

第6章 動名詞と分詞 (Gerunds and Participles)

動名詞 (gerund) : 動詞の ...ing 形 ⇒ 名詞的用法

分詞 (participle) : 動詞の ...ing 形 (現在分詞形)
または過去分詞形 ⇒ 形容詞的用法

§6-1 主語としての動名詞

次の二つの文章を比べてみよう。

The substitution of these values into Eq. (1) yields an α of $5 \times 10^{-6} \text{ K}^{-1}$.
Substituting these values into Eq. (1) yields an α of $5 \times 10^{-6} \text{ K}^{-1}$.

抽象名詞を用いた方は、客観的でやや堅い表現になっている。それに対して動名詞を用いた方は動作が直接表現されており、主観的で臨場感がある。(§3-3 でも抽象名詞を動詞化することの優位性を述べた。)

Increasing the temperature to 800°C did not significantly change the oxidation effects.

§6-2 動詞の後の動名詞 (目的語)

他動詞の目的語として不定詞と動名詞のどちらをとるかは、それぞれの動詞によって異なる。

W: ** *We have finished to install a new program for the data analysis.* **
←文法上の誤り

R: We have **finished installing** a new program for the data analysis.

動名詞のみに目的語としてとる他動詞には、
finish, avoid, involve, keep, suggest, resist, postpone などがある。

to+不定詞のみに伴う他動詞には、
agree, decide, manage, fail などがある。

(参考)

+目的語+不定詞 の他動詞: let, make

Everything above absolute zero radiates in infrared, **letting** astronomers see deep into our galaxy.

しかし受動態では +to+不定詞

You were **made to go** out and get her. (Hey Jude, the Beatles)

(Exercise 6-1) 括弧内の正しい方を選べ。

1. The government postponed (to start / starting) the new nuclear project.
2. Classical mechanics fails (to account, accounting) for an interference experiment with electrons.
3. I have finished (to write / writing) the report for the student lab.
4. We have finally managed (to repair / repairing) the scintillation counters.
5. I look forward (to meet / to meeting / meeting) you again at the next international conference.
6. We prefer (to use / using) it anyway (rather than to send / to sending) it back to the manufacturer.
7. The temperature inside the chamber finally stopped (to increase / increasing).

§ 6-3 前置詞の後の動名詞（目的語）

前置詞+動名詞（あるいは接続詞+現在分詞）の形で行為を表すことにより、文が引き締まることが多い。

They first produced various color centers *by irradiation of* the crystal.

They first produced various color centers by irradiating the crystal.

同様に “by measurement of” より “by measuring” の方が、用法は名詞ではあるが本来は動詞であるという動名詞の機能が生かされて、簡潔明快になる。熟語的に決まった前置詞があるときは、それに続けるには動名詞を用いる。

W: ** *Impurities play an important role to increase metal hardness.*

R: Impurities play an important role in increasing metal hardness.

“play a part (a role) in”の後には名詞か動名詞。同様の例として “be worth ...ing”, “get rid of ...ing”, “succeed in ...ing” などが挙げられる。

Murphy's law:

If anything can go wrong, it will.

Corollaries (系):

1. If there is a possibility of several things going wrong, the one that will cause the most damage will be the one to go wrong.
2. It is impossible to make anything foolproof because fools are so ingenious.

§ 6-4 分詞

分詞：動詞の...ing 形（現在分詞形）または過去分詞形の形容詞的用法
A scattering cross section decreases with **increasing** ~~the~~ energy of the incident particle.
分詞“increasing”は“energy”を修飾する形容詞なので、“the”は不要。

現在分詞は能動的（能動分詞） a heating filament （加熱用フィラメント）

過去分詞は受動的（受動分詞） a heated substrate （加熱された基板）

☆この過去分詞は時制とは全く無関係

時制の表現は：

能動分詞の完了形は having + 過去分詞

受動分詞の完了形は having been + 過去分詞

(Exercise 6-2) 原型の与えられた動詞の分詞をカッコのなかに入れて文を完成せよ。

1. The cable () the electricity is very heavy. [supply]
2. The () gas is discarded before high-purity $^{18}\text{O}_2$ gas is introduced into the chamber. [remain]
3. A new composite material () last year is already being produced on a commercial basis. [develop]
4. () the strengths of this new model in the last section, I will now discuss its drawbacks. [emphasize]
5. () in Fig. 10 are some of the simpler Feynman diagrams for electron-electron scattering. [show]

(Exercise 6-3) 次の文を分詞を使って書き改めよ。

1. The force that holds the sun and the earth together is gravitation.
2. The mechanical parts which should be repaired immediately are listed below. (“require” を用いて)
3. Hadrons which differ only in their charge can be combined into groups which are called multiplets.

§ 6-5 分詞構文 (Participial Construction)

分詞を含む副詞節が主文を修飾する構文.

1. A crystal often grows into the shape of a cube or an octahedron, **reflecting** the symmetry of the atomic structure.
2. **Equating** this value to the right-hand side of Eq. 29, we arrive at a self-consistent equation for k .
3. **Not having** (= Because we did not have) any electronic calculators at hand, we had difficulty in evaluating the molar weight of the compound.
4. These capacitors can store charge from pulses of current and then release the stored charge between pulses, thereby **producing** a steady current.

懸垂分詞 (Dangling participles)

分詞の意味上の主語と、主文の主語とが異なっている誤用.

分詞構文でもっとも大切なことは、分詞の意味上の主語と、主文の主語とを一致させること.

W: ** *Having been kept at 1000°C for 5 hours, the student took out the samples from the furnace.* **

R: After **keeping** the sample at 1000°C for 5 hours, the student took it out from the furnace.
(正しい文の例では”keeping”は動名詞である.)

W: ** *Seeing from a distance, the particle accelerator looked like a doughnut.* **

R: **Seen** from a distance, the particle accelerator looked like a doughnut.

W: ** *Comparing with the data previously obtained, the present results are in excellent agreement with the Landau theory.* **

R: **Compared** with the data previously obtained, the present results are in excellent agreement with the Landau theory.

この種の誤用は非常に多くみられる. 書き手は see, compare 等の動作を自分あるいは他人が行うというつもりになり能動態 (現在分詞) を用いてしまいがちだが, 分詞の主語と主文の主語を一致させるという原則から受動態 (過去分詞) をとる必要がある.

一般に分詞構文では, 助動詞の being あるいは **having been** は省略されることが多い.

“Using” を除いて懸垂分詞はほとんど例外無く厳禁されていると考えるべき. また considering, regarding, concerning 等のように前置詞として定着している語句は使っても差し支えない.

1. These parameters were obtained using the least-squares method.
2. Strictly speaking, this sentence is not good English.
3. Judging from these results, the experiment was a complete failure.

(Exercise 6-4) 次の文を正しく書き改めよ.

1. **Our interest here is to explore its implications, assuming that the same reactions take place in other systems.**
2. **Looking farther back, an endless cycle of expansion and contraction of the universe stretched into the infinite past can be imagined.**

接続詞と分詞の結合

分詞構文では, 接続詞を省略した形で「時, 原因, 理由, 手段, 結果, 条件, 譲歩」など様々の付帯事項を付記できる点が便利である. しかし, それだけではどうしても意味が不明になりやすいので時, 条件, 譲歩などは分詞の前に接続詞を置くことにより, 意味を明示することが多い.

1. When using this machine at temperatures above 300 K, you should make sure that adequate arrangements for cooling water are made.
2. While being irradiated with X-rays, the blue crystal faded to gray.
3. Optical glass fibers, if properly fabricated, withstand a tensile stress over 5 GPa.