

บรรณานุกรม



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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



ภาคผนวก

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



ภาคผนวก ก.
ตัวอย่างการวิเคราะห์โครงสร้างทางไวยากรณ์

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

TEXT: Weinberg's Biology

61/105 The energy of metabolism is [commonly] measured [indirectly].

62/105 (Differences in (the efficiency with which food is digested)) make some people need [more food than] others.

63/105 For (most people who eat three meals [daily], and who do not depend on snacks), the appetite is (a [pretty] good guide to (the amount of food they need), and to weight control.)

64/111 [Realizing <that plants provide food for man and for beast>], people have [long] assumed <that plants obtain this food [from (the soil in which they grow)]>

SENTENCE NUMBER	SENTENCE COMPLEXITY				COMPLEX NOUN PHRASES				NOMINALIZATIONS		ADVERBIALS			TENSE
	Finite Clauses	Complex noun phr.	Nominalizations	Total	Words	Function	Phr. clause nominaliz., & N. adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
61/105	1	-	-	1	-	-	-	-	-	-	Wd.	MAN.	-ly	1P-
					9	A	2	1-6			Wd.	MAN.	-ly	
62/105	2	2	-	4	7	E	1	6	-	-	Phr.	COMP.	more.....than	1P- , 1
					14	E	3	103 - 4 - 4 - 1			Wd.	FREQ.	-ly	
63/105	4	3	-	7	15	D	4	106 - 103 - 1 - 1 - 5 - 1	-	-	Wd.	DEG.	pretty	1 , 1 , 1 ,
					6	E	2	1 - 5						
64/111	4	1	2	7	6	E	1	6	1	E	Cl.-	CAUS.	v.ing	1 , 4 , 1 , 1
											Wd.	EXP.	long	
											Prep.	SRC.	from + N.	

TEXT: Weinberg's Biology

55/111 [Further,] [when Priestly relit the burned-out candle], it [once more] burned [brightly].

56/111 [About 1780], two amateur scientists -- Jan Ingenhousz, (physician to the Emperor of Austria), and Jean Senobier, a minister -- extended Priestly's work.

57/115 <Supplying more CO₂> does not lead [to an increase [in photosynthesis.]]

58/115 (Additional evidence <that the two phases are [quite] distinct>) came [from (experiments showing <that cyanide poisons the dark reaction [without <reflecting the light reaction>])>)]

59/115 Light is (a form of radiant energy, no different [essentially] from the other kinds of radiant energy: radio, infrared, ultra-violet, X rays, and gamma rays.)

SENTENCE COMPLEXITY					COMPLEX NOUN PHRASES				NOMINALIZATIONS		ADVERBIALS			TENSE
SENTENCE NUMBER	Finite Clauses	Complex noun phr.	Nominalizations	Total	Words	Function	Phr. clause nominaliz. & N. adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
5/111	2	-	-	2	-	-	-	-	-	-	Wd. Cl.+ Phr. Wd.	LINK. WHEN. REQ. LAN.	further when once more -ly	2, 2
56/111	1	1	-	2	6	P	2	1 - 1	-	-	Prep.	WHEN.	about + N.	2
57/115	1	-	1	2	-	-	-	-	2	A	Prep.	RES. PLA.	to + N. in + N.	1
58/115	3	2	3	8	9	A	1	103 - 11	1	P	Wd.	REQ.	quite	
					13	E	4	2 - 11 - 1 - 11	1	D	Prep.	SRC.	from + N.	1, 2, 1
									2	E	Cl.-	LAN.	without + v.ing	
59/115	1	1	-	2	23	D	3	1 - 203 - 1 - 1	-	-	Wd.	LAN.	-ly	1

TEXT: Weinberg's Biology

70/120 Ruben and Kamen prepared (water and bicarbonate containing small amounts of oxygen isotope O^{18}), and used them [in (setting up illuminated chlorella cultures.)]

SENTENCE COMPLEXITY					COMPLEX NOUN PHRASES				NOMINALI-ZATIONS		ADVERBIALS			TENSE
SENTENCE NUMBER	Finite Clauses	Complex noun phr.	Nominalizations	Total	Words	Function	Phr. clause nominaliz. & N. adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
70/120	2	1	1	4	10	B	2	2 - 1	2	E	Cl.-	MAN.	in + v.ing	2, 2

TEXT: Willie's Biology

231/385 The vertebrate ear began [as an organ of equilibrium], the cochlea being (a [later] evolutionary outgrowth of the sacculi which reaches full development [only] [in mammals].)

232/391 [When an extra amount is given], the body uses [more oxygen, produces [more metabolic wastes, and gives off [more heat than]]] it [normally] does.

233/391 The skin becomes waxy and puffy, [owing to (the deposition of mucous fluid [in the subcutaneous tissues])], and [usually] the hair falls out.

SENTENCE COMPLEXITY					COMPLEX NOUN PHRASES				NOMINALI-ZATIONS		ADVERBIALS			TENSE
SENTENCE NUMBER	Finite Clauses	Complex noun phr.	Nominali-zations	Total	Words	Function	Phr. clause nominaliz., & N.-adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
231/385	2	1	-	3	14	D	3	106 - 103 - 1 - 4 - 1	-	-	Prep. Wd.	LAN. WHEN.	as + N. later	2, 1
232/391	5	-	-	5	-	-	-	-	-	-	Wd. Prep. Cl.+ Phr. Phr. Wd.	DEG. PLA. WHEN. COLP. COLP. COLP. LAN.	only in + N. when more ... than more ... than more ... than -ly	1P- . 1 . 1 1 . 1
233/391	2	1	-	3	9	E	2	1 - 1	-	-	Prep. Prep. Wd.	CAUS. PLA. FREQ.	owing to + N. in + N. -ly	1 . 1

TEXT: Villee 's Biology

234/391 (The incidence of this type of goiter) has been [greatly] reduced by (modern packing and shipping methods which permit (the transport of seafood [to all parts of the country])), and by (the addition of iodine (as potassium iodide) to table salt).

235/395 These substances are volatile and have (a sweetish smell, which gives to the breath of diabetics its peculiar, characteristic odor.)

236/395 The secretion of insulin is controlled by (the level of glucose [in the blood]).

237/395 Some investigators believe (that epinephrine is secreted [during emergencies]) [to coordinate (the activities of the various parts of the body) [for fighting or escaping]].

SENTENCE COMPLEXITY					COMPLEX NOUN PHRASES				NOMINALI- ZATIONS		ADVERBIALS			TENSE
SENTENCE NUMBER	Finite Clauses	Complex noun phr.	Nominali- zations	Total	Words	Function	Phr. clause nominaliz., & N. adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
234/391	2	4	-	6	7	A	2	1 - 1	-	-	Ad.	DEG.	-ly	4P+ , 1
					17	E	4	103 - 104 - 104 - 1 - 1 - 1	-	-	Prep.	GO/L.	to + N.	
					10	B	3	1 - 1 - 1						
				10	E	3	1 - 1 - 1							
235/395	3	1	-	4	14	B	3	103 - 4 - 1 - 1	-	-	-	-	-	1 . 1 . 1
236/395	1	1	-	2	7	E	2	1 - 1	-	-	Prep.	PLA.	in + N.	1P+
237/395	2	1	1	4	9	B	2	1 - 1	1	B	Prep.	NEEN.	during + N.	1 . 1P-
											Cl.-	PUR.	to + v.	
											Prep.	PUR.	for + N.	

TEXT : Villee's Biology

238/400 The [slightly] higher temperature of the abdominal cavity destroys the sperm-forming cells, but not the interstitial, hormone-secreting cells .

239/400 It should be kept in mind <that males produce female sex hormones (estrogens)> and <that females produce androgens as well as estrogens.>

240/400 [Whether or not fertilization occurs] . (the follicular cells left [after <the rupturing of the follicle>] [in ovulation]) multiply [rapidly] and fill (the cavity left by the previous follicle).

SENTENCE NUMBER	SENTENCE COMPLEXITY				COMPLEX NOUN PHRASES				NOMINALIZATIONS		ADVERBIALS			TENSE
	Finite Clauses	Complex noun phr.	Nominalizations	Total	Words	Function	Phr. clause nominaliz., & N. adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
238/400	1	-	-	1	-	-	-	-	-	-	Wd.	DEG.	-ly	1
239/400	3	-	2	5	-	-	-	-	1	Al	-	-	-	MIP-
240/400	3	2	1	6	12	A	4	103 - 3 - 1 - 11 - 1	3	E	Cl.+	COND.	whether	1 , 1 , 1
					7	B	2	3 - 1			Prep.	WHEN.	after + N.	
											Prep.	WHEN.	in + N.	
											Wd.	MAN.	-ly	

TEXT: Keeten's Biological Science

181/455 But they do not congregate [in (the [more] [strongly] acidic zone [immediately] surrounding the bubble of CO₂)], the region of congregation is [farther] [away from the bubble].

182/455 (Such simple behavior as (a paramecian's response to a bubble of CO₂)) is not dependent upon taxes, [as we have [just] seen].

183/460 [In other words], it is not (practice that causes the flight of a [newly] fledged bird to improve), it is greater maturity.

SENTENCE COMPLEXITY					COMPLEX NOUN PHRASES				NOMINALI-ZATIONS		ADVERBIALS			TENSE
SENTENCE NUMBER	Finite Clauses	Complex noun phr.	Nominali-zations	Total	Words	Function	Phr. clause nominaliz., & N. adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
181/455	2	1	-	3	11	E	2	106-106-103-202-2-1	-	-	Prep. Wd. Wd. Wd. Prep.	PLA. DEG. DEG. MAN. DEG. PLA.	in + N. more -ly -ly farther away from + N.	1, 1
182/455	2	2	-	4	12 8	A E	3 2	103-1-1-1 102-1-1	-	-	Cl.+ Wd.	MAN. WHEN.	as just	1, 4
183/460	3	1	-	4	12	A1	2	4-1	-	-	Prep. Wd.	LINK. WHEN.	in + N. -ly	1, 1, 1

TEXT: Keeton's Biological Science

184/460 (A third difficulty in <determining <what an animal can learn>>) is <that a particular behavior can [often] be learned [only] [during a [rather] limited critical period [in its life]]>.

185/465 You will have noticed [in (our discussion of the various forms of learning)] <that repeated references were made to reinforcement, <the rewarding of the animal for some responses and/or <punishing for others.>>>

186/465 But attainment of the goal [also] acts [as positive reinforcement [to the successful behavior pattern.]]

SENTENCE COMPLEXITY					COMPLEX NOUN PHRASES				NOMINALI- ZATIONS		ADVERBIALS			TENSE
SENTENCE NUMBER	Finite Clauses	Complex noun phr.	Nominali- zations	Total	Words	Function	Phr. clause nominaliz., & N. adjunc	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
184/460	3	1	3	7	10	A	3	103-1-11-11	2 4 1	E B D	Wd. Wd. Prep. Wd. Prep.	FREQ. DEG. WHEN. DEG. PLA.	often only during + N. rather in + N.	M1,1,M1P-
185/465	2	1	3	6	8	E	2	101-1-1	1 3 2	B F F	Prep.	SRC.	in + N.	M4, 2P-
186/465	1	-	-	1	-	-	-	-	-	-	Wd. Prep. Prep.	LINK. MAN., GOAL.	also as + N. to + N.	1

TEXT : Keeton's Biological Science

187/470 [Thus] the male does not waste energy <responding to females> [before he is [sexually] competent] , but [once he becomes competent] he has (a built-in system for <locating a mate> [without random searching].)

188/470 [In a control experiment] , Bogert showed <that (24 females released [in the dark] [near a silent speaker]) had scattered [randomly] [in all directions] [by (the time the lights were turned on [30 minutes later.])]

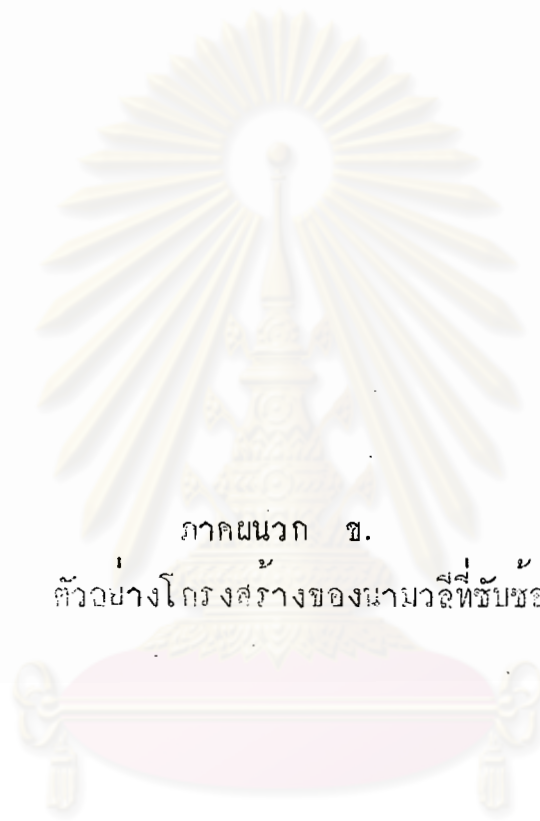
SENTENCE NUMBER	SENTENCE COMPLEXITY				COMPLEX NOUN PHRASES				NOMINALI-ZATIONS		ADVERBIALS			TENSE
	Finite Clauses	Complex noun phr.	Nominali-zations	Total	Words	Function	Phr. clause nominaliz., & N. adjunct	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
187/470	4	1	2	7	10	B	3	103-1-11-1	2	H	Wd. Cl.+	LINK. WHEN.	thus before	1, 1, 1, 1
											Wd. Cl.+	MAN. WHEN.	-ly once	
											Prep.	MAN.	without + N.	
188/470	3	2	1	6	10 10	A B	3 2	100-3-1-1 9-12	1	B	Prep. Prep.	PLA. PLA.	in + N. in + N.	2, 5, 2P-
											Prep.	PLA.	near + N.	
											Wd. Prep. Cl.+	MAN. PLA. WHEN.	-ly in + N. by the time	
											Phr.	WHEN.	later	

TEXT : Keeton's Biological Science

189/475 (The chemical nature of [only] a few of these is known [at present.]

190/475 Other releaser pheromones of ants include alarm substances and death substances.

SENTENCE COMPLEXITY					COMPLEX NOUN PHRASES				NOMINALI-ZATIONS		ADVERBIALS			TENSE
SENTENCE NUMBER	Finite Clauses	Complex noun phr.	Nominali-zations	Total	Words	Function	Phr. clause nominaliz., & N. adjunc.	Structure of Noun Phrase	Type	Function	Form	Type	Marker	
189/475	1	1	-	2	9	A	2	103-1-1	-	-	Wd. Prep.	DEG. WHEN.	only at present	1P-
190/475	1	-	-	1	-	-	-	-	-	-	-	-	-	1



ภาคผนวก ข.

ตัวอย่างโครงสร้างของนามวลีที่ซับซ้อน

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Text : Weinberg's Biology.

1. (properties peculiar to it and absent [in nonfire])
203 - 1 - 203 - 1
2. (a biologist who wants <to explore an uncharted area>>)
4 - 11
3. (the tracts that you will pass on [to your children,])
5 - 1
4. (the energy that muscle fermentation fails to release
[from glucose])
5 - 11 - 1
5. (all the vital functions of the cell in which this
intricate series of reactions has occurred.)
103 - 103 - 6 - 1
6. (one reason why a human being is capable of <reading
this book> [while a yeast plant is not.])
100 - 7 & 1 - 11 - 12
7. (experiments showing <that cyanide poisons the dark
reaction [without <affecting the light reaction>] >>)
2 - 11 - 1 - 11
8. (ringlike fibrovascular tissue which enables dicots <to
grow [in diameter] > and <to put forth branches and new
leaves [readily] >>)
103 - 103 - 4 - 11 - 1 - 11
9. (an important factor in (their ability to hold their own
[in (the constant war they wage with man)] >>>)
103 - 1 - 13 - 1 - 5 - 1

10. (Nutritional mutants which have lost (the ability to synthesize certain nutrients.))
103 - 4 - 13
11. (Darwin's overwhelming proof (that organisms do change))
102 - 104 - 11
12. (real knowledge of (how hereditary traits are formed and transmitted))
103 - 1 - 11
13. (the assumption (that organisms originate [by reproduction] [rather than] [by spontaneous generation]))
11 - 1 - 12 - 1
14. (another intriguing suggestion (: [If we are correct in (believing (that life arose [through [wholly] natural processes]))], [then] , [given enough time] , it should appear [wherever conditions [in the universe] permit])))
103 - 104 - 11 - 12 - 1 - 11 - 11 - 1 - 12 - 12
15. (parts of a skeleton which seemed (to be human) , [yet] [at the same time] [somewhat] normal)
1 - 4 - 11 - 202 - 1 - 202 - 203
16. (the fact (that races differ))
11
17. (the question (whether some races are [biologically] and [intellectually] superior to others))
11 - 1
18. (the task of (improving man's present condition) [through



- <providing better environments in which to live>]])
1 - 11 - 1 - 11 - 6
19. (a colony which contains (thousands of bees all contributing to its maintenance , and all depending on it))
4 - 1 - 202 - 2 - 1 - 202 - 2 - 1
20. (winter time when they are killed or driven [out of the hive])
9 - 1
21. (the effort to use the land [while [also] preserving it [for the future]])
13 - 12 - 1
22. (a condition which prevents <normal functioning of the body> , and which stems from a variety of definite natural causes)
4 - 11 - 4 - 1 - 1
23. (the threat of nuclear war, which would destroy (scores of millions of lives) and (most of <what we call civilization>)))
1 - 4 - 1 - 1 - 1 - 11
24. (underdevelopped countries , where increases in population are [most] explosive)
105 - 8 - 1
25. (everything the astronauts need - except energy [from the sun])
5 - 1 - 1

Text : Villee's Biology.

1. (subject for (a test of (a hypothesis <that (daily doses of extra amounts of vitamin C) might help prevent colds>)))
1 - 1 - 11 - 103 - 1 - 1
2. (an inbred strain of rats that are [as alike as] possible [in inherited traits])
103 - 1 - 4 - 1
3. (a struggle for survival among the many individuals born)
1 - 1
4. (countless billions of cells fitted [together])
103 - 1 - 3
5. (a variety of mineral salts, of which sodium, potassium, calcium and magnesium are the chief cations ([positively] charged ions), and chloride, bicarbonate, phosphate and sulfate are the important anions ([negatively] charged ions))
1 - 6 - 6
6. (a solution containing the proper balance of these three salts)
2 - 1
7. (the conversion of protein to carbohydrates and to fat, [as well])
1 - 1 - 1 - 12
8. (experiments with (substances labelled with isotopes of carbon, hydrogen, and nitrogen))
1 - 3 - 1 - 1

9. (the fact <that they are [selectively] stained by a particular stain, Janus green >)
11 - 1
10. (oxygen and nutrients that can enter [only] [through the cell surface])
4 - 1
11. (the ability to pump water or certain solutes in or out [through the plasma membrane])
13 - 1
12. (a tail by which they propel themselves)
6
13. (the ability to "fix carbon dioxide, to incorporate carbon dioxide [into a variety of organic compounds])
13 - 13 - 1 - 1
14. (the ability to convert radiant energy to chemical energy [to drive the process])
13 - 1 - 12
15. (the amount of some particular enzyme present [in a tissue extract])
1 - 203 - 1
16. (dehydrogenation reactions involving substrates with the H C OH configuration, such as the dehydrogenation of lactic or malic acid)
107 - 2 - 1 - 1

17. (the three \rightarrow P which are made for (each pair of electrons that pass [from pyridine nucleotide to oxygen]))
100 - 4 - 1 - 1 - 4 - 1 - 1
18. (the same problems of <getting food [for energy]> , <getting space to live> , <producing a new generation> and so on)
103 - 1 - 11 - 1 - 11 - 11
19. (places where there are decomposing bodies of animals or plants or masses of plant and animal by- products)
8 - 1 - 1
20. (organisms which cannot synthesize their own food [from inorganic materials] , and [therefore] must live either [at the expense of autotrophs] or [upon decaying matter])
4 - 1 - 1 - 1 - 1
21. (two basic concepts useful [in <describing the ecologic relations of organisms>])
100 - 103 - 203 - 1 - 11 - 1
22. (an abstraction that includes (all the physical, chemical, physiologic and biotic factors that an organism requires to live))
4 - 5
23. (a sort of <pinching in of the sides of one cell> [to form two daughter cells])
1 - 11 - 1 - 1 - 12
24. (the inner sides of scalelike leaves that are [usually] arranged [spirally] [to form a cone])
103 - 1 - 4 - 12

25. (a few cells enclosed [within the tissues of the sporophyte] and [entirely] dependent on it [for food])

103 - 3 - 1 - 1 - 203 - 1 - 1

26. (a classification system similar to (the one used by botanists), consisting of species, genera, families, orders, classes, and phyla.)

107 - 203 - 1 - 3 - 1 - 2 - 1

27. (this cavity where the food is broken down into small pieces and [then] absorbed [into (the gastrodermis cells where digestion is completed)])

8 - 1 - 1 - 8

28. (a substance that had been known [for many years] but whose antiscorbutic properties had not been suspected)

4 - 1 - 10

29. (their power to relax)

13

30. (chemical and physical changes occur which reverts the fiber [to its original condition])

14 - 1

31. (the follicular cells left [after the rupturing of the follicle] [in ovulation])

103 - 3 - 1 - 11 - 1

32. (the disposal of sewage [to prevent the infection of intermediate hosts])

1 - 12 - 1

33. (the mating of individuals of [totally] unrelated strains)
 termed outbreeding)
 11 - 1 - 1 - 3
34. (bacteria, molds and fruit flies which produce large
 numbers of offspring and which have [only] a short time
 [between successive generations]))
 4 - 1 - 4 - 1
35. (tropical forests, where animal remains are likely
 (to undergo rapid decay) [before they can be fossilized]))
 103 - 8 - 11 - 12

Text : Keeton's Biological Science

1. (limitations on (what it can do)))
 1 - 11
2. (the capacity of adjunct carbon to form single, double,
 or triple bonds [as in butadiene, benzene, and propyne])).
 1 - 13 - 1 - 1
3. (the hydrocarbon chains of the fatty acids shown [simply]
 [as R groups] [in the figure.])
 107 - 1 - 3 - 12 - 1
4. (one of the bases for (the theory (that there are
 (small pores [in the plasma membrane] through which
 [only][very]small particles can move))))))
 1 - 1 - 11 - 1 - 6

5. (evidence (that the smooth unit membranes of the Golgi apparatus are [often] continuous with the membranes of the endoplasmic reticulum and constitute, [therefore] another portion of the complex cellular membrane system))
11 - 1 - 1 - 1 - 1
6. (the presence of brown and red pigments, which [frequently] mask (the green chlorophylls that the plants also contain))
1 - 4 - 5
7. (the major energy release that occurs [when the car rolls [down the hill]])
103 - 107 - 4 - 12 - 1
8. (the narrow range of temperatures to which the active organism is tolerant)
103 - 1 - 6
9. (chickens fed [primarily] on (polished rice dropped [in the kitchen and dining area of the military quarters]))
3 - 1 - 3 - 1 - 1
10. (powerful waves of contraction which churn the food, [mixing it], and [breaking the larger pieces])
103 - 1 - 4 - 12 - 12
11. (a net movement into the capillaries at the venule end [not only of water but also] of waste materials [from the tissues] and of (any special products synthesized by the tissues in question, such as hormones [from the endocrine glands]))
103 - 1 - 1 - 12 - 1 - 1 - 1 1 - 3 - 1 - 1 - 1 - 1

12. (an example of organism that must get its oxygen [from
 (a medium in which the partial pressure of oxygen is
 [lower than] [in (the atmosphere we [ordinarily] breathe))]))

1 - 4 - 1 - 6 - 1 - 12 - 1 - 6

13. (a reduction of the osmotic concentration of the body
 fluids within the bounds possible for (the continuance of
 the life of the tissues))

1 - 1 - 1 - 1 - 1 - 1

14. (experiments in which the Darwins cut off the tip and
 found < that the coleoptiles failed to bend, [even though
 (control coleoptiles damaged in other ways, but with their
 tips intact) , bent [normally]]>))

6 - 11 - 1 - 3 - 1 - 1

15. he removed the tip of oat coleoptiles (which made the
 coleoptiles stop growing)

14

16. (a conduit within which damaged fibres can grow [from the
 cell. body] [back to their proper target tissues])

6 - 1 - 1

17. (additional association neurons that run [in ascending
 tracts] [through the cord] [to the brain])

103 - 107 - 4 - 1 - 1 - 1

18. (those individuals whose eyes formed the best images and
 whose central neurons system could [best] translate these
 images into (information leading [to a propriate responses]))

10 - 10 - 1 - 2

19. (one reason why arthropodes, [as varied and successful a group as] they are , have [never] [even] approached the sizes of many vertebrates)
100 - 7 - 12 - 1
20. (a device that will measure (the extent of contraction of the muscle) [when it is stimulated])
4 - 1 - 1 - 12
21. (a firm conviction <that the behavior of animals is [just] [as valid a part of biology as] are anatomy and physiology>)
103 - 11 - 1 - 12 - 1
22. (four haploid spore cells, each of which divides [mitotically] and develops [into (a haploid multicellular stage in which the organism passes most of its life cycle)]))
100 - 103 - 107 - 4 - 1 - 6 - 1
23. (the gene for black color can express itself [only] [if the temperature is low] , (which it [normally] is [only] [at the body extremities])))
14 - 1
24. (a secondary protective tissue, the cork, composed of (cells derived [from (a new lateral meristem, the cork cambium, which forms [from a layer of the old cortex] or [from the pericycle] or [even] [from the older pholem])))))
103 - 103 - 3 - 1 - 3 - 1 - 4 - 1 - 1 - 1 - 1
25. (an environment that is subdivided [into (many local areas where [slightly] different conditions prevail)]))
4 - 1 - 8

26. (a case of polymorphism where the [less] frequent of two forms has become the [more] frequent, and [vice versa])
1 - 8 - 1
27. (a demonstration <that the birds had not [simply] learned <to avoid all mealworms>> and <that their avoidance of the palatable green-banded ones ("mimics") was due to (the resemblance of these worms to the unpalatable green-banded ones ("the models"))>>)
11 - 11 - 11 - 1 - 1 - 1 - 1
28. (differences that will lead, [given enough time] [to (the development of intrinsic isolating mechanisms, which are (biological characteristics that prevent the two populations from <occurring [together]> or from <interbreeding [effectively]> [when or [if they [again] occur [together]]])])]))
4 - 12 - 1 - 1 - 4 - 1 - 11 - 1 - 11 - 12
29. (the maximum potential birth rate, which is the theoretical maximum [under ideal conditions])
103 - 107 - 107 - 4 - 1
30. (the notion <that the maggots [in decaying meat] arise [de novo] [from the meat]>, or <that earthworms arise [from the soil] [during heavy rains]>, or <that mice arise [from (sweaty shirts placed [in a dark corner] and sprinkled with wheat)] , [as Jean-Baptiste van Helmont had suggested]>, or [even] <that micro-organisms appear [spontaneously] [in spoiling broth]>>)
11 - 1 - 1 - 1 - 11 - 1 - 1 - 11 - 1 - 3 - 1 - 1 - 12 - 11 - 1

Text : Weisz's The Science of Biology

1. (fatty-acid-like carbon chains containing conjugated double bonds and carrying six-membered carbons ring [at each end]) .
103 - 107 - 2 - 2 - 1
2. (the common sea lettuce Ulva)
103 - 107 - 107
3. (fibrous roots ; in which numerous branch roots lead off [from the stem base] [into soil] [in all directions] , [as [in grasses.]])
103 - 6 - 1 - 1 - 1 - 12
4. (paired lime glands, which secrete calcium ions [from the blood] [into the alimentary tract])
103 - 107 - 4 - 1 - 1
5. (the amount of food a mammal [normally] eats)
1 - 5
6. (the hormones that the hunger and satiety centers send to the body)
5 - 1
7. (the ATP used [in <converting one molecule of free glucose to glucose-6-phosphate>])
2 - 1 - 11 - 1 - 1
8. (the life cycle of slime molds, [already] outlined [in Chapter 12])
107 - 1 - 202 - 2 - 1

9. (any type of change, occurring [on any level of living organization] and [at any time [in living history]])

103 - 1 - 2 - 1 - 1 - 1 - 1

10. (the key process to be explained)

103 - 13



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



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ประวัติการศึกษา

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