or synonyms for synonyms*

Carnapian notion of state description

- Carnap利用“state-description”說明分析性。
→Carnap認為一切複雜語句都是原子語句 (atomic sentences) 加上邏輯連詞而形成。
- →所謂的‘state-description’就是指窮盡一個語言所有原子語句真假值的分配組合。
Quine認為所謂的分析語句，就是在state-description的各種真值組合中，保持為真的語句。

- 但是Quine認為這種說法沒有幫助，因為這個說明下的原子語句，必須是相互獨立的。不能有同義詞的介入
- 不能有“John is a bachelor”與“John is unmarried”這樣的原子語句。
不然就會有一種真假值組合，指定前者為真而後者為假，使得原本被視為分析句的“**No bachelor is married**”，變成是綜合句。所以state-description頂多可被視為對第一種分析句 (logical truths) 的重建，對於第二種則毫無用處。

2. Definition definition

- 有人以為分析句基礎穩固，因為同義詞可以經由定義來取得。
- 但這種定義何來，難道拿本字典來就可以了嗎？
字典編纂者是以一種語言實際上如何使用來作為編纂的依據，所以上述講法是本末倒置。
- 哲學家與科學家常常藉由定義，利用較常見的概念來解釋深奧的概念。但這跟上

面說的一樣，其實是依靠事先就已存在的同義性關係。

- 語言表式之間要有何種充分與必要的 (sufficient and necessary) 關聯，才能被視為同義，這點並不清楚。
→但可以肯定的是，Quine認為這種相互關聯必須以用法為依歸。

explication

- 的確還有一種不同型態的定義。Quine所指的是Carnap所謂的**explication**
- Explication的目的不在於以一個同義詞來取代原語詞，而是利用在定義端 (definiens) 對被定義端 (definiendum) 語詞的意義做出修正或補充，以此去改良被定義的概念或被定義語詞的意義。
- 值得去做**explication**的語詞要是一個有用的語詞，一定有某些使用的脈絡在整體上算是足夠清楚與明確。
Explication的目的就是要保存這些脈絡，以使其他脈絡下的使用更為精鍊。所以explication中definiendum某些被選定的脈絡，必須與definiens是同義的。
- 縮寫 (abbreviation) 或介紹一個全新概念的定義，的確不需要先前的同義關係。除此之外，定義都與在先的同義關係有關。

例如**Republic of China** → **ROC**

two types of economy

- 一種是敘述上的經濟 (**notational economy**)，可以使邏輯敘述簡化，由於具有豐富的概念與定理可茲運用，證明上也可以簡化。
- 另一種是概念上的經濟 (**conceptual economy**)，如果我們只要求最基本的概念與推論規則，複雜的概念或推論程序可以藉由這些基本的概念與推論規則加以說明。
- 兩種經濟考慮都很重要。通常我們會想保有二者，作法是將兩種系統當作不同的語言，便利但複雜的那一種包含了不便但簡單的另一種
- 兩種語言可以藉由**rules of translation**來連結，任何非基本notation的用法，等同於從基本表式所建構出來的**complex** (合成物)。這些**rules**就是形式系統中所謂的定義。它們不應該被看成某一個語言的輔助物，而應該被視為兩種語言間的連結。
- 類似所謂物理語言和現象語言間的翻譯。
- 但是這種關聯不是任意的。它們應該可以顯示或證明，所有複雜系統所能做到的，簡單的系統也可以做到
- 這種關聯或**rules of translation**不出前面所提到的三種所謂的定義。
陳述先前就存在的同義性(**synonymy**), or
精鍊了被定義端的用法 (**explication**), or
介紹一個全新的語詞或概念 (**abbreviation**)

- 除了第三種以外，定義都無法對同義性提出不會循環的說明

some clarification

- Quine事實上overstate許多事情。以Carnap所區分的內外部問題 (**internal/external question**) 來看 (“Empiricism, Semantics, and Ontology”)—即如何決定一個convenient language form是一回事 (外部問題)，但語言一旦被設定了，分析句就會產生，因為這是內部問題。
- 但當然，Quine並不贊同Carnap的區分，留待第六節。部分原因會在第四節討論。

3. Interchangeability

interchangeability

- 對同義性一種最自然不過的解釋，是保全真值的可相互替換性 (interchangeability)，也就是Leibniz所謂的*salva veritate*
- 這可以被視為提供同義性一個充分必要條件—即在兩個語詞是同義的情況下，它們是*salva veritate*；而且當它們是*salva veritate*時，它們就是是同義

some restrictions

- 譬如說同義詞不能出現在一個更長的片語之中，譬如說 ‘bachelor’ 跟 ‘bachelor of arts’，或者出現在提到該詞而非使用該詞的語句中—譬如 “‘Bachelor’ has less than ten letters”
- 這種作法似乎把 ‘bachelor of arts’ 或 ‘bachelor’ 當成一個字 (**word**)，以此來要求同義詞不得以某字之一部分出現。這種作法的問題，在於訴諸一個預先設定的概念 ‘字’ (**wordhood**)。

how strong can it be?

- 現在的課題是，保全真值的可相互替換性，是否強到僅讓同義詞可以滿足這項條件，還是某些異義詞也可以做到？
- 所謂的同義性必須再嚴格限制，Quine在此強調所謂的同義性，並非指兩個字詞在心理聯想或詩意特質上完全相同。他所關心的是認知上的同義(cognitive synonymy)。
- 認知同義性只有等釐清分析性之後，才能有清楚的說明。

- 倒過來想，我們可以根據分析性來定義認知同義性，說 ‘bachelor’ 與 ‘unmarried man’ 是認知同義，就是說

(3) All and only bachelors are unmarried men

是分析的。

→ that is, (3)'s being true is purely in terms of *meaning*

→

(3.5) If (3) is analytic, then ‘bachelor’ and ‘unmarried man’ are cognitively synonymous

necessarily?

- 接下來要看的是，保全真值的可相互替換性是否是認知同義性的充分條件。它似乎是，因為

(4) Necessarily all and only bachelors are bachelors.

顯然是真的。就算我們把 'necessarily' 限定成只適用於分析句，它還是真的。

- (4.5) 'bachelor' 與 'unmarried man' 是可以保全真值的來相互替換
- 那麼，(4) + (4.5) \rightarrow
(5) Necessarily (3) (all and only bachelors are unmarried men).
一定也是真的。
- 但說(5)是真的等於說(3)是分析的
 \rightarrow (5) (or Necessarily (3)) iff (3) is analytic
- **the argument form**
(3.5) & (4) & (4.5)
(4) + (4.5) \rightarrow (5)
(5) \rightarrow (3) is analytic
((3) is analytic & (3.5)) \rightarrow
'bachelor' and 'unmarried man' are cognitively synonymous
how rich is our language?
- 上述說法必須倚賴於我們所使用語言的豐富性，豐富到足以接受一個內涵性的概念—必然性。
- 但是接受必然性的概念，其實意謂著我們已經先對分析性有了令人滿意的答案。
- 基於必然性與保全真值的可相互替換性，(5)是真的，說(5)是真的等於說(3)是分析的，說(3)是分析的就等於說 'bachelor' 與 'unmarried man' 是認知同義的。
- 基於必然性與保全真值的可相互替換性，(5)是真的
(4) & (4.5) \rightarrow (5)
- 說(5)是真的等於說(3)是分析的
(5) (or Necessarily (3)) \leftrightarrow (3) is analytic
- 說(3)是分析的就等於說 'bachelor' 與 'unmarried man' 是認知同義的
(3) is analytic & (3.5) \rightarrow 'bachelor' and 'unmarried man' are cognitively synonymous
- 問題在於兩點：
其一，必然性與分析性密不可分
Necessarily P iff P is analytic
前面已說過，我們要尋找的是不需倚賴分析性的認知同義性
其二 (4) 到 (5) 的推論不是建立在保全真值的相互替換上，而是同義上
(meaning & naming)。
That is, (4.5) is a disguise of synonymous relation.
- "Necessarily, evening star = evening star" "Necessarily, evening star = morning star"

an extensional language

- 外延化的語言：邏輯連詞 (and, or, if-then, not) 與量化詞，一位述詞 (比方說Fx意指x是人) 與多位述詞 (譬如Gxy意指x比y高)，所有複雜句可由原子語句藉由真值函項 (truth function)獲得。這套語言甚至可以處理到單稱詞或描述詞
- 兩個述詞在外延上一致，就是在保全真值的前提下可相互替換。
Morning star (/Evening star) is the last star we see in the morning.

- 這種語言可以用來談數學或科學論述，但它不足以處理牽涉到違反事實條件句與模態詞的系統。
- 這種外延語言下保全真值的可相互替換性，不足以提供分析性所需要的認知同義性。因為在上述的語言中，**(3)**只不過是真的，不是分析的
- 而且這種外延上的相互替換，無法保證可相互替換的原因，是字詞擁有相同的意義，而不是偶然的事實
- 外延一致是目前最逼近同義性的說法。
但它不足以構成第一節裏面對分析句的說明

not a sufficient condition

- 但是這種外延上的一致不足以說明分析性，不是認知同義性的充分條件
- 如果這個外延語言豐富到擁有必然性這樣的內涵性概念，保全真值的可相互替換性就足以作為認知同義性的必要條件，但這個語言只有在分析性這個概念已經被瞭解的情況下，才是可接受的。

from analyticity...

- 有了分析性，就可以說明何謂認知同義性。
一位述詞：譬如 '在臺北' 與 '在臺灣最大都市'，可以經由 "所有在臺北的建築都在臺灣最大的都市" 是分析的，來說明它們的認知同義性。
多位述詞比照。單稱詞利用彼此之間的同一性 '=' 是分析的，來說明它們是認知上的同義。
語句的認知同義也可以利用它們所構成的雙條件句是分析的，來予以說明。

- what is the problem of 'homonymy' here? (p. 32)
→ 'I am content that the content of this book is good' and 'The desert in the desert is good'
- 外延性的概念基本上很少能跟必然性扯上關係。
但分析性概念就可以點石成金，因為只要它們的相關語句不是分析句，它們就不是認知同義。
所以要用分析性 + 外延語言才能定義認知同義性

4. Semantical Rules

what does 'analytic' mean?

- Quine舉例說，他不知道 "Everything green is extended" 是否是分析的 (analytic)。問題不在於他不瞭解 'green' 或 'extended' 的意義，問題出在 'analytic' 這個字。

- 比較好的例子：
The four angles of a regular tetragon are orthographic.
artificial language?
- Carnap認為從日常語言中區分分析句與綜合句的問題，在於日常語言的含混。如果有一個具備明確‘語意規則 (semantical rules)’的人工語言，這項區分就一清二楚。
- Quine則打算證明這是一種誤解。
the notion of analyticity needed
- a sentence or statement S (for variable S) is *analytic* for a language L (for variable L, so that this relation can be made generally)
- 這個問題的困難度，對人工語言不比對自然語言簡單到那裏去。
**the first version of
semantical rules**
- 假設有一個人工語言 L_0 ，它的語意規則藉由遞歸或其他方法 (enumeration)，明確地列舉出 L_0 所有的分析句。
- 規則告訴我們僅僅這些語句是 L_0 的分析句。問題在於，上面就語意規則的敘述中，包含了我們原本就不瞭解的字‘analytic’。
- 在我們瞭解一個像“A statement S is analytic for language L_0 if and only if...”的語意規則之前，我們必須先知道‘S is analytic for language L_0 ’ (‘S’與‘L’都是variables) 指的是什麼。
- 把所有analytic-in- L_0 、analytic-in- L_1 、analytic-in- L_2 ...聚集起來，並不等於說明或定義了S (for variable S) is *analytic* for a language L (for variable L)。
analytic-for- L_0
- 或者我們可以把上述的語意規則，當成對一個新符號‘analytic-for- L_0 ’的定義
- 以什麼語句在 L_0 中是analytic來解釋‘analytic-for- L_0 ’這個符號，我們並沒有解釋什麼是‘analytic’或‘analytic for’
- 沒有對“a sentence or statement S (for variable S) is *analytic* for a language L (for variable L)”，這個瞭解分析性的重要句式做出說明，我們只用一個新符號界定某一個人工語言內的分析句。
the second version
- 分析句一定是真的
- 轉向語意規則的第二種形式，不是去說那些語句是分析句，而是說那些語句是以何種方式被包括在真語句之中。
- 這種語意規則並打算去界定出一個語言中所有為真的語句，它僅僅是以遞歸或其他方式，在其他未被界定的語句中，去規定 (stipulate) 那些語句為真。這樣的規則或許可以讓步到認為它是足夠清楚

- 由此我們可以推論出如何界定分析性：一個語句是分析的，當且僅當它不僅僅是真的，而且是依據語意規則為真。
- Carnap first defines the notion of L-true (a statement is L-true if its truth depends on *semantic rules*) (分析句被內建在 **logical truths** 之中) and then defines the notion of L-false (a statements is L-false if its negation is L-true). **A statement is L-determined if it is L-true or L-false; analytic statements are L-determined.**
- For Quine: 本來訴諸的是未經解釋的語詞 *analytic*，現在則是訴諸於未經解釋的片語—語意規則。並非所有去說某組語句為真的真語句就是語意規則，不然所有真語句就都是分析的
- Quine認為語意規則僅有在標有‘語意規則’的頭銜下才能辨認，那它們等於是沒有意義的。意即你區分語意規則與非語意規則的方法，就是稱它們為語意規則，而其他的不是，這等於什麼都沒說。
- 我們當然可以說一個語句是分析的，當且僅當它不僅僅是真的，而且是依據特別增加的語意規則為真。但是我們發現一切又回到原點。一旦我們要去解釋 ‘a sentence or statement S (for variable S) is *analytic* for a language L (for variable L)’，依據語意規則 ‘true according to the semantical rules of L (for variable L)’ 是一樣無效。因為 ‘...的語意規則’ 這個關係詞就像 ‘*analytic for*’ 一樣有待釐清。

meaning postulate

- 有人將語意規則與公設 (postulate) 的概念相比
- 相對於一個給定的公設集合，要說公設是什麼很容易：公設就是這集合的一分子。相對於一個給定語意規則集合，語意規則就是這個集合的一分子。
- 但相對於一種敘述方式，是否是數學的無所謂，你可以對這套敘述方式做徹底的瞭解，我們是否就能說那些真語句是公設呢？
- 選擇任何一組數量有限的語句 (最好是真的)，這組語句跟任何其他選擇一樣可以被視為一組公設。公設這個字詞只有相對於研究而言才有意義，我們可以依據不同的研究目的而給定不同的公設，意即針對不同的研究目的，我們可以從所有為真的語句中，選定一組公設。
- 沒有人可以從一個語言為真的語句中，表明某個子集合的真語句比其他真語句更可以被稱為語意規則。就 ‘*analytic*’ 指 ‘true by semantical rules’ 而言，L中沒有一個真語句，可以在排除其他真語句同樣為 *analytic* 的情況下，被視為 *analytic*。

some supplement

- Carnap認為那一種語言有助於我們建構科學理論，是基於實用的考慮 (外部問題)。譬如說，自然語言包含太多含混與歧義的成分，還必須面對悖論的威脅，好比說謊者詭論，或者理髮師悖論。但是一旦選擇了某一套人工語言，那這套語言的語意規則就可以幫助我們決定分析句 (內部問題)。

- All ravens are black
(x) (Rx → Bx)
- All bachelors are unmarried
(x) (Bx → ¬Mx)
- 這些就形成了Carnap所謂的語意規則 (meaning postulate)。
- “All bachelors are unmarried” is true by semantical rule or meaning postulate
“(x)(Bx → ¬Mx)” (or “(x)(Bx = ¬Mx)”)
- Quine區分legislative (立法或規定的) 與discursive (推論的) 兩種定義與公設。
- **legislative**定義是介紹linguistic expression的新用法，**discursive**則是對linguistic expressions間的interchangeability或coextensiveness提出一種對預先存在關係的說明
- Quine指出這種定義上的區分並非針對語句，而是針對我們解釋或證明上的目的，而對語言中的真語句採取不同的行動。
- the dilemma
legislative與discursive公設：
(1) 如果Carnap的目標是建立全新的人工語言，那所謂的公設的確是legislative那種。
- 我們的確可以由此得出一組分析句，但這並非自然語言中已經存在的分析句 (也不會是所有語言的分析句)
(2) 如果這些公設是discursive，那它們只是從已經存在的真語句中，任意或相對於我們的解釋目的選出一組公設。
- 人工語言L或許可被視為一個語言加上一組明確的語意規則—形成一有序對，L的語意規則就可被界定為這個有序對的第二個分子。但是也可以將人工語言L與其分析句視為有序對，分析句就成為這組有序對的第二個分子。
translation rules?
- 所謂人工語言 plus 語意規則的有序對，是否就是conceptual economy language plus translation rules ?
→語意規則有時候是人工語言翻譯到自然語言的翻譯規則。人工語言的分析句，其實是自然語言中分析句的翻譯而已。如果是這樣，以人工語言來思考分析性的問題就註定是徒勞了。
artificial languages are not helping
- 由人工語言來探討自然語言的分析句，可謂毫無幫助
→必須先知道自然語言的分析性概念，才能知道那些是該人工語言中的分析句。
- 訴諸人工語言在釐清分析性上，也可以很有幫助。
但如果這個模型只將分析性視為某種無法化約的特質，不可能對解釋分析性有所貢獻。

linguistic and factual

- 真理顯然依靠語言與語言之外的事實。
→“荆軻殺了秦始皇”會是真的，如果世界史與我們的有所不同，但如果“殺”指的是“觀見過”，那這句話也會是真的。
→因此我們可能會大受誘惑，把語句之真分析成一個語言成分與一個事實成分。某些語句的事實成分等於零，似乎是合理的下一步，這些語句就是分析句。

5. The Verification Theory and Reductionism verification theory of meaning

- 證實主義的意義理論是說：語句的意義在於經驗上證實 (confirm) 或否認 (disconfirm, Quine用infirm) 它的方法。
- 分析句就是極限的例子，它們無論如何都會被confirm。
- the *synonymous relation* in terms of verificationism
→the supervenience relation
the synonymous relation
- verificationism :
statements are synonymous iff they are alike in point of method of empirical confirmation or information.
- 從語句的同義，我們可以導出其他言語表式的同義性概念：
any two forms are synonymous iff putting of the one form for an occurrence of the other in any statement yields a synonymous statement
- 有個這樣的概念，我們就可以照第一節的方式，根據同義性與邏輯真語句來定義分析性。我們可以更簡單的根據語句的同義性，把分析句定義成與邏輯真語句同義，這樣甚至不必倚賴語詞的同義性。
- 上述對語句同義性說法的問題，在於如何去比較confirming或disconfirming經驗的相同與否。換言之，語句與加強或減弱它的confirmation的經驗之間，到底有何種關係

radical reductionism

- 二者之間的關係，最天真的講法是直接報導。這就是徹底的化約主義 (radical reductionism)：每一個有意義的語句被認為可以翻譯成一個關於立即經驗 (immediate experiences) 的語句。
- sense datum: sensory events or sensory qualities?
- 它們如合結合在一起也不甚清楚。尤有甚者，這個理論過分嚴格限制在毫無必要的一個個語詞的型態上。
- 在未超過radical reductionism的條件下，比較合理的說法是把整個語句作為意義的基本單位。
- radical reductionism的目標，就是設計一套sense datum語言，然後把日常語言的語句翻譯成這套語言的語句。這就是Carnap在*The Logical Structures of the World* (簡稱Aufbau) 的計畫。

Aufbau

- Carnap所選擇的語言嚴格說來不完全是sense datum語言，因為它包含了邏輯與集合論的敘述方式，事實上它包含了所有的純數學語言。
→由此而來的存有學，不只是sensory events，還有集合與集合的集合等等。某些經驗論者對此種奢侈大感驚慌。
- 除此之外，Carnap的出發點在邏輯以外或sensory的部分非常節約。

Carnap's method

- 關於物理世界最簡單語句的建構，也停留在粗略的層次。
將時空中一個瞬間點，解釋成四個實數（代表三維空間與一維時間）所構成的類座標。
→大體說來，他根據某些準則把sense qualities賦予瞬間點的作法（參照下一段），是要得出一個可以跟我們的感覺經驗，以最鬆散的方式相容的物理世界。

Why Carnap failed

- Quine認為Carnap似乎並沒有認知到，他對物體（即瞬間點）的化約不僅有過於粗略的問題，而且在根本上就有致命的缺點。
- “Quality q 是在 (is at) 瞬間點 (point-instant) $x;y;z;t$ ” 的真假值，是根據整體描述上的特性來調整的，而且隨著經驗的累積，語句的真假值會以類似的方式隨之修正。
→holism→good schematisation of scientific research
- 但是Carnap沒有提供任何線索，告訴我們如何把“Quality q 是在 (is at) 瞬間點 $x;y;z;t$ ”這樣的語句，翻譯成他的sense datum與邏輯的基本語言。“是在(is at)”這個連接詞依然是一個未曾定義的額外連接詞，Carnap的準則只告訴我們如何去用它，沒有說如何能把它消去。
- Carnap後來也發現這個問題，所以他放棄了將物理世界語句翻譯成立即經驗語句的計畫。

the connection between the two dogmas

- 每一個綜合語句都與一組獨特的可能sensory events有關，任一個這種sensory events的出現都會強化這個語句之為真，而另一組相關的sensory events則可能減弱它為真的可能性。
- 這個概念當然隱含在verificationism的意義理論之中。

reductionist assumption

- 每一個語句可以獨立於其他語句，單獨接受經驗的confirm或disconfirm。
- Quine的想法完全相反，源自Carnap在Aufbau中關於物理世界的理論，他認為我們的語句在面對經驗法庭（另一個比喻，the tribunal of sense experience）時，不是以單一語句來面對，而是以一個整體來面對。

the connection

- 經由verificationism的意義理論 (from syhtheticity)，可以從第二個獨斷連結到第一個獨斷。

- 更直接的說，第二個獨斷以下列方式支持第一個獨斷：只要談論一個語句的 **confirmation** 或 **disconfirmation** 是有意義的，談論一個語句事實上會被一切經驗空洞的 **confirm** 就是有意義的，而這種語句就是所謂的分析句。

from the second we gain the support

- **the two dogmas are at root identical**
- 由此得到一種感覺，好像一個語句的真似乎可以被分析成一個語言成分與一個事實成分。
- 對經驗主義者來說，事實成分就必須濃縮到一組 **confirmation** 的經驗。在極端的例子中，只有語言成分跟語句之為真有關，這樣的語句就是分析句。

- 除了一個箱子裏放進特定數目的黑球與白球這樣的例子之外，他同樣對如何得到綜合語句在經驗上明確的 **confirmation** 感到困惑。
- 科學作為一個整體，的確倚賴語言與經驗二者，但這種二元性無法有意義的追溯到一個個獨立的科學語句。

verification holism

- **Quine** 要呼籲的是，把語句作為意義的基本單位，我們還是把格子劃得太小了。經驗意義的基本單位是整體科學。
- 為什麼意義的基本單位不是語言而是整體科學呢？
→ 因為一旦分析句與綜合句之間的界限被取消，一個語言與被這個語言所描述的科學理論之間，就沒有清楚的區分。

two holistic arguments

- 事實成分 vs. 語言成分：
(1) 一個語句是分析的 iff 它僅僅依據其意義 (或語言成分) 為真。
(a sentence is analytic iff it is true in terms of its linguistic component)
- 證實主義：
一個語句是分析的 iff 它可以被任何經驗所證實。
(a sentence is analytic iff it can be confirmed by all experiences)
- (I) 反駁第一個定義的論證—現象主義的整體論論證：
(1) 一個語句是分析的 iff 它僅僅依據其意義 (或語言成分) 為真，這個定義邏輯上隱含語言與經驗成分二者，可以追溯到一個個獨立的科學語句。
(2) 科學作為一個整體，的確倚賴語言與經驗二者，但這種二元性無法有意義的追溯到一個個獨立的科學語句 (整體論)。(第42頁)
(3) 因此“單一語句具備語言成分與事實成分”這個主張就是假的。
(4) 所以這個定義是錯的。
- 對這個論證的可能反駁：
→ 如果我們把語言固定下來，意即語言成分不列入考慮，事實成分就可以被視為所有可能經驗的組合

分析句就可以被視為在所有理論中皆為真的語句。←state description

- 這個反駁的問題：
一旦我們把語言成分固定下來，我們自然就會得出一組分析句，因為根據原本的定義，分析句是依據語言成分而為真的語句。那麼上述反駁就是多此一舉。
- (II) 反駁第二個定義的論證就是證實主義的整體論論證：
(1) 一個語句是分析的iff它可以被任何經驗所證實，這邏輯上隱含經驗意義的基本單位是語句。
(2) 經驗意義的基本單位是整體科學。(第42頁)
(3) 所以這個定義是錯的。
- 對這個論證的可能反駁：
有滿意的認知同義性概念，就可以語句同義，經由保全真值的相互替換得到語詞的同義。
- 假設我們現在有一個理論T，根據Quine的說法，只有整個理論才有經驗意義可言(上述論證的第二個前提)，個別語句沒有經驗意義，那麼我們將B語句替換理論T之中的A語句，我們得出一個新理論T'
再進一步假設理論T與T'擁有相同的經驗意義，我們就可以宣稱B語句跟A語句是認知同義的。我們可再根據上面談到的方法得到同義的語詞
Roger Gibson, Jr.的錯誤
- 在*Enlightened Empiricism*中，Gibson提出Quine可能被批評在第五節是在做循環論證。
- Quine似乎一方面以缺乏可接受的confirmation理論(所以談論個別語句的confirmation does not make sense)與可接受的分析句/綜合句區分，來證明整體論成立，另一方面以整體論來證明前述二者的不成立
- 以H代表整體論，C代表confirmation theory，D代表分析與綜合句的區分，兩個論證可以表述如下：
1. $\sim H \rightarrow C \ \& \ D$ [$\sim H \rightarrow C, \]$
 $\sim C \ \text{and} \ \sim D, \ \text{so} \ H$ [$\sim C, \ \text{so} \ H$]
2. $H \rightarrow \sim C \ \& \ \sim D$ [$H \rightarrow \sim D$]
 $H, \ \text{so} \ \sim C \ \text{and} \ \sim D$ [$H, \ \text{so} \ \sim D$]
- Gibson認為只要從“ $\sim C$ ”，我們就可以得出“H”。所以第一個論證可以先改寫如下：
1'. $\sim H \rightarrow C \ \& \ D$
 $\sim C, \ \text{so} \ H$
他認為1'與2並無循環的問題。
- Gibson似乎誤以為僅僅要求找不到令人接受的confirmation theory，就可以避免循環論證，但他所做出的論證還是形成循環，因為1'邏輯上隱含1''

1". $\sim H \rightarrow C$
 $\sim C$, so H

- 而2邏輯上隱含2'

2'. $H \rightarrow \sim C$
H, so $\sim C$

- 但1''與2'是循環論證，因為2'的H必須靠1''的 $\sim C$ 才能得到，而2'的H確推論出 $\sim C$ 。
- 1''' $D \rightarrow C$, $H \rightarrow \sim C$, H, so $\sim D$. (現象主義的論證)
2'' $D \rightarrow C$, $H \rightarrow \sim C$, H, so $\sim D$. (證實主義的論證)
- 在Gibson的1與2兩個論證中，C所代表的東西是不一樣的。
- 在1之中，C指的是無法對個別綜合語句在經驗上有**confirmation** (pp. 41-2, "...how baffling the problem has always been of arriving at any explicit theory of *the confirmation of a synthetic statement.*")。
- 但是在2之中，C指的是每一個個別語句在經驗上都可以有**confirmation**與**disconfirmation** (p. 41第二段第二行，"...*each statement*, taken in isolation from its fellows, can admit of confirmation and infirmation at all.")。

6. Empiricism without the Dogmas the first paragraph

- 我們的總體知識或總體信念，不論是從跟因果關係最為偶然的地理或歷史，到最深奧的原子物理定律，或甚至是純數學與邏輯，都是一個人工的織造物，只有延著邊緣與經驗接觸。或者，整體科學像是一個力場，經驗是其邊界條件（**boundary conditions**）。(1-6 行)
- 既然個別語句沒有經驗意義，經驗意義必須以科學或理論整體作為基本單位，那科學或理論整體與經驗的關係，就是接下來必須探討的課題。
- 這個隱喻**第一個重要的意義**，在於明示科學整體從最抽象、最普遍的純數學，到與經驗最緊密的科學部門之間，形成一個人類知識系統的**整體**，換言之，不同部門間並非各自獨立的，必須以一個相互關聯的整體來視之；這個整體與經驗的關係，就建立在與經驗密切相關的科學部門與經驗的關係上。
- 任何在邊界上與經驗發生的衝突，就必須在內部作出調整。某些語句的真值必須被重新分配。(6-9 行)
- 進一步要說明的就是科學內部各部門間的關係。
因為沒有任何語句與經驗有直接的關係——意即每一個語句與經驗意義沒有一一對應的關係。
- 這個隱喻**第二個重要的意義**，就在於理論與經驗之間的衝突，並不是以直接修改與經驗有關的語句就了事

- 修改理論系統內任何語句都可以，只要使修改過的理論不再與經驗衝突即可。
- 因為彼此之間的邏輯關係，對某些語句的再評估，邏輯含蘊了對其他語句的再評估。邏輯定理也不過就是理論系統中的某些語句而已，力場中某些更進一步的成員。(9-12 行)
- 這個隱喻第三個重要的意義，理論系統內由最抽象到最靠近經驗的語句，它們之間的關係是邏輯關係。同時，Quine 也明確指出邏輯定理本身，亦不過是理論系統的一部分而已。
- 重新評估了某一個語句，我們就必須再評估其他的語句，後者可以指與前者有邏輯關係的語句，或甚至是邏輯關係本身。(12-15 行)
- Quine 的整體論並未到此收手，因為他認為推論規則或邏輯定理，亦不過是理論系統或說整體科學的一部分而已，所以它們也免不了可以被修改的命運。
- Quine 在此指出了他的立場，他認為邏輯並沒有這種特權。
- 但邊界條件即經驗對整個力場的決定是如此不完全(underdetermined)，以至於在任何背反經驗之下，到底要修改那個語句，在選擇上有非常大的空間。力場內部的給定語句與任何特定經驗間並沒有連繫，只有對力場整體平衡狀態的間接考慮除外。(15-22 行)
- 第四個重要意義在於：
 - (1) 既然特定經驗與個別語句之間沒有特別的關係，
 - (2) 那麼特定經驗與理論系統相違背時，我們就無法找到應該要被修改的特定語句；
 - (3) 因此我們在選擇要修改的語句時，就有很大的餘裕；
 - (4) 而且修改了一個語句，就會牽動其他語句的修改，這在上面第三個重要意義時已經談過，而且可供修改的語句還包含了邏輯定理在內；
 - (5) 但是我們的選擇並非完全沒有限制，這就是所謂整體平衡狀態的間接考慮，意即如何選定要修改的語句，或一組語句，以使修正後的理論系統不再與該背反經驗相衝突。

the second paragraph

- 如果上述隱喻是真的，要談論個別語句的經驗內容(經驗意義)就是誤導的。尤其當它是離力場的邊緣很遠的語句時。
→ 尤有甚者，尋找僅因經驗而偶然為真的綜合句，以及不論經驗為何都為真的分析句之間的區分，註定是徒勞無功。
→ 任何語句都可以在不論經驗為何的情況下，被認為是真的 (any statement can be held true come what may)，只要我們在理論系統內做出足夠劇烈的改變。
- → 甚至離力場邊緣很近的語句，都可以在遇到背反經驗時保持為真，只要訴諸幻

覺，或者將所謂的邏輯定理加以改變即可。

→同理，我們可以反過來說，沒有語句可以免於修改 (**Conversely, by the same token, no statement is immune to revision**)。修改排中律都甚至成為簡化量子力學的手段；這樣一種對邏輯定理所做的改變，與克卜勒取代托勒密，或者是愛因斯坦取代牛頓，或者是達爾文取代亞里斯多德有何不同？

- (一) Another two arguments against the definitions of analyticity (discussed in the last section):
 - (i) 反駁現象主義的定義：
即一個語句是分析的iff它僅僅依據其意義 (或語言成分) 為真。
這個定義邏輯上隱含了下面這點：既然分析句僅以語句的語言成分即為真，這意謂著語句的事實成分與它的真假無關，即語句的事實成分是空的。所以分析句就可以在不論經驗為何的情況下，都保持為真。
(analytic statement are those that can be confirmed come what may)
 - Quine反駁的論證如下：
 - (1) 一個語句是分析的iff它僅僅依據其意義 (或語言成分) 為真。
 - (2) (1)在邏輯上隱含了分析句可以在不論經驗為何的情況下，都保持為真。
 - (3) 根據整體論，任何語句都可以在不論經驗為何的情況下，保持為真。
 - (4) 由 (3)，一切語句都是分析句，但這違反常識，所以上述定義不成立。
 - (ii) 反駁證實主義的定義：
即一個語句是分析的iff它可以被任何經驗所證實。
這個定義等於同時對綜合句下了個定義：
綜合句不能僅以其語言成分為真，必須同時倚賴語句的事實成分，所以綜合句可能因為背反的經驗事實而被修改。
這個對分析句與綜合句的定義邏輯上隱含了下面這點：*既然只有分析句可以被任何經驗證實，那它就不會因為經驗而被修改。*
- Quine的論證如下：
 - (1) 一個語句是分析的iff它可以被任何經驗所證實。
 - (2) (1)在邏輯上隱含了分析句不會因為經驗而被修改。
 - (3) 根據整體論，任何語句都可以被修改。
 - (4) 由 (3)，沒有語句都是分析句。
- (二) 上述兩個論證的第三個前提，是Quine的主要論點。
有人會質疑說，*它們是一個或兩個論證？*
- (1-3) 根據整體論，任何語句都可以在不論經驗為何的情況下，保持為真。
(2-3) 根據整體論，任何語句都可以被修

改。

- (三) 不論上述是一個或兩個論證，這些論證似乎是無效的。以下我們可以利用 **Carnap**理論的延伸，來反駁 **Quine**的論證，但這並不是 **Carnap**本人提出的，只是我們做理論上的猜想而已。
 - 就第一個論證的第三點—任何語句都可以在不論經驗為何的情況下，保持為真—而言，**Carnap**要接受這一點根本沒有困難
 - 對他來說，任何綜合語句的確都可以在不論經驗為何下被認定為真，但是分析句則不只如此，分析句必然被認定為真
對他而言，去認為分析句亦可以修改不會成為問題，因為那意謂著語意規則也被修改了
 - 第二個論證的第三點—任何語句都可以被修改—也駁不倒證實主義對分析性所下的定義。**Carnap**當然可以同意能夠被任何經驗證實的分析語句亦能被修改，這不過意謂了語詞的意義被改變了而已
 - (四) 我們可以看出上面對 **Quine**論證的反駁，關鍵點都在意義的變更上，意即 **Carnap**都可以用語意規則或語言的改變，來解釋為何現象主義與證實主義的定義都不會被 **Quine**駁倒。
 - 在討論第四節時，已經提出了 **Quine**反駁語意規則的論證，這代表上面對 **Quine**論證的反駁有虛假的前提—即分析句是依據語意規則而為真
 - 一個回應 **Carnap**的論證。
 - (1) 如果分析句一旦被認定為假，就代表某些語詞的意義改變，因而代表我們所用的語言改變了
 - (2) 就算我們承認有所謂的語意規則，那這與科學發展中，新理論取代舊理論之間有何不同。
 - (3) 所謂克卜勒取代托勒密，或者是愛因斯坦取代牛頓，或者是達爾文取代亞里斯多德，都代表原有理論中某些理論語詞的意義改變了。
 - (4) 如果這不算語言改變，(1) 就不成立。如果 (3) 的改變意謂著如同 (1) 一般是語意規則改變，則語言會隨科學理論改變而改變，這說法有爭議。
- sensory periphery**
- 某些語句與某些經驗相關，其他語句又分別與其他經驗較有關聯。
→這些語句就是 **Quine**所謂靠近力場或說理論織造物邊緣的語句。但是此處所謂的‘密切關係’，指的不過是當背反經驗發生時，我們比較傾向於去修改這些語句
 - 但只有程度上的不同，沒有種類上的不同
 - 在想像的案例中 (意即艾姆街上有磚房)，我們自然的傾向，會讓我們希望對現有理論的干擾越少越好
(這就是所謂的保守性 **conservatism**，意即對科學理論的修改，所更動的範圍越少

越好)

- 相較於物理或邏輯或形上學的理论語句，這些語句因此就令人有跟經驗密切有關的感覺。這些理論語句在相對的意味上，可以被視為位於理論系統的中心位置，所謂的中心位置，指的就是它們跟特定的感覺予料不太有優先的連結而已。

positis

- 作為經驗主義者，Quine一直將科學的conceptual scheme當作一種工具，最終是為根據過去的經驗來預測未來的經驗。
- 物體 (physical objects) 之所以在概念上被引進理論系統之中，是作為方便的中間物，這並非是根據經驗而給出的定義，而只是無法消除的設定物，在知識論上與荷馬的諸神相當。
- 由知識論的立場來看，物體與諸神作為設定物，其差異不過程度而已，並不是種類上的不同。
- 所以經驗與理論的關係，在於我們設計理論的目的，就在於去解釋我們的經驗，所以各式各樣的設定或說posit，在解釋我們的經驗這點上是具有同等的地位。

theoretical entities

- 設定並沒有停止在肉眼可見的物體這種層次。
 - 對原子層次物體的設定，是為讓相關於肉眼可見物體的定律，以至於最終到經驗法則，都可以更為簡單並易於處理。
 - 我們不需要去期待藉由肉眼可見的物體，來對原子或次原子層次的實體所提出的定義，要比藉由感覺予料對肉眼可見的東西所下的定義要更為完整。
- 科學是常識的延伸，而且它繼續使用常識的方便法門，利用存有學的膨脹來簡化理論。
- 更重要的是，我們對肉眼可見物體的存在，並非經由經驗而來，並不是我們藉由科學方法對經驗進行研究而得出的結果，而是作為一種存有學上的設定，我們用物體來統合我們的感覺經驗，來簡化我們的科學理論。
- 就知識論而言，這與物體或荷馬諸神沒有差別，既不會更好也不會更差，只是在我們處理感覺經驗時的便利程度不同而已。
- 有理數與無理數的代數，無法由有理數的代數所完全決定，但是它更好用
- 包含數學、自然科學、與人文科學的整體科學，有類似的情況，但更無法由經驗來加以決定。
理論系統的邊緣必須與經驗相符合，理論系統的其餘部分，包含了各種各樣可能的神話或想像，只不過為科學定律極簡化的目標而存在。

external and internal?

- 存有學在這點上，與自然科學沒有兩樣
- Carnap在“Empiricism, Semantics, and Ontology”中，認為這不是一個關乎事實的問題，而是選擇一個便利的語言、一個便利的科學語言或架構的問題。

就這點來說，Quine同意他，但必須再加上一項**但書**，這點不僅是對何物存在的問題而已，還必須對所有科學假設一體適用。

- Carnap承認他之所以能在存有學與科學假設之間抱持雙重標準，是因為假設了在分析與綜合語句之間有絕對的區分。而Quine對此是完全反對的。
- Carnap的看法
 - (1) Carnap認為有所謂的外部問題與內部問題 (external and internal questions)，前者指選擇一個便利的語言來做科學研究，這種選擇與事實無關，是一個實用上的考慮
 - (2) 但是一旦選定了一套語言之後，對科學假設的接受或修改，就是一個理論問題，而且跟經驗事實有關。
 - (3) 而Carnap認為選定了一套語言之後，就會有一組語句會依這個語言的語意規則為真。
 - (4) 不僅是一般的分析句而已，還有像數目存在這類的語句都是分析的，或者是沒有意義的，端賴於我們所選擇的語言中，到底有沒有包括數目在內。如果有包括數目，那數目存在就因此是分析的。
 - (5) 所以我們在選擇語言時，也就是考慮外部問題時，純粹基於實用性來考慮是否要我們的語言包括有關數目或集合之類的語言表式。
- (6) 一旦我們選定的語言有包含它們，那根據內部問題的考慮，數目存在或集合存在就是分析的，如果我們選定的語言不包括它們，那這樣的語句就是沒有意義的。

Quine's argument

- (1) Carnap認為語言的選擇是實用的問題，接受或修正科學假設是關乎事實的問題，接受任一語言系統，就會產生一組分析句。
- (2) Quine認為理論系統內的任何語句與經驗沒有直接的關聯。這點在邏輯真語句或科學假設或甚至所謂的分析句上沒有差別。
- 所以接受或修正科學假設固然與經驗事實相關，但亦是實用上的問題，所以我們才可以選擇維持與經驗較為相關的語句不變，而去改內部極度理論化的語句，因為這麼做可能在保持理論的簡單性上有實用價值。所以根據整體論，科學假設的接受或修正亦是實用上的問題。
- (3) Quine指出，Carnap本人亦承認他之可以維持存有學與科學假設上的截然二分，是因為他主張分析句與綜合句之間有絕對的劃分。
- (4) 由此看來，分析與綜合句的區分是內部、外部問題之所以能夠區分的前提，因此我們無法藉由外部、內部問題的區分，來說明在內部問題的考慮下，只要接受一套語言，就等於接受一組分析句這種說法。因為這會造成循環。
分析與綜合句的區分

convenience or fact?

- 是否有集合存在，似乎比較是一個關乎選擇便利語言的問題，是否有半人馬，或者艾姆街上是否有磚房，似乎比較是關乎事實的問題。
- Quine一再強調，這種差異只是程度上的問題，只不過是在面對特定背反經驗時，這種差異點燃了我們模糊的實用傾向，使我們選擇去調整科學理論這個人工織造物的某一根而非另一根線。保守性被包括在這樣的選擇中，簡單性亦是如此。

empiricism without the dogmas

- Carnap與Lewis和其他人，在選擇語言—或說科學架構時採取了實用主義的立場。但是他們的實用主義，在分析綜合這個想像的分野前停下了腳步。在拒絕這種分野的情況下，Quine採納了更徹底的實用主義。
每個人都擁有一套科學傳統，外加感覺刺激持續的密集火網。爲了符合他持續的感覺刺激，指引他調整他的科學傳統的諸多考慮，只要是合乎理性的，就是實用的。

Word and Object: chapter II

Section 7: First Step of Radical Translation indeterminacy of translation

- stimulation and empirical content
- stimulus conditions and the scope left for empirically unconditioned variation in one's conceptual **scheme**—the **first way of stating THE THESIS**
- **the intuitive way** of stating the thesis
→the protest
- **the technical way of putting this thesis:** the mapping of equivalence sentences could be in a very loose sense of the word 'equivalence'
- **the realistic way**
“manuals for translating one language into another can be set up in divergent ways, all compatible with the totality of speech dispositions, yet incompatible with one another”

language acquisition and current stimulations

- the instance of “The man shoots well.”
→when translating one's language use, you automatically refer all past stimulation to the learning phase
- the distinction between language acquisition and current use is shaky, for it depend for its plausibility on the **modulus of stimulation** to count what as **current**

What is radical translation

- the objective data: surface irritations impinging on the informant, and observable behaviour, vocal and otherwise.
- stimulus, objectivity, meaning—from the above to all possible sentences
- What counts as radical translation?
- how to do—actual cases
- translation in terms of roughly the same range of stimulations that the informant would assent or dissent
- “in a more causal vein of stimulations that will **prompt** the [indigenous informant] to assent or dissent to the queried sentence”
- the difference between eliciting and prompting
→the former is the result of a combination, including the prompting stimulation and a query sentence

Section 8: Stimulation and Stimulus Meaning what prompts what

- It is the stimulation rather than the animal at scene that is about the matching between sentences.

- the argument: if it is the animal rather than the stimulation, then it cannot be explained when people are still prompted by a counterfeit

What is a visual stimulation?

- For present purpose, it should be best identified as the pattern of chromatic irradiation of the eye
- we “want to keep clear of his idiosyncratic neural routings or private history of habit formation”
- “we are after his socially inculcated linguistic usage, hence his responses to conditions normally subject to social assessment”

the conjecture

- the above mentioned characterisation of stimulation is still not possible for the field linguist to check for
- it is all right as far as there is a reasonable conjecture that “the native would be prompted to assent to ‘Gavagai’ by the microscopically same irradiations that would prompt the linguist to assent to ‘Rabbit’”

Not static irradiation patterns

- single irradiation snapshot cannot even be mentioned without mentioning others before and after.
- modulus of stimulation (Due to Davidson)
→ “the relevant stimulations not momentary irradiation patterns, but evolving irradiation patterns of all durations up to some convenient limit of modulus”

spatial entirety

- the ocular irradiation patterns are best conceived in their spatial entirety
- some sentences are not subject to particular objects
- the whole scene without rabbit in it is needed in prompting dissent from “Gavagai” or “Rabbit”

a crude concept of empirical meaning

- the sameness of meaning is the basis of translation.
- Now what we have at hand are non-verbal stimulations

affirmative and negative stimulus meanings

- why a technical name?
- the affirmative stimulus meaning of a sentence for a given speaker (at time t) is the class of all the stimulations that would prompt his assent, and so is the negative one except changing ‘dissent’ for ‘assent’
- The stimulus meaning is then the order pair of the two
- Equating of “Gavagai” and “Rabbit”—because of the same stimulus meaning
the definition
- a stimulus meaning is the stimulus meaning *modulo* n seconds of sentence S for speaker a at time t

- of course not just visual stimulations should be counted in but also various kinds of other stimulations

the mutual exclusiveness

- the affirmative and the negative parts are mutually exclusive—otherwise a sentence would be assented or dissented at the same time
- prompted once then need to be prompted again. If different, the SM changes
- The components of the ordered pair do not determine each other.
→ many stimulations are neither of them

Would

- strong conditional using 'would'
- not worse than solubility
→ x is soluble iff it **would** dissolve when put in water
stimulation = particular event or universal
- bad things happen when taken stimulation that *would* prompt assent as particular events
- Including everything past, present, and future—future events aren't yet happening. This makes prediction impossible
- because of the strong conditional—the definition of stimulus meaning
- including infinite number of stimulations: for each given stimulation σ all of its duplicates *would* prompt assent or dissent count
- also exceed human capacity

holism vs single sentences

- holism—but singly given sentence is the only entrance of understanding the inclusive theory
- SMs help—the entrance of the language or inclusive theory
- A device for exploring the fabric of interlocking sentences—the behavioural explanation of holism.

Carnap's empirical semantics and Quine's SM

- (1) terms and sentences
- (2) presupposition of communication and isolation of each queried sentence
- (3) imaginary circumstances-virtue: the distinction between non-existence such as 'goblin' and 'unicorn'—and possible stimulations
- the role played by subjunctive conditionals

Section 9: Occasion Sentence. Intrusive Information occasion and standing sentences

- relative to modulus
- standing sentences can grade off toward occasion sentences if the modulus can be increased
- "the distinction between standing sentences and occasion sentences is relative to the modulus; an occasion sentence modulo n seconds can be a standing

sentence modulo $n - 1$ "

in between

- What if the stimulations are neither affirmative nor negative ones?
- For occasion sentences, it inhibits a verdict
- For standing sentences, except the case of inhibiting, there is another case of irrelevant

another difference

- in both cases of them, each one of them might differ in meanings by any intuitive account of meaning
- the difference between them rests on how they are susceptible to the stimulations of their stimulus meanings

collateral information

- same stimulus meaning is still a too strong condition for synonymy
- the reason is collateral information
- this is a rejection of verificationist assumption of the supervenience relation between verification conditions and meanings

community wide collateral information

- Imagining a community wide collateral information of rabbit-fly—an indicator of the presence of rabbits
- For all indigenous informants, the stimulus meaning of "Gavagai" including this piece of collateral information, which is no part of that of our field linguist

the range of 'would'

- more cases can be imagined against to equate the relation of sameness of stimulus meaning with the relation of synonymy
- the bystander's verdict case
- according to the definition of stimulus meaning the word 'would' confer any informant the affirmative answer

THE behaviouristic argument

- If there is a genuine boundary between verbal habit, in which the stimulations prompt a given subject's outright assent to or dissent from a given sentence, and collateral information, in which those stimulations affected by that also prompt his assent or dissent, then there will be a genuine boundary between what goes into the speaker's learning to apply the sentence and what goes into his learning of supplementary matters about the object.
- There is no general experimental distinction between what goes into a speaker's learning of how to apply an expression and what goes into his learning of supplementary matters about the object concerned.
- Therefore, there is no genuine boundary between verbal habit and collateral information.
- the argument
If there is a genuine boundary, then there is a general distinction in learning

how to use them—there is no such a distinction—therefore, there is no such a boundary.

collateral information and meaning change

- Suppose that there is a class Σ comprising just those stimulations each of which suffices to prompt assent to a sentence S outright, without benefit of collateral information.
- Suppose that some other stimulations make up another class Σ' , which are equally sufficient to prompt assent to S, whose efficacy is attributed to widely disseminated collateral information, C.
- The meaning (or empirical content) of S evolves when new information is acquired.
- That is, if the empirical content of S is how it relates to sense experiences, then there is no genuine distinction between stimulations in Σ and Σ' which would all prompt a speaker's assent to S.
- In other words, the stimulations in Σ' can be taken as directly prompting assent to S with benefit of C. This simply means that the empirical content of S is changed.
- What is not significant is an evident criterion which can distinguish collateral information C, widely disseminated in Σ' , from those stimulations in Σ .
- C can be seen as dissolving in the stimulus meaning of S without any specifiable character.

more cases

- The discrepancy from Shock, only some shocked, misjudged
→allowed by the definition of SM
- not serious—not fooling our linguist—but the point is that they are all allowed by the strong subjunctive mood of 'would'

SM, dispositions, and objective reality

- So SM is not a good counterpart of meaning
- However, SMs are the objective reality for the linguist in doing radical translation.
→sample and estimate all the dispositions within the SMs of occasion sentences.
- Translation is not in terms of sameness of SMs but significant approximation of them.

natural expectation and induction

- Translation is not just influenced by the objective data only.
→taking collateral information of different kinds as unidentified interferences
- by doing so, the legitimacy behind is the natural expectation that for every rabbit country there has to be *some* brief expression that could be best translated as "Rabbit"

- what is further assumed is the similarity of physiological structure
- The whole method used here is experimental and scientific compatible—scientific induction
- the whole process is to form scientific hypotheses and to check them subsequently

**Section 10: Observation Sentences
less susceptible to collateral information**

- Some sentences such as “Red” is less sensitive to collateral information.
- this seems to make its stimulus meaning closer to the intuitive concept of synonymy.
- the difference between occasion sentences “Red” and “Rabbit” is not in kinds but in degrees

a scientific and inductive method again

- the difficulty of translating colour-word sentences is not because of collateral information
- It would remain to be there even if the distinction between meaning and collateral information were drawn
- statistical scatterings—the corresponding penumbras of vagueness of “Red” and that of the indigenous sentence is similar

vagueness and collateral information

- If you were to complicate the notion of stimulus meaning, what you would get is probably an improvement on the stimulus meaning regarding vagueness relative to the reaction time (modulus), but it would not be the same case when it comes to collateral information.

“Bachelor” is another story

- faces of one’s male unmarried friends or acquaintances are the stimulations related to the prompting, however, they generally prompt one time or maybe two.
- the stimulus meaning of it cannot possibly be treated as its intuitive meaning
- The collateral information of occasion sentences such as “Bachelor” is entirely different from speakers to speakers.

observationality

- The first definition of **observation sentences**:
→none under the influence of collateral information
- the stimulus meaning = the intuitive meaning
- These are occasion sentences that wear their meanings on their sleeves.
- **Observationality**: a degree grading from sentences such as “Red” to the other end of sentences such as “Bachelor”.
→the definition is not that satisfactory, for although it does provide some restrictions on sentences being observational the phrase ‘not under the influence of collateral information’ seems to be in need of elaboration.

→observationality on the other hand is **too weak** to provide a real demarcation between observation sentences and non-observation ones.

observationality and stimulus meaning

- Except community wide collateral information, which has been argued that there is no experimental sense to make the distinction between it and related meaning, the stimulus meanings of those sentences with high observationality for different speakers tend to coincide.

observationality and modulus

- observationality
→defined in terms of the concept of stimulus meaning
→so it is also relative to modulus
- increasing the modulus we enhance the possibility of a sentence becoming observational

observationality and the constancy of SM

- The definition of observationality depends on the constancy of the stimulus meaning of a sentence for different speakers.
- This works for standing sentences for wrong reason
- Still, the high observationality, the more likely the sentence can be translated in terms of the stimulus meaning

wide and narrow senses of observation sentences

- The notion of stimulus meaning constitutes a reasonable notion of meaning
→depending on how wide or narrow sense of observation sentence you request, sentences with different degrees of observationality can be counted as observational
- The more sloppy definition of observation sentences: sentences with high observationality

The general picture up to now

- a. observation sentences→data of science
- b. The third definition of observation sentences: the occasion sentences on which there is pretty sure to be firm agreement on the part of well-placed observers
- c. The infallibility of observation sentences: as far as sentences do not get involved with the theory behind, the verdict of them are direct and straightforward
- Still, this infallibility is explained in terms of observationality, so the immunity to error is only a matter of degree.
- d. Observation sentences are not about sense data but about ordinary things
private stimulus meaning,
social observationality
- the notion of stimulus meaning is private.
→Even if the notion of observationality is in need of the notion of stimulus meaning to be explained, it is social

- The behavioural definition (, that is, the third one,) offered for it above turns on similarities of stimulus meanings over the community.

low observability

- low observability→intersubjective variability of stimulus meaning
 - The distinction between sentences that are in close relation to their stimulus meanings and for different speakers the stimulus meanings of them tend to be constant and similar, such as “Red” and “Rabbit,” and sentences that are inculcated through connections with other sentences, such as “Bachelor”.
 - Highly unobservational occasion sentence for a speaker→the combination of two factors:
 - a fairly standard set of sentence-to-sentence connections
 - a random personal history
 - the analogy of elephant trees
 - If the queried sentence is a standing one, then the constancy comes from the wrong reason—the nearly irrelevance of stimulus meanings
- #### **The consequence of the random character of stimulus meaning**
- The strong connection to personal random history makes the stimulus meaning of one speaker differs from the other’s.
 - Quine acknowledges the possibility of some low observational sentences to get the same stimulus meanings with some other sentences.
 - For instance, A’s stimulus meaning of “Bachelor” according to the analysis above differ drastically from one to another because of the low observational character—that is, it has little connection to current stimulations.
 - However, by sheer exhausting of cases, we can enumerate every single bachelor A knows to form the stimulus meaning of “Bachelor” for him.
 - Quine’s reply to this imaginary question is that there is no place for such a suitable inventory to begin with.
 - Be impractical as it is, the problem of this reply is that it does not shut down the possibility to simply take this as a theoretical solution to certain randomness of stimulus meanings of sentences

salience and the assortment of occasion sentences

- For sentences with high observability such as “Red” or “Gavagai”, there is always some distinct trait salient enough to be shared by the linguist’s and her informant’s stimulus meanings.
- This is a normal inductive procedure, so it is just a scientific hypothesis with every possibility to be revised in the future.
- However, when the case comes to “Bachelor”, there is no such salience to begin with. That is, there is nothing to be inductively collected and built from while doing translation.

- Therefore, the above mentioned theoretical solution is more than impractical. There is certain feature in translation that distinguishes sentences like “Bachelor” from occasion sentences with high observability.

**Section 11: Intrasubjective Synonymy of Occasion Sentences
the supervenience relation for non-observational sentences**

- the notion of stimulus meaning remains defined with no regard to observability
- The importance of the role played by the stimulus meanings of occasion sentences goes down at the rate of the degeneration of observability of them.
- The meaning and the stimulus meaning of a sentence as such do not have a very close relation, not mention the supervenience one.

stimulus synonymy

- In terms of the definition of stimulus meaning
→for every given speaker the stimulus meanings of both “Bachelor” and “Unmarried man” are the same
- This is stimulus synonymy, which has nothing to do with intuitive concept of meaning
- At least in the case of a speaker, stimulus synonymy of non-observational occasion sentences is intelligible.

stimulus synonymy for a community

- As far as two sentences are stimulus synonymous for each member of a speech community, they are stimulus synonymous community wide.
- Bilingual case—a representative of two languages
→stimulus synonymy for sentences of two languages
- whether or not the bilingual is a good sample is a question of **normal induction**
→checking the **fluency** of her communications in both communities and comparing her with other bilinguals.
- **fluency** is Quine’s idea of checking the membership of a given speech community.
- intrasubjective synonymy is only applicable to a given speaker
a bilingual linguist
- The stimulus meanings of non-observational occasion sentences are not unreachable for our field linguist now, as far as she can learn the indigenous language directly as an infant might.
- becoming a bilingual then she can do the radical translation business.
the recognition of indigenous falsehood
- If only observation sentences are translatable, the linguist cannot disbelieve any of the indigenous verdicts as false.
→‘verdict’ cannot be overruled
- Becoming bilingual changes that
what not a bilingual can still do

- comparing two indigenous sentences by checking the informant's response while giving certain stimulation
→even though you have no idea what their stimulus meanings are
- If there were a Martian on Earth, she would distinguish the stimulus meaning of "Bachelor" for a given speaker from that for another
- and she would also discern that the sentence is stimulus synonymous with "Unmarried man" for the **same** speaker.
- The only problem: what triggers the linguist, alien or not, to compare the pair of sentences?
→so it is less readily accessible

**the difficulty caused by
second intention**

- Words that are about words
→in quotations, or in spelling of a word...
→'bachelor', for instance

**extension to long sentences
by analogy**

- At the very beginning, short sentences are what one can check the intrasubjective stimulus synonymy between sentences.
- in terms of analogy—that is, by constructions
→any fixed way of building a composite expressions from arbitrary components of appropriate short
- including certain additive words (grammatical device words, for example), as well as the way of arranging the unfixed components →adding new words.

collateral information

- One might overestimate the capacity of intrasubjective stimulus synonymy to withstand collateral information
- Himalayan explorer—"Everest" from Tibet and "Gaurisanker" from Nepal
- The two sentences coincide for him thenceforward.
→The huge piece of collateral information—the painful climbing and learning

**Indian nickels and
Buffalo nickels**

- The boodle case of Indian and Buffalo nickels—that is, a nickel with the other side that is not a Buffalo
→in some cases collateral information does intrude some seemingly straightforward cases of stimulus synonymous sentences.

what the 'would' implies

- Although in the actual cases the novice does not and will not be presented with

the fake nickel, the counterfactuality suggests already that under that kind of conditions there is a stimulation pattern would prompt the novice to respond to “Indian nickels” and “Buffalo nickels” differently

- for the novice, two sentences have different stimulus meanings but the two corresponding terms are coextensive.

some clarification

- The instance of “Indian nickels” and “Buffalo nickels” is to examine two supposedly coextensive terms, namely, ‘Indian nickel’ and ‘buffalo nickel’, for sameness of stimulus meaning.
- one of the consequences of pursuing two one-word stimulus synonymous sentences is to see whether the corresponding words are synonymous or coextensive or coreferential.

the purification and the social collateral information

- With the intrusion of collateral information, some sentences such as “Indian nickels” and “Buffalo nickels” have trouble to be called stimulus synonymous.
- Socially stimulus synonymy for a speech community can help exclude these sentences.
- collateral information in the social level should be seen as acceptable as argued in section 9.

Section 12: Synonymy of Terms

stimulus meaning and the meaning of terms

- Words→learned in terms of the roles they played within sentences
One-word sentence—stimulus meaning—word meaning
- Stimulus synonymy of the occasion sentences such as “Gavagai” and “Rabbit” does not even guarantee the two corresponding general terms are coextensive.

inscrutability of reference: preliminary stage

- (IR) rabbit, rabbit stages, or undetached rabbit parts
→translating ‘gavagai’ as ‘rabbit’ is just the projection from the field linguist’s own habit formation.
- that is, the sameness of stimulus meaning of brief sentences does not determine the two corresponding words to be coextensive
- the reductio argument:
 - (1) if two one-word sentences are stimulus synonymous then the corresponding terms are synonymous (for reductio)
 - (2) if two terms are synonymous then they are coextensive (general assumption)
 - (3) if two one-word sentences are stimulus synonymous then the two corresponding terms are coextensive (from (1) and (2))
 - (4) (3) is false (because of (IR))
 - (5) therefore, (1) is false (from (4) and (2))
- second consideration regarding reference
- ‘gavagai’ & ‘rabbit’ taken as general terms or singular terms
→using Goodman’s way—not general terms applicable to all rabbits but taking

as a singular term

→the fusion of all rabbits: that single though discontinuous portion of spatial-temporal world that consists of all rabbits

- the stimulus meaning remains constant
→the distinction between general terms and singular ones is independent
- On the other hand, Quine suggests that singular terms such as Quine can be explained as general terms
→the other way round is the same
- Or take 'gavagai' as a singular term naming a recurring universal, rabbithood.
→the distinction between concrete and abstract objects is independent of their corresponding stimulus meanings too

stimulus meaning and terms

- Translation does not suggest a total match.
→“Gavagai” can be translated as “Rabbit” or “A rabbit is there” but that does not suggest a total match between their components
- How are we sure that “Gavagai” is a word or two?
pointing, identity, and grammatical structure
- Pointing is not helping because you point to every one of them
- Unless the pointing is accompanied with questions of identity and diversity?
→Too sophisticated for now
- the indigenous may achieve the same net effects (of our grammatical structure: articles and pronouns, singular and plural, copula, the identity predicate...) through linguistic structures so different
- the variation of the interpretation of grammatical devices of the indigenous language suggests the arbitrariness of the translation business.
- “**occasion sentences and stimulus meaning are general coin; terms and reference are local to our conceptual scheme**”
numerical identity
- The inscrutability lies not in resemblance (qualitative identity) but in the anatomy (the analysis) of sentences.
→The point is rather this: the fix of reference and the translation of the corresponding grammatical device are closely related.
- Is this the same rabbit?
Are these the same rabbit stages?
intrasubjective stimulus synonymy?
- cannot help solve the inscrutability.
- in the case of Martin: one of 'bachelor' and 'unmarried man' might apply to men and the other to undetached parts of men
the sufficient and necessary conditions of
- 'Everest' and 'Gaurisanker' are coextensive but the two corresponding

occasion sentences are not stimulus synonymous
→not sufficient

- Even if “Gavagai” and “Rabbit” are stimulus synonymous, the corresponding terms are not necessarily coextensive
→not necessary

- **Coextensiveness is not a clearer notion than synonymy or translation or even the fix of the grammatical device**

Within English, the synonymy of terms is doable

- Definitions: ‘F’ and ‘G’ are stimulus synonymous as terms for a speaker at *t* iff as occasion sentences they have the same stimulus meaning for her at *t* and she would assent to “All Fs are Gs and vice versa” if asked at *t*.
- Simply saying that any stimulation might be imposed at *t* without varying the subject’s assent to “All Fs are Gs and vice versa”, if to anything.

stimulus analyticity

- A sentence is stimulus analytic for a subject (within the modulus) if she would assent to it no matter what stimulation is given.
- Stimulus synonymy of general terms can be reduced to the stimulus analyticity of “All Fs are Gs and vice versa”.
- For singular terms, then it is the stimulus analyticity of “*a = b*”.

- These things can only be done when the relevant grammatical device is settled in advance.
- Not necessarily applicable to wider domain of words other than ‘rabbit’ or ‘bachelor’

the variation of the stimulus synonymy of terms

- Whether or not terms are coreferential or coextensive is not determined by their being synonymous or not.
- social stimulus synonymy of terms: those that come out stimulus-synonymous for each individual speaker almost without exception
- But some terms can be coextensive for some speakers but not the other, due to the empirical learning of their being coextensive
- **(1)** ‘bachelor’/‘unmarried man’ satisfies the condition
- **(2)** ‘Indian nickel’/‘buffalo nickle’ on the other hand does not

rating within intuitive semantics what terms are synonymous

- ‘bachelor’ and ‘unmarried man’ are rated as synonymous make more sense than in the case of ‘Indian nickel’ and ‘buffalo nickel’ within intuitive semantics.
- But why? Because **(1)** the former depends on learning appropriate associations of words with words, and **(2)** the latter on the other hand depends on learning directly to associate the term with sample objects.

- Why 'unmarried man' is seen as *semantically* anchoring 'bachelor'? Because they do not have socially constant stimulus meaning, not like observation sentences.
→ something of course can be *observationally* anchoring something else
- 'brother' and 'male sibling' are similar. They do not have a close relation to stimulations or verbal connections and hence do not contribute to basic language learning

the third sort: theoretical terms

- **(3) Theoretical terms** are like 'bachelor' with no close relation to stimulations but also unlike it in the sense of not having a more complex network of verbal connections.
- Why for theoretical terms there is no significant distinction between synonymy and factual equivalence?
- momentum = mass x velocity
→ if this fails one inclines to take it as theoretical change rather than the change of meanings
→ synonymy intuitions do not emerge here because the terms are linked in much more complex ways to connect to the rest of language than 'bachelor'

Section 13: Translating Logical Connectives

truth functions

- Occasion sentences and standing sentence make no difference.
→ Because assenting and dissenting are enough.
- giving a semantic criteria of truth functions?
→ not really a *truth*-functional explanation of the meanings of logical connectives
→ but an *assent/dissent*-functional one
- From short components to long ones but without any limit of sentence length
→ for the sake of convenience and avoiding unnecessary confusion
- The indigenous words of negation, conjunction, and alternation can be incidentally translated as 'not', 'and', and 'or'.
→ But the three words do not really represent negation, conjunction, and alternation.
→ every truth-functionally compound sentence with an unique true value can be equally stated in terms of semantic criteria

prelogical mentality

- No one is that absurd to accent to "*P* and not *P*".
→ Prelogical mentality hardly makes sense insofar as one has to impose her own logic upon the informant to avoid translating the informant's words as queer as possible.

the maxim of translation—principle of charity

- “The maxim of translation underlying all this is that assertions startlingly false on the face of them are likely to turn on hidden differences of language.”
- “The common sense behind the maxim is that one’s interlocutor’s silliness, beyond a certain point, is less likely than bad translation—or, in the domestic case, linguistic divergence.”

A, E, I, O

- A—all are; E—none are; I—some are; O—some are not
→the definition of A
“the compound commands assent (from a given speaker) if and only if the affirmative stimulus meaning (for him) of the first component is a subclass of the affirmative stimulus meaning of the second component and the negative stimulus meanings are conversely related”
- this is wrong
→consider the case of the coextensiveness of ‘Indian nickel’ and ‘buffalo nickel’ for the novice and the difference in stimulus meanings of “Indian nickel” and “Buffalo nickel” for her again
- A, E, I, O are about quantification—this is about reification—it is about reference
- “On this score the suggested semantic criterion is at odds with ‘All Fs are Gs’ in that it goes beyond extension”
- even worse and more serious
→whereas rabbits are not rabbit stages, there is no distinction in their stimulus meanings of the corresponding sentences
→that is, “All rabbits are rabbit stages” apparently prompt dissent from any English speaker, yet according to the definition mentioned above this sentence should prompt assent.

behavioural criteria and truth function

- consider section 12, “**occasion sentences and stimulus meaning are general coin; terms and reference are local to our conceptual scheme**”
- the above categories or quantification exceeds what stimulus meanings of the components of a compound sentence can determine
- “the truth functional part is the only part the recognition of which, in a foreign language, we seem to be able to pin down to behavioural criteria”

Section 14: Synonymous and Analytic Sentences broad and narrow types of synonymy

- broad: assent and dissent concomitantly, “due strictly to word usage rather than to how things happen in the world”
- normally in terms of truth value→the same truth conditions

→but for Quine: “[he] wrap[s] it over to [assent and dissent] in order to maximize chances of making sense of the relation on the basis of verbal behaviour”

narrow sense

- Carnap’s intensional isomorphism
 - structure similarity: In logic and mathematics, a relation between two systems such that there exists a one-one correspondence between their elements, and an identity of some relation that holds between any of the elements in one system and the corresponding elements in the other system.
 - can be defined by broad synonymy and analogy of roles in sentences
- in terms of assent and dissent but not truth values
 - confusion because its length and complexity
 - section 11

for occasion sentences

- intrasubjective synonymous relation is easy to understand→especially socialised ones.
- the concomitant variation of two occasion sentences over all possible stimulations can be accounted for by verbal habit
- only intrasubjective synonymy is talked here
 - This is why stimulus synonymy still apply to standing sentences.
- the intrusion of collateral information? Cf. the arguments in section 9
 - the sparser the stimulus meaning**
 - stimulus synonymy makes less sense for this sort of standing sentences
 - these sentences are in more important relations to other sentences.
 - sparseness of SM does not affect its intuitive meaning
 - lengthening the modulus**
 - we enrich SM→tighten SS
 - get out of hand when the modulus is excessive→a month?
 - agents can revise their theories and thus changing the meanings of words
 - approximation to verification conditions**
- Standing sentences on the other hand do not have this sort of relation to experience
- “If the business of a sentence can be exhausted by an account of the experiences that would confirm or disconfirm it **as an isolated sentence** in its own right, then the sentence is substantially an occasion sentence.”
- the different relations towards other sentences
 - the interconnections between sentences
 - experiences normally have indirect ways to standing sentences
- recalcitrant experiences
 - many alternatives

→holism

Grice and Strawson

- On every assumption as to the truth value of other sentences, two sentences are confirmed (and disconfirmed) by the same experience on that assumption→synonymous
- confirmatory and disconfirmatory experiences→stimulus meaning
- for S (the conjunction of other sentences), if “ $S \rightarrow S_1$ ” and “ $S \rightarrow S_2$ ” are stimulus synonymous, then S_1 and S_2 are synonymous.

- But Quine indicates that it does not render any relation tighter than stimulus synonymy.
For if S_1 and S_2 are stimulus synonymous, the conditionals are of course stimulus synonymous.
- their definition can only render S_1 and S_2 to be stimulus synonymous
- the conditionals are too weak to infer that S_1 and S_2 are synonymous.

- Why “ $S \& S_1$ ” and “ $S \& S_2$ ” are stimulus synonymous cannot help provide them to be synonymous?
- Grice and Strawson’s account, if successful, could be taken only as intralinguistic, though unnecessary to be our own
→Martian

synonymy and analyticity

- the intuitive notion of analyticity
→the sentence is true purely by meaning and independently of collateral information.
- Interdefinition:
two sentences are synonymous iff the biconditional formed by them is analytic (Two Dogmas); a sentence is analytic iff it is synonymous with self-conditionals (If p then p).
- synonymy—analyticity
→stimulus synonymy—stimulus analyticity

analyticity, come what may, and stimulation

- the analytic, the *a priori*, the necessary have never been defined in terms of detectable features of verbal behaviour
- A is analytic iff we are prepared to confirm come what may
→how to explain ‘come what may’
- come what stimulation may
behaviouristic ersatz
- socialising stimulus analyticity
- “But analyticity in even this improved sense will apply as well to ‘There have been black dogs’ as to ‘ $2 + 2 = 4$ ’ and ‘No bachelor is married’. Let us face it: our socialised stimulus synonymy and stimulus analyticity are still not

behaviouristic reconstructions of intuitive semantics, but only a behaviouristic ersatz”

Why ‘assent come what may’ does not work

- Because of instances such as “There have been black dogs.”
- intuitive notion of analyticity is supposed to have something more than the ersatz in the cases of ungrasped of foreign sentences.
 - If it is a logical law, then some uses of the logical particles are lost and this disrupts the communication.
 - If the informant has a constant inclination to behave like this, there is no depending on him in most of the further contexts containing the terms in questions.

**the distinction between
the analytic and the synthetic**

- If the notion of stimulus analyticity explains people’s attitude regarding so-called analytic truth, then it is just about the bewilderment about what a person who denies certain sentences, including “There have been black dogs,” can be talking about.
- This bewilderment, however, can be a gradual and cumulative affair—that is, a gradual and cumulative affair between the so-called analytic and synthetic sentences
 - more importantly there is no such a sweeping epistemological dichotomy.
- The notion of such a dichotomy only encourages confused impressions of how language relates to the world

「蒯因」期中考題（限以中文作答，必要時可直接使用英文名詞）

簡答題：（請自行選擇 5 題作答，每題 10 分；請各以 1 段答題）

1. 根據蒯因的描述，請簡要說明柏拉圖(Plato)與霍布斯(Hobbes)對於「知識」與「idea」的定義及看法，並說明兩者有什麼不同？
2. 洛克(Locke)認為知識來自於 idea，而 idea 來自於 sense impression；然而，自「語言的轉向」(linguist turn)後，從經驗主義的觀點如何說明知識的基礎？
3. 請簡要解釋何謂“perceptual similarity”及“receptual similarity”，並舉例說明兩者的差異及關係。
4. 蒯因認為，不管是天生或習得的，perceptual similarity 相對於不同的個體、物種或人類族群而言都是私有的(private)。基於此，請簡要說明：為何普遍而言人們仍然能夠對某個情境產生類似的反應？「天擇」在此扮演了什麼角色？
5. 請簡要說明：為什麼蒯因主張‘to be is to be a value of a variable’？
6. 蒯因在本體上只承認物理的事物(physical objects)和集合(classes)的存在。請根據‘no entity without identity’這樣的判準，簡要回答：為何蒯因並不承認其他抽象事物（如性質）的存在？

申論題：（每題 25 分；請各以 3-5 段答題）

1. 卡納普(Carnap)試圖利用邏輯、數學等基本的陳述，針對我們的心靈和經驗，建構一套系統性的科學解釋，並透過對感官經驗的說明來建構物理的實在(physical reality)。請試著盡可能詳細說明：卡納普如何以“elementary experiences”、“part similarity”、“similarity circles”、“sense quality”、“similarity of qualities”等概念來建構這套系統性解釋及物理的實在？
2. 請說明：對蒯因而言，何謂「觀察語句」(observation sentence)、「觀察類句」(observation categorical)?並試著基於這兩個概念詳細說明：為什麼由於我們偶然地忽略了實質代名詞(essential pronoun)和省略性代名詞(pronouns of laziness)之間的差異，因而可以形成普遍化的斷言或全稱語句一如「所有的烏鴉都是黑的」？

「蒯因」期末考題 (限以中文作答，必要時可直接使用英文名詞)

簡答題：(每題 10 分)

1. 請問蒯因認為科學理論經驗上的檢查點(checkpoints)是什麼？請說明一個科學理論如何利用這個檢查點被測試，以及在什麼情況下這個理論會被證明為假；請具體說明，在這個測試過程中，科學理論、此檢查點、可觀察條件(observable condition)、可觀察結果(observable result)之間的關係。
2. 請問蒯因如何區分並定義「分析性的觀察泛句」及「綜合性的觀察泛句」(observation categorical)？哪一個才能作為科學理論的經驗內容？並請進一步說明何謂「肯定的刺激性意義」(affirmative stimulus meaning)及「否定的刺激性意義」(negative stimulus meaning)。
3. 請根據理論假設(theoretical hypothesis)、初始條件(initial condition)等概念，以及科學理論檢驗和修改的過程，簡要說明為什麼蒯因主張「整體論」(Holism)。
4. 暫且不考慮進一步的深究，請根據「臨界量」(critical mass)的概念，簡要解釋一個理論語句如何間接獲得經驗內容。
5. 請簡述蒯因認為邏輯和集合論有哪三個差異。
6. 請簡述哥德爾不完備定理(Gödel's incompleteness theorem)如何證明「數學理論不能同時是一致的(consistent)且完備的(complete)」。
7. 請簡述「Grelling 的悖論」(關於「異質性」(heterologous)的悖論)；請問這一類悖論被認為問題在於哪裡？
8. 蒯因認為，由於「真理」(truth)就是「指示關係」(denotation)的一種特殊的例子(0 位述詞)，所以也會遇到類似於指示關係所遇到的悖論。請簡要說明關於「真理」的悖論——「說謊者悖論」——之內容。
9. 蒯因認為，指示關係和真理所遇到的悖論都必須訴諸「階層」(hierarchy)來解決，而這樣的階層解釋說明了「引號消解範式」(disquotation paradigm)如何適用於指示關係和真理。請分別舉例說明「引號消解範式」如何應用於這兩者。(本題可直接以英文作答)
10. 蒯因認為，利用代理函數(Proxy function)對每一個指涉語詞重新指定其指涉對象後，所有語句的真假並不改變。這麼一來，語詞所指涉的本體對象將可以不斷被重新指定而不改變所有語句的真假值，造成本體上的相對性。請簡要說明蒯因如何利用代理函數重新解釋指涉關係(reference)。

「蒯因名著選讀」期中考題（限以中文作答，必要時可直接使用英文名詞）

簡答題：（請自行選擇 5 題作答，每題 10 分；請各以 1 段答題）

1. 請簡要說明經驗主義的五個里程碑(The Five Milestones)。
2. 基於經驗主義的第二個里程碑，請根據語詞和語句在意義上的關係來說明何謂「脈絡性定義」(Contextual Definition)。
3. 請根據綜合句(Synthetic Sentence)、分析句(Analytic Sentence)、經驗內容/意義之間的關係，說明整體論(Holism)如何促成了方法學上的一元論(Methodological Monism)。
4. 請簡要說明蒯因所提出之「經驗主義的兩個獨斷」。
5. 請問蒯因認為分析語句(Analytic Statement)一般被區分為哪兩類(Classes)? 請分別舉例說明，並藉此說明何謂「認知同義性」(Cognitive Synonymy)。
6. 請問證實主義的意義理論(Verification Theory of Meaning)如何定義「語句的意義」(Meaning of a Statement)? 根據這樣的基本主張，請說明證實主義如何定義「語句同義性」(Synonymous Statements)。

申論題：（每題 25 分；請各以 2-4 段答題）

1. 傳統上有些哲學家認為：「保全真值的可相互替換性(Interchangeability / *Salva veritate*)是認知同義性的充分條件。(並希望藉此定義「分析性」)」請以蒯因構作的論證形式來說明這個主張；並請說明蒯因如何批評這是一個循環論證—偷渡「分析性」用來定義「認知同義性」。
2. 以下是傳統經驗主義及證實主義對「分析語句」的定義：
 - (1) 一個語句是分析的，若且唯若，它僅僅依據其意義（或語言成分）為真。
 - (2) 一個語句是分析的，若且唯若，它可以被任何經驗所證實。對於這兩個定義，蒯因以整體論的觀點分別提出兩個論證加以反駁。請詳細說明蒯因的這兩個整體論論證。

「蒯因名著選讀」期末考題（限以中文作答，必要時可直接使用英文名詞）

簡答題：（請自行選擇 5 題作答，每題 12 分；請各以 1 段答題）

1. 蒯因以「力場」譬喻整體科學，以經驗為其「邊界條件」(boundary condition)，以邏輯定理為遠離經驗的核心。請簡要說明經驗與理論系統內的關係，並舉例說明：為何蒯因認為我們可能因為某些極端的背反經驗而修改基本的邏輯定理。
2. 在 *Word and Object* 第二章 Translation and Meaning 中，蒯因試圖以「刺激意義」(stimulus meaning) 界定證實主義(Verificationism)的證實條件(verification conditions)。請問何謂一個語句的「刺激意義」(stimulus meaning)，何謂「一個語句的意義隨附於(supervene on)它的刺激意義」，並舉例說明之。
3. 蒯因認為情境語句是高觀察性的語句，而穩定語句是低觀察性語句。請簡要舉例說明何謂「情境語句」(Occasion Sentence)與「穩定語句」(Standing Sentence)，並說明其差異。
4. 在 Gavagai 的例子中，蒯因認為社群中廣泛的並行資訊(community wide collateral information)將會造成我們無法確定 Gavagai 的刺激意義？請舉例簡述何謂「並行資訊」，並解釋它如何影響語詞的刺激意義。
5. 蒯因認為，如果兩個語句對某個主體及社群中其他成員都具有「內在主體的刺激同義性」(intrasubjective stimulus synonymy)，則它們就具有「社會性刺激同義」(socially stimulus synonymy)。請簡述何謂「內在主體的刺激同義性」及「社會性刺激同義」，並舉例說明其差異。
6. 蒯因認為，如果我們將「分析語句」界定為「無論刺激為何皆會被肯定的語句」(come what stimulation may)，我們仍然無法捕捉原來的分析性概念。請簡述其理由。

申論題：（40 分）

蒯因以「指涉的不可測度性」(inscrutability of reference)來論證：兩個情境語句的刺激同義性，無法保證它們各自所對應的語詞有共同外延。請說明此論證，並詳細解釋之。