

第4章 動詞 (Verbs)

§ 4-1 主語と動詞の呼応

主語と動詞が正しく呼応しないことは、日本人科学者が英語を書く際に、最も多くみられる文法上の誤りである。

W: ** *Classical condensation theory are used to explain these phenomena.* **
←文法上の誤り

R: Classical condensation theory is used to explain these phenomena.
(古典的な凝縮理論)

W: ***The difference between the two cases are discussed in the next section.* **

R: The difference between the two cases is discussed in the next section.

(Exercise 4-1) 次の文のなかで、主語と動詞の呼応に誤りがあれば正せ。

1. The activation energy of the free carriers are estimated as 27 meV.
2. The diameter and (the) length of the tungsten wire were 0.1 mm and 5 mm, respectively.
普通, "The diameter and the length of ..." としないことに注意.
3. The distribution of B in these cases is shown in Fig. 2.
4. The current modulation rate were kept at about 2% for the two signals.
5. The capacitance of the other parts was kept constant.

この種の誤りは次の例でもわかるように、単数主語と動詞との間に複数形の名詞が存在する場合に、最も多くみられるものである。

W: ** *The current density in the laser tubes are rather high.* **

R: The current density in the laser tubes is rather high.

主語が何であるかを見極めれば、この種の誤りは避けられるはずである。

(Exercise 4-2) 次の文の主語に下線を引き、動詞の呼応に誤りがあれば正せ。

1. The ratio a/b for protons and electrons are, however, independent of the potential.
2. The dependence of the capacitance values of these ceramics on temperature is given by the following equation.
3. The above considerations on the space charge effect leads to the conclusion that the results in our previous report was not representative of the intrinsic behavior.
4. A total of 21 values were obtained.
5. A series of unexpected events was recorded.

(補足) a series of ...の次には複数名詞がくるが、全体で単数扱い。

§ 4-2 単数か複数か

1. a **number** of + [C] *pl.* + **are** ... (= many, たくさん)
a large number of ... are ...

W: ** *A number of topics relating to this subject has already been fully reviewed in a recent article.* **

R: A number of topics relating to this subject have already been fully reviewed in a recent article.

主語は "a number of topics" で、複合的に複数扱い。

個数を意味する "number" は単数。

R: The number of particles entering the chamber per unit time was measured by the method described earlier.

2. an amount of + [U] + is ... 量を表す

R: A large amount of information was obtained by this experiment.

W: ** *The amount of atoms in the sample space increases with pressure.* **

R: The number of atoms in the sample space increases with pressure.

(補足) 多数・多量両方の意味で使える a lot of ..., a variety of (第3章) は, 多数[C]pl.の場合複数扱い、多量[U]の場合単数扱い。尚, a lot ofはやや口語的であり, 科学論文になじまない場合もある。

3. each of +[C] pl. + is ...

R: Each of these electron-doped specimens was examined with a scanning electron microscope. (SEM: 走査型電子顕微鏡)

every ... も同様に単数扱い。

4. or ⇒ 動詞は近くの主語に呼応

R: Two conventional detectors or a single new detector provides sufficient sensitivity.

W: ** *This is especially true when x or y are very small.* **

R: This is especially true when x or y is very small..

R: If **either a or b** exceeds the limit, the second solution is applicable.

R: **Neither** a drop in voltage **nor** a change in temperature affects the response.

5. as well as

語法 (1) A as well as B では A の方に意味上の重点が置かれ, それを主語とする述語動詞の数は A と一致する: John, as well as his friends, was injured in the accident.

cf. **Not only B but (also) A** では動詞は A と呼応する.

(2) ときには A と B が意味上対等な重みで併置されることがある: In theory as well as in practice, the idea was unsound.
(新英和中辞典, 第6版 (研究社, 1994) .)

6. 計量値の主語 ・ 見かけは複数形でも単数主語

R: Five grams of NaCl was added to the solution.

§ 4-3 時制

現在形 : 科学的真理 「いつ誰がやってもそうなること」
(present tense) 文中の図表の説明にも使う。

過去形 : 実験の行為の説明
(past tense) 実験結果の記述

現在完了形 : 最新の結果を強調
(present perfect tense) (過去の時点が明記されておれば過去形)

R: Bednorz and Müller discovered superconductivity in the Ba-La-Cu-O system in 1986.

R: Bednorz and Müller have recently discovered superconductivity in the Ba-La-Cu-O system.

(Exercise 4-3) 次の文における時制の誤りを正せ.

1. A much improved LED is recently developed.
2. A pulsar has been discovered in 1957.
3. The numerical solution of Eq. 16 has schematically been shown in Fig. 3.

§ 4-4 他動詞か自動詞か

	他動詞 (<i>v.t.</i> , transitive verb)	自動詞 (<i>v.i.</i> , intransitive verb)
目的語	必要	伴わない
受動態	できる	できない

(1) 他動詞

1. discuss (*v. t.*)

W: ** *Let us discuss about the validity of this approximation.* **

R: Let us discuss the validity of this approximation.

前置詞 “about” は不要である。話し言葉において特に間違えやすい。

2. consider (*v. t.*)

W: ** *We considered about this possibility thoroughly.* **

R: We considered this possibility thoroughly.

discuss と同様 “(誤) *consider about ...*” の誤用が多い。

3. equal (*v. t.*)

“A equals B.” (*v. t.*) または “A is equal to B.” (*adj.*)

これらの用法を混同しないように。

W: ** *The product of the secondary voltage and current equals to that of the primary voltage and current.* **

R: The product of the secondary voltage and current equals that of the primary voltage and current.”

R: The product of the secondary voltage and current is equal to that of the primary voltage and current.”

4. enter (*v. t.*)

W: ** *Both of these impurity elements enter into the A site.* **

R: Both of these impurity elements enter the A site.

「...に入る」は日本語では自動詞であるが、英語では他動詞。

他動詞 “enter” には「入力する、記入する」という意味もある。

R: Complete your application by entering your student ID number here.

自動詞の “enter” は物理の英語ではほとんど用いない。

似た例として visit などもあげられる。(v.i.の用法もある。)

W: ** *I will visit to your university this summer.* **

R: I will visit your university this summer.

5. approach (*v. t.*)

W: ** *As x approaches to unity, f(x) diverges.* **

R: As x approaches unity, f(x) diverges.

(x が 1 に漸近すると, ...)

他動詞 “approach” に前置詞 “to” は不要である。

自動詞の “approach” は物理の英語ではあまり用いない。

6. substitute (*v.t.*)

強磁性

W: ** *We substituted copper by iron in order to induce ferromagnetism.* **

R: We substituted iron for copper in order to induce ferromagnetism.

R: We replaced copper with iron in order to induce ferromagnetism.

A で B を置換する: A が “substitute” の目的語になる。

7. attribute (v. t.)

“(We) attribute A to B.” (v. t.)

If you **attribute** something **to** an event or situation, you think that it was caused by that event or situation. (WEB上の英英辞典が便利:

<http://www.collinsdictionary.com/dictionary/english-cobuild-learners.>)

★ A と B の論理関係 (B が原因) に注意 !

同義語に **ascribe A to B** がある.

R: We therefore attribute this discrepancy to the crude approximation made in Eq. (3).

R: Therefore, this discrepancy **is attributed to** the crude approximation made in Eq. (3).

R: Therefore, this discrepancy **is attributable to** the crude approximation made in Eq. (3).

8. raise (v. t.)

raise (v.t.) と rise (v.i.) の混用に注意.

R: The quantity of heat that raises the temperature of the whole bulk of a substance by 1 K is called its heat capacity.

R: The intensity of the light rose again at higher scattering angles.

(2) 自動詞

1. result (v. i.)

ふたつの用法がある. (1) A results in B: A→B.

(2) B results from A: B←A.

R: Fifty percent of the traffic accidents result in head injuries.
(補足) percent の複数形は percent.

result は自動詞であるから、次のように「過去分詞」を形容詞的に用いることはもちろんできない.

W: ** *The resulted particles have diameters ranging from 2 μm to 5 μm.* **

R: The resulting (resultant) particles have diameters ranging from 2 μm to 5 μm.

2. remain (v. i.)

W: ** *The remained question is how to reach the quantum limit of detection.* **

R: The remaining question is how to reach the quantum limit of detection.

W: ** *The inelastic contribution from spin scattering remains a large value.* **

R: The inelastic contribution from spin scattering remains large.

R: The inelastic contribution from spin scattering **retains** a large value.

3. occur (v. i.)

W: ** *The temperature rise occurred a drop in voltage.* **

R: The temperature rise caused a drop in voltage.

R: A drop in voltage occurred with the temperature rise.
(温度上昇が電圧の降下を引き起こした.)

スペルに注意 : occurs, occurred, occurring, occurrence

4. consist (v. i.)

“A consists of B.” (A は B からなる. B は A の構成要素である.)

W: ** *We used a solvent consisted of 60 wt% toluene and 40 wt% ethanol.* **

R: We used a solvent which consists of 60 wt% toluene and 40 wt% ethanol.

R: We used a solvent consisting of 60 wt% toluene and 40 wt% ethanol.

consist は進行形には出来ない. 上の例文の consisting は分詞.

W: ** *This review is consisting of five chapters.* **

R: This review paper consists of five chapters.

(Exercise 4-4) 次の文のなかで、動詞の用法に誤りがあれば正せ。

1. *Magnetic oscillations are resulted from the quantization of energy levels.*
2. *The apparatus is consisted of three parts.*
3. *CP violation is occurred in the kaon decay.*
4. *We have already discussed in detail concerning the nonlinear effects.*
5. *The relativistic effect is attributed to the long lifetime of the muons.*
6. *X-ray was irradiated to the sample for two hours.*
7. *The temperature of the sample raised to promote the reaction.*

§ 4-5 能動態と受動態

☆なるべく能動態を使うことが望ましい。受動態は文章の明確さを弱める。

能動態: $s + v.t. + o.$

受動態: s (もとの o) + be (の諸形) + $v.t.$ (過去分詞)

+ **by** + “agent” (動作主, もとの s).

動作主が道具などの場合は

+ **with** + “agent” (道具, もとの s).

☆受動態を不必要に二重に用いるのは悪文!

* *The discrepancy is considered to be caused by the crude approximation.**

← スタイルの誤り

R: *The discrepancy is attributed to the crude approximation in Eq. (3).*

(Exercise 4-5) 能動態で書かれている次の文を受動態に書き改めよ。

1. An electron microscope can resolve the atomic configuration.
2. We have successfully substituted iron for copper.
3. Most of the previous authors have ascribed this phenomenon to adiabatic softening.
4. Equation 1 permits us to calculate the magnetic flux density inside.

(Exercise 4-6) 受動態で書かれている次の文を能動態に書き改めよ。

1. Laser processing is featured in the 2015 models.
2. The origin of attraction between electrons is attributed to the electron-phonon interaction.
3. There were a number of diffraction peaks which were not identified.

(補足) 科学英語における動詞の用法については、以下の解説が詳しい:
原田豊太郎: 英語論文執筆ガイド (講談社ブルーバックス B1364, 2002)
ポイント 6-10, pp. 116-185.

(補足: 動詞のアクセント) 物理の口頭発表等で、日本人の中には次のような動詞にも、誤って第1音節 (the first syllable) にアクセントをつけるクセの人が多い。

動詞: (誤) *réport*, *íncrease*, *óccur*, *résult* など

(正) *repórt*, *increáse*, *occúr*, *result*

第一音節で (正) *differ*

The origin of “Murphy’s Law” マーフィーの法則

In 1949 at Edwards Air Force Base, Captain* Ed Murphy, a development engineer from Wright Field Aircraft Lab, remarked by referring to the technician who had wired the strain gauge bridges: “If there is any way to do it wrong, he will”,

Arthur Bloch: *Murphy’s Law: 26th Anniversary Edition*
(A Perigee Book, 1993).

*Captain: (空軍) 大尉