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# PSYCHOLOGY

A Class Manual in the Philosophy  
of Organic and Rational Life

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*By*

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This Class Manual is Dedicated  
with Reverent Affection  
(and with much concern about what he may think of it)

To

THE REVEREND ERNEST GENSHEIMER, O.S.B., PH.D.,  
of Saint Vincent Archabbey, Latrobe, Pennsylvania,

*a true student, a philosopher richly worthy  
to be called great, an eminent teacher, and a  
just (but alarmingly frank) judge of textbooks  
in philosophy.*

## PREFACE

This textbook takes its place as the seventh volume in a series designed to meet the needs of the ordinary college student. It is not to be judged from the standpoint of the specialist. The important but minute psychological matters which charm the specialist will be found charmingly compressed herein, or even more charmingly omitted from these pages. Further, this is a textbook in the *philosophy* of organic and rational life as manifested here upon earth. It is not a manual in what is called General Psychology; it is not a text in the experimental, phenomenal, or laboratorian *science* of psychology. It could not be any of these and lay claim to a place in the series of which it is now, happily or unfortunately, an integral part.

Let us anticipate the favorite line of the casual reviewer: *there is nothing new in this book*. Why, then, has it been allowed to come to light? Because novelty of subject-matter is not a particularly valuable feature in a textbook. The statement of doctrine herein contained may,—in arrangement, expression, and stresses,—be found suited to the requirements of many a hard-working collegian. It may meet his acute needs, crowded as he is with the weighty items

## PSYCHOLOGY

of a full curriculum. In some cases, the book may awaken desire for wider and deeper studies in philosophical psychology, and so may lead the student who uses it to those splendid and mighty works before which this little volume takes its reverent stand as a page at the feet of royalty. The book should help the college student to lay a sound and solid foundation of philosophy for the superstructure of scientific psychology which, somewhere in his course of studies, he will certainly be expected to raise. Further, the book should prove valuable to the studious layman who inevitably reads much psychology of one kind or another, and much that can easily lead off his mind from fundamental truths which man disregards at his eternal peril. It may help such a man by focussing his attention on things ultimate; by affording to his use the tests and touchstones of final reality with which he may learn the actual worth of what he hears and reads about life and its meaning. These are the reasons for the existence of this book. These are the ends it looks to, and the purposes it hopes to serve.

P. J. G.

College of St. Charles Borromeo,  
Columbus, Ohio.

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## INTRODUCTION

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|---------|---------------|-------------|---------------|
| 1. Name | 2. Definition | 3. Object   | 4. Importance |
|         |               | 5. Division |               |

## I. NAME

Philip Melanchthon (1497-1560), the most learned of Luther's associates in the religious revolution of the sixteenth century, was a notable student of Greek, and he had a flair for inventing Greek names. His own family name of Schwarzerd (which is a combination of *schwarz* "black" and *erde* "earth") he translated literally into Greek, combining the words *melanos* "black" and *chthon* "earth" in *Melanchthon*. At the ripe age of eighteen, Melanchthon was a lecturer in Aristotelian philosophy at the University of Tübingen, and it was here, probably, that he formulated the name *psychology* for Aristotle's treatises on the soul and vital phenomena. The name is apt, for it is made up of the Greek words *psyche* "soul" or "life-principle" and *logos* which really means "word," "speech," or "thought," but which has long been employed to indicate connected, concentrated, systematic thought or discussion, and thus is taken to mean a scientific treatise or simply *a science*. Thus, from *psyche* "soul" and *logos* "science" we have *psychology*

or "the science of the soul or life-principle," "the science of life and its manifestations." It is, of course, evident that the name *psychology* is younger by many centuries than the science to which it was thus applied.

In our day, *psychology* is a term of very wide and inclusive meaning. The name *psychology* is applied chiefly to the study of those phases and manifestations of life which have their proximate explanation in physics, physiology, and biology. This psychology is usually called the *science* of psychology, in the limited sense which the term *science* has taken on in the past hundred years, and is distinguished from (although subservient to) *philosophical psychology* which is to be our subject of study in the present treatise. Scientific psychology is a prodigious, and largely recent, development of doctrine achieved by use of means and methods which were first made readily available by the laboratorians of the nineteenth century. Psychology as a *science* is really a complex group of sciences; its branches and departments are almost numberless. It is a worthy body of related sciences, the steady development of which is contributing hugely to our knowledge, and is affording inestimable practical benefits in the realms of education, sociology, economics and mental therapy.

But, since the field of scientific psychology is widely various; since it has the strong appeal of a *modern* achievement; since its swift growth opens continuously new avenues of investigation; it has suffered,

and is suffering, from the activities of charlatans and over-zealous popularizers. Many sins against truth and moral rectitude are committed hourly in the name of psychology. (Many false doctrines,—some merely silly, some starkly calamitous,—are foisted daily upon a gullible populace (school-trained or ruggedly uncultured) as the most recent, and therefore the most valuable (!), discoveries of psychology. The word *psychology* has become a common, yet precious, term: it flavors the most insipidly casual of conversations; it is the standby of the travelling salesman; it has a pleasing taste in the mouth of the callowest of undergraduates and is savored solemnly on the lips of the most overpowering of professors. The name *psychology* is attached to cheap publications, and appears as the caption of treatises which flatter the half-educated by inviting them to soar on an ostensibly lofty plane of intelligence. Courses in psychology are made available to all, and may be undertaken without reference to the race, creed, color, or prevailing intellectual ineptitude of registrants, by the simple process of signing a coupon or mailing a pre-franked postcard. Psychology sparkles in odd corners, and shines in solemn "departments," of the ordinary daily newspaper. Indeed, the term *psychology* is as pitilessly abused to-day as that beaten and battered and bewildered word *science*.)

In the present study we employ the term *psychology* to indicate *the ultimate science, or the philosophy, of*

life and living bodies. Psychology the science is one thing; psychology the ultimate science or philosophy is another. The science looks to data to be discovered and applied by experiment, observation, collation, integration. The philosophy looks to ultimate truths about the essence and nature of life and its basic principle. The science and the philosophy are, indeed, closely related, and philosophical psychology does much of its groundwork in the field of scientific psychology. But philosophical psychology is rational in method; scientific psychology is largely experimental. The field of philosophical psychology is of wider, higher, and surer reach than that of scientific psychology, which is limited to the investigating of detailed phenomena and to the observing, testing, and applying of its individual discoveries.

## 2. DEFINITION

Psychology, as we employ the term, is *the philosophical science of life and living bodies*. Since the most important chapters of this science treat of the life that is manifested in *human bodies*,—a life that has its principle in the spiritual human soul,—the definition of psychology may be more fully stated as *the philosophical science of life, living bodies, and the human soul.*

a) Psychology is *a science*. We here use the term *science* in its older and literal meaning to indicate a body of demonstrable truth, whether the demonstra-

tion is to be made by laboratory experiment or worked out by reason. *A science*, as we here understand the term, means a body of connected data, relatively complete, and set forth in a systematic and logical manner, together with the reasons which justify acceptance of the data as true, and compel assent to conclusions drawn from them. Psychology squares with this definition of a science, and is, in consequence, a true *science*.

b) Psychology is *a philosophical science*: that is to say, it searches out the very deepest reasons for each point of its doctrine, and does not rest satisfied with proximate reasons as experimental science must do. Psychology is a philosophical science, and indeed it is an integral part of philosophy but it is not, strictly speaking, a *metaphysical science*. It belongs to philosophical physics, not to metaphysics. It is a department of *natural philosophy* in the ancient Aristotelian sense of that term.—Psychology is a speculative or theoretical science, for it presents truth to be recognized by the mind and held as an enrichment and an illumination. It is not a *practical* or *normative science*, for such a science gives knowledge that leads immediately on to action, to something-to-be-done as the normal fruitage of that which is scientifically known.

c) Psychology is the philosophical science of *life, living bodies, and the human soul*. The term *psyche* means *life-principle in a living body*, whether the

body be plant, animal, or man. Psychology, which is the science of the *psyche*, treats of all life-activities and studies life in all its forms and manifestations. Psychology is a human science (that is, a science built up by human efforts and not enriched by divine revelation), and is not competent to deal directly or fully with the purely spiritual life of the angels or with that Ineffable Life which is God, the All Living. Psychology must deal with life as it is found in bodily creatures. Even in its larger and more important portions,—those, namely, which treat of man's soul,—psychology takes its data from human life and functions as manifested in man's earthly and bodily existence. Psychology is therefore the science of life and living bodies. We add the phrase "and of the human soul" to this definition, merely to indicate the outstanding importance of *human* psychology, or *major* psychology, as it is usually called.

### 3. OBJECT

Every science has a definite field of inquiry; this is called its subject-matter or its material object. Further, every science deals with its subject-matter in a special and definite way, and with a clearly specified end-in-view. This point of attack, this special aim and purpose, is the formal object of the science. Two or more sciences may have the same material object, for many inquiries may be prosecuted in the same general field. But no two sciences may have the

same formal object; if they had, they would be identified, and would be really *one* science and not two. To illustrate: anatomy and hygiene are sciences which study the human body and its organs, and, in so far, these sciences have the same subject-matter or material object. But these two sciences have not the same formal object; anatomy studies the human body and its organs to know their structure; hygiene studies the human body and its organs to know their proper functioning. Sciences are ultimately distinguished one from another by their respective formal objects.

The material object of psychology is *life in all its forms and manifestations* (bodily, mental, volitional) in so far as these things may be studied in bodily creatures. In a word, the material object of psychology is *life in living bodies*. The formal object of psychology (that, namely, which it seeks in studying its material object) is *the ultimate causes and reasons of life and its manifestations*. Here we notice how philosophical psychology (which we are here discussing, and to which we shall refer henceforth by the unqualified term *psychology*) differs formally from scientific psychology which seeks proximate, not ultimate, causes and reasons in its investigations of life-phenomena. Psychology inquires into essences; it asks what life is, what the life-principle or life-source is, whence this principle comes and whence it has the power to function as it does; psychology



also inquires what life is aimed at, what it is *for*.

On the score of its formal object psychology is distinguished from all other sciences which deal with living bodies. We have seen how it differs in scope and method from experimental and scientific psychology. It differs from botany and zoölogy which are limited to the study of vegetal and sentient life alone. It differs from biology which, while dealing with man's organic life, is incompetent to deal with essences and is unconcerned about first principles. It differs from physiology which excludes the study of mental and spiritual life. It differs from anatomy which studies the structure of living bodies; from histology which studies the tissues of organisms; from natural anthropology which seeks to classify man in the catalogue of animal organisms.

The material object of psychology is, as we have seen, life in living bodies, whether these be plants or brutes or human beings. But it is obvious that the most important kind of bodily life is human life; it is the most complex life, the most wondrously effective life, the most dominant life, the noblest life manifested here on earth. Besides it is the only life of which we, who study psychology, have any direct and conscious experience. Hence, although life in all living bodies is the *adequate* material object of psychology, the *primary* object of this science is human life and its manifestations. The life of plants and brutes

constitutes the secondary material object of psychology.

#### 4. IMPORTANCE

It is manifestly of great importance for the person of education and culture to know all that can be known of life, and particularly of human life. Such a person requires a scientific and philosophical basis for his appreciation of human dignity, and for the proper grasp of the aim and purpose that is found in every human existence. To appreciate self, and neighbor, and God; to have the true philosophy of life and to know its meaning and destiny, the trained mind needs the equipment of psychological discipline. Common sense and simple faith suffice for the unschooled mentality; but who shall dare lay claim to the throne of the educated without a fundamental interest in *what it is* that is educated,—the physical, mental, spiritual, volitional life of man? Psychology is the very basis and ground of sane methods in pedagogy; it gives meaning to the thing called education. Further: psychology is the foundation of ethics inasmuch as psychology manifests the spiritual and immortal character of the human soul, and the freedom, and consequent responsibility, of the human will. And, since ethics is essential to political and juridical science, to sociology and economics, it is evident that psychology is basically related to all these

sciences. Psychology is, therefore, a most important science; it holds an indispensable place in the programme of collegiate studies.

A knowledge of philosophical psychology is of the greatest value to the student of experimental or empirical psychology in any of its branches. Such a knowledge keeps the student "on the right track"; it helps him to avoid quests that are destined to be barren; it keeps him from formulating theories that are bizarre or even harmfully at variance with truth; it gives him the key to many problems that, for the laboratorian, must remain forever unsolved.

As most modern errors in critical philosophy come from the failure of philosophers to distinguish accurately the fields of sense and of mind, so most modern errors in psychology come from the failure of philosophers and scientists to make a clear distinction between the physical and the psychical. Only the thoroughly trained student of philosophical psychology is equipped for making this distinction with accuracy and discernment.

For all these reasons, philosophical psychology presents itself to the student as a supremely important, and supremely necessary, subject of study.

#### 5. DIVISION

This treatise is divided into two *Parts*, the first of which deals with life *in general* and *as manifested in plants and non-rational animals*. This Part is known

as Minor Psychology. The second Part treats of *human life*; it is known as Major Psychology. The present manual is, therefore, arranged as follows:

#### PART FIRST

##### *Minor Psychology*

- Chap. I. Life
- Chap. II. Vegetal Life
- Chap. III. Sentient Life
- Chap. IV. The Origin of Species

#### PART SECOND

##### *Major Psychology*

- Chap. I. Human Life
- Chap. II. Human Sentiency
- Chap. III. The Intellect
- Chap. IV. The Will

PART FIRST

MINOR PSYCHOLOGY

This Part studies the meaning of life in general, discusses the life-principle or soul which exists in every living body, and investigates the essential powers and operations of plant life and animal life. Further, the Part discusses the origin of species, that is, of essentially different classes of living bodies. These matters are set forth in the following chapters :

Chapter I. Life

Chapter II. Vegetal Life

Chapter III. Sentient Life

Chapter IV. The Origin of Species

## CHAPTER I

### LIFE

This Chapter discusses the nature of the reality which is universally indicated by such terms as *life, living, alive*. It studies the essential differences which mark off things which live from things which are not endowed with life. It discerns distinct grades or degrees of life and of living things. Finally, it discusses the root-principle of life, which is commonly called *the psyche* or *the soul*.

The Chapter is divided into the following Articles:

Article 1. What We Mean by *Life*

Article 2. The Difference Between Life and Non-Life

Article 3. The Scale of Life and of Living Bodies

Article 4. The Principle of Life

#### ARTICLE I. WHAT WE MEAN BY *LIFE*

- a) Life as Movement
- b) Life as Activity
- c) Life as Actuality
- d) Definition of *Life*

##### a) LIFE AS MOVEMENT

We know what a thing is by studying its characteristics, its inevitable functions, its natural qualities. In other words we know a thing by knowing its *properties* or *attributes*. Characteristics (in quality or operation) which mark a thing as long as it remains what it is, and which change only when the thing itself has

been changed into something else, are *proper* to the thing; they constitute its *properties*; they must, of necessity, be *attributed* to the thing, and are its *attributes*. Properties or attributes are the indicators of *essence* and *nature*. Essence is that whereby a thing is constituted in its inmost and most real being as such a thing; nature is that whereby an essence has such and such inevitable operations or functions: for nature is essence considered as the root of function. When we ask what a thing is, we ask what is its essence and nature.

When we ask what *life* is, we ask what is the essence and nature of life. And we find the answer to our query by discovering what characteristics life confers upon the things which possess it; by noticing the attributes or properties of living things.

Now, there is one characteristic universally recognized as the mark of a living thing; indeed, this characteristic is so intimately bound up with the very idea of a living thing that there is no thinking of *life* or *living thing* without it. And this characteristic is the power of self-movement. A living thing is one that can somehow move itself; not that it must be capable of skipping about from place to place, but in the sense that it is, of itself, equipped to *do* something by way of connatural operation or function. This power of self-movement is native to the living thing; it is innate in it; it is not merely put into it by some outside or *extrinsic* agency, as steam is let into the cylinders

of a locomotive; it is an *intrinsic* force or power.

There is an ancient axiom which declares that "where you find movement, you find a *mover* and a *thing moved*; and nothing really moves itself." This is quite true, but it does not contradict our notion of life. A living thing does not move itself into existence; it does not equip itself with its life-powers; but its powers, once bestowed, are exercised by the living thing, and *in* and *for* the living thing itself, and so are said to *perfect* the living thing; and for this reason life is described as *the power of self-perfecting movement*. In saying that life is self-movement, we do not utter an absurdity like the statement that a man can lift himself by pulling on his own boot-straps. We merely declare that a living thing is natively equipped with a power, intimately resident in itself and to be exercised through itself, whereby it does something for itself,—"*moves*" is the general term for the exercise of such power. A man cannot lift his weight into the air by pulling on his own boot-straps; but a man can pull on his own boot-straps, and that is an activity or movement which the man does by reason of a native or inborn power: the *man* does the pulling; the *man* has the power to pull; he exercises a movement of *his own*, and, in so far, it is self-movement. The force or power which the man exercises is not conducted to him from some extrinsic source; he need not be wound up like a clock, or connected with a dynamo by a cord and socket, or furnished with a steam-

line, or equipped with antennae or tubes or aerials. He does the moving *himself*. And so it is with the man's growing, or digesting, or hearing, or thinking. These activities are *his own*, exercised by means of powers with which he is natively equipped, and which function in him, and by him, and for him, and so are called, in their functioning, *self-movements*, and *self-perfecting movements*.

When a thing moves itself, we know it is *alive*. When a thing, natively equipped for self-movement, is no longer capable of such movement, we know that it is *dead*. We sometimes use the terms "alive" and "dead" in a figurative or poetical sense, as when we speak of a "live wire," or say that our radio is "dead." But the "live wire" is not really alive, as we well know; and we need no long period of observation to tell the difference between such a wire and a living thing,—a serpent, for instance. Nor do we conceive the physical and mechanical activity or "movement" of the radio as something proceeding from a natural and inborn principle of power. It is precisely because we recognize some sort of self-movement as characteristic of a living thing that we (who are all poets and lovers of figurative speech) are so quick to employ the analogy of *life* and the *absence of life* in daily speech. And so we speak of "a living flame," "a dead silence," "a style that is vibrant with life," "a dying echo," and so on.

Living things, therefore, are things which can, in

one way or another, move themselves. And life is the *power* of self-movement. And, since self-movement is movement in, by, and for the mover, life is described as the power of self-perfecting movement. This description, however, is applicable only to the life of *creatures*, and is most clearly evidenced in the life of *bodily* creatures.

#### b) LIFE AS ACTIVITY

Here we are to go over the ground already covered in our consideration of life as movement, but we are to employ a new term, to make a required distinction, and to learn some necessary definitions. Self-movement is, obviously, self-activity. For activity is action or the power to act; and a thing which moves itself (in the sense explained above) exercises activity; and that which has power for self-perfective movement, possesses activity.

*Activity* and *action* are distinguished as *immanent* and *transient*. *Immanent* activity (the term is from the Latin *in* "in," and *manere* "to remain") remains in the being which acts (called "the agent" from the Latin participial noun *agens* "the doer; the performer"). *Immanent* action or activity is said to "remain in" the agent, because it originates in the agent, and is finished in the agent, and produces its main effect in the agent. A plant grows; and the activity of growth is *immanent* in the plant. There are "outside" effects, of course; the growing plant stands in a

different relation (as to measurement or size) to surrounding bodies as it grows larger; but the main effect is *in* and *on* the plant itself. The growth as such begins in the plant and affects the plant and, as a function, ends in the plant. It is an immanent action or activity. All life-actions (or "vital actions" as they are usually called, from the Latin *vita* "life," and *vitalis* "having reference to life") are immanent actions. We shall have occasion to stress this point again.

*Transient* activity or action takes its name from the Latin *trans* "over; across," and *iens* "going." A transient action "goes across" the chasm which separates the agent (or doer, or performer) from an object outside his acting-power. A transient action is not finished in, by, and for the agent, but produces its main effect upon something else. The batter hits the ball. Inasmuch as the action is the batter's own exercise of power it is *immanent*; inasmuch, however, as the terminus, goal, or finished effect of the action is found in something other than the agent, the activity is rightly said to "go across" from the agent to the object affected, and the action is, in so far, *transient* action. The batter's activity,—in taking his posture, grasping the bat, moving his arms, swinging the bat to meet the ball,—is, inasmuch as it is *his own activity*, an *immanent* activity. Inasmuch as his activity results in the fact that the bat is grasped, arms are moved, bat is swung, ball is struck, the activity is *transient*. In transient activity force or power goes

out, or goes across, from the agent to an object acted upon, affected, or, in this technical sense, "perfected."

For an action to be *immanent* it is required, then, that its main effect, its goal or terminus, be within the agent which originates it. For an action to be *transient*, it is required that its main effect or terminus be found in something other than the agent which originates it. An action is not immanent merely by

reason of the fact that it goes on *within the body* of the agent; nor is an action wholly transient by reason of the fact that it is completed outside the originating body. The whirling and churning of food in the stomach is, in itself, transient activity: it is the activity of the stomach upon something other than itself. Yet the activity of the stomach, considered precisely as such, is unquestionably the action of a living thing, it is its own action, its own self-perfecting movement, and is, in so far, immanent. The movement of the heart, the contracting and expanding of the lungs, are,—inasmuch as they are actions of part upon other part, or of containers upon contents,—transient activities; but, inasmuch as these activities are *vital*, inasmuch as they are activities exercised in, by, and for the living being, they are *immanent* activities. Again, a man clapping his hands, or bringing an emphatic fist down upon his knee, or stroking his whiskers, is engaged in activity which, looked at simply, is *transient*, even though the action affects no other body than the man's own. For activity of part upon part is transient ac-

activity. Yet inasmuch as the movement of hand or fist is the man's own proper and self-perfecting movement (which could not be originated by a corpse or by a non-living body) and inasmuch as the action is begun and finished by exercise of a power that functions in, by, and for the man, the action is immanent. Its external or outer exercise is indubitably transient; its character as a vital manifestation marks it as unquestionably immanent. All vital activity is immanent; all immanent activity is vital: there is no immanent activity except the activity of a living being.

Immanent activity is not necessarily bodily. A man's thinking is immanent activity, so is his willing. And these activities are, as we shall see later, of a spiritual, supra-sensuous, supra-bodily character. This is a point to keep steadily in mind, and we should frequently recall it, for it might easily be forgotten or even overlooked in our studies of the manifestations of life *in bodies*.

Immanent activity in living bodies is regularly accompanied by transient activity, that is, by transient effects. A tree is growing outside my study window, and I find that it has now grown so large that it cuts off the view of my garden. This is a transient effect. The tree is growing by an immanent drive and force to reach and maintain its own mature state and condition; it is not growing to cut off the pleasing view from my window. The enlarging of outer bulk is transient, for it inevitably affects other things in the

surrounding universe; but the enlarging *in itself*, as a growth and a development and a perfecting self-movement of the tree, is immanent activity. Mark Twain tells, in *A Tramp Abroad*, of something he noticed in the Black Forest: "A toadstool—that vegetable which springs to full growth in a single night—had torn loose and lifted a matted mass of pine needles and dirt of twice its own bulk into the air, and supported it there, like a column supporting a shed." He adds, musingly, "Ten thousand toadstools, with the right purchase, could lift a man, I suppose. But what good would it do?" The growth of the toadstool, inasmuch as it is the exercise of a power which functions in, by, and for the toadstool, is an immanent activity. The main effect is in the toadstool itself. The fact that it lifts matted pine needles, or lifts men, is, so to speak, a side-issue, and not the main terminus and effect of its growth: it is something *transient*, and not immanent or indwelling within the toadstool itself as a growing thing.

All activity other than that of living things is transient activity. The rolling of a stone down a hill, the smooth movement of a well-built and well-oiled motor, the speeding automobile, the puffing locomotive, the ticking watch, the quiet sweep of the hands of an electric clock, the whizzing bullet, the upsurge of bubbles in a glass of carbonated water, the impact which sends sound waves from radio or phonograph, the flash of light from a beacon or from a distant star,—



all these are examples of transient movement or activity. None of these things is the self-perfecting movement of an agent. All are instances of movement or activity contributed (transiently) by an agent to some other thing. Consider the moving locomotive. The locomotive moves because the wheels go round; the wheels move because the driving-rods force them to do so; the driving-rods are moved by the steam in the cylinders; the steam owes its power to the heat and the confined space of the boilers; the heat is due to the releasing of energy from the fuel; the fuel got its energy from chemical and substantial changes, induced, under the pressure of earth, in decaying vegetable matter; the vegetable matter got its power from its structure and its response to the action of sunlight and heat and moisture and air; and the sun and the elements got their power, ultimately, from their Maker. And their Maker is the All Living God. All movement or activity, even the most obvious and mechanical of local movements, can be traced back by an inevitable chain of strict reasoning to the First Cause. All activity, even the most purely transient activity, can be, and indeed must be, traced back to indicate an Infinite Immanence of Activity, to an existing God, the Necessary, Eternal and Non-originated First Being.

Life, then, may be described as the power for immanent activity, which is only another way of saying that life is the power of self-movement, and of self-

perfecting movement. Again we notice that this is a description of life as it exists in *creatures*.

### c) LIFE AS ACTUALITY

A thing which exists is said to be actual; a thing which can exist, which is possible, is said to be potential. Further, an existing thing is actually what it is; it is potentially what it may become. Ice is actually ice, but potentially it is water; it actually has existence as a solid, but potentially it has existence as a liquid. Conversely, water is actually liquid, and potentially solid (ice) and gaseous (vapor or steam). The boy is actually a boy; potentially he is a man. The sinner is actually a sinner; potentially he is a saint.

A thing has actuality inasmuch as it has a determinate being. A living thing is actually a living thing inasmuch as it has the determination, or "form," which makes it alive. Therefore the determinate reality, the form, by which a thing is a living thing, is the basic actuality or the first or fundamental actuality about the thing-as-a living thing. For this reason, the determinate reality, the form, the essence, which makes a thing alive is called life in first actuality. The ancient Latin phrase is "*vita in actu primo*": "life in first act" or "life in first actuality." We shall presently find that the principle or form which makes a body a *living* body is the psyche or *soul*. The soul itself is "life in first act." The soul is that actuality whereby, first and foremost, the bodily being which

actual  
power

has it is alive. Hence, the soul or life-principle is "life in first act."

The life-principle, or soul, in a living body tends naturally to exercise life-activities in and through that body. Not that the life-principle is merely enclosed in a body as a prisoner is enclosed in a cell; no, the life-principle is joined with the body in a substantial way, so that the living body is one living substance; and it is this living substance which has life-activities. Yet it is *by reason of* the life-principle that the living body has life-activities and tends to exercise them,—*must* exercise them, indeed, if it is to remain alive. And the actual exercise of life-activities constitutes "vita in actu secundo," "life in second actuality," or "life in second act."

To put the matter more simply: a living body, must have a life-principle or soul to make it live. This principle, therefore, *is* the life of the living body inasmuch as it is the first, and foremost, and basic actuality whereby the body is alive. Further, the living body, to be living at all, must necessarily exercise the activities proper to a living body. Such exercise of life-activities, therefore, *is* the life of the living body, not indeed basically (or *in first act*) but as a necessary consequence upon the fact that the body lives. Exercise of life-activities comes in the second place, once the body is alive in the first place. Hence the exercise of vital activities is life in second act.

\* In a word: life in first act (that is, in first actual-

ity) is the soul or life-principle. Life *in second act* (that is, in second actuality) is the vital function or operation.

#### d) DEFINITION OF LIFE

We are to define the term *life*, and the term expresses the idea or concept (that is, the mind's essential grasp) of the *reality called life*. Our definition is to be at once the explanation of a word or *term*, of the *idea* or concept which is expressed by the term, and of the *reality* or thing of which the mind has the idea and for which the term stands.

Life is the natural capacity of an agent for self-perfective immanent activity or movement. This is rather a definition of life *in first act*. We may define life *in second act* simply as *self-movement*.

Life is defined as the natural capacity of an agent for self-perfecting movement, because this capacity is common to all living things (that is, *created* living things); it is the source of their life-activity; and it is never found in lifeless things. The definition, therefore, is the accurate explanation of an essence, and is, in so far, a true definition. Further, life is defined as self-movement, for such movement is inevitably characteristic of every living creature (plant, animal, man, or spirit), and is never predicable of a lifeless thing. Again the definition accurately designates a certain thing, a definite essence, and is, in consequence, a true definition.

Life, as we have defined it, is the life of creatures, of limited agents. God, the all-perfect Being (as we learn from the branch of philosophy called Theodicy) is the All Living; but the divine life is not self-perfective; indeed, that which is all-perfect cannot be perfected. Further, in creatures life-activity is something distinct from the life-principle; the living thing is not the same as its vital activity, nor is the life-principle or soul the same as the operations which proceed from it. In God, the vital activity is one with the divine essence and substance. Again, in creatures life-activity is *caused* by the life-principle; in God nothing is caused; the divine essence is the *reason* for the infinite life-activity of God's understanding and will, but does not *cause* this activity. Finally, in creatures self-movement inevitably involves a *change* in the living thing which exercises it; in God there is no change or shadow of alteration.

From the foregoing consideration we see that life, inasmuch as it is a *perfection*, is predicable of every thing which lives, of creatures and of God, the Creator. But life, inasmuch as it is a *perfecting*, is predicable of creatures but not of God, who is all-perfect and therefore not perfectible. Life, therefore, is predicable of God and of creatures in a manner that is not wholly the same, nor yet wholly different. It is said to be predicable *analogously* (or *by analogy*) of God and of creatures. But life is predicable of living creatures *univocally*, that is, in precisely the same man-

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 the divine life is not self-perfective

ner of each, though not necessarily in the same *degree*. Thus when we say that a plant is alive, and that an animal is alive, and that a human being is alive, and that the soul of man is alive, and that an angel is alive, we use the term "alive" in precisely the same sense, even though we do not mean that the same *degree* of life,—the same capacity and complexity of varied vital operation,—is present in each of the creatures mentioned.

SUMMARY OF THE ARTICLE

In this Article we have learned what is meant by the *attributes* or *properties* of living things, and have found that these indicate and evidence the reality called *life*. We have seen that the basic property of a living thing is its capacity or power for *self-movement*. We have distinguished activity or movement as *transient* and *immanent*, and have learned that life-activity is always *immanent activity*, even though it regularly has outer effects or "side issues" which are transiently effected. We have noticed that immanent activity is synonymous with vital activity or life-activity, and that all non-vital activity is necessarily transient in character. We have noticed further that the existence of activity, immanent or transient, points inevitably back to an Infinite Immanence of Activity as its necessary First Cause. We have described life in *first actuality* and in *second actuality*.

We have defined life, and have noticed that life is predicable of living creatures *univocally*, while of living creatures together with the Living Creator life is predicated *analogously*.

## ARTICLE 2. THE DIFFERENCE BETWEEN LIFE AND NON-LIFE

a) How Things May Differ    b) Points of Essential Difference in Living and Lifeless Bodies

a) HOW THINGS MAY DIFFER

Things are either *identical* or they are *different*. The identity of things may be more or less complete. It may occur only in minor matters such as quality or quantity (thus snow and milk are identical in point of whiteness; honey and sugar are identical in the fact that they are both sweet; a yard of silk is identical with a yard of cotton in quantity) or it may occur in the major matter of essence. In point of essence again, identity may be more or less complete. The oak and the pine are identical as *trees*; the oak, the pine, weeds, moss, grass, and ivy are not identical as trees, but they are identical as *plants*.

The absence of identity is called *distinction*, and sometimes *difference*. It is obvious that just as *identity* is a matter of degree, so with *difference*.

Of course, every single reality in the universe has its own proper identity as *an individual thing*, and, in

this respect, it is distinct and different from every other individual thing. The grains of sugar in a sugar-basin are individual grains; one is not another; and hence every grain is distinct from (and, in so far, different from) every other grain, and from every other reality. But the grains of sugar are all of the *same essential kind*; they are identical in their *essence*, even though they are distinct as *individual grains*. Again: John and Mary differ as individuals; they differ in sex and in name, and, most likely, in age, in size, in weight, in appearance, in complexion, in strength of body, in ability of mind, in disposition, in degree of health; likely, they differ also in parentage and place of birth; perhaps they differ in nationality, and even in color. But John and Mary do not differ in their essence,—in the basic *kind* of being they are; for each is a *human being*. They differ as *individuals*, but not in *essential kind*. In other words, their difference is not *essential*, but non-essential or *accidental*.

Now we ask about the difference between life and non-life, which, for our present study, amounts to the difference between living bodies and lifeless bodies. We ask, "Is this difference *essential*, or is it merely *accidental*?" The question is fundamental in psychology; upon its answer depends our whole philosophy of life and living bodies.

And the right answer to the question is this: living bodies differ *essentially* from non-living bodies. The proof of this assertion is now to follow.

b) POINTS OF ESSENTIAL DIFFERENCE BETWEEN  
LIVING AND LIFELESS BODIES

Everyone knows that there are marked differences between living bodies and lifeless bodies. But some philosophers and scientists have taught that these differences are not *essential* but merely *accidental*. Against this mistaken view stands the certain fact that the *properties* of a thing (unvarying characteristics and inevitable functions) indicate its essence; and the fact that the properties of living bodies are *essentially* different from (and often opposite to) the properties of non-living bodies. Now, essences that are indicated by essentially different properties are *essentially different essences*. Therefore, living bodies are *essentially* different from non-living bodies.

Among many points of essential difference between living and lifeless bodies we must notice the following:

1. *Natural Origin*—Living bodies come into existence by way of vital generation. Immediately or mediately, parent bodies produce them. And the parent bodies are of the same essence and nature as the generated bodies. Non-living bodies do not come into existence in this way. They are not generated by a vital process but are formed by physical accretion or by chemical combination. The apple-tree produces apples which have seeds that will produce other apple-trees, and these will produce other apples, and so on indefinitely. Apple-trees really come from parent

apple-trees (in the mediate way described above, or by the immediate way of cutting and planting a suitable portion of the parent tree). The parent-trees and the generated trees are of the same nature and essence. But a block of granite does not bud forth fruit or seeds from which other blocks of granite may be grown, nor will a "cutting" of the block grow and develop into another block. In point of *natural origin* we discern an essential difference between living and lifeless bodies.

2. *Growth and Decline*—A living body begins with a cell or group of cells which multiply and form tissues and organs and so build up a definite and complete living body (or *organism*) of a determinate type and kind. Normally, this body will develop into a state of maturity, using, from the first,—as indeed it did in its primal cells,—a strange power called *nutrition*, by which it takes alien substances into itself and changes these into its own substance. Reaching maturity, the living body tends to maintain its perfection *for a time*, still taking food and replacing the cells and tissues used up in the exercise of its functions. After a time,—even though food remain plentiful and all external conditions for living continue favorable,—the living body begins to decline in power, activity, function. Presently the organism breaks down; life is no longer present; the body is resolved into its physical and chemical elements. Now, it is not so with the growth and decline of non-living bodies. These do

not really grow at all, even when they increase in size or bulk. Non-living bodies do not come from active cells which multiply to build up their bulk and structure. There is, in lifeless bodies, no inner drive for development to a state of maturity or towards completeness in size, shape, or constitution. Lifeless bodies increase by the addition of parts from without, not by the development of parts through the exercise of immanent power. No one can fail to notice the essential difference between the growth of a plant and the increase of a snowdrift. The plant grows by the exercise of an inner power which assimilates alien substances and changes these into its own substance; the snowdrift grows by the external addition of flake to flake. Like the snowdrift, certain crystalline substances "grow"; chemical attraction draws to the mass of crystals other free crystals of the same essential kind, and these are piled up, layer on layer, to make the mass larger. But who does not see that this is a process essentially different from the growth of a living body?—Living bodies tend to exist and function for a period of time which can be well determined within maximum and minimum limits, and then to break down and decay; they tend to run a definite course of self-perfective action. Non-living bodies, on the contrary, tend to remain stable and maintain an equilibrium. The crystal vase may be as frail as the lily it contains; but the vase, if merely left alone, will stand ten thousand years, while the lily fades, dies,

and falls to pieces in a few hours. Non-living bodies may, indeed, be worn down and dissolved, but this is always an effect of the activity of outer agencies; they never disappear through the failure of some indwelling power which finds the body structure increasingly unsuitable to sustain its action. It is surely obvious that, in point of growth and decline, living and lifeless bodies are marked by *essential* differences.

3. *Structure and Function*—Every living body is *cellular* in structure. That is to say, a living body is made up of *cells*, which are microscopic bits of living matter (and hence each cell is itself a living body). The cells are highly complex in constitution and amazingly active. They grow and divide, spread and multiply, to build up a body of most varied parts (roots, bark, fiber, leaves, etc., or flesh, bone, muscle, nerve, etc.) and yet a body that is perfectly arranged and organized according to a definite type, and unified for its proper functions. The cells build up the body and the *organs* of the body. Organs are special parts (root, radicle, sucker, etc., or eye, ear, nose, lung, liver, heart, etc.) which are fitted to different and individual functions, and yet all their varied operations are meant to serve *the living body as a whole*. The cells thus build up a body that is most complex and varied in its parts, and all the various parts come together in a marvellous unity and balance according to a definite nature, plan, and type, in each sort of living body. The living body is, therefore, *heterogeneous* in its

parts (that is, it has parts of different kinds) but perfectly *harmonious* in its entirety. The union of heterogeneous parts in a harmonious living unit is called *organization* (for each part is an *organ*) and the living body is said to be *organized* and constitutes an *organism*. Sometimes we use these terms metaphorically in our daily speech, as when we speak of a newspaper as the *organ* of a political party, or say that a committee was *organized* for some purpose, or declare that a company of business men is a well-balanced *organization*. But, strictly and literally, there is no organization but that of the parts of a living body united in one harmonious whole. The word *organism* is synonymous with *living body*. Every living cell is an *organism* (for it is a living unit made of various parts) and every body made of living cells is an *organism*.—Now, non-living bodies are not cellular in structure, nor are they built up by a drive or power resident in their elements and tending to form them into bodies of definite structure and function. Atoms and molecules are active in non-living bodies, but their activity is purely *mechanical* (local movement), *physical* (variation in qualities, such as color, heat, sound, electricity), and *chemical* (activity of uniting, dissolving, etc.); their activity is never *vital*. In other words, the activities of non-living bodies are invariably *transient* in character, while the activities of organisms (that is, of living bodies) are specifically *immanent*. Of course, living bodies are *bodies*

and have the activities proper to *all* bodies, living and lifeless; and hence there is much activity, even in organisms, which is mechanical, physical, or chemical in character. But the point we make is this: living bodies have all the kinds of activity observable in non-living bodies, and, in addition, they possess an inner drive towards definite, complex, balanced structure and function, which non-living bodies do not possess at all, and do not so much as begin to possess at all. Further: living bodies are *heterogeneous* in their parts; lifeless bodies are *homogeneous* (that is, all parts are the same essential kind). The branch of a tree is of a different structure from its root; the fruit is not the same as the bark; but a bit of limestone chipped from a block is of the same structure as the block. An explosion may blow plant or animal into ten thousand pieces; but the pieces are not as perfectly plants or animals as the original living body was plant or animal. But an explosion will blow a block of limestone into ten thousand pieces, and each of the pieces is just as perfectly limestone as the original block. This illustrates what we mean by indicating *heterogeneity* and *homogeneity* as points of essential difference between living and lifeless bodies. We might develop the point further: the parts of a heterogeneous living organism are *interdependent*; their special functions all meet in a unified and unvarying tendency to perfect the organism as a whole,—to develop it, preserve it, and propagate it. And these interdepend-

ent parts and functions are thus *substantially* united in one living body. But the parts of a homogeneous mass (non-living body) are not *interdependent*, and they cling together *accidentally* (and not substantially) by reason of the external or extrinsic forces called gravitation and cohesion. Knock off a part from a living body, and the body suffers; it tends to repair the injury, and if it cannot repair it, or heal its wound and manage without the lost part, it dies and decays, and is dissolved into non-living matter. Knock off a part from a non-living body (a stone, a block of dry wood, a ball of wax) and the body is not discomfited; it makes no effort to heal or repair; it shows no tendency to decay and to resolve itself into other kinds of matter. Here we see that in point of interdependence and substantial union of parts, living bodies differ essentially from non-living bodies, the parts of which are not interdependent nor substantially unified. In all this we clearly see that living and lifeless bodies are such different things that only the blindest or most perverse judgment could refuse to recognize their difference as *essential*. *Structure and function* indicate, beyond the possibility of quibble, that living and non-living bodies are basically different *kinds* of bodies. In other words, they are *essentially* different.

#### SUMMARY OF THE ARTICLE

In this Article we have studied the meaning of *identity* and *difference*, and have learned what is meant

by *essential difference* as distinguished from *accidental difference*. We have reasoned from the essential difference of the *properties* of living and of lifeless bodies to the essential difference of these bodies themselves. In support of our reasoned argument we have drawn special proofs from a study of living and non-living bodies in point of their *natural origin*, their *growth and decline*, and their *structure and function*. Thus we have established the inescapable truth that between life and non-life, between living bodies and lifeless bodies, there is a difference truly *essential*.

#### ARTICLE 3. THE SCALE OF LIFE AND OF LIVING BODIES

a) Differences Among Living Bodies    b) The Degrees or Grades of Life

##### a) DIFFERENCES AMONG LIVING BODIES

All the living things in this bodily world may be grouped into three general classes: those that have growth, those that grow and move and have feeling, and those that grow and move and feel and reason. In other words, the three fundamental classes of living bodies, recognized by everyone, are *plants*, *animals*, and *human beings*.

There are many minor classifications, of course, in the classes of plants and animals. The botanist will present endless litanies of groups and sub-groups. The



zoölogist and the biologist will offer general classes or *phyla*, and carry each phylum down through classes, orders, families, genera, species, races, and varieties. But the botanist recognizes, throughout his lists, one *form* of life, namely, the *vegetal* or *plant* form. And the biologist finds in all the varied objects of his study the *sentient* or *animal* form of life. The psychologist must discern, in the major object of his attention, the specifically *human* form of life, which is *intellectual* or *rational*.

Now, are these three forms of life *essentially* different, one from another, or is their difference merely *accidental*? All living bodies are at one in the fact that they are *alive*; all have life in the sense of a capacity for self-perfective immanent activity; all manifest self-movement. In a word, all have *life*, and life is a single essence, with a single definition. Still, a single essence may have forms which are essentially different. We have just seen that there are essentially different kinds of bodies (*viz.*, living bodies and lifeless bodies), although all are equally bodies, and a body is one definite essence or reality, with a single definition. The fact is, of course, that some bodies are merely bodies and nothing else, while other bodies are bodies plus another essence called life. In the same way, plants, animals, and human beings all have life; but animals possess all that plants have, plus something else, and human beings have all that plants and animals have, plus something else. And the "something

else" in each case is something essentially different and superior. We assert that the difference which marks off animal life from vegetal life, and the difference which distinguishes human life from the life of plants and animals, is, in each case, an *essential* difference. The assertion is not difficult to prove, and we shall pause upon the point for only one brief paragraph.

We have already seen the axiom, "Function follows essence," an axiom very often quoted in the old Latin formula, *agere sequitur esse*. The phrase means that as a thing *is* so it must *act*. A reality is constituted by its *essence*; its essence makes it what it is, and therefore determines the scope and character of its activity or operation. Conversely, the operation or activity of a thing,—that is to say, its *proper* activity,—is an indicator of the basic constitution or essence of that thing, and indicates the capacity and the limitations of that essence. Hence, if one living body has a proper operation for which another living body shows no capacity whatever, there exists, between these two living bodies, an *essential difference*. For function follows essence, and the proper function of the first body follows from, and indicates, an essence which is in no wise indicated by the proper operation of the second body. In a word, here are *two* essences. And this is but another way of saying that the difference between the two bodies in question is an *essential* difference. Now, the operations of sensing, and of

conscious local movement, are proper to animals, and are in no wise attributable to plants; plants are not equipped with organs for sensing; they lack the nervous structure required for conscious activity, and they are regularly rooted and fixed in such a way that self-directed local motion is utterly impossible to them. Yet the essence of plants is definitely and completely constituted without these functions, whereas the essence of animals requires them. Different functions indicate different essences. Therefore, between plant and animal there exists an essential difference. Further, the human operations of understanding and willing are entirely beyond the capacity of brute animals; the animal essence is complete without these operations while the human essence requires them, at least *in actu primo*, in basic capacity, even if this capacity be unrealized in actual operation. Different proper functions indicate different essences. Therefore, between brute animal and man there exists an essential difference.

We conclude, therefore, that there are, in this bodily world, three essentially different forms of life: *plant life* (or *vegetal life*); *animal life* (or *sentient life*); and *human life* (or *rational* or *intellectual life*).

#### b) THE DEGREES OR GRADES OF LIFE

Not only are there three essentially different forms of bodily life, and consequently three essentially dif-

ferent kinds of living bodies, but the forms and kinds are also *grades* or *degrees*. The word "grade" (and, indirectly, the word "degree") is derived from the Latin *gradus* "a step." And a step is a pace forward or back, up or down; it suggests a connection or relation with another situation. A step is like one level of a stairway, or one rung of a ladder, chiefly in this: that the second level or rung has all the elevation of the first, *plus* its own elevation; and the third level has all the elevation of the first two, *plus* its own elevation.

In bodily life, and in living bodies, we discern true *degrees* or *grades*. The lowest and least complex level of life is *plant* life. The next level is *animal* life. A plant is a bodily thing which takes nourishment, grows, and generates its kind. So is an animal. All that a plant can do, an animal does; but an animal does *more*. An animal, in addition to plant operations, manifests its own proper activity of sensing, appetizing, and moving about. Therefore, plant life and animal life are not merely two forms of life, but two *grades* of life. The third and highest level of life in living bodies is *human* life. Man takes nourishment, grows, and propagates his kind, like a plant; he senses, appetizes, and moves about, like an animal; and, in addition to these operations, he exercises his specifically human operations of understanding and willing. Hence, plant life, animal life, and human life are distinct *grades* of life. And plants, animals, and hu-

man beings are distinct *grades* of living bodies. In the foregoing section of this Article, we have seen that these grades are *essentially distinct or different*.

#### SUMMARY OF THE ARTICLE

This brief Article has taught us that all the myriads of living bodies found in the world may be classified under three general heads,—vegetal beings, sentient beings, and human beings; or, more simply, plants, animals, and men. We have learned that these classes of living bodies manifest, respectively, functions or operations which are different, not merely *accidentally*, but *essentially*. And since function follows from, and indicates, essence, we have concluded that plants, animals, and human beings are *essentially different kinds of living bodies*, or, in other words, that they are endowed with *essentially different forms of life*. We have learned further that these essentially different *forms* of life are also essentially different *degrees or grades* of life.

#### ARTICLE 4. THE PRINCIPLE OF LIFE

- a) Meaning of *Principle*
- b) Need of a Life-Principle
- c) Character of the Life-Principle

##### a) MEANING OF PRINCIPLE

A *principle* is a source or a starting point. The word *principle* is the English form of the Latin *prin-*

*cipium* which, in its simplest meaning, signifies “a beginning.” In somewhat ampler form, the definition of *principle* is this: “A principle is that from which anything takes its rise in any manner whatever.”

We often employ the term *principle* with reference to things of the mind, and so we speak of “the principles of logic,” or “the principles of mathematics.” Again, we use the word with reference to moral character or conduct, as when we say, “He is a man of principle,” or “Some politicians have no principles.” These uses of the term are justified by its definition. The principles of logic and of mathematics are the self-evident and axiomatic truths (and also truths fully demonstrated) which serve as *the source or origin* from which conclusions are drawn; or these principles are the laws of procedure which, in a true sense, *give rise* to the processes of reasoning conducted in accordance with their requirements, and to the fruits of such rightly conducted processes. Again, “a man of principle” (that is, “a man of good or admirable principle”—the expression is elliptical) means a man whose knowledge of what is right, and whose will to act in accordance with that knowledge, serve as the source or origin or well-spring of his conduct. On the other hand “one who has no principles” (the phrase is elliptical and means “one who has no proper or good principles”) is a person who lacks a noble and unfaltering will to do well, and hence does not possess the moral equipment which

should be the well-spring of admirable human conduct.

A *principle* is that whence *anything* takes its rise *in any manner whatever*. A beginning is a principle, for a thing which begins takes its rise at that point. A law is a principle, for that which is in accordance with the law is, so to speak, guided into being by the law, and takes its rise there. A cause is a principle, for a cause contributes to the being of its effect, and the effect therefore takes its origin or rise in its cause.

In our present study we are concerned with the *principle of life* or the *life-principle*, and we wish to know the origin, source, or well-spring of vital activity. We wish to know whence life and life-activities come. We do not now ask about the Creator of life. We take the living body as it stands, and ask what makes it live, what makes it capable of life-activities, what there is in the living body that makes it a *living* body.

#### b) NEED OF A LIFE-PRINCIPLE

The living body is itself the principle of its vital operations; it lives and functions. Why, then, should we seek anything further in the way of a principle of life? Will it not suffice to say that the body itself *as a material substance, or as an organized substance, or as a substance characterized by the interplay of physical, chemical, and mechanical forces*, is the sole and adequate principle of life-activities? No; we may

not truly say so. The living body is indeed the principle of its vital operations, but it is not the *first* principle of these activities. As philosophical psychologists we must seek out the first, the fundamental, the basic principle of life in living bodies. And there is something in the living body,—something substantially united with it, yet not to be identified with its mass, its structure, its incidental forces, or its organic parts,—by reason of which the body is a living and functioning body. This “something” is the fundamental and substantial reality that we seek as the *first principle of life* in a living body.

The body is, first and foremost, a material thing; it is composed of *matter*, that is, of a three-dimensional corporeal substance. Can the material constitution of a living body be the basic source of its life and its vital activities? No; otherwise all bodies would be living bodies, which is not the case. There were certain philosophers in old Greece, from six to four centuries before Christ, who believed that all matter (that is, the whole bodily universe) is alive. These theorists were called *hylozoists*, and their doctrine *hylozoism*,—terms which derive from the Greek *hyle* “matter,” and *zoe* “life.” And there are some physicists to-day who hold that living and lifeless bodies are all “of a piece.” But the hylozoists, ancient and modern, have not only failed to justify their contention by anything remotely resembling a show of evidence; they have gone flatly against the requirements

*Life Principle*

of reason, the testimony of experience, and the unceasingly repeated findings of laboratory tests. We need not discuss the point, for we have already proved that there is an essential difference between living and lifeless bodies. We may state our position thus: all bodies are material realities, but not all bodies are alive; therefore matter (or "materiality") cannot be the basic principle of life in living bodies. There is need to look further for this first life-principle.

The living body is not only material in constitution, it is *organic* in structure; it is an *organism*. In other words, it is a substance composed of active, heterogeneous, interdependent, balanced parts, unified and working harmoniously together by an immanent activity which tends to the well-being of the living body as a whole. If, then, the material constitution of a living body is powerless to explain its vital activities, may not its organic structure be the basic source or first principle of these activities? It cannot be so. For the organism is the *effect* of life and life-activities. Life and its functions are present in the primal cell, which, *by means of vital functioning*, develops into the finished organic body. Certainly, then, we cannot say that what is the *effect* of life-activity is the principle or *cause* of the same activity. We should not be so unreasonable as to assert that the structure of the automobile engine makes the car go; few are likely to say that who have had the exhilarating experience of paying current prices for gasoline

and oil. Yet it would be far more reasonable to ascribe the mechanical activity of an engine to the arrangement and inter-balance of its parts than to assert that the organic structure of a living body accounts for its vital functioning. For the simplest engine does not present itself to our observation as a thing *developed* by an inner power, of resistless drive and definite direction, once resident in a microscopic wheel or bolt. Further: if the organism were the basic principle of vital activity, life could not cease as long as the organic structure should endure. But a sudden death,—not *apparent*, but *real death*,—sometimes leaves the organic body momentarily intact. True, the organism begins to disintegrate and decompose immediately *after* the life-principle has departed. But how, in the circumstance here considered, could life depart if the organic structure of the body were the basic source of its life?—It may be here objected that the organism of the primal cell, and not the completed organism of the full-membered body, is the basic principle of life. The objection is a mere quibble. It simply carries the question of the life-principle from larger bodies to smaller bodies. Life in the cell or in the elephant presents the same need of explanation by a vital first principle which is neither the body-mass nor the organic structure of the living body. If you are studying the nature of wood, you do not come nearer to your goal by grinding a massive beam into minute grains of sawdust.

For the nature of wood is manifested in the smallest grain of sawdust as perfectly as in the largest log. But this metaphor of beam and sawdust falls far short of the reality it illustrates in the present instance. The grains of sawdust could not develop into a log, although a log may be computed in terms of sawdust, and considered as a simple aggregate of its grains. Not so the living body with respect to its cells. What is there in the microscopic cell, or in its organic structure, to explain its development into wholly various and interdependent parts, and into the bewilderingly complex finished organism of the living body? How does the tiny cell explain its tendency to increase and multiply, to build up bone and muscle and tissue and nerve and sinew and eye and ear and stomach and heart? Nay, how does the cell or its structure account for its simple act of growth and fission, so that two cells exist where one existed before? The cell's growth and fission, and all its further developments, are *effects* of life and of the activity of the life-principle; they are not the *causes* of life, not its principle. The cell *has* something by virtue of which it lives and grows and functions and develops. It has an indwelling power and drive which carries it in a definite and marvellously well-planned direction. The cell *has* something; it *has* life; and it has the substantial *principle* of life. And this principle is not the mere organic structure of the cell, or of the larger and more complex organism which develops

from the cell. No; we must look further than organic structure in our quest for the fundamental principle of life in a living body.

Granted that material mass does not explain life; granted that organic structure is the *effect* of life and not its explaining principle; may we not still declare that *certain physical, chemical, and mechanical forces*, resident and active in the living body, are the basic principles of vital functioning? Again we answer that it cannot be so. For the specific activities of living bodies are *immanent* in character; physical and chemical and mechanical forces or energies are invariably *transient* in their action. Life-activity is manifested as a continuous tendency to *movement*, to self-perfecting immanent action; physical, mechanical, and chemical activity tends towards *equilibrium and rest*. All the widely various activities of a living body are superbly *harmonized*, and tend to the accomplishment of a single end,—the well-being of the living body itself. This well-being is the development, the perfection, the preservation, and the propagation of the living body. No such activity is manifested by non-living bodies or their forces. Consider just one activity of a living body,—the activity of a plant in seeking and finding a required item of nourishment. Mark Twain, speaking in *Following the Equator* of the "great gum trees, lean and scraggy and sorrowful" which he saw in Australia, writes, "Once a cement water-pipe underground at Stawell began

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gradually to reduce its output, and finally ceased altogether to deliver water. Upon examining into the matter it was found stopped up, wadded compactly with a mass of root fibers, delicate and hairlike. How this stuff had gotten into the pipe was a puzzle for some little time; finally it was discovered that it had crept in through a crack that was almost invisible to the eye. A gum tree forty feet away had tapped the pipe and was drinking the water." Here we notice that no mere mechanical or chemical activity will explain the phenomenon recorded. It was not the *roots* that needed the water; it was the *tree*, and the well-being of the whole tree was served by the unusual growth of roots and the amazing accuracy of that growth through forty feet of soil and several inches of cement pipe. Nothing in the play of physical, chemical, or mechanical forces can even begin to explain the *vital* activity of the quest and absorption of nourishing elements by a living body. And if this is the case in one function of the lowest grade of living bodies, what shall be said of the much more wonderful phenomena of sensing, appetizing, conscious movement, understanding, and willing? Life is clearly not explicable in terms of physico-chemical or mechanical activity; life has not even the beginning, nor the beginning of a beginning, of an explanation in such activity. For, granted that living bodies do manifest activities of a mechanical and physico-chemical nature, these are invariably *instrumental*

to the life function, and are under the direction and control of the life-principle which applies them to its uses; they in no wise explain the life-function itself. There is need to look further for a basic life-principle in every living body.

To sum up: the material bulk of a living body is, in one sense, a principle of the body's activities, but it is not the *first* principle. The organic structure of a living body is a principle of its function, but it is not the *first* principle. The interplay of physical, chemical, and mechanical forces observable in a living body, is a principle of some of the body's activities, but not the *first* principle. There is, and must inevitably be, in every living body, an indwelling, con-natural, substantial principle,—a constituent element of the living substance itself; not something merely resident inside the living body, and using the body and its members as instruments of its action,—which makes the body live, and gives it its determinate substantial character as an organism of definite kind or type; which makes the living body a body, a *living* body, *this kind* of living body, *this one substantial living body* with all its capacities and operations. This principle is the first, the basic, the fundamental life-principle. It is called *the psyche* or *the soul*. Some scientists and philosophers do not like the word *soul*, and go to ridiculous lengths to avoid it. They call the soul the *growth-force*, or *bathmic force*, or *plasmic energy*, or *biotic energy*, or *entelechy*, or *vital direc-*

tion, or even *the something over*. Something over, indeed, the life-principle is; something substantial, over and above the material mass of the living body, its organic structure, and the physico-chemical and mechanical activities observed as instrumentally employed in its vital functions.

✓  
virtually  
c) CHARACTER OF THE LIFE-PRINCIPLE

Aristotle's definition of the life-principle is not likely to be improved. He calls it *the first act of a physical organic body*. In the definition the term *act* means *actuality* or *actuality*; it does not mean *action* or *operation*; for, as we have seen, action or operation in a living body constitutes life *in second act*, and an *action* (which is indeed an *actuality* or *act*) presupposes the fundamental actuality of the thing which acts. The definition requires a word or two of explanation.

((a) The soul is *the first act or first actuality of the living body*. In other words, the soul is what is called *the substantial form* of the living body.) Every bodily object presents two aspects to our consideration: first of all, the object is *a body*; secondly, it is *this kind of body*. Now, all bodies are at one in being *bodies*. A bit of coal, a weed, a worm, a bird, a horse, a man, are all *bodies*; each is as truly and completely *a bodily thing* as the others. There is, therefore, some *common basic substrate in all bodies*, living and lifeless; it is that by reason of which they are *bodies*. This common

fundamental substrate does not exist *apart* from existing individual bodies; it does not exist *by itself*. It is *purely potential*, that is, purely capable of receiving existence in determinate actual bodies. And this fundamental bodiliness, this highly imperfect substantial reality which is the basic substrate of all bodies, is called *prime matter*. We must not conceive of prime matter as a definite *kind* of bodily substance; we must not image it as an original mass of dough out of which various body-biscuits are formed. No; a body that possesses a definite *kind*, exists in that kind; it is already *formed*; and prime matter is completely without *form* (i. e., without determinate being). Prime matter is *purely potential*; it is not determinate or *actual*; we may even say that prime matter is *pure potentiality*. (For a body to exist, prime matter must be *in-formed*; that is, some substantial, determinate, and determining principle must join in substantial union with prime matter. By so joining (i. e., by so *in-forming* matter), the substantial determinant *actualizes* the prime matter, and a bodily being,—actual and determinate,—emerges.) This determining substantial principle is called *the substantial form*, and, as is obvious, it is the first act, the first actualization, of the prime matter, and it bestows actual existence upon the prime matter in the bodily being so formed. Thus every bodily thing is a composite of *prime matter* and *substantial form*. All that is substantially determinate about a body must come



from its substantial form; for prime matter is pure potentiality, pure indeterminateness.—In passing, we must notice here that a bodily thing has a *third* aspect: not only is it a body, and *this kind* of body, but it is this *individual body* of this determinate kind. It will have many marks which belong to it as an individual body, such as exact shape and size and location and temperature, and so on. And all these items are *determinations*, and hence *forms*. But they are *accidental forms*. An individual body has as many *accidental forms* as it has *accidental determinations* (for these are synonymous), but it is inevitably a substance of one definite essence and nature and kind, and hence has only *one substantial form*.—We are not concerned here with accidental forms, but with the substantial form, and with the substantial form of a living body. (That which makes a body an actual, definite, determinate, substantial being of one essence, nature, and kind, is its substantial form. The substantial form is the first, the basic, the fundamental *actualness* in the bodily substance! It is therefore rightly called *the first act* of the body. Now, in living things, *the first act by which the body has its being as an actual, existent body of this definite kind*,—that is to say, *the substantial form of the living body*,—is the life-principle or soul. The soul is, therefore, rightly defined as *the first act of the living body*.)

(b) The soul is the first act of a *physical organic body*. The soul does indeed make the living body a body

for the soul is the *first act* or the *substantial form* of the living body, and without it the body would not exist. But we define the soul as the first act of the *physical organic body* to indicate that, among substantial forms, the soul has a special character. The substantial form of a lifeless body actualizes prime matter into a body of like or homogeneous parts. The substantial form of a living body (i. e., the soul) actualizes a body of different or heterogeneous parts; and these parts are organic and constitute an *organism*, a composite of unified, balanced, interdependent, yet different parts. The substantial form of a lifeless body is said merely to actualize a body, or, more accurately, to actualize prime matter and in-form a body. The substantial form of a living body truly does this also (actualizes prime matter and in-forms a body) but *as a soul*, as a *life-principle*, it is accurately said to actualize the organic body or to in-form the *organism*,—in other words, to in-form the *physical organic body*.

#### SUMMARY OF THE ARTICLE

In this Article we have studied some very important things, a few of which are involved and difficult. We have learned the meaning of *principle*, and, in special, of *life-principle*. Life is a thing to be accounted for, and we have sought its explanation vainly in the living body as a mere *material substance*,

as a substance of *organic structure*, and as a substance characterized by the interplay of *material forces* (physical, mechanical, chemical). We have discerned the need of a basic life-principle, over and beyond these. We have recognized the need of a life-principle which is a substantial, constituent element of the living body; which makes the living body what it is, and dowers it with its capacities and functions. We have called this principle *the soul*, rejecting the somewhat bizarre names which certain scientists and philosophers have invented for it. We have defined the soul, and have explained the definition. Incidental to the definition of the soul, we have indicated the meaning of *prime matter, substantial form, accidental form.*

## CHAPTER II

## VEGETAL LIFE

This Chapter presents a brief study of the *vegetal form* or *plant form* of life. It offers conclusive evidence in proof of the fact that a plant is really *alive*, and of the further fact that, although the plant is a *living body*, it is not dowered with *sentient* or *animal* life. The Chapter discusses the *vegetal operations*, and treats of the *vegetal life-principle* or *plant soul* with its natural characteristics. These matters are discussed in the following Articles:

Article 1. The Life of Plants

Article 2. The Vegetal Operations

Article 3. The Vegetal Life-Principle

## ARTICLE I. THE LIFE OF PLANTS

a) Plants as Living Bodies    b) Plants as Non-Sentient Living Bodies

## a) PLANTS AS LIVING BODIES

A living body must be an organic body which is capable of self-perfective immanent activity. And such self-perfective action means action which tends to the upbuilding or *development* of the body, to its *preservation* by means of constant repair and replacement of worn-out and discarded elements, and to the discharge of connatural function in *propagating* its

species or kind. Now, a plant has the capacity for such self-perfective immanent activity, and, given fair opportunity, it will infallibly exercise all of its functions. It will develop and grow to maturity; it will actively tend to maintain itself in being and perfection; it will tend to be fruitful and thus to generate other plants of its own nature, kind, and species. Therefore a plant is truly *a living body*. It is not a mere automaton or a machine-like arrangement of parts which operate under the action of physical, chemical, and mechanical energies or forces. Such forces are manifestly at work in the living plant, but they are under a direction not their own. There is a unifying and constituent principle in the plant which uses these lifeless energies or forces as the instruments of the plant's activity and various operations. This principle is *the substantial form* of the plant; it is *the vegetal life-principle*; it is *the plant soul*.

There have been in times past, and indeed there are to-day, physicists (from the atomists of ancient Greece to the Cartesians of the past three centuries and the materialists and mechanists of the present) who maintain that plants are not alive at all. But this contention stands fully confuted by the fact that plants have life-activity, and hence a life-principle, and therefore life itself. Plants are alive. The plant has its own fixed and determinate mode of action, and its action is really its own: it is immanent action, performed by, in, and for the plant itself; it is

action originated by the plant, directed by the plant, and finished by the plant. Thus, for example, a plant takes food or nourishment, and shows a nice discrimination in selecting and assimilating what suits its nature. It transforms the food into its own substance, building up and maintaining the various parts of a highly complex and delicately interbalanced whole. Now, no operation of lifeless bodies or of lifeless forces (physical, chemical, mechanical) is thus self-originating and self-directive and self-perfective. Chemical affinities, physical union, gravitation, cohesion, inertia, electrical vibration or impulse, local movements,—all these and all other lifeless forces or energies are, in non-living bodies, exercised by the wholly *extrinsic* influence of one bodily thing upon another, even when this influence ends in the substantial union or fusion of the bodies in question. There is nothing *self-directive* in lifeless activities considered in themselves. There is in them no inner drive or tendency to keep on functioning for the benefit of the bodies in which they are found; there is rather the tendency, excited externally or extrinsically, to exercise their mutual function *and have done with it*; there is a tendency to equilibrium, and rest, and inertia. Thus lifeless forces are always *transient* and *extrinsic* in their manifested activity; they show no tendency towards development, preservation, and propagation in themselves or in the bodies which they affect. Living bodies, on the contrary, tend, not to

equilibrium and rest, but to continuous, unremitting, self-perfective action; and the plant is, on this score, a truly living body. The plant, as we have seen, manifests *immanent* and *intrinsic* activity. And even when the plant employs lifeless forces (physical, chemical, mechanical) as it constantly does, it *controls* these, and *applies* them, and *directs* them, by a power not resident in these forces but *in itself*, towards its own well-being. Plants are, therefore, not to be classed with lifeless bodies. Plants are truly *living* bodies.

b) PLANTS AS NON-SENTIENT LIVING BODIES

A *sentient* living body has the powers of *sensing*, *appetizing*, and *moving locally*. It has the power of *sensing*, that is, the power of being *aware*, of *knowing*, by means of body-structure or organ, certain bodily objects. A sentient living body has one or more *senses*, that is, organic powers of knowing bodily objects, and among these powers the basic and fundamental and essential one is *the sense of touch* or *feeling*. The most imperfect sentient body has at least the sense of touch. Indeed, it is by the manifestation of the sense of touch that certain very imperfect animal bodies show that they are truly sentient. It is by discerning the presence of this sense that the scientist is enabled to classify the lower animals (such as the one-celled animals) as sentient or animal bodies, and to distinguish them from plants.

A sentient body has the power of *appetizing*,

that is, of tending towards what the sense apprehends as good or pleasing or desirable, and away from what is grasped as bad or displeasing or harmful. This *appetition* or *appetite* is the natural outcome of knowledge; appetite necessarily follows on sensation.

A sentient body has the power of *moving*, that is, of *locomotion*. Appetition would be a great hardship if the appetizing body could not *move* to carry out the tendency consequent upon sense-knowledge.

Now, manifestly, plants are not *sentient*. If they were, they would necessarily give some outward signs of it. Life is an inner capacity and force, but, in living bodies, it inevitably manifests itself in *organic* (and hence *outer*) action. In an earlier chapter we learned that Immanent activity may be accompanied or evidenced by outer and transient effects (Cf. *Chap. I, Art. 1, b*). This is always the case with sentient activity which necessarily involves some modification or change in the organ affected by such activity. To put the matter more simply: all bodily life must be manifested in a bodily way: function follows essence. Now life-functions are ceaseless while life endures, and, in the living body, these functions are continuously exercised through and by means of the bodily organs or parts. Therefore we must say that, if plants were sentient, they would infallibly give signs of sentiency. But, as a matter of fact, plants do *not* give signs of possessing sentiency. In the first place, they are not equipped with the special organic *system*

necessary for sentient functions. And, in the second place, such parts or organs as plants have, manifest no sign, or beginning of a sign, of a tendency towards sentiency. We conclude that plants are not sentient. They are *living* bodies; but they are not *sentient* living bodies.

There is a saying, axiomatic among philosophers, that "Nature does nothing in vain." In other words, no natural thing, no natural body, will have powers that it cannot use. But if plants were sentient, their sentiency could not serve them; they could not make use of it; and, in consequence, it would be an utterly "vain" piece of natural equipment. For consider: sentiency involves appetite and the power of local movement. But plants have obviously no power of local movement; they are regularly rooted and fixed in one spot. The tree slowly sends its roots far abroad to obtain nourishment, but the tree itself does not stir abroad in quest of desirable food, nor does it move, or tend to move, to avoid the advancing axman. Conscious appetite would be a vain thing, and a great hardship, in a living body which lacks the power of local movement.

It may be objected that there are certain plants with such unusual functions that they have been called *sensitive* or *sentient* plants. There is the plant which shrinks away from a touch; and there is the plant which closes the petals of its flower upon insects. These and other "sensitive" plants are not really

sentient at all. Their reaction to outer stimulus is marked, and much more evident to the casual observer than that of more common plants, but it is a vegetal and not a sentient reaction. Every plant closes upon its food in one way or another, by the action of vessels in root or leaf or flower. Every plant reacts in some measure to certain outer agencies, and the shrinking of a flower from a harsh touch is no more wonderful than the closing of the morning-glory when darkness comes, or the drooping of certain plants because of excessive dryness or excessive moisture. These activities, far from indicating sentiency, appear, at first sight, to be merely mechanical and chemical in their nature; but, as we have seen, closer investigation shows them to be radically vital.

#### SUMMARY OF THE ARTICLE

In this short Article we have studied the manifestations of *vegetal life* or *plant life*. We have seen that, while physico-chemical and mechanical energies are used as the *instruments* of the plant's functions, the plant itself applies, directs, and controls these forces to its own development, maintenance, and propagation. We have seen that the plant, in its life-activities, is self-directive and self-perfective; that, in a word, the plant gives unmistakable evidence of perfective self-movement, that is, *of life*. But we have found that the plant, although truly a *living body*, has only



3. *Absorption*. Organ: *intestine*. Function: the true food-elements of chyle are taken into the blood,—passing through the intestinal walls by a process called *endosmosis*,—and are carried, partly by veins and partly by lymphatic vessels, to the heart, and thence, by the pulmonary artery, to the lungs, where the blood is perfected and purified.

4. *Respiration*. Organ: *the lungs*. Function: the blood,—a liquid which carries needed elements to all parts of the organism, and carries away used and discarded matter and harmful by-products of organic action,—is taken through the pulmonary artery (or *lung-artery*) to the lungs, where an intake of oxygen, and the discharge of its freight of carbonic-acid gas (carbon dioxide) purifies it. When laden with carbon dioxide, the blood is very dark in color; when purified, it is bright red. The action of the lungs is partly *mechanical* (bellows-like action of breathing) and partly physico-chemical (mingling of the oxygen in the inbreathed air with the elements of the blood; elimination of carbon dioxide).

5. *Circulation*. Organs: *heart; arteries; veins; capillary vessels; lymphatic vessels*. Function: the heart, a hollow muscle of two parts, acts like a double pump: one channel of its pressure carries the dark used blood (and its freight of new elements from food digested and absorbed) to the lungs; the other carries the red blood through the arteries to build up and maintain the organism and support its connatural

operations. *Arteries* carry the red blood to the organs (but the *pulmonary artery* carries the dark blood to the lungs); *veins* carry the used blood from organs back to heart (but the *pulmonary veins* carry red blood from lungs to heart); *capillary vessels* exist in great number at the terminations of the arteries and connect the arteries with the veins; *lymphatic vessels* (so named from *lymph*, a colorless liquid which helps bring absorbed food elements to the heart) constitute a sort of parallel system with the veins and arteries and connect with the system of veins not far from the heart.—It will be noticed that the circulation of the blood has two "circuits": one carries the blood from heart to organs and back to heart, and this is the major circuit; it is known as *systemic circulation*. The other circuit carries the blood from heart to lungs and back to heart; this minor circuit is called *pulmonary circulation*,—a term which derives from the Latin *pulmones* "lungs."

6. *Assimilation*. Organs: all the various parts of the organism which take from the blood the elements they need and transform these into their own substance. Function: the transforming of required elements found in the blood into the substance of the acting organ; the *deassimilation* or unloading into the blood of waste matter by the various organs.

7. *Secretion and Excretion*. Organs: *glands*. Function: the *secreting glands* produce fluids,—drawing the materials for these from the blood,—which the

living body requires for positive organic functions. Such, for example, are the salivary, the gastric, the intestinal glands, the pancreas, the liver. The *excreting* glands separate out a product that is to be eliminated or cast off from the body, either as simple waste matter, or as a cleanser and wash for organic parts. Such, for example, are the kidneys, the sweat-glands, the lachrymal glands (or tear-glands).

#### b) GROWTH

The direct effect of nutrition is the preservation and development of the organism. As the living body develops, it increases in size; it *grows*. Growth continues, in normal circumstances, until the organism has attained a state of maturity or complete development. Thereafter, the effect of nutrition is to maintain the mature body in a properly functioning condition until its term of operation is finished.

It is by means of nutrition, and as a result of nutrition, that the body grows. Yet growth is a vital operation really distinct from nutrition. Growth may be defined as "a vital operation whereby a living body, by taking nourishment, increases its quantity and tends to attain its proper size."

Growth is a *vital* operation; it is *immanent* in character, although it necessarily has outer effects which are *transient* in relation to surrounding bodies.

Every species of living body (that is, every distinct natural class, the members of which do not breed

indefinitely with members of another class) has a definite *morphological type* (a term derived from the Greek *morphe* "form," which, in the present use, indicates structure and shape). There is, in every species, a *range of size*, from minimum to maximum, within the bounds of which bodies of that species are always found.

The basic element of every living body,—plant, animal, human,—is *the cell*. The cell is a microscopic organism, usually somewhat rounded in shape, which contains *protoplasm* and a *nucleus*. Protoplasm (from Greek *protos* "first," and *plasma* "a thing formed") is a jelly-like material technically described as "a viscid, contractile, semiliquid, somewhat granular substance, which forms the larger portion of the cell." The nucleus (Latin *nucleus* "kernel") is a body embedded in the cell; it is the main organ of the cell; it is the organ which serves the cell, first and foremost, in the discharge of its functions. The cell draws in food, by a process of osmosis, from surrounding substances, for the cell, being an organism or living body, manifests the operation of *nutrition*. Further, the cell *grows*, and when it has attained a suitable size, it is multiplied, each of the resultant cells being like the original cell. The growth and multiplication of cells continues; different cells of the same nature are united in *tissues*. From tissues the *organs* are built up, and the balanced union of organs makes a finished living body of the type from which the origi-



nal cell (or parent-cell) was derived. Thus, the growth and multiplication of cells,—in accordance with the vital drive resident in the original cell, which makes for the upbuilding of a definite *morphological type*,—accounts for the growth of living bodies.

It is to be noticed that the cell itself is a living body or organism. Except, however, in the one-celled animals (*unicellular* animals), the cell tends to develop into a larger and more complex organism of a definite kind (or *morphological type*). Both the cell itself and the body which results from its development and multiplication are *organisms*. It is more usual, however, to employ the term *organism* for the completed body,—that is, for the body completely *formed*, although not necessarily completely *developed to maturity*.

### c) GENERATION

By the term *generation* we mean, in this present study, an active vital operation. We mean the operation of *propagating*, of *reproducing*. Generation is an operation found in all types of living bodies. It may be defined as "a vital operation whereby a living body produces, out of its own substance, another living body of the same nature."

The definition does not mean that the new living body (the *offspring*) comes completely formed out of the substance of the parent-body. It usually comes in the form of a *seed* or *germ* which is capable of

developing (and *tends* to develop) into a complete living body of the same nature and morphological type as the parent-body. In plants and in the more imperfect animals, generation sometimes takes place by the budding out of offspring already formed, or by the mere severing of a suitable part from the parent body,—such, for example, as a branch, or twig, or root, capable of sustaining life and exercising vital operations as an independent individual plant. In most cases, however, generation comes about by the development of a cell which contains elements drawn from a male and a female body of the same specific nature. This seed-cell grows and develops in the manner already described; it is the source of all the cells, however different, that go into the making of the *new organism* or *offspring*.

Sometimes the original cell (containing the male and female elements) develops into the organism outside the confines of the parent-body. Thus seeds of plants are sown in the fertile earth so that the organism may develop. Thus the eggs of certain types of animals are hatched outside the parent-body. Sometimes the original cell (seed or germ) is developed within the female body which contributed, with the male, to its formation; and then the developed offspring is *born* into its separate existence. A point to be remembered is this: generation is not *birth*; the operation called generation is exercised when the male and female elements conjoin to form an active cell

which thereupon begins to develop; the moment of this joining is called the *moment of conception*; and the moment of conception sees the emergence of a *new life*, a new and individual organism, which, in the case of human beings, has then and thenceforth the *right to life*.

#### d) VEGETAL POWERS

Wherever we find an operation we find a *principle* for that operation. A principle, it will be recalled, is that from which anything takes its rise in any manner whatever. Now, we know that the living body is the principle of its operations; more precisely, we know that the soul or life-principle is the principle of the vital operations. That is to say, the soul is the *first* principle of such operations. But there is need to discern the *immediate* or *proximate* principles whence arise the specific operations of living bodies. We find that there are certain *powers*, distinct one from another, and all of them distinct from the substance of the living body, which constitute the active equipment of the organism. These powers,—notably in the higher types of animals and in men,—are sometimes called *faculties*, a term which comes from the Latin *facere* "to make" or "to do." Powers or faculties are capacities possessed by the living body for *doing* something, that is, for exercising the operations proper to its nature.

In plants, and in all living bodies,—since all organ-

isms possess the basic plant-grade of life,—there are three distinct *vegetal powers* or *plant faculties*, and these are the respective proximate principles of nutrition, growth, and generation. We call these proximate principles of plant-operation: the *nutritive power*, the *augmentative* or *growing power*, and the *generative* or *reproducing power*.

The first power manifested by the plant is the nutritive power. The most noble or excellent is the generative power. An organism is said to have reached full development or *perfection* when it is capable of reproducing its kind.

#### SUMMARY OF THE ARTICLE

This Article has given us a knowledge of the con-natural operations proper to *plants*, and,—since all living bodies share the *vegetal grade* of life,—to *organisms* generally. We have defined *nutrition*, and have discussed the *functions incidental to this operation*, listing those peculiar to animal and human organisms in addition to those found in plants. We have defined *growth*, and have indicated the development and multiplication of *the cell* as the root-source of growth in living bodies. We have defined *generation*, which is the reproductive operation in living bodies; we have indicated the manner in which new organisms come into existence. Finally, we have learned that the respective *proximate principles* of the

vegetal operations are three *powers* or *faculties* proper to organisms (*viz.*, the *nutritive*, the *growing*, and the *generative* powers); we have learned that these three powers are *distinct from one another*, and also distinct from the substance of the living body which possesses them.

### ARTICLE 3. THE VEGETAL LIFE-PRINCIPLE

a) Nature of the Vegetal Life-Principle b) Characteristics of the Vegetal Life-Principle

a) NATURE OF THE VEGETAL LIFE-PRINCIPLE  
A vegetal organism, like every bodily substance, is a composite of two fundamental substantial principles, called respectively *prime matter* and *substantial form* (cf. *Chap. I, Art. 4, c.*) Prime matter is the common fundamental substrate of all bodies. Substantial form is not common, but specific; and each body is constituted in its *essential kind* by its one (and only *one*) substantial form. That whereby a body is *bodily* is prime matter; that whereby a body is an *actual* body with a determinate essence and nature is the *substantial form* of the body in question. These two things,—prime matter and substantial form,—are the two co-principles by which a bodily being is constituted. Both are *substantial*; prime matter (which has no varieties but is simple and pure *potentiality*) is the most imperfect of substantial things, and can in no wise exist by itself, although it

is not an *accidental*, that is, a mere mark, qualification, or characterization of something else. Substantial form is also imperfectly substantial (unless it is *spiritual*). In a word, prime matter and substantial form, are *incomplete*. They must come together *in substantial union* to constitute the single complete substance of a body. And when they so come together in substantial union, the body is constituted as a complete, actual, existing body of a determinate essence, nature, and substantial kind.

Now, as we have seen, the vital principle or *soul* of a living body is the *substantial form of that body*. For the life-principle or soul is the *first act* (that is, the first actualization, actuality, actualness) of the physical organic body. Therefore *the vegetal life-principle is the substantial form of the living plant*. Notice carefully the words, "of the living *plant*." The higher types of organism (animals and human beings) have plant life, but, as we shall see, a *plant* soul is not the substantial form of either beast or man. The *animal* or *sentient* life-principle is the substantial form of an animal, and the *only* one (since there is not a plurality of substantial forms in the same body); and the *rational, spiritual human soul* is the substantial form (and the *only* one) in each living human person.

Since each plant has only one substantial form, and since this one substantial form is the vegetal life-principle or plant soul, it follows that all the substan-

tial actualness or determinateness of the plant must be radically attributed to the vegetal life-principle. This conclusion is inevitable. For the only other substantial principle in a plant, in addition to the substantial form, is prime matter; and prime matter is wholly indeterminate in itself, hence it cannot be the root-source of actualness or determination of any kind whatever. Therefore it is the vegetal life-principle which makes the plant *an actual body* and *an actual organism* of the plant type. The contribution made by the vegetal life-principle (or substantial form) to each plant is actuality, substantial existence, essence, nature, organization, capacity for operation. Yet the vegetal life-principle makes this contribution only when substantially united with prime matter, or, more properly, with the organic body. Taken alone, the vegetal life-principle has not in itself the essence, nature, organization, or capacity for operation which belong to the plant; nay, it has neither actuality nor existence. It is the substantial principle of all these things in the living plant, which it *makes* a living plant by its substantial union with matter. For prime matter and substantial form are substantial co-principles; *both* are required; *both* must be present in substantial union, else the body which they should constitute does not exist. All this is mentioned to stress two important facts: first, the fact that the vegetal life-principle is the sole radical source of the actuality and operation of the plant; secondly, the

fact that the bodiliness or matter of the plant is an essential principle of its constitution as an organism.

It is evident, from the foregoing study, that the vegetal life-principle is *incomplete as a substance*, and *incomplete as a plant*. Substantial it truly is; but it has no actualness and no proper operations apart from the plant of which it is a constituent substantial part. And, being but an essential *part* of the plant-substance, it is manifestly not completely a plant. Technically speaking, "the vegetal life-principle is *incomplete* both in the order of *substantiality* and in the order of *species*." In plainer terms, "the plant soul is *itself* neither a complete substance nor a complete plant."

The vegetal life-principle is a *material* substantial form. Not, indeed, that it is *made* of bodily matter but that it *requires* matter (in substantial union with itself) in order that it may actually exist and discharge the operations of which it is the root-source. The plant soul is called *material* because, in the sense described, it *depends on matter* in being and in operation.

#### b) CHARACTERISTICS OF THE VEGETAL LIFE-PRINCIPLE

1. *The vegetal life-principle is simple.* Simple means uncomposed, not made of parts, and hence *not divisible* into parts. Every substantial form has the property of indivisibility or simplicity. And the vege-

tal life-principle, is, as we have seen, a substantial form. The plant soul, therefore, is not made of separable parts like the organic body. It cannot *itself* be cut up by knife or saw or other instrument.

2. *The vegetal life-principle is actually one, but potentially many.* The rose-bush, for example, is one living body. Yet a gardener may make a dozen bushes out of that one body by the simple process of cutting off suitable parts from it and planting them in fertile ground. The knife of the gardener has not divided the plant-soul *itself*, for this, as we have just seen, cannot be done. But the organism, the rose-bush, can be divided; it is not simple; it is made up of parts. And the gardener in making his cuttings (which are thenceforth so many separate and individual rose-bushes) has actualized a *capacity* or *potentiality* of the original rose-bush to become a plurality of rose-bushes. The life-principle of the original bush was, before the cutting, *actually* one; but it was such a thing *as could become multiple* (that is, it was *potentially multiple* or *potentially many*). And the cutting actualized this capacity. The eleven new rose-bushes are now separate and individual plants. Each has its own single life-principle which is not any longer the life-principle of the original rose-bush from which the cuttings were taken. Nor is the life-principle of any of the new bushes a part of the life-principle of the parent plant. The cuttings, until severed, were parts of the original rose-bush; as soon as they are

severed they are no longer such parts, but are now individual and complete plants. But the life-principle in a cutting was not, before the cutting was made, a separable *part* of the life-principle of the parent rose-bush. For that life-principle is *simple*; it is not composed of parts (as the bush itself *is*), and hence it cannot be divided into parts. But, while it cannot be divided into parts, it is potentially *multiple*. In other words, it cannot be *divided*, but it can be *multiplied*.—There are various ways of explaining the phenomenon here considered. Some psychologists prefer to say that the vegetal life-principle is not divisible *per se* (that is, it has no parts *of its own* into which it may be divided) but is divisible *per accidens* (that is, divisible by reason of the divisibility of the matter on which it depends for being and operation). In other words, the vegetal life-principle is not *itself* divisible, but is *divisible inasmuch as the organic body which it vivifies is divisible* into parts which can sustain life as individual plants. Others prefer to express the matter thus: the plant-soul is *essentially simple*, but *quantitatively* it is *compounded* or *composed*.

3. *The vegetal life-principle is generated or re-produced per accidens.* This point is evident from the foregoing. A thing generated is generated *per se* or it is generated *per accidens*. Literally, *per se* means "through itself"; the phrase comes close in meaning to our ordinary expressions, "of itself" or "by itself"; sometimes the simple word "itself" makes the best

translation. The literal meaning of *per accidens* is "through that which is accidental"; and "an accident" or "an accidental" is contradistinguished from what is *substantial*, or, sometimes, from what is *essential*. The word "accidentally" is the most common translation for *per accidens*, but sometimes we must use a roundabout and wordy phrase to get the exact equivalent in English. The meaning of *per se* and *per accidens* in the present instance may be gathered from a restatement of the sentence which stands at the head of this paragraph. We may put it thus: the plant-soul is not generated *by itself*; it comes into being *with the living body* to which it belongs. Therefore, although the life-principle in a plant is an *essential* and a *substantial* constituent element of the plant (and not in any sense *an accidental*), the *mode of its coming into existence* is accidental to the generation of the organism which it vivifies.—In the generation or reproduction of plants, it is the entire *plant* that is generated. The plant *itself* is generated. Hence we say, the plant is generated *per se*; the life-principle of the plant, however, is generated *per accidens*.

4. *The vegetal life-principle undergoes corruption per accidens.* In modern casual speech the term "corruption" signifies either "rotteness" or the process by which a thing rots away. Thus we speak of the physical corruption which fills the sepulchre. Thus we speak of the moral corruption of youth by the bad conduct of their elders. But in the present instance

we use the word "corruption" in the ancient and philosophical sense. It is the opposite of "generation." Generation and corruption are not *gradual* processes; they are *instantaneous*. When, for example, a new organism comes into existence, there is a moment when it does not yet exist as an organism, and an indivisible instant later it is an organism. The gardener approaches the rose-bush, knife in hand. He begins to make the cutting. There is an instant when the part to be severed is still part and parcel with the original plant; there is a moment during the process of severing,—an indivisible moment or instant,—when the cutting ceases to be a part of the original plant and is a separate and individual plant. *That indivisible moment*, that immeasurable instant, is the moment of *generation*. Suppose again that some living body (plant or animal) is about to die. Death is instantaneous. We may speak of "dying," and consider it as something that goes on for a longer or shorter period of time; but, in such use, the term is figurative. A thing is either alive or it is not alive; there is no middle ground between the states of life and non-life. Now, the plant or animal which we consider to be at the point of death is, at one instant, alive; the next instant, it is dead. An indivisible line has been crossed; a measureless instant has intervened between life and death. Up to a certain moment, the body was alive; after that moment it was dead; and the moment itself is not measurable. That moment,

that incalculable instant, is the moment of *corruption*. It is in this sense that we use *corruption* in the present study. We assert that the soul or life-principle of a plant does not *itself* die or undergo *corruption*. No; it is the *plant* which dies. And when the plant dies, the plant-soul perishes. In other words, the plant is corrupted (here the word means *dies*) *per se*; the plant life-principle is corrupted *per accidens*, i. e., ceases to exist with the cessation of the organic existence of the plant.

## SUMMARY OF THE ARTICLE

In this Article we have reviewed the doctrine of the fundamental constitution of bodies (*prime matter and substantial form*) and have learned that the vegetal life-principle is the substantial form of the living plant. We have found that the vegetal life-principle is substantial, is a substance, but not a *complete* substance. We have learned that it is incomplete both in the order of *substantiality* and in the order of *species*. Further, we have learned that the vegetal soul or life-principle is a *material* substantial form, not in the sense that it is made of matter, but that it depends on matter. We have considered important characteristics of the vegetal life-principle, and have found that it is *simple*, that it is *actually one* but *potentially multiple* in each plant, that it comes into being and perishes *per accidens* and not *per se*.

## CHAPTER III

## SENTIENT LIFE

This Chapter discusses the life of animal organisms, a life that is known as *sentient* or *sensuous*. It offers proof that animals are really living bodies, and that they are equipped with powers superior to those of plants, but that they lack reason. The Chapter studies the *operations* proper to the sentient organism, and the powers which constitute the *immediate principles* of these operations. Finally, it treats of the *life-principle* of sentient organisms, and discusses the *natural characteristics* of the animal soul. These matters are discussed in the following Articles:

- Article 1. The Life of Sentient Bodies
- Article 2. The Operations of Sentient Bodies
- Article 3. The Sentient Life-Principle

## ARTICLE 1. THE LIFE OF SENTIENT BODIES

- a) Meaning of *Sentient Body*
- b) Animals as Sentient Bodies

## a) MEANING OF SENTIENT BODY

A *sentient body* is a living body or organism which has, in addition to the nutritive, augmentative, and generative powers of the plant, some power of *knowing* through the use of bodily organ or organs; some capacity of being guided or *influenced* by such knowl-

edge; and some capacity to act upon knowledge by physical local movement. A sentient body is an *animal body*, or, more simply, *an animal*. And by the term *animal* we mean every bodily organism of a higher order than the plant. We use the term *animal* to indicate an essence, and we are not limited to the casual use of the term. We apply the term *animal* to bird or beast or insect or reptile; we apply the term to all phyla, sub-phyla, classes, orders, families, genera, species, races, varieties, and individuals studied by the biologist. We even apply the term to human beings, but it is not a term completely definitive of the human essence which is animality plus something else, namely, rationality.

An animal may be defined as an organism with sentient life. And a sentient body is necessarily an animal organism. Thus the terms *sentient body* and *animal body* (and the term *animal* as a substantive) are completely synonymous. Size and structure (the *morphological type*) is important for the laboratorian, but not for the philosophical psychologist. For animal life is as perfectly possessed (although not so complex or diversified in function) by the amoeba as by the elephant. From the standpoint of the simple essence *animal*, the mastodon and the flea on the ear of the mastodon are perfectly alike: each is a *sentient organism*, each is an *animal*.

An organism is necessarily a body endowed with vegetal life and the operations of nutrition, growth,

and reproduction. A *sentient* organism is truly an organism, and therefore possesses these operations. But a sentient organism is more than a plant. It is a living body of the *next higher grade* after the plant.

The term *sentient* means having some power of *sensing*. And to *sense* means to *know* by means of a bodily part (or bodily parts). The bodily part which serves the organism in the operation of *sensing* (or *sensation*, or *sense-knowledge*) is called a *sensory*, or, more commonly, a *sense-organ*. The fundamental animal operation of *sensing* is always manifested by sentient organisms in connection with two other capacities: the *tendency to act* on the sense-knowledge acquired, and the *capacity for actually acting* upon that knowledge by bodily local movement.

#### b) ANIMALS AS SENTIENT BODIES

We are all well aware that there are animal organisms in the world, and that these living bodies have the power of sensing. We know that the dog or the cat has eyes and ears, and we know that these organs serve the animals as eyes and ears serve ourselves. Plenty of evidence is given us in the manner in which animals act. An animal may be deaf or blind, and its failure to respond to sound or light is as obvious and marked as the actual response given these stimuli by animals with normal eyes and ears. Yet there have been scientists and philosophers, and notable ones too (like René Descartes, for instance) who



held that animals are not alive at all; that they are merely wonderful pieces of machinery. Descartes would have us believe that the cry of an injured animal is no more a vital manifestation than the squeaking of an ill-greased wheel, or the clatter of machinery when some part has been broken. On the other hand, there have been, and indeed now are, some who teach that brute animals are not only alive, but that they possess the power of reasoning and willing. The true doctrine, the doctrine capable of clear proof, is this: Animals (that is, brute animals, animals less than men) are sentient organisms, but they lack reason.

An animal is not a mere machine or *automaton*. For the action of a machine is the action of set and determined character; it is a matter of wheels and grooves and driving rods, and gears. A machine acts only when some extrinsic or outside force is made to play upon its parts and set them, and keep them, in motion. And, given the same circumstances and conditions, a machine will always act in the same way. Now, an animal acts *immanently*, without application from without of an extrinsic force; and it does not always act in the same way when circumstances and conditions are the same. The racing dog may stop suddenly at his master's command; but unless he is a very well-trained dog, he will not *always* do so. The playful cur may chase the marauding tom-cat, but, having once had experience of his claws, it will not chase the cat a second time. The bird will fly in terror from the

hawk; but the same bird may face the hawk and die when there are defenceless young in her nest. No machine can give evidence of such varied action. For the rest, we have already shown that *plants* are truly alive, and the animal has all the perfection and the operations of the plant plus its own proper operations. If the lower order of organism is truly alive, the higher order certainly is.—We have seen and approved the ancient axiom, "Nature does nothing in vain." And surely nature would be engaged in the most stupendous of vanities if she went, humanly speaking, to all the bother of constructing the highly complex animal organism, furnishing it with marvelously planned organs, like eyes and ears and nose, if these things are to have no meaning whatever. And, of course, these things would have no meaning and no use if the animal were merely a lifeless machine.

The animal is truly *alive*; is truly *sentient*; but the animal is not *rational*. Certain philosophers like Damiron (1794-1862) and Condillac (1715-1780), as well as the materialists and positivists, put men and brute animals on a common plane in point of knowledge and reason. We assert that the brute animal is not rational, or, in other words, that the animal does not possess *intellect*. We often hear animals called "intelligent," but the term is misused in this connection. An animal may be alert in the use of its proper powers, but it is never intelligent, never possessed of reason or capable of intellectual activity. Animals are

possessed of what is commonly called *instinct*, and it is a very wonderful thing; we shall speak of it later in its proper place. But animals have not intellect, and, for the present study, the following proof will amply suffice.

A bodily being endowed with *intellect* infallibly does three things: he *understands* (and does not merely *sense*); he learns to use significant signs which, in normally constituted organisms of this type, takes the form of articulate *speech*; and, thirdly, he is able to *learn*, and to *improve* himself in his manner of acting. In a word, a bodily being possessed of intellect can understand, he can talk, and he can learn how to do things in a better and more convenient way. We shall say a word on each of these points.

*I. A being endowed with intellect can understand.*  
The phrase *to understand* does not mean merely *sense and interpret* in an individual and concrete way, as a dog does, for instance, in hearing and obeying a command. To understand means to grasp an *essence*, to lay hold of a thing *in universal*, to apprehend a meaning *in the abstract*: and this is the function of *intellect*. If a person says to me, "I saw a beautiful flower to-day," I know what the words mean. I do not demand a picture of the flower in question, nor must I be led to look at the flower itself, before I grasp the meaning of the statement. For I know (intellectually) what a flower is, *any flower, every flower.*

I have an intellectual grasp of the *essence* indicated by the term *flower*. In other words, I have the *idea* or *concept* of the reality known as *flower*. This explains what is meant by saying that I grasp the meaning of *flower in universal*, abstracting from the individual and concrete determinants of the flower in question. I know what *flower* means *as such*. Now, an animal, a merely sentient being, does not *understand* in the true sense of that term. An animal may be trained to recognize certain words (that is, certain *sounds*) as signals or commands, but it cannot be made to grasp the sound as the expression of an idea. You may train the dog to do some definite thing when you pronounce the word "flower"; you may train the dog to bark, to whine, to run, to lie down, to stand on hind legs, or to do any one of an indefinite number of things, or a series of things, when he hears the word uttered in a particular way. There is nothing beyond the reach of *sense* in all this; there is no understanding in it, no intellect. You cannot teach the dog to *understand* the word "flower" any more than you can teach him to have an active interest in the science of botany or to gather and arrange specimens for a herbarium. But with a human being, the case is different. Once the human person has experienced what is meant by "flower" (and, indeed, his knowledge must *begin* with the senses) he goes on to form the idea or concept of what a flower essentially is. And so he understands the statement, "I saw a beautiful

flower" without having to see the precise individual flower; he understands, indeed, without having to inquire about the sort of flower indicated; he understands without knowing whether the flower referred to be rose, or violet, or aster, or lily. And the case would be the same if the statement were, "I saw a rose." The human person would understand "rose" in universal, or in general; he would understand in the abstract, without being told that the rose was large or small, of this variety or that, in budding form or in full flower. For the human person (having had some sense-experience of certain individual roses) *understands*; he grasps the *essence* indicated by the term *rose*; he knows what *a* rose is as such, what *any* rose is, what *every* rose is.

An amusing tale is told of a stolid pupil in geometry class, who demanded an explanation of the statement, "Two angles equal to a common third are equal to each other." The teacher said, "Suppose I have three hats here on the desk. Hat number one is precisely like hat number three. Hat number two is also precisely like hat number three. Now, what must I conclude about the resemblance of hats number one and two?" The pupil answered, "I'd have to see the hats." Naturally, there was uproar in that classroom. And why? Because the pupils saw the absurdity of the dunce's reply. And why did they find the reply absurd? Because every one of them knew precisely what is meant by *hat*, and by *likeness*, and *unlikeness*, and *resem-*

*blance*. They knew these things in general or in universal. They had no need to have the hats before them as "these three silk hats" or "these three straw hats" or "these three old hats" or "these three expensive hats." No; they *understood*; they had a grasp of the essential meaning of the terms used; they knew what is meant by *hat as such*,—*a hat, any hat, every hat*. In a word, their grasp of the meaning of the term *hat* was *abstract* (that is, independent of considerations such as shape, size, color, material, style, price, of any one individual hat, or of any collection of hats) and *universal*. For the pupils had *intellect*, and not *sense* merely.—Even the dunce knew what *hat* means. If he was befuddled by the technical phrasing of the axiom about angles, he none the less knew what *angle* means,—*any angle, every angle, angle as such*. And he knew what was meant by *equality* in angles or in hats. Otherwise, he could not even have put his question or have made his demand to see the hats.

It is the mark of a being endowed with intellect that he *understands*; that he grasps *essential meanings*; that he lays hold of essences *in a universal way*; that he knows things *in an abstract manner*; that he can unite, distinguish, differentiate, and elaborate the elements of his essential knowledge, and so can draw conclusions and exercise the power of reasoning. All this is the function of intellect. And no animal,—not the cleverest animal in the circus, nor the "most intelligent" of household pets,—gives any sign, or the

beginning of a sign, of possessing such a power or such a function. We are forced to conclude that while brute-animals have *sentience*, they have not reason or *intellect*. Brute animals are *non-rational* animals; only man is a *rational* animal.

②. *An organic being endowed with intellect can use significant speech.* This point follows from the foregoing. For a human being,—the only organic being endowed with intellect,—not only *forms* ideas and elaborates processes of reasoning; he *expresses* these things; he *communicates* them. This fact makes instruction possible; if it were not a fact, we should have no teachers, not even teachers who teach that animals have intellect or that man hasn't. And the expression and communication of ideas, thoughts, essential meanings, reasonings, is managed by intelligent (or intellectual) beings through the invention and use of some code of sounds or signs or gestures. Human beings are well equipped for the utterance of varied, modulated, articulated *sounds*; they have organs admirably suited for such utterance, and obviously designed for it. The normal human being learns very early in life to imitate, to understand, and to use the *articulated speech* of those habitually about him. Now, the mere utterance of sounds, even of such as have a sentient significance, does not constitute *speech*. The tiny baby will cry when in pain, will laugh with delight, will coo with pleasure. The baby will utter sounds, and the sounds are expressions of *sensed* reali-

ties; but these sounds are not *speech*; they are not evidence of functioning intellect. For, while the baby has intellect, its intellect is not yet in adequate use; just as the baby has legs, but has not yet the use of them in walking. Experience, and *sense* experience, must serve the baby before his intellect can form ideas and acquire a usable system of them. Nor, when he has acquired the use of intellect, will the child entirely cease to use "animal sounds" which are the expressions of sensed realities; even as a man, he will sigh, and sob, and yawn, and groan, and will cry out when he experiences sudden pain. But the child will not be *limited* to "animal sounds" very long. And an animal, young or old, is always limited to such sounds,—to sounds which express *sensed* realities. The angry growl of a dog or his bark of joy; the cooing of doves in the mating season, or the chattering of monkeys,—these and all other "animal sounds" are always merely sentient in character; they always fall short of intellectual significance. Even those who like to say that "animals talk to one another" cannot force themselves to believe it. Even these (somewhat sentimental) persons cannot refrain from smiling as at an absurdity when some instance of animal "speech" is recorded as though it were a fact; they cannot, for instance, receive, with serious faces and assenting minds, the famous story of the blue-jays' pow-wow as told by Mark Twain in an early chapter of *A Tramp Abroad*. Nor could the exponents of animal "intelligence" ac-

cept seriously the same humorist's account of the comments passed by a ship's parrot on the occasion of the passengers' concert. The parrot in question was perched in the lounge where the concert was held, and he made a free running commentary upon the offerings of the performers. After a lady had sung, with much feeling, the old song which begins, "Home again, home again, from a foreign shore . . .," the parrot strode back and forth on his perch, swore horribly, and declared that "he wouldn't give a hang for a tugload of such rot." The criticism killed the concert; there were no more songs; and the parrot leaned up against the bars of his cage and "laughed himself hoarse for joy." Of course, these humorous accounts of animal "speech" are human concoctions; but why, if animals could really be regarded as intelligent, would these fictions be regarded as so deliciously funny? Mr. G. K. Chesterton, in *The Everlasting Man*, makes some notably pointed observations on the subject of "animal intelligence" and "animal speech." He tells us of the poet who rises early to catch the glory of the sunrise and to express his sentiments about it in a sonnet. He adds that the cows in the field give us no sonnets on sunrise, although admirably situated for viewing many rosy dawns. We shall wait a long time before we notice the gambolling sheep or the winging skylark gaining the attention and applause of fellow-animals for such lines as

Full many a glorious morning have I seen  
Flatter the mountain tops with sovereign eye.

And, although "the lark, at break of day arising, sings hymns at heaven's gate," the hymns are not expressed in intelligible speech, and we shall probably wait in vain for the publication of a skylark Watts.

Animals may be trained to utter at command certain sounds,—barks, or growls, or neighs, or grunts. Certain sentient beings may be trained to imitate the sound of human speech. But the most enthusiastic believer in animal intelligence would not profess to find in these sounds *an animal language*. Yet the parrot, for example, could, if it had intelligence, *learn* human speech even as a child learns it; such a parrot could be educated; it could be schooled; it could, in time, become a glamorous Bachelor of Arts. No parrot has, as yet, been graduated by an American university. A dog, however, has had that honor; he was made a Bachelor of Caninology by a publicity-seeking university in the hinterland in June 1935. We await with interest the publication of his dissertation.

It is a mark of an organic being endowed with intellect that he can learn to employ intellectually significant speech. Brute animals give no sign, nor the beginning of a sign, of a capacity for such utterance. We are forced to conclude that brute animals, while *sentient*, are not endowed with *intellect*.

3. *An organic being endowed with intellect can*

*improve his mode of action.* An intelligent being can understand, can communicate understanding, can give and receive instruction, and can *show the fruits of instruction*; he can also show the fruits of *understanding* and *personal reasoning*. A boy can be taught the use of carpenter's tools. He can be made to understand the use of such tools, partly by being told about them, partly by having the instruction exemplified, partly by practice in their use. And thus, in time, the boy may become an expert builder. Another boy, lacking all instruction and all opportunity to handle tools, will not become an expert builder. But a little bird becomes an expert builder of a certain type of nest, entirely without instruction; and no amount of instruction will make that bird the builder of a different type of nest. Bees do not come together, even once in a century, to discuss an improved honeycomb. The bees do their work well, but there is no improvement in the product of their labor; what Virgil, the poet, said of bees two thousand years ago is just as true to-day as it was in that long-vanished time. A spider spins its web; it needs no schooling or instruction in the art; nor does it show any variation in the type of web it weaves. With man, an intelligent being,—an organism endowed with intellect,—it is not so. The whole history of mechanical invention is a proof of the point. Man can and does use his intellect to devise new and improved dwellings, conveniences, means of communication and transportation.

Some experimental psychologists like to observe the behavior of animals imprisoned in a labyrinth; to notice how the imprisoned animal learns to make its escape, and how, upon repeated trials, it makes its way to freedom more and more easily. This sort of thing does not affect our present contention in any way. We ask whether the animal shows any improvement in its method of attending to its natural needs; and the manifest answer is that it does not. You can teach a rat to escape from a labyrinth; you can observe how it makes its way out of the prison, and learns to escape more and more readily. But you cannot teach a rat to make an improved style of rat-hole, or to construct a comfortable rat-house of tiny bricks.

It is a mark of an organic being endowed with intellect that he can improve his mode of action, his methods, his products. Brute animals give not even the beginning of a sign of such a capacity. We are forced to conclude that brute animals, while *sentient*, are not endowed with *intellect*.

The natural tendency of a sentient organism, and indeed of every being, carries it toward what is suitable and good for it. In man, as we shall see in a later chapter, this tendency may be baffled in some of its effects by perversity of judgment and abuse of the freedom of choice. But in merely sentient organisms, activity proceeds according to definite, predetermined plans, and produces astonishing results. A man, when he has at last weathered the long years of weakness

and immaturity, knows well enough that he has need of food and shelter, and he is aware of many a convenience that he might find a profit and a pleasure. But he has to study out ways and means of providing himself with these things, and no two men would,—uninstructed and uninfluenced by word or example of others,—work out the problem in precisely the same way. With an animal, however, the case is flatly reversed. The animal passes into maturity (usually in a much shorter time than man requires) and proceeds to attend to its needs; and the members of a given species of animal will do the work in the same way. You might put three men on three desert isles, and you would find later that one had made himself a shelter of stones, another had found a cave in the rock, and a third had fashioned a sort of cabin of saplings and chopped boughs. Nor would there be much resemblance in the style or size of their habitations, even apart from the materials used in their building or arrangement. But three birds of the same kind loosed on three desert isles would make nests of the same style and pattern. And three swarms of bees would make the same sort of honeycomb. Nor would birds or bees require instruction in the work, or have to make trial of this and that before settling down to the building of what they require.

The beaver takes no instruction in the art of building dams, but produces, none the less, a work of such balance and finish as to excite the admiration of car-

penter, joiner, and engineer. The bee studies no blue-prints, but the architecture of the comb is flawless. There is a certain sort of beetle (*Rhynchites betulae*) which cuts and rolls a particular kind of leaf, and closes and seals it as a nest for her developing young; and the manner in which this piece of construction is "laid out" and executed would do credit to a master engineer, with all the higher mathematics in his head and the finest of draughtsman's tools on his table. There is a wasp (called *sphex*) which requires living food for her young, and she pierces the spine of caterpillar or spider *in the exact spot necessary to produce paralysis but not death*; then she places the helpless victim in her nest so that her new-hatched grubs may find their proper diet provided.

Animals not only make the things they need; they also avoid what is harmful. The young chickens may never have seen a hawk, but they are flutteringly aware of his presence in the neighborhood all the same. The sick dog searches out certain grasses, and finds what he seeks, without medical advice or the need of a prescription. Cattle will avoid poisonous herbage without being warned against it and taught methods of recognizing it. Sheep will fly from a wolf without pausing to find whether his advances be friendly. Thus animals show a constant tendency to take care of themselves: *positively*, by making or arranging what they require; *negatively*, by avoiding what would be harmful. And this holds for the kind

or *species* of the animal even more strongly than for the individual. The drive of nature is to perpetuate the species; not to let it die out or be destroyed; and the welfare of the young is therefore of greater concern to nature than the welfare of parent animals. The bird will fly away from the cat to protect itself. But the mother-bird will often forget herself, and face death, to defend her young fledglings from the cat.

Now, in all this we discern the workings of a particular *sense*,—an *interior* sense, which the philosophers of an older day called “the estimative power” (that is, the power for estimating or judging what is useful, necessary, harmful) or simply “the estimative,” and which is now usually called *instinct*. Man has instinct too, but, since he has the higher light of intellect, he uses instinct less than animals do, and is less practised in its exercise; besides, man needs it less. It is usually of occasions of stress, of sudden action, of sharp alarm; or of preoccupation, that we speak, when we say a man “acts instinctively.” But animals act instinctively all the time. And so wondrous is the product of their instinctive action that many scientists and philosophers have been led to the mistaken conclusion that animals possess intelligence or intellect. There is a vast difference, however, between instinct and intellect, and we shall presently indicate a few points of this diversity. But there is another thought that must first be suggested.

If animals possess intellect; if the wondrous work of beaver, and bee, and beetle, and wasp, and bird, and dog, and cattle, be really a work intelligently planned and executed, *then the intellect of animals must be immeasurably superior to that of man*. A young man, uneducated and uninstructed, cannot plan and execute a masterpiece of engineering and carpentry; but a young beaver can do it, and does. The bee is an architect and builder without schooling or learned degrees, but a man requires long and tedious training before his mind and his hands will serve him adequately in the architect's profession. The beetle described above is, if intelligent, a master mathematician and craftsman, and should be the holder of an honored chair in a university. And we should send our surgeons to the *sphex* (if she be intelligent) for post-graduate courses in instant diagnosis and infallible incision. Yes; if animals have intellect, it is a far better intellect than man's. And yet,—this is the surprising thing,—this matchless intellect (if it be an intellect) has produced nothing in all the ages of the world but an *admirable routine*. There is nothing new in its product, nothing fresh, nothing varied. Surely, an intellect such as this would startle the world with its inventiveness and its “infinite variety.” Thus we see that the naïve explanation of animal activity as the product of intellect, is a little too simple to be true. The assertion that animals think, and reason, and understand what they do, does not untangle a complex



problem; on the contrary, it presents a problem of inexplicable and inextricable tangles.

Let us look now at some points of difference between intellect and instinct.

1. *Instinct is an organic faculty; intellect is inorganic and spiritual.* Instinct is a *sense*, and an *inner* sense; it is organic because it is served by an *organ*; its organ is part of the brain. In consequence of the fact that instinct is a *sense*, its object is some individual and concrete thing present here and now. Intellect is not limited to the concrete and individual objects here and now present. Intellect grasps things in the abstract, in universal. The bee draws nectar from this flower and that, and carries its treasure home. But the bee is incapable of reasoning about flowers in general, or of methods in the abstract, and cannot consider ways and means of making better honey or of turning out the commodity with less effort. But the least instructed man can reason about his work, can consider ways and means of getting it done. In a word the bee executes a splendid plan—but the plan is not its own. The man makes his own plan, or may make it, even when he fails to execute it. For the man has intellect, which is not an organic faculty, but a power of the spiritual soul. Of this we shall speak in detail in another place.

2. *Instinctive knowledge is inborn and antecedent to experience; intellectual knowledge is acquired, and*

*presupposes experience.* The yearling bird knows how to make its nest without instruction and without watching the parent birds. The human builder needs plenty of instruction and much practice before he can turn out an admirable product. Human beings *learn* how to do what is required to provide themselves with the necessaries of life; animals do not learn, they know without learning.

3. *Instinct is not inventive; intellect is endlessly working out something new.* The history of intelligent beings (of men) is a story of progress in the liberal and mechanical arts. But animals give no sign of novelty or improvement. In matters of mind it is possible, in matters of mechanical art it is usual, for one generation of men to take up where the last generation left off. But one generation of animals of a given species does not take up where the last left off; each generation does the same sort of thing (in providing for natural needs) and in the same sort of way.

4. *Instinct is limited to one or a few manifestations; intellect is almost boundless in its capacity.* A bird can build a nest, a bee can make honey and honeycomb; but bird and bee cannot exchange services. But a man can learn a great variety of arts, and, indeed, never reaches a stage where he can learn no more. An animal is master of one "trade"; man is jack-of-all-trades, even if he master none.

5. *Instinct is changeless in its manifestations; intellect applies its knowledge in an endless variety of*

*ways*. The instinct of animals makes them do certain things in a certain way. The intellectual knowledge of men is changeless in the fact that it is a grasp of unchanging truth, but the applications of that truth are variously made by various individuals. Certain basic mathematical truths, for example, are so applied by intellect that we have such various products as chemical formulae, the science of aero-dynamics, and the theory of music.

#### SUMMARY OF THE ARTICLE

In this lengthy Article we have studied the meaning of *sentient body* or *sentient organism* or *animal organism*. We have proved that brute animals are truly living bodies and not automata. We have proved further that, while *sentient*, animals are not endowed with *intellect*. In support of the latter fact we have mentioned three outstanding characteristics of intellectual organic beings, viz., the power of knowing things in universal and in the abstract; the power of using intelligently significant speech; and the power of improving the mode of action. We have found that none of these characteristics is found in any merely sentient being, and have therefore concluded that brute animals are not intelligent. We have made a short study of *instinct*; we have noticed the astonishingly adequate nature of its product; we have found, nevertheless, that instinctive activity is not an evidence, in any sense, of the presence of intellect. We

have contrasted *intellect* and *instinct*, and have noticed several striking points of essential difference between these faculties.

#### ARTICLE 2. THE OPERATIONS OF SENTIENT BODIES

- |                       |                    |               |
|-----------------------|--------------------|---------------|
| a) Vegetal Operations | b) Sensation       | c) Appetition |
| d) Locomotion         | e) Sentient Powers |               |

##### a) VEGETAL OPERATIONS

We have already learned that life in bodies is manifested in essentially distinct *grades*. Therefore, life of the second grade will possess all the perfection of life of the first grade, and will add thereto its own proper and essentially different perfection.

*Animals* or sentient bodies are living bodies of the second grade. Hence animals possess all the perfection of living bodies of the first or lowest grade (i. e., *plants*) and, in addition, possess their own proper perfections which are essentially different from (and superior to) those of plants.

It is manifest that animals have the vegetal operations; hence they have the vegetal powers or faculties which are the proximate principles of those operations. Animals take nourishment; they grow to the mature state of their type; they tend to reproduce their kind. Nutrition, growth, and generation are as manifest in animals as in plants. But the essen-

tial specific distinction of animals as compared with plants, lies in the fact that animals possess, in addition to vegetal operations and powers, the sentient operations and powers which we are to consider in the following paragraphs.

#### b) SENSATION

The term *sensation*, frequently used in casual speech to indicate an unusual or startling occurrence, means, in the present instance, *a vital operation*. It means *the activity of sensing* which is found, in greater or lesser degree of complexity and perfection, in every animal organism.

To *sense* an object is to react consciously to an impression received from that object through bodily organs or sensories. *Sensation* is the conscious reaction, by or through bodily parts, to bodily impression. Sensation is a *knowing* activity; it is *an awareness*. It is the awareness in an animal organism of bodily reality manifested by the qualities (common and proper) of such reality,—qualities such as color, sound, shape, hardness, desirability, harmfulness.

When we say that animals have the operation called sensation, we mean that animals are equipped with a *knowing power* suited to their nature and needs, and that they actually *exercise* such power. The point needs no proof. We have already identified animals as *sentient* organisms; we have proved that they

are not mere automata or wondrously constructed machines; we have seen that they react to bodily impressions, that they receive such impressions through organs, and are manifestly aware of the bodily realities whence the impressions come. Thus the dog comes when called; he hears the call, and hearing is *sensation*. He sniffs his food; and smelling is *sensation*. He gives evidence of relishing some foods and of finding others unpleasant to taste; and tasting is *sensation*. He cries out when injured; and feeling is *sensation*. He sees objects; and seeing is *sensation*.

Animals are obviously equipped for sensation. The higher animals have organs well adapted for external sensation, and it is a matter of daily experience that they use these organs in sensing, even as we human beings use similar organs. The lower orders of animals (such, for instance, as the amoeba) give evidence of possessing the sense of touch or feeling, and the entire organism appears to be the organ for this sensation.

The exercise of acts of sensation is the test and identification employed by scientists in determining whether an organism is plant or animal. Animals are known, and their essence is defined, in terms of sensation. There is, therefore, no need of elaborating a proof of the manifest fact that what we know as an *animal organism* is an organism fitted for sensation and actually exercising this operation.

## c) APPETITION

*Appetition*, like sensation, is a *vital*, and therefore an *immanent*, operation. It is an operation by which an animal organism is moved to do or to acquire what the senses apprehend as good to do or desirable to have. It is a tendency consequent upon sense-knowledge or sensation. Technically, we may define *appetition* (a term which, with *appetite* and *appetency*, comes from the Latin *ad* "toward" and *petere* "to seek" or "to strive") as *an immanent operation by which an animal is inclined towards that which the senses apprehend as good.*

Every being, living and lifeless, tends to what is suitable or good for it. A being, in other words, tends to fulfill the functions of its nature. Thus, the parts of a body tend to cohere; bodies tend to obey physical laws, such as the laws of gravitation and inertia; certain chemical substances tend to form compounds; the plant tends to grow to maturity and fruitfulness; an organ tends to do the thing it is made for, and thus the eye tends to see, the ear to hear, and so on. In all these examples we have instances of what is called *natural appetite* or *natural appetency*: it is the *natural striving-towards* or *seeking-after* that which is in line with the functions of nature and the maintenance of natural powers. Thus all beings, lifeless and living, non-sentient and sentient, manifest *natural appetency* or *natural appetite*. But *appetition* is an appetency or appetite which follows upon knowledge and is

aroused by knowledge. And sense-appetency or *sense-appetition* is that appetency which is aroused by, and follows upon, *sense-knowledge* or *sensation*. It is of this *sense-appetition* that we speak in the present study.

Simple sensation,—that is to say, *sense-knowledge*,—does not fully explain animal behavior. There is in animals a manifest *tendency to act on knowledge*. This tendency is *appetition*. The dog sees food and smells it; but the simple seeing and smelling do not explain the *attraction* which the dog finds in the food. He senses the food, and this sensation evokes the second animal operation of *appetition*. The dog *knows* the food (sensation) and he *wants* it (appetition). If the dog be sick, or fed to repletion, he refuses the food. Yet *appetition* is as manifest in the refusing as in the taking of the object sensed. Here sensation makes the food known as *a good thing to avoid*.—The beaver in constructing its dam senses the materials used and senses (by instinct) the desirability of doing the work, although the beaver has, of course, no grasp of purpose or finality in the work. It senses the materials as good to use, and the task as good to do. Upon sensation follows the tendency to act in accordance with it; in a word, *appetition* follows.

If animals were without *appetition*, the dog might starve in the very presence of suitable food, for the dog, in this case, would see and smell the food without experiencing the impulse or desire to take it. If

there were no appetite in sentient organisms, the bird would see straw and twigs, but she would not build a nest, for there is nothing in the mere seeing of materials to stir her to the task of building. Without appetite, animals would not, and indeed could not, exercise many of their natural functions. But it is a matter of commonest experience that they *do* fulfill their functions. It follows inevitably that animals possess the power, and exercise the operation, of *appetition*.

#### d) LOCOMOTION

The most obvious manifestation of the fact that animals possess sensation and appetite is seen in this: that animals *go after* what is sensed and appetized. An animal *carries out* the tendency of appetition, which is evoked by sensation, and so it *moves* into action. We know that the dog senses food and wants it from the fact that he *goes to it* and eats it. Appetition follows sensation; *movement* follows appetition. Movement which has its roots in knowledge is called *spontaneous* movement. Now, the spontaneous movement of an animal in response to sensation and appetite is called *locomotion*.

Locomotion (from Latin *locus* "place," and *motio* "movement") is the *vital, or immanent, operation by which an animal moves itself spontaneously from place to place.*

Sentient organisms are all endowed with some ca-

capacity for locomotion, and, when normally constituted and uninjured, they all exercise it in some degree.

Every movement of a body from one place to another is called *local motion*, but unless such movement is the spontaneous self-movement exercised by an animal organism, it is not *locomotion*. Locomotion is a *vital* capacity and operation. It is the third operation of sentient organisms. Now, there are movements, even within the animal organism, which are not manifestations of *locomotion*. The heart moves; the lungs have a bellows-like motion; there is movement in the blood-stream, and in the stomach and intestines of the animal. These movements are not spontaneous; they are not consequent upon knowledge, but take place independently of knowledge; they are called *automatic* movements. Some of these movements *may* follow knowledge; a man, for instance (and man is a *rational animal*), may deliberately and knowingly inhale and exhale. But knowledge is not necessary to the natural and automatic function of breathing, and ordinarily one breathes without adverting to the operation at all.

That animals move about, within greater or lesser area and with more or less alacrity is a patent fact. Sensation defines the animal, but movement is the determinant of sensation, and unless the animal could react to the sensed stimulus, it would not, in many cases, be possible to tell whether the organism were plant or animal, or even whether the organism were

really an organism, that is, were really alive. Locomotion is a mark of sentient life.

e) SENTIENT POWERS

Every operation has its *principle*, and its *proximate* principle; it has its active source. The animal-organism is the principle of animal operations, but not the *proximate* principle. The animal possesses a power or faculty or capacity for its operations, and it is by reason of such capacity that the animal is enabled to exercise its operations. And the animal has as many distinct faculties or capacities or *powers* for operation as it has distinct kinds of operations.

The animal operations are six in number. First, there are the three operations common to all organisms, viz., nutrition, growth, generation. Then there are, in animals, the operations which belong to an animal as a distinct essential kind of organism, i. e., a *sentient* organism, and these are the three operations we have just now considered, viz., sensation, appetition, locomotion. Six distinct vital operations must come from six distinct vital powers. We therefore assert that the animal is equipped with six vital faculties or *powers of operation*, and these are: the nutritive power, the augmentative or growing power, the generative or reproducing power, the sentient or sensing power, the appetitive power, and the power of locomotion.

These powers, rooted in the animal, and actual by

virtue of the sentient life-principle, are not to be identified with the organism itself or with the life-principle itself. These are powers which the animal *has*, not powers which the animal *is*. These powers are the proximate or immediate principles by which the animal exercises its connatural operations, and they are distinct from the organism, and distinct one from another.

SUMMARY OF THE ARTICLE

This brief Article has set before us a schematic study of the *sentient* or *animal* operations and powers. We shall elaborate this same matter with much detail when we come, in a later Chapter, to speak of the sentient life of man. Here we have learned the meaning of *sensation*, *appetition*, and *locomotion*. We have defined these operations, and have illustrated their exercise. We have noticed that the respective operations are distinct one from another, and come from distinct capacities, faculties, or *powers* of the sentient organism.

ARTICLE 3. THE SENTIENT LIFE-PRINCIPLE

a) Nature of the Sentient Life-Principle    b) Characteristics of the Sentient Life-Principle

a) NATURE OF THE SENTIENT LIFE-PRINCIPLE

We have already seen that every bodily being is made of prime matter and substantial form. Further,

we have learned that in *living* bodies, the substantial form is the vital principle or soul. It is obvious, therefore, that the substantial form of an animal is its life-principle or animal soul.

Now, animals manifest the operations of two grades of life. They have the *vegetal* powers and operations as well as those distinctively *sentient*. The question may, therefore, arise: Have animals two souls each, or only one; and if they have but one, is this a vegetal soul with animal powers, or an animal soul with vegetal powers? The answer is this: Animals have each but one life-principle or soul; and this single life-principle is the *sentient life-principle* or *animal soul* which is at once the radical principle of the vegetal and sentient operations of the animal organism. An animal is possessed of life in the second grade or degree (sentient life) and this grade necessarily includes the perfections of the first or lowest grade. Therefore, the animal soul is at once vegetal and sentient. More precisely, the sentient life-principle (that is, the life principle of a sentient organism) is *also vegetal*.

There is, of course, only *one* life-principle in any organism. For the life-principle is the substantial form of the organic body, and there cannot be, in the same bodily substance, a plurality of substantial forms. Now, the animal is a sentient organism; sentience is distinctive and definitive of its very essence. Hence the one substantial form of the animal or-

ganism is the principle of its sentient life. But its sentient life involves the vegetal life. For many animal functions mingle the operations of the two grades of life in an inextricable manner. The animal reproduces, and generation is, in *itself*, a vegetal function; but the product of animal reproduction is a sentient organism: a vegetal function and a sentient product. The same thing is observed in nutrition and growth as manifested in animal organisms: these operations are, taken in their essential character, *vegetal* in nature; yet, in animal organisms, the thing that takes nourishment and grows is *sentient*, that is, the animal and its organic members. Hence we assert that the animal soul or sentient life-principle is *at once vegetal and sentient*.

Some philosophers refuse to admit that the plurality of substantial forms in a single body is a definitely impossible thing; they regard the matter as still an open question. We hold this position untenable, but we shall not pause to discuss it here. We merely offer, in addition to the reasons mentioned in the last paragraph, some items of evidence which prove beyond quibble that there is only one life-principle in each animal organism:

1. If the animal were not a single, but a dual substance; if there were in the animal two life-principles or substantial forms, one vegetal and the other sentient, we should find it impossible to explain why the operations of both principles should *cease at precisely*

*the same moment*, that is, at the moment of the animal's death. We should, that is to say, find it impossible to explain why this is *always* the case. For plant-life can exist and manifest itself in its proper operations without sentiency; it does so in grass and trees; why should it not go on in a dog that has ceased to be sentient?

2. If there are two life-principles in an animal we shall find it impossible to explain their *continuously unvarying harmony* of operation. There is never a "conflict" between the vegetal and sentient functions of an animal, not even in minor manifestations. The growth of an animal does not, for example, develop a type satisfactorily vegetal but unwieldy for sentient functions.

3. If vegetal and sentient life-principles exist separately in an animal we find it impossible to explain *the essential interdependence* of vegetal and sentient operations in the same organism. We have instanced examples of this just now when we spoke of the sentient life involving the vegetal operations, and of the two being inextricably bound up together. To illustrate further: the more perfect animals, at least, sense their food before taking it or even before finding it; thus, the sentient operation is necessary for the vegetal operation of nourishment. On the other hand, defective function in the vegetal order may impair sentient operations: thus, a sick animal (defective in vegetal function) is not so perfectly alert and capable

in its sentient operations as an animal in sound health.

The animal soul or sentient life-principle is a single principle which is at once vegetal and sentient. But it is none the less *essentially* different from the life-principle which is merely vegetal and not sentient, that is, from the plant soul. Function follows essence (*agere sequitur esse*), and essentially different and superior functions or operations indicate an essentially different and superior principle whence they proceed. Now, as we have seen, the functions or operations of the animal as such are essentially different from, and superior to, the functions and operations of the plant as such. In other words, operations of plants and animals indicate the fact that here are *two* essences; and the difference between two essences is an *essential* difference. The animal, indeed, has the operations of the plant, and it manifests these more perfectly in its own way than they are manifested in a simple vegetal organism. But you cannot say of an animal that it is merely a plant. It *has* plant-operations, but it has *more*; it has operations more complex and admirable than the plant can exercise; it has *sentient* operations. Therefore, the animal is not only possessed of a different essence than that of the plant; the animal's essence is also *superior* to that of the plant.

The sentient life-principle is,—like the life-principle of a plant,—a *material* substantial form, a *material*



life-principle, a *material* soul. It is not, indeed, made or constructed of bodily parts, but it *depends* for its existence and its operations upon the organic body, which is material in structure. The sentient life-principle *depends* on matter; without the body it does not have actuality or function; therefore, it merits the designation of *material*.

The sentient life-principle is *incomplete* both as a substance and as an animal. Manifestly, it is not an animal, but an essential constituent *part* of an animal. Nor is it a complete substance, for it is not fitted to exist by itself, but depends upon the organic body for existence and operation. Therefore the sentient life-principle,—like the life-principle of a plant,—is “incomplete both in the order of substantiality and in the order of species.”

To sum up: If we are asked to describe the nature of the sentient life-principle, we say: (a) that it is an incomplete substance which,—joined with the organic body of which it is the first substantial act,—constitutes the sentient organism or animal as a complete, existing, functioning living body of the second grade of organisms; (b) that it is a single actuality in each organism, and is at the same time sentient and vegetal; or, more precisely, that it is the root-principle of both the vegetal and the sentient operations of the animal organism; (c) that it is a *material* substantial reality, in the sense that it has an essential dependence on matter for its existence and operations.

b) CHARACTERISTICS OF THE SENTIENT LIFE-PRINCIPLE

1. *The sentient life-principle is simple.* It has no formal parts; no parts *as such*; no parts *of its own*, even though it is the vivifying principle of an organic body which has such parts. For the sentient life-principle is the substantial form of the animal body, and every substantial form has the property of simplicity.

2. *The sentient life-principle is actually one, and, in the more perfect animals, it is not potentially multiple.* Some of the lower, less complex animals, such as worms, may be divided into parts, and each part will continue to live, and will exist as an independent and complete individual organism. But among the higher animals this is not the case. There is nothing in the animal life-principle itself to balk potential multiplicity, for it is a material principle dependent on a divisible organism. But the great complexity and diversified functions of the higher animals appear to constitute an insurmountable obstacle to multiplication by simple partition of the organic body. The higher animals are multiplied by generation only,—that is, by the organic functional process,—and not by partition or division of the organism.

3. *The sentient life-principle is generated per accidens.* When animals generate or reproduce, the offspring is not a life-principle, but *an animal*, and this animal has a life-principle. The animal is generated

*per se*; it is the thing which is directly reproduced; and *with* it, so to speak, the life-principle comes into being. For this reason the life-principle is said to be generated *per accidens*; that is, not in itself directly, but *along with* something else, viz., the generated animal, of which it is an essential constituent part.

4. *The sentient life-principle undergoes corruption per accidens.* Just as it is *the animal* which is generated, and not the bare life-principle, so it is *the animal* which is corrupted or dies. The animal *itself* dies; the animal dies *per se*. The life-principle of the animal passes, with the death of the animal, from actual existence; it is corrupted or dies *per accidens*. At the risk of some inaccuracy we may put the statement thus: the animal itself dies, and this is corruption *per se*; the passing from actual existence of the animal life-principle is incidental to, or accidental to, the passing of the animal, and this is corruption *per accidens*.

5. *The lower life-principles (plant soul and animal soul) are educed from the potentiality of matter, and are reduced to the potentiality of matter.*

The potentiality of matter is the sum of possibilities latent in it. Now, matter *can* be alive; matter *can* be informed by a substantial life-principle. We know this is so because, as a fact, matter *is* alive in plants and animals; and what *is* alive *can* be alive. Thus we find that *to-be-alive* is within the range of possibilities realizable in matter. Not that matter can of itself

*come to life*, but matter, when actualized by a substantial life-principle *can be alive*, can be *living* matter, can be plant or animal. Matter, therefore, may be considered as *waiting* for the action of the substantial form which will actualize it as an organism. But we must not make this consideration too literal, for matter is pure potentiality and has no existence *of its own*. Keeping this clearly in mind (that matter itself has no actual existence in a formless state), we may use a very imperfect analogy, and say that the matter which is to become alive (when the substantial form is substantially joined with it) waits for its *substantial* form as the block of marble waits for the *accidental* form which is to make it a statue. And when a plant or animal is generated this waiting capacity, this *potentiality*, is actualized in fact, and a new organism exists. Now, in a sense, the life-principle which gives to matter actual existence as an organism, is *drawn out* or *educed* from matter, just as (allowance being made for the accidental character of the simile) the form of the statue is, so to speak, *drawn out* or *educed* from the marble block. The block of marble *can be* a statue, not, indeed, by its own power, for it has no power of its own *to become* a statue; it has only the capacity *to be made* a statue, and this capacity is actualized by the operation of a capable agency working upon the marble. And yet the accidental form of the statue is not something alien to the marble and *attached* to it from without; marble itself has the ca-

capacity for *having this form*, and the action of the sculptor causes this capacity of the marble to be realized in fact. And thus one is justified in saying that the accidental form of the statue is *drawn out* of the marble block, is *educed* from the marble. And if the statue displeases the sculptor; if he takes the hammer in hand and destroys the accidental form or shape which he has given the marble, so that not a feature of the image remains, the form of the statue is *reduced* or *thrown back* into the potential stage. The result of the sculptor's destructive action is what we call a "shapeless" block of marble. And yet this shapeless block can be formed into a statue again. The potentiality to be a statue is still there. The form of a statue has been *reduced* to the potentiality of the marble. Now, this simile is admittedly very defective indeed. The cautious student will, however, find it valuable for its *suggestion* of the educating of the substantial life-principle of an organism (that is, plant or brute animal) from the potentialities of matter, and the reducing thereto of the same substantial principle when the organism dies. For matter has the capacity for *existing as an organism* when a capable agency (generating or parent organisms) acts or operates to give it the substantial form of an organism. And when that form is given, it is not created by the parent organisms and attached to matter externally, nor is it produced by itself and afterwards fitted to matter; but the parent organisms, by their generative act, give

to matter a constitution which it is fitted connaturally to have; matter under the generative action is so constituted, so substantially formed, that it *lives*. And this is what we mean by saying that the life-principle of plants or brute animals is *educed* from the potentiality of matter. And when the organism dies, the substantial principle of life is not drawn off and kept in actual existence, to be deposited in some plant-heaven or animal-hell; no, the life-principle of the plant or animal ceases to have actual existence when the organism dies. It is not annihilated, but is reduced or thrown back to the potentiality of matter. For, while a dead plant or animal no longer has the substantial form of a living body, it still remains true that matter *can* have such a form.

It is important, in the present study, to reason most carefully, and to keep several important facts always in view. Such facts are the following: (a) The matter which enters with substantial form into the constitution of a body (living or lifeless) *does not have actual existence by itself*. There is no bare prime matter; there is no matter but in-formed matter; *formless* matter cannot actually exist for actual existence is a *form*. When matter takes new substantial form, it loses old substantial form. "The generation of one thing is the corruption of another." In this axiom, the term *generation* is not limited to the production of living things, but means the substantial production of any body, living or lifeless. Thus we speak of *generat-*

ing water from the gases called *hydrogen* and *oxygen*. These gases, combined in due proportion under action of a capable agency, produce *water*; water is *generated*; and at the same instant in which water comes into being, the gases pass out of actual being. The gases lose their respective substantial forms when the single substantial form of the chemical compound called *water* actualizes them. Thus when a new substantial form is actualized in bodies, it takes the place of an old substantial form, or of old substantial forms if the new body be substantially compounded of two or more elements. A new substantial form actualizes (generates) the new body, and the old substantial form or forms disappear (corrupt); and this all takes place *instantaneously*; and so "the generation of one bodily thing is the corruption of another." When a new substantial form comes in, it drives out the old. There is no *medium*, no middle ground, no "no man's land" between the two substantial forms. Therefore, we cannot view prime matter alone, for it does not exist alone. When a living body ceases to be alive, the substantial form (life-principle) is reduced to the potentiality of matter; but the body, the cadaver, is not formless matter. The dead body is still possessed of the outer shape (an *accidental form*) of the living body, and will retain it for a time; but the dead body is,—the instant the organism dies,—merely a parcel, in the shape of an organism, of various chemical ele-

ments and compounds, each of which has its proper substantial form as a lifeless substance. The substantial *unity* of the living body is conferred by the life-principle, and when the life-principle no longer actualizes the body, this substantial unity is instantly broken up and destroyed.

(b) The substantial form of an organism is its life-principle. But if this be a *material form it has no actual existence by itself*. There is no actually existing substantial form (if it be material, i. e., dependent on matter) except in actually existing bodies. Substantial form and prime matter must be substantially united, and then the actual body (essentially constituted of prime matter and substantial form) has actual existence. Remember that neither matter nor material form is *complete* either as *substance* or as *bodily being* in a definite essential kind.

(c) When a plant or animal is generated, this happens because the operating organism (or organisms, for there are usually two, male and female) produces a cell of such constitution that it has life in the same grade as the parent, yet *its own* life, which is not the life of the parent, but of the germinated cell as a *new living organism*. The *materials* of the new cell came indeed from the parent body or bodies, and these materials were not pure prime matter, but matter in-formed, matter with its own substantial character. The fecundation or germination of the matter

resulted in the fact that the matter took on a new substantial character; its old substantial form gave place to the new, and the new substantial form was a single substantial life-principle.

In all this, we have been discussing the production and the corruption of the *lower* life-principles, the *material* life-principles, which are the respective substantial forms of plant and animal. These principles, as we have explained, are educed from the potentiality of matter, and reduced thereto at the death of the organism. But there is another life-principle found in a living body which is not material, but spiritual. This is the human life-principle or *rational soul*, and we shall study it in the second Part of this manual. Here we merely mention an important fact: the human soul is not educed from the potentiality of matter (for, being spiritual, it is in no sense within the possibilities latent in matter) nor is it reduced thereto when a man dies. The human soul is, in each instance, produced by the direct creative act of Almighty God, and by the same act is simultaneously *infused* into the body, that is, is substantially united with the body, to actualize the single human substance. When a human being dies, his soul remains in actual existence apart from the body. For the human soul is spiritual, and, although it is united in *one human substance* with the body (and does not merely reside in the body like a prisoner in a cell), it is not dependent on matter for its existence or those operations which are peculiarly its own.

## SUMMARY OF THE ARTICLE

In this Article we have studied the nature of the *sentient life-principle* or *animal soul*. We have seen that each animal has a life-principle, and that this principle is the substantial form of the animal's organic body. We have seen that this substantial form is the root-source of all the vital operations of the animal; that it is the *one and only* vital principle whereby the animal *lives, takes nourishment, grows, propagates, senses, appetizes, moves by local movement*. We have seen that the sentient life-principle, although it is *both vegetal and sentient*, is, nevertheless, a principle *essentially different* from, and *superior* to, the merely vegetal life-principle of a plant. Like the plant soul, the sentient life-principle is *material*, since it depends for being and operation upon matter, i. e., upon the organic body of which it is the first substantial act. We have seen that the sentient life-principle is *incomplete* both as a substance and as an animal. We have noticed the outstanding characteristics of the vital principle of an animal, and have found that it is *simple, actually one* (and only in the lower animals is it *potentially multiple*); that it is generated and corrupted *per accidens*; that (like the vegetal life-principle of a plant) it is *educed from the potentiality of matter*, and is *reduced thereto* when the animal dies.

CHAPTER IV  
THE ORIGIN OF SPECIES

This Chapter discusses the wondrously harmonious yet varied groups of living bodies found in the world, and studies the gradation observable among them. It seeks to account for the order and apparent relationship existing among these organisms. It tries to explain the presence of organic types which were not found on the earth in an earlier period, and to discover the connection between these types and others which were once in existence but which have long since disappeared. The Chapter presents and studies various theories which have been advanced to explain the present state of organic life on the earth. These matters are discussed in two Articles:

- Article 1. The Existence of Species  
Article 2. The Problem of Species

ARTICLE 1. THE EXISTENCE OF SPECIES

- a) Meaning of *Species*      b) Variety and Multiplicity of Species.

a) MEANING OF SPECIES

The term *species* is used in a wide variety of meanings. It has one meaning for the student of Logic, another for the person who studies the knowing process (as we shall presently do in the second Part of this manual), and still another for the laboratory

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scientist. And in current daily speech the word *species* is almost synonymous with *sort* or *kind*. In the present study we employ the term *species* in the biological sense.

*Species*, in the biological sense, means a definitely marked group of living bodies. It means a class or group of living things (plants or animals—but we refer it here chiefly to animals) which is distinguished from other such groups by the *structure* of its members (their bodily "build") and their capacity for *interbreeding*. Many definitions of *species* have been formulated by biologists, and no one of them is entirely acceptable to all scientists. Professor Bateson offers us this sonorous definition: "A species is a class (of organisms) marked by morphological discontinuity and interspecific sterility." *Morphological discontinuity* indicates the fact that the body-structure of members of one species is unlike (or discontinuous with) that of members of another species: in a word, there is dissimilarity of "build" and bodily form between members of differing species. *Interspecific sterility* means that a female member of one species and a male member of another species cannot produce offspring. Professor Poulton formulates a very simple definition of *species*; he calls it, "An interbreeding community."

Whatever be the best definition of *species*, all agree that the most notable marks of such a class are two: *similarity of structure*, and,—apart from physical in-

capacity due to difference in size,—the capacity for having offspring indefinitely in the natural or wild state. The members of a species have bodies built on the same general plan, and, when left in their natural (or wild) state, the species tends to perpetuate itself, and not to die out.

Sometimes organisms of differing species may have offspring. Such offspring is called a *hybrid*. But the hybrid has no offspring, or, if it has,—and cases of the kind are extremely rare,—the offspring is not like the hybrid, but like one of the parents of the hybrid. Thus the offspring of a hybrid manifests what is called *reversion* or *reversion to type* (from the Latin *reversio* "a turning back").

Within the group called *species* there are minor groups called *varieties*. When varieties are artificially cultivated, they are called *breeds* or *races*. The offspring of parents of different races is called a *mongrel*. Now and then the descendants of a mongrel (perhaps after several generations) exhibit marked characteristics of one or other of the breeds in which the mongrel strain began. This sort of reversion or "throw back" is called *atavism*, a term derived from the Latin *atavus* "ancestor."

A species differs from every other species, as we have seen, in point of *structure* and *filiation* (from Latin *filiatio* "the having of offspring"). But many species may be grouped together on the basis of common characteristics more general than the specific de-

terminants. Such a group of species is called a *genus*. And a genus grouped with other genera forms a *family*. And families of a type constitute an *order*. Orders are grouped into *classes*, and classes into *phyla*. The phylum is the most general class of organisms recognized by the biologist.

#### b) VARIETY AND MULTIPLICITY OF SPECIES

There is no need of argument or explanation to establish the fact that this earth of ours is inhabited by a bewildering number and variety of living bodies. Bird, and beast, and reptile, and fish, and insect, are types of organisms which we all know and recognize; and the earth is a veritable wonderland of varied plants. Even the least observant among us notices a great variety of types among animals and plants, and recognizes differences among the members of the same general type. The student who has had to study botany or biology, and has been put to the task of classifying the members of one *order* (such as the beetles), or of one *genus*, will be much more deeply impressed than the ordinary man by the variety and multiplicity of organisms, and by their amazing unity, harmony, arrangement, and gradation.

Geologists,—those scientists who study the strata of the earth-crust on which we live,—show us proof that the earth was not always the home of living bodies. The fossil remains of plants and animals furnish further proof that, when life appeared, or-





## b) FIRST ORIGIN OF LIFE

Scientists have long ago come to the conclusion that a living thing comes only from a living thing. True, there are a few who hold stubbornly to the utterly indefensible view of the Materialists that there is no essential difference between living and lifeless bodies; that life is to be explained in terms of physical, mechanical, and chemical activity; and that differences among existing organisms is merely a matter of the degree of complexity and intensity in such lifeless activity. We have seen that this view is not only unfounded but is flatly in conflict with reason and the facts of experience (Cf. *Chap. I, Art. 2, b*). Life is essentially different from non-life, and life does not come from non-life. The great majority of scientists are quite agreed on the point. They accept as axiomatic the phrases: *omne vivum ex vivo* "every living thing from a living thing"; *omne ovum ab ovo* "every egg,—or vitalized germ,—from an egg"; *omnis cellula ex cellula* "every cell from a cell"; *omni protoplasma ex protoplasmate* "all protoplasm from protoplasm."

We have all heard the famous question, "Which came first, the chicken or the egg?" It is an interesting question, but it is not a basic question. Granted that either the chicken or the egg had to come first in that particular chicken-and-egg series, the fundamental question is this: "Whence did the first chicken,—or first egg,—have life and the power to start this ap-

parently unending chicken-and-egg series?" Mr. G. K. Chesterton, in one of his entertaining yet penetrating essays, says that it is more exciting to have a nose than to have a Norman nose. Similarly, it is more exciting, and vastly more important to the serious investigator, to find *life* than to find life in this or that organism. Tell us first where life came from, and we shall then take up the minor question of the various manifestations of life. We must face the problem of life,—i. e., of organic life on earth,—before we face the problem of species.

We have seen that life is *essentially* different from non-life. It follows at once that life cannot have originated in non-life. An effect must find explanation in its *adequate cause*, which will be one cause or a sum of contributing causes. True, a capable agent can use inferior materials to make a superior product, but in this case the *power of the agent* and the *agent's own perfection* which is back of the power, enter into the sum of causes which account for the product. We do not say that bricks make a wall, and exclude the builder and the planner of the wall. Mr. Dooley remarks in one of his more caustic moments: "It was discovered that ink and pa-aper wud projooce wurds, and thin the printin'-press was invinted." We all catch and enjoy the point of the remark, but our very enjoyment comes partly from the absurdity of the notion that ink and paper of themselves, without thinker, and writer, and compositor, and pressman,

could produce words. For nothing can of itself produce an effect which is superior to itself. Now, a living body is unquestionably superior to a non-living body. The living body has a constitution that is wondrously more complex, amazingly more balanced, and inexpressibly more unified than a non-living body. And the operations of a living body are of immeasurably greater variety and power than those of lifeless bodies. The living body is the superior thing, and the lifeless body the inferior. And hence the non-living body cannot of itself have produced the living body. An agent cannot give what he does not possess; he cannot do what is manifestly beyond his power to accomplish. You cannot pay a bill of one dollar with a single dime. You cannot lift the Pyramid of Cheops with three fingers. Neither can non-living matter give what it does not possess, *i. e., life*; nor can lifeless bodies do what is manifestly beyond their power to accomplish, *i. e., confer life* with its wondrous capacity for immanent operation. To say that life comes from non-life is to enunciate an absurdity; there is an obvious lack of essential proportion between life and non-life; viewed as cause and effect, with non-life in the role of cause, these items do not meet the requirements of reason or fact; they do not, as the schoolboy says, "add up right." If we find life in matter, as we manifestly do, there is only one possible conclusion that will satisfy reason, and this is that life was *put* into matter, and

has not come from matter itself. This conclusion of sound reason is backed by the whole history of experimental science.

A while ago it was the opinion of some scientists that the more imperfect animal organisms were generated by non-living bodies. It was found, for example, that water, completely sterilized and free from every form of life, would, in the course of a few hours, contain microscopic organisms. It seemed to the scientists in question that reason would have to surrender to stubborn fact and admit that life had come from non-life. Either that, or the old doctrine of a living universe (*hylozoism*) would have to be revived as the true philosophy of this bodily world. But the difficulty was only a seeming one. A few experiments, notably those of the great French chemist, Louis Pasteur (1822-1895), solved it completely and finally. These experiments showed that the organic life found in the water came there from the atmosphere, which is literally filled with tiny organisms or living germs. When the air was scientifically strained to prevent the infiltration of germs, the water was found to remain perfectly sterile. Further, it was discovered that when the water was left open to the air of the crowded city (with its hundreds of breathing beings, and its unavoidable accumulations of filth and decaying organic matter) it was soon filled with organisms, while water left exposed to the clear air of a mountain-top remained compara-

tively free from them. Thus was the death-blow administered to a theory called,—somewhat inaccurately,—*the theory of spontaneous generation*, that is, the theory that matter can, of itself, “come alive” or can germinate living bodies. We are all so familiar nowadays with processes of sterilization and pasteurization (which latter term is a perpetuation of the name of Pasteur) that we can hardly believe that, not very long ago, solemn scientists and serious philosophers found a baffling problem in the fact that exposed foodstuffs will “breed” maggots, and that the apparently solid apple has a wiggling worm in its heart. We know,—and accept the knowledge as a thing almost self-evident,—that infected foods take their infection from the germ-laden air, and that the worm in the apple was first a tiny egg deposited by a winged creature in the apple-blossom. And we prevent infection of foods by pasteurizing milk and by placing edibles into our refrigerators; we secure a crop of wormless apples by repeated and rightly timed spraying of our orchards. We know, in a word, that the organisms here considered come from other organisms; we know that life comes from life; we know that lifeless matter does not “breed” living things.

Now, even if matter *could* give life,—which it cannot do,—the basic question of the origin of life on earth would not be answered by this fact. For the question would at once revert to this: whence came

the original matter, and whence came its power to give life? It would not do to say that matter came from other matter which existed, perhaps, in the form of a primal mist or nebula. Such an answer would only delay the solving of the problem presented by matter as a source of life. Matter from matter, and this from other matter, and this from still other matter, and so on until the primal nebula is reached, and behold, this is still matter! The problem is not solved; the question is not answered. Not a single step, not the shortest distance, not an inch, not the breadth of a hair, has been traversed in any advance upon the problem. After considering all the long series of phases of matter, one has not yet even come to grips with the problem. The problem is precisely what it was at the outset; the question remains the same: where did the first matter come from and how did matter get the power to develop into living bodies? Now, it does not signify whether matter has undergone many changes or passed through many remarkable phases of existence. If matter is to be regarded as the source of life there must have been *a first quantity of matter* endowed with the power of producing a chain of material things which would eventually bud forth life. And our question is concerned with this *first* matter. The subsequent development of matter does not concern us at all until the fundamental question is answered, the question of where the original life-bearing matter came from and

where it got its cargo of transmissible life. The Materialists have always dodged this issue. They have not even had the grace of the politician in inventing some cloak or cover for their twisted and broken chain of ostensible reasoning. Some of them have explained life on earth by saying that it must have come from some other planet; which, as Mr. Chesterton points out, is like explaining the ghost in the village churchyard by saying that it must have come from a neighboring village. In a word, the explanation does not explain; it merely shifts the problem, leaving it completely unsolved and even unattacked. Other Materialists have dwelt, almost lovingly, upon the vast reaches of time during which matter has been developing, and they offer *that* as the explanation of life on earth; which is like explaining the character and personality of your guest by telling what a round-about journey he made to reach your house. No; if matter is in any sense the source of life, it somehow and somewhere *got the power* to give life. That is the fact to be faced. That is the issue that cannot be ignored, for it is the issue upon which depends the whole philosophy of life in living bodies.

Matter, then, could not of itself have produced life. For matter, far from explaining the existence of living bodies, does not even explain its own existence. But there must be an explanation for everything. "Nothing exists," says the axiom, "without a sufficient reason for existing." Now, the sufficient

reason for an existing thing must be found in the thing itself, or in something else. If it exists in the thing itself, that thing is a being which *must* exist, a being of such character that it cannot be non-existent: otherwise, the being is not self-explanatory, but finds its explanation in something else, viz., in its causes. A being which explains itself, which is its own sufficient reason for existing, must be self-existent, must be uncaused. And such a being must, in the fullest sense, be self-sufficient. It must be boundless in perfection and absolutely infinite; for, not having to submit to the action of any causes (of things other than itself), there is no conceivable thing which could limit it or accidentally qualify it. In a word, a self-explanatory being must be infinite, eternal, all-perfect.

Now, there actually must be such a self-explanatory being. Why? Because all other things are inevitably traced back to it and require it as *their* ultimate explanation. For other things are explained in their producing causes; and these causes are explained by *their* causes, and so on. But there is an end to this; there is an end which is The Beginning. Things which do not explain themselves point inevitably back to something which does explain itself. To put the matter in a more technical way, *contingent* beings (beings which are dependent on, or contingent on, the action of their causes, and which would not be here if those causes did not operate) indicate infallibly the existence of a *necessary* being (a being

which is of such essence that it *must* exist; which is so limitlessly perfect that its very essence involves its existence and is identified with its existence). Contingent beings presuppose a necessary being. Caused beings presuppose an existing First Cause.

The necessary, uncaused Being which is the great source of all being, cannot be matter. And why? Because matter is not necessary, but contingent. Matter is manifestly subject to the action of causes; matter is changeable; matter can be shaped and moulded and formed and transformed. We see evidence for this statement all about us every day and hour. Material things, living and lifeless, come into existence and pass out of it; they are born and they die; they wax and they wane; they ripen, and rot, and decay, and disappear; they are in process of continuous change and movement. Now, if matter were a necessary thing; if matter were self-explanatory and self-existent; if matter *had to exist*, it would not be subject to the action of any causes, and would perform *be changeless*. But matter is far from changeless; on the contrary, it is continually changed. If the ancient lush vegetation of the earth *had to exist* changelessly, how could it pass from its proper existence and become coal? If coal *had to exist* unchanged, how could it be transformed into ashes and smoke? If the baby *must* be what it is, unaffected by any causes, how does it presently become a man or

woman? Where there is change, there is *contingency*, for change is due to causes and is contingent upon their action. But the self-existent First Cause is not subject to causes; it is the *First Cause*; there exists no other cause which, from the beginning, could have had an influence upon it. The First Cause is *necessary*, and not *contingent*. Hence it is clear that matter, which is contingent, cannot be the necessary First Cause.

The First Cause which accounts for itself, for its own existence and that of all other things, must be *infinite* (for no cause exists to limit it), *eternal* (for time is the measure of creatural things that change), *all-perfect* (for it is subsistent being itself, boundlessly existing, purely actual and not potential). We call this one necessary Being by the name *God*. And if matter is in any sense the bearer of life, it is because God has made matter, and endowed it with the form of an organism and given it power to propagate. All life in organisms is, directly or indirectly, created life. And all created life comes, immediately or ultimately, from the Creator, God. It signifies nothing where you begin your investigation of life and its origin; it is of no consequence what preconceived notions you are pleased to entertain,—be they as materialistic as you will,—you *must*, if you keep open eyes and a clear mind, come at last to the conclusion, inevitably as you come to the conclusion of a

rightly solved problem in mathematics, that life comes from the Author of Life; that life comes, in last analysis, from God.

Life does not come from non-life. Life comes from life. Ultimately, life comes from Life. Living bodies can be explained only by reasoning back to the Creator and First Cause of all, Himself uncaused, God the All-Living. This is the true, the inescapable first origin of life on earth. And notice carefully that this is not a postulate of faith or religion; this is a conclusion of cold, scientific reason.

#### b) ORIGIN OF SPECIES

Organic life has its first origin in the creative act of God. We must now ask about the different types of living things which have organic life. Did the Creator put life into only one or a few organisms and empower these to develop into all the types of organisms now existing? Or did the Creator make each and every specific type as we now know it? Or did the Creator make certain species and afterwards allow them to become extinct on earth and then replace them by other newly created species? These questions express the problem which is indicated in the phrase, "the origin of species."

All the theories propounded to explain the origin of species may be reduced to two: the theory of *changeless species*, and the theory of *transformed or derived species*. The last named theory is known as

*transformism*, although it is commonly called, by laymen and scientists alike, by its less accurate name of *evolutionism* or simply *evolution*. We shall make a brief study of these two types of theory.

1. *The Theory of Changeless Species*—Species are stable. *Of themselves*, they are changeless. One species has no inherent and connatural tendency to develop into another species; on the contrary, each species, while admitting varieties, clings stubbornly to its type and shows a fixed tendency to maintain it. God created the various changeless species, and this in one of three ways: (a) by successive independent creations; (b) by a single creation of all types of organisms (species) which implanted them, so to speak, in the world, each to appear at a suitable time; similarly, a gardener might sow at one time the seeds of many kinds of flowers, some of which would appear sooner, others later; (c) by creating a certain number of species, changeless *in themselves*, but specially endowed with a power, over and above their specific capacities, of developing into other species. We shall pause a moment upon these possibilities.

(a) God created the various types of organisms directly, each at the moment it appeared on earth. Certainly, this theory involves no self-contradiction. It proposes something entirely possible. And there is much to be said for it. It explains satisfactorily the

constancy of species, for, in spite of all the scientific talk about one species being transformed into another, not one example of it has ever been found and verified. Species hold fast to their type, and when a departure from specific type seems to be begun, as in the birth of a hybrid, it stops at once; either the hybrid is without issue, or its offspring pops back into one of the parent species, utterly refusing to carry forward any evolution or to establish a change of specific type. Nay, even among varieties within a species, there is a tendency to hold the original natural types; and when artificial pressure is removed from a cultivated variety, the variety slips back into the state in which it formerly was. The theory of successive independent creations squares well enough with this constancy of fixed types or changeless species. The theory is an explanation that does explain. That it is the only explanation, or the true explanation, we dare not assert.

(b) St. Augustine, in his commentary on the Scriptural account of creation says, "In all the elements of the bodily world there are certain *seed-essences* which, when time and conditions are suitable, come to fruitfulness as species. . . . As a seed contains invisibly what will in time become a tree, and contains it from the first, so the world, which God created all at one time, must be regarded as containing from the first all that was created in it

and with it." This theory of *rationes seminales* (or *seed-essences*) would make the bodily world a kind of fertile field in which the Creator sowed, at the beginning, the seeds which would appear, each at its own time, as species of living things. This theory, like the foregoing, is a theory that does explain. It takes account of the stubborn constancy of species, and it recognizes,—what so many modern scientists are apt to overlook,—the fact that in the marvellously graduated scheme and scale of species there are real fixed differentiations as well as real resemblances; there are missing links by the million as well as nicely graduated organic types. It is truly strange that more modern scientists do not adopt a view somewhat akin to that of St. Augustine (who lived from 354 to 430) and see in the beautiful gradation of organisms, not an argument for evolution, but the manifestation of one Builder's magnificent and orderly plan.

(c) Some scientists feel that the theory of successive independent creations does not meet the requirements of the boundless wisdom of the Creator. How, they ask, could the all-wise God have made species simply to destroy them? No, they say, the first things He made served Him in the forming of those that came later. He modified the earlier organisms bit by bit, and with wondrous skill, to build up the variety of specific forms which have appeared in the successive geological stages of the world's development. In

other words, while species have no connatural tendency to transform *themselves* into different species (and this self-destructive tendency is nowhere observed in the universe), the Creator has imparted to species a special power so to develop; more accurately. He has successively intervened directly, not to create new species, but to make essential modifications in the old. Here again, we have a theory which explains the origin of species in a manner entirely possible. It does, however, seem a bit unfair to say that the theory of successive new creations is in conflict with divine wisdom. Might it not be that the extinct species served their turn and their time, and were of benefit to the rounded well-being of the world while they were here, and that afterwards they were allowed to disappear? And would their existence and disappearance then be in conflict with the divine wisdom? It seems not.

2. *The Theory of Transformed or Derived Species*—This theory, is, as we have said, called the theory of *evolution*; sometimes it is called the theory of *descent* or *derivation*, since it holds that one species is descended from, or is derived from, other species. There are several types of evolution, chief of which are the following: (a) Monistic Evolution; (b) Darwinian Evolution; (c) Christian Evolution.

(a) *Monistic Evolution*—The name of this type of evolution is derived from the Greek word *mones*

"alone; only." The theory holds that there is *only one* kind of substance in the universe, and that all things, living and lifeless, are made of it. Monism, in the very words of its founder, Ernst Haeckel (1834-1919), "conceives all nature as *a single whole*, and recognizes the existence of mechanical causes only." In other words, the world and all things in it are composed of a single sort of substance, which, since the world is bodily, must be a *material* substance, although Haeckel expressly denies that a *spiritual element* is excluded from the common world-stuff. Things differ by reason of the action of mechanical causes working on the world-stuff, and mechanical causes are those that produce local motion; thus things differ only by the direction and intensity of the movement of their atomic parts, and also, perhaps, by the number and arrangement of such parts in so far as number and arrangement could be the effect of mechanical causes. The world, originally a whirling mass of atoms of the world-stuff, has, through its mechanical activity, *worked itself out* or *has evolved* itself into its present state of order and regularity.

We cannot accept Haeckelian monism as a satisfactory explanation of the origin of species. *First of all*, it proposes a material substance as the self-existing, self-explanatory First Cause; we have seen that this cannot be. Matter (even though mingled with some spiritual element) is not necessary being,



but contingent being. It cannot be the *first* being. Haeckelism therefore is a theory which does not account for the facts it is meant to explain; it does not say where the world-stuff came from; it leaves us to accept, as a basic principle, the absurdity of unproduced matter. *Secondly*, this type of monism leaves us to suppose that the orderly universe came to its present state and condition by pure chance. No one who observes the great cosmic movements or who looks at the delicate order and balance of the tiniest organism can accept such a suggestion for a moment. Throw a handful of type on the ground and expect it to print a perfect sonnet in the dust; toss a pinch of finely ground iron-ore into the air and wait for it to form itself into a perfectly constructed chronometer; plant a bit of stone and look for the growth of a majestic building,—do these absurd things if you will, but refrain from that absolute nadir of insanity which looks upon world and life and murmurs "Chance!" Chance is never a cause; chance is indicative of something unexpected or unforeseen in an *effect*. The type-slugs cast on the ground might chance to print a sonnet, but the sonnet has still its *cause* in the type-slugs and the thrower. The thrown dust may form itself into a watch, and this effect may be regarded as a chance effect, but there was no chance about the cause; the dust had to be thrown, there had to be someone to throw it. *Thirdly*, Haeckel's monism proposes uncaused mechanical motion

as the basic actuality of things. Yet mechanical motion is not, and cannot be, self-originating. Mechanical motion is transient motion, and not immanent activity; and even if it were immanent activity, which it is not, it would, as we have seen, have to be infinite, and therefore subsistently independent of the finite universe which it actuates, in order to qualify as the ultimate reason and explanation of the world. Yet Haeckel explains the universe as the product of mechanical causes working within its own limits and existing only there. *Fourthly*, the monism of Haeckel recognizes no essential difference between life and non-life, and assumes the absurdity that matter can produce life which matter itself does not possess. But we have seen that there is a demonstrable essential difference between life and non-life; we have also noticed a simple requirement of reason in the principle that an effect cannot exceed the sum of its causes, and has nothing which the causes did not first possess and then bestow upon it. *Fifthly*, Haeckelism supposes that organisms, having come alive through the mechanical motion of the world-substance, can change themselves, and do change themselves, into organisms essentially different from themselves and of a higher grade. This doctrine is in manifest conflict with both the principle of causality and the principle of sufficient reason. Besides, the theory ignores the constancy of species, and leaves unexplained their stubborn tendency to hold their proper nature and not to destroy

it even for the sake of having it transformed into something superior. Such a suicidal tendency as the Haeckelian theory attributes to organisms is nowhere found in the universe. Organisms do tend to develop to the perfect and mature form of their own type; they never tend to lose their identity and become something specifically new and different. Nor may it be objected that Haeckel denied the essential difference of species; we admit that he did, but we are not discussing his opinion on the point; we are dealing with objective fact in the light of his doctrine of monistic evolution. *Sixthly*, the doctrine of Haeckel would make human life in all its manifestations a matter of mere mechanical motion. Thought, ideals, reasoning, willing, virtue, civilization, culture, and every phase of human action and achievement would be expressions or effects of such activity as one observes in water running down hill or in a kite that floats aloft on the summer wind. All the products of men's minds, all the science, all the philosophy, all the poetry, all the art, would be the product of mechanical action,—of action like the turning of a wheel, of action no whit different from that which is observed in the ticking watch or the throbbing motor. The patriot's devotion, the mother's self-sacrifice, the child's trusting love, the student's interest and tireless effort, the honest man's earnest practice of religion, the statesman's careful planning, the humble laborer's submission to endless fatigue in the work of earning

bread for his family,—all these would be manifestations of activity like that which sends the waves upon the beach or drives the raindrops down upon the earth.—For all these reasons we reject monistic evolution as the explanation of life and the origin of species. We find the theory utterly inadequate, utterly contradictory of reason, of fact, and of its own postulates.

(b) *Darwinian Evolution*—Charles Robert Darwin (1809–1882), an English naturalist, taught that all species of animals,—including man,—have come from one or two types of the lowest form of sentient organisms. The original parent-types tended to change and vary (as animals still do); the variations were transmitted to offspring, and these, in their turn, tended to add their own variations. So races were multiplied, and the changes eventually carried the varying races across the line of their specific nature, and new species appeared. The species that have endured and have held their place as lasting stages in the evolutionary process, are those which were found best qualified to meet the strain of the struggle for existence; other species, unequal to the struggle, have died out and become extinct. We may notice the struggle for existence, and the survival of the qualified, even in the individual animals of a litter, or in groups of animals that prey upon one another. The stronger manage to live; the weak and incompetent

perish. In a word, the history of species, as of individual animals and groups of animals, manifests a *struggle for existence* and *the survival of the fittest*. Now, the survival of the fittest is a *natural* process inasmuch as nature has equipped the survivors with those individual or specific superiorities (variations) which brought them victory, and hence the survivors may rightly be said to be *selected* by nature to endure. Existing species, therefore, are the conquering heroes of the struggle, and victory came to them by way of *natural selection*. Man is developed, by force of natural selection, from the higher apes.

We cannot accept Darwinian evolution as the explanation of the origin of species. We find it in contradiction with reason and with experience.

(i) Darwinian evolution contradicts *reason*. It makes *natural selection* the motive power which differentiates species, and natural selection is nothing more nor less than *chance* selection. In other words, Darwin, like Haeckel, proposes a universe of organisms evolved by chance. Reason cannot accept chance as a cause, for it is never a cause; chance presupposes a cause, for chance is only a quality in an effect; it is not the producer of an effect. Again, Darwinian evolution contradicts reason in assigning tremendous effects to trifling causes, after giving the causes existence by mere chance. To say that racial variations, when long sustained and amplified through generations of animals, will avail at last to change the very

nature of the animals concerned and turn them into new species of organisms, is as fatuous as saying that if a man wears brighter and brighter clothing, and instills into his children a love for more and more colorful attire, one of his descendants may eventually become a rainbow. Indeed, it is as silly as to say that the rainbow may eventually become a brightly clothed child; for the evolutionary drive (by force of pure chance or, if you prefer the synonym, by natural selection) is ever upward, from the lower type of being towards the higher. Reason demands a *proportion* between an effect and its adequate cause,—that is, the sum-total of causes which contributed to its being. Reason requires a measure and balance in things. Reason cannot conceive of a cause which confers what it does not possess, and of an effect which exceeds in perfection the total perfection of all the causes which contributed to its production. Darwinian evolution ignores this requirement of sane reason. The theory, therefore, is in conflict with reason; it *contradicts* reason; it must, in consequence, be rejected. Now, it will not do to say that Darwinian evolution is a development like that of a seed or germinated cell into the mature organism. The evolution of the seed or cell is not the evolution of one species into another by force of *accidental* variation which unaccountably becomes, on a sudden, *essential* variation. The evolution of the seed or cell is the growing-up of a specific organism to full stature.

Specific life, and specific drive for development, were present in the cell from the first, and the species of the seed or cell and of the mature organism which develops from it is one and the same species. Nothing is left for natural selection in the development of the germinated cell; the type of organism to be evolved is already predetermined.

(ii) Darwinian evolution is in conflict with *experience*. This type of evolution conceives species as ever varying, ever reaching out by countless variations towards the borderland of higher species. In consequence, species are not clearly defined. But modern experimental science presents us with litanies of species perfectly defined and clearly differentiated. The clear-cut character and stability of species is the very foundation of botanical and biological science. Again, the best of scientists freely confess that all the efforts of experimenters, gardeners, breeders, biologists, have not succeeded in driving an organism out of its species into another of either higher or lower type. Varieties are produced in almost countless numbers; a new species, never. Finally, the attempt to "cross" species directly by interbreeding (the process is called *hybridization*) has always failed to produce a new species. The hybrid is usually sterile, and when fertile, its offspring or descendants invariably revert to the species originally crossed. Thus is Darwinian evolution found to be in conflict with experience. For these reasons, therefore,—viz., that the theory con-

tradicts reason and is in conflict with experience,—we reject Darwinian evolution as inadequate. We do not find in this theory an explanation of the origin of species.

Before passing on to consider *Christian Evolution*, we pause momentarily to inspect the *Theory of Mutations* proposed by the famous Dutch botanist, Hugo de Vries (1848- ). This theory explains the origin of species by asserting the occurrence of sudden "jumps" in the evolutionary process. It does not admit the steady variations and gradual adaptations and overlappings which link up all species of animals in the Darwinian scheme. It asserts a series of sudden changes or mutations each of which introduced new species. In criticism of this theory, we may only say that if it attributes the "jumping power" to organisms themselves, without the intervention of an extrinsic controlling force (which is, ultimately, divinely applied), it fails by the same reasons which condemn Darwinism. If it means that God directly intervenes to produce the mutations, the theory is not essentially different from the third type of theory which supposes species to remain naturally changeless (Cf. *supra* p. 137. c).

(c) *Christian Evolution*—There exists to-day a mistaken attitude of mind on the subject of evolution,—an attitude so common as to be almost universal,

even among students and professors of the natural sciences,—which should be firmly and uncompromisingly corrected wherever it is encountered. It consists in the notion that evolution and religion are subjects inevitably, and even inextricably, intertwined. In many minds the notion is extended to include the conviction that an evolutionist is a man without belief in God. Now, the fact is that evolution, taken simply as a hypothesis, has nothing whatever to do with religion, nor has religion anything to do with evolution. It is a further fact that many professed evolutionists have been,—as many now are,—men of markedly religious life and abounding faith. Evolution cannot dispense with God, and even the monistic scheme ignores God rather than denies Him. For the rest, the universe is God's; if He choose to create it and have it go through a slow process of development and growth rather than to create it in full and complete and final form; it is still a creature-world and God is still its Creator. As a fact, we know that this earth of ours has gone through a long progress involving many changes. There was a time when life did not, and could not, exist on the earth. There was a later time when organisms existed in species which are now no longer found. There are now in existence organic bodies of species which were unknown in an earlier time. And, for the matter of that, Holy Scripture itself tells us that there was a process and a progress in the creation of the world; God created

all things in six periods or stages, which, we may well believe, were of immensely protracted duration, since geology seems to indicate as much, and there is nothing whatever in Revelation to suggest an idea of their length. Taken simply as an *hypothesis*, that is, as a provisional explanation assumed to be tested and tried in an effort to get at the truth of the world's history, evolution is a subject of purely scientific character and does not touch religion at all. In our rejection of *monistic evolution* and *Darwinian evolution* we have not invoked religion. We have found these systems in conflict with reason, with facts, and with experience, and so we have been compelled to reject them as inadequate and untrue. We have thrown aside these faulty theories, not because they are irreligious (as, indeed, in their practical effects upon human life they would undoubtedly be), but because they are utterly unreasonable and therefore manifestly false. *But there is one point upon which many evolutionists bring their hypothesis into conflict with religion, and it is the evolutionists themselves that cause the conflict, like a mad motorist who deliberately swerves his car out of line and drives it full tilt into another. The point is this: these mistaken evolutionists unwarrantedly teach that man, body and soul, with all his elements, faculties, and powers, is a pure product of animal evolution. This doctrine no Christian can accept; nay, no sane man can accept it, for reason recognizes the fact that the chasm between animal life in*

brutes and rational life in men is unbridgeable by any organic development, no matter to what lengths of complexity and refinement that development may be carried. For man's rational life is not organic at all, and therefore cannot find its origin or explanation in organic development. Man's rational life, as its operations testify (and operations indicate nature; function follows essence) is *supra-organic*; it is *spiritual* in character. This is a point we shall study in detail in another part of this book. The Christian, therefore, must reject any theory of evolution which brings man, body and soul, into the scheme of organic development. Notice, however, that the Christian is not compelled to make the rejection by religion alone; he makes it also on the authority of reason which finds the theory wholly unacceptable. In a word, the Christian rejects human evolution not only because he is a Christian, but because he is a man; not only because he has faith, but because he has a mind which can tell a hawk from a handsaw. *Man is simply outside any evolutionary theory or scheme.* This being once admitted, the Christian may (since Christianity is utterly reasonable and is the fostering mother and guide of right reason) accept evolution as the explanation of the world and of the origin of species, *if he finds the evidence satisfactory.* We have seen that the evidence is not satisfactory (for Christian or non-Christian) in the case of the two special theories of evolution called respectively *monistic* and

*Darwinian* evolution. Any evolutionary scheme, to be acceptable to reason, must recognize the following facts: (i) Matter is not self-existent nor self-explanatory. Matter requires a producer, and, ultimately, a Creator. For matter is contingent, and the existence of a contingent being demands, as its explanation and sufficient reason, the existence of a necessary being, an infinite being, God. (ii) Matter is not, of itself, immanently active; matter is not, of itself, *alive*. If matter have life, as it has in organisms, its capacity for vital functions was conferred upon it, was put into it,—ultimately, by the Creator,—and is not to be explained in mechanical or physico-chemical terms. (iii) If organisms have really the power to transform themselves into *other*, and specifically *superior*, organisms, this power must have been conferred upon them by the Creator who wills to have organic life so manifested and so developed; but, *of themselves*, and without specially conferred power, organisms cannot tend to become things essentially different than they are in their own mature and rounded constitution. (iv) Man is outside the field of any evolutionary development in nature, and the human soul is, in each individual instance, created immediately and directly by Almighty God.

Once all these requirements of reason (as well as of religion) are met, the Christian may, without let or hindrance from his faith, accept an evolutionary doctrine as the origin of species.

Let us now round out our position on this subject of evolution by a series of questions and answers:

Is it possible for a Christian to accept evolution as the explanation of the origin of species, if man is excluded from the evolutionary scheme?—Yes.

Is not evolution already utterly condemned in the condemnation of the Haeckelian and Darwinian systems?—No; *two special theories on the manner in which evolution is supposed to carry on* have been rejected; evolution as a possible *fact* has not been denied.

Is evolution, excluding man, really a fact?—It has not been proved so, even for the lowest of organisms. It seems probable enough. It may well be a fact. Again, it may not. We await further evidence for one conclusion or the other.

Are not all scientists avowed champions of the evolutionary theory or hypothesis?—No, but many are. Yet it is not the function of a scientist to champion any cause or to promote any enthusiasm; his work is to discover the *facts* in the field which he investigates. What any scientist *believes* is of small importance for science; true science, as Ruskin says, "does not speak until it *knows*," and can establish knowledge by inescapable proof.

Is not one out of tune with the scientific mood and trend if one withholds full assent to the evolutionary idea?—The *scientistic* mood, yes. There is no *scientific* mood. *Science* is not a matter of moods and

trends, of styles and fashions; *scientism* is. And even in many seats of learning *scientism* holds, by usurpation, the place which belongs to *science*. Scientism is incompetence, insincerity, or chicanery, wearing the mask of science.

Do not many people,—even learned people,—believe that the Catholic Church is the bitter foe of any evolutionary doctrine, and are not these persons therefore convinced that the Church stands opposed to science?—Yes. And many persons believe that the earth is flat. And some persons believe that a Catholic pays to have his sins forgiven. If people will not face facts, if people will not read history, if people will insist upon explaining what they do not begin to know, what shall be done about it? The fact that some persons of this stamp are regarded as "learned" and can show university degrees, is only an additional cause for tears—and the tears are not shed for the Catholic Church, the mother and promoter of true science. Fatuity, and mental vacuity, and charlatanism, are, like poverty, always with us, nor are the "learned" free from these lamentable ills.

Could a Christian hold the theory that man's *body* has an animal origin, that is, that the body of one single individual animal was developed through organic stages, after being first formed from the slime of the earth, until it was adequately prepared for God's purpose of infusing a human soul into it, and so creating our first father, Adam?—There is ab-

solutely no evidence for this belief. On the other hand, the notion *in itself* does not appear to conflict with reason or with the revealed account of man's creation.

Could a Christian accept the theory that many, or at least several, animals were thus prepared for elevation to the human status by the creation and infusion of souls?—Absolutely no. The best scientific study as well as clearly revealed truth combine to inform us that mankind is descended from a *single pair* of parents, and we have it as a truth divinely revealed that the body of the first woman was formed from the body of the first man.

When all demands of reason are met in elaborating a scheme of evolution, excluding man, what has religion to say for or against the possibility or probability of such a scheme as the statement of fact?—Nothing whatever.

What has philosophy to say of such a scheme?—Nothing whatever.

#### SUMMARY OF THE ARTICLE

In this lengthy Article we have learned many important things. We have stated the problem of the *origin of life* on earth, and that of the *origin of species*. We have found that the first origin of life is the creative act of an infinite and necessary First Being and First Cause, God. We have seen that mat-

ter does not explain its existence, nor can it explain the fact that material bodies possess organic life. *Spontaneous generation* we have found inadequate to explain the origin of life, and indeed we have seen that it is impossible. We have reduced to two general classes the systems which attempt to explain the origin of species: *the theory of changeless species*, and *the theory of transformed or derived species*. Under the first head, we have discussed the theories of *independent successive creations*, of *seed-essences*, of *essences changed by a specially communicated power for specific modification*. Under the second head, we have grouped the evolutionary theories, and have discovered that Haeckelian evolution (or *monistic evolution*) and Darwinian evolution (or the *evolution of natural selection*) fail to square with reason, with facts, with experience, and are therefore to be rejected as false doctrine. We have explained *Christian evolution* and have admitted its possibility, although we are forced to acknowledge that it is an unproved hypothesis.



PART SECOND

MAJOR PSYCHOLOGY

This Part of our manual is devoted to the study of the life, the nature, and the destiny of man. It studies the human life-principle or rational soul; it discusses the nature of the soul, its union with the human body, its powers or faculties which are the immediate principles of human operations.

These matters are studied in the following Chapters:

- Chapter I. Human Life
- Chapter II. Human Sentiency
- Chapter III. The Intellect
- Chapter IV. The Will

## CHAPTER I

### HUMAN LIFE

This Chapter studies the nature of the human life-principle or soul, and discusses the union of soul and body which constitutes man. The Chapter is accordingly divided into two Articles, as follows:

Article 1. The Principle of Human Life

Article 2. The Union of Soul and Body in Man

#### ARTICLE I. THE PRINCIPLE OF HUMAN LIFE

- a) The Human Soul
- b) Nature of the Human Soul
- c) Origin of the Human Soul

##### a) THE HUMAN SOUL

We have already learned that every living body, every *organism*, has, in its essential constitution, an element or constituent part, by virtue of which the organism is *alive*. We have also learned that this *life-principle* is not the material of which the organism is composed, nor is it some special arrangement of that material; neither is it some combination of physical, mechanical, and chemical forces which manifest their interplay in the organism. The life-principle is *something over*; it is something over and above the body-mass, the body-structure, and the body as a field for

the play of lifeless energies. And it is a *substantial* something, not an accidental of the living body. Nay, it is the *substantial form* of the living body; the form which constitutes the organism as an actual body, a living body, and a living body of one specific type. The life-principle is the "first act of the physical organic body." It is the root-source of all the actualness, and all the actual power and operation, which the organism possesses. It is called the *soul* of the organism.

Now, *man*, that is to say a *human being*, is an organism or living body. Therefore man has a life-principle which is in him a basic constituent part; which is the substantial form of the living human body, which is the root-source of all that is actual about the human organism; which is "the first act of the human organic body." This life-principle is called *the human soul*.

We have already adverted to the fact that the ancient term *soul* is seldom used nowadays as a simple equivalent or synonym for *life-principle*. Modern scientists and philosophers do not, as a rule, speak of the *soul* of plant or brute animal. We, however, have done so, following a very old and honorable usage. But we are aware of the fact that the unqualified term *soul* is almost universally understood (among those who use the term at all) to indicate the spiritual, immortal life-principle of man. When, therefore, we speak, in the present study, of *the soul*, we mean the

*human soul*; the principle of human life; the substantial form of the living human body.

#### b) NATURE OF THE HUMAN SOUL

The life-principle of a plant is called a *vegetal soul*; that of a brute animal is called a *sentient*, or an *animal soul*. Man's soul is called a *rational soul* because it is the basic principle of all man's vital operations, the most important of which are the rational operations, that is to say, the distinctively *human* operations of understanding and willing. *The rational soul* is merely another name for *the human soul*; we use the terms interchangeably.

Man's *rational soul* is, like every life-principle, the substantial form of the organism which it vivifies. It is a *substantial form*; it is a *substance*. It is, like all substantial forms, *simple* or uncomposed. It is rational, and therefore *spiritual*. Being *spiritual*, it is *immortal*. In a word, the human soul is a simple, spiritual, immortal substance. We have need to pause upon each point of this description.

1. *The human soul is a substance*. Speaking with approximate exactness, we may say that all reality is divided into two great classes: *substances* and *accidentals*. The term *accident* is usually employed by philosophers instead of the noun *accidental*. Realities, then, are *substances* and *accidents*. And a *reality*

is anything that can be thought of as positively existing. Anything actual or positively possible is a *reality*. No creatural reality can exist or even be thought of as existing except (omitting other fine philosophical classifications which do not concern us here) as a *substance* or as an *accident*.

A *substance* is a reality which is fitted to exist *itself*. It does not exist *of itself*. It has its producing and constituting causes; ultimately, it has its Creator and Preserver. And, taking the term *substance* strictly, it *always* has its causes, for the Divine Being does not come under the full classification of *substance* inasmuch as this involves limitations and imperfections and God is all-perfect. But, to revert to our point, a substance exists *itself*. It does not exist as the mere mark, qualification, modification, or limitation of *something else*. An *accident*, on the other hand, is fitted to exist as the mark, qualification, modification, or limitation of something else; and this *something else* is, proximately or remotely, a substance. A block of marble is a bodily substance. An angel is a spiritual substance. A human soul, as we shall see, is a spiritual substance. A man is a bodily substance,—even though his soul is spiritual, the compound or composite of body and soul is the bodily human organism.

A block of marble is a substance. It exists *itself*. The size of the block of marble, its shape, its color, its roughness or smoothness, its hardness, its tem-

perature, its location, its state of being at rest or moved about—all these are *accidents*. They are accidents of the block of marble. They mark and qualify and modify and limit the marble. They are said to *inhere* in the marble, that is, in the substance which they qualify. And the substance gives them actuality. For if you think of the marble as utterly destroyed, where are its shape, its size, its weight, and all the other accidents? The substance *supports* the accidents in being; it *stands under* them, so to speak. And, indeed, that is why it is called *substance*, for this term comes from the Latin *sub* "under," and *stare* "to stand." And right here we discern the reason for the statement made above that God is, strictly speaking, not to be called *substance*; for the Divine Being is not qualified by accidents; It *stands under* no accidental modifications or limitations; for It is all-perfect and unlimited. But inasmuch as substance is conceived as that which exists *itself*,—leaving out the note of its supporting of accidents,—God is the Supreme and Perfect Substance.

We have said that accidents cannot exist (except by a miracle) if you take away the substance they qualify. Thus the size and weight and color of the marble block cannot exist *themselves*, that is, as size in the abstract, without being the size of anything; as weight taken alone without anything which can be weighed, and so on. But the marble can exist, and will, even if you take away its *present* weight and

color and size and all the other accidents. You can change the accidents by dividing the marble block, washing it, grinding it to smoothness, moving it, putting it into the sunlight or into an ice-chest. You change the accidents by such treatment, but you do not change the substance. Accidents may be changed without changing the substance in which they inhere; but if the substance is changed the accidents will regularly change too. Thus the accidents regularly *depend* on the substance. But the substance does not depend on the accidents. True, the substance will regularly have *some* accidents; but the point we make is that it need not have precisely the accidents that, at any moment, are found to qualify it. It does not, therefore, *depend* on its accidents.

Catholic students of this manual will understand our use of the word "regularly" in the foregoing sentences. For Catholics know of one case in which a substance is changed without a change in accidents, and of a substance which exists without any accidents to qualify it. In the Blessed Sacrament we have the true bodily substance of the living Christ (together with His Divinity) without its accidents. The accidents present are those of bread, not those of Christ. In the Consecration at Mass, the substance of bread and the substance of wine are changed into the substance of Christ, but the accidents of bread and of wine remain; and these accidents remain without *any* substance to support them, for they do not inhere

in the substance which is there, namely, the substance of Christ. This consideration does not, of course, properly belong in our present study; it is made merely for the sake of completeness, and to forestall a possible objection arising from misapprehension.

A substance is either *complete* or it is *incomplete*. Every substance is fitted to exist *itself*, but not every substance is fitted to exist *by itself*, i. e., to exist *alone*. The life-principle of a plant or animal is a substance. But without the organic body this substance cannot exist. It is incomplete. It is unable to exist *by itself*. It needs some other substance as co-principle. But notice: it is not an *accident* of that co-principle. The co-principles exist together; one does not inhere in the other after the manner of accidents. An accident exists *in* its substance; an incomplete substance exists *with* its co-substance. A *complete substance* is one that is fitted to exist by itself alone. Thus a plant or an animal is a complete substance. An *incomplete substance* requires another substance *with which it joins* in substantial union (and so constitutes a *complete substance*). Thus the life-principle of a plant or of an animal is an incomplete substance. Thus prime matter is an incomplete substance.

We shall presently see that the human soul is a *complete substance*. It is not a complete *man*, but it is a complete *soul*, and it can exist as a soul *by itself*. For it is *spiritual*, and not *material* (i. e., not dependent on matter for existence and operation) as plant

souls and animal souls are. We say, therefore, that the human soul is "complete in the order of substantiality, but incomplete in the order of species." In other words: the human soul is a complete substance (a spiritual substance) but it is not a complete man (does not, by itself, make the *species* "man"). But we have, first of all, to prove that the human soul is truly a substance.

Now, the human soul is that which constitutes the human being as a human being. It is that which substantially actualizes man, and makes him substantially different from every other sort of substance: from a lump of coal, a meadow flower, a brute animal. Between man and other substances there is a *substantial* difference. But that which constitutes a substance in its substantial reality and marks it off as substantially different from other things, is itself a *substance*. An *accident* is not competent to go above itself and its capacity, and establish a substance or mark a substantial difference. Therefore the human soul is truly a substance.

Further: the human soul is the root-principle of human operations. But operations, in creatures, are not identified with that which operates. The thinker is not the same as his thought; the growth of a body is not the body itself. Operations come from powers to operate, and these powers are rooted in the thing which *has* the powers and performs the operations. For operations as such are *accidents*, and accidents

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require a substance in which to inhere. Therefore, the human soul which is the first principle of human operations is substantial; it is a *substance*.

For the rest, the soul is the substantial form of the human body, and every substantial form is, at least incompletely, a substance.

2. *The human soul is a simple substance.* When we say that the human soul is *simple* we mean that it is not composed or compounded; we mean that it is not *essentially* compounded of matter and form (as every *bodily* substance is), and that it is not *integrally* composed of quantitative parts. The soul is a substance which precludes essential and integral composition.

First of all, the soul is *essentially* simple; it is not composed of matter and form. For the soul is the first principle of life, and we have seen that such a principle is not, and cannot be, *matter*. A living thing composed of matter and form is an *organism*, a *living body*, not a *soul*. The soul, therefore, is not composed of matter and form; it is solely a form. Hence it is *essentially* simple. This essential simplicity is not only a mark of the human soul; it is a mark of every life-principle, even that of plant or brute animal, and of every substantial form, even that of a lifeless body.

Further, the soul is *integrally* simple; it is not made up of quantitative parts. This follows from the foregoing. Quantitative parts are bodily or material, and

that which has no matter in its make-up has no quantitative parts. But the soul has no matter in its make-up; it is a form alone, not matter-and-form. Hence it is integrally simple. Again we must notice that integral simplicity is a property of every substantial form, even of such as are called *material* (in the sense that they *depend* on matter for existence and function) and of such as are *potentially multiple*.

We may leave dry reasoning on this matter and take evidence for the soul's simplicity from our own consciousness. We are conscious that we can *reflect*, that is, we can "bend back" the knowing act of the mind (which is a vital function, the principle of which is the soul) upon itself. We can know that we know; we can make the knowing act the thing known; we can study our own mental states and processes. Now, a thing made of parts could not possibly perform such an operation. Part might be bent back upon part, but the entirety could not be wholly bent back upon itself. This operation called *reflection* is, by the way, a proof of the spiritual nature of the soul as well as of its simplicity. But, for the present, we consider only the fact that the power of reflection is a certain proof of the absence of material or quantitative parts in the substance which reflects.

Since the soul is a *simple* substance it cannot be divided *per se*. But there are other simple substances, and hence substances indivisible *per se*, which are nevertheless divisible *per accidens*. Lifeless bodies are

divisible *per se*; for lifeless bodies are homogeneous in their structure; one part is like another, and when the parts are divided, each has the nature which the unbroken body had at the outset. A piece of limestone may be broken into many pieces, and each piece is limestone. Living bodies are not divisible *per se* into a plurality of living bodies. But plants and the lowest sentient organisms are so divisible *per accidens*. That is, *accidentally* to the division of the bodily parts in such a way that each part has enough of the organic (heterogeneous) structure to support life, the living creature is multiplied. Thus the rose-bush can be divided into a plurality of rose-bushes, and worms, rightly cut in two, can each become two worms. Such organisms are said to be divisible *per accidens*, and their respective life-principles are said to be *potentially multiple*. But with the higher types of animals and with man the case is otherwise. For here the organism is highly diversified and the organic structure is not complete enough in the different parts to make these capable of sustaining a full organic life like that of the undivided original organism. The higher organisms are, therefore, not divisible, either *per se* or *per accidens*, and, in consequence, their respective life-principles are not potentially multiple. As to man, we shall presently see that his soul is spiritual, and a spiritual substance is independent (for existence and proper function) of matter, and therefore is in no wise accidentally divisible according to

the divisibility of the material organism of which it is the substantial form.

The human soul is a substance essentially and integrally simple and absolutely indivisible.

3. *The human soul is a spiritual substance.* A spiritual substance is a substance which is intrinsically independent of matter for existence and operation. It may be (and in the case of the human soul it is) a substance designed to be the form of a material thing, and hence a co-principle with matter in constituting a *specific essence*, or simply a *species*. But *in itself* and for those operations which are *proper to itself as a spiritual substance*, it is always independent of matter. If the spiritual substance is, in itself, a rounded and complete specific nature, not designed for union with any other substance as co-principle, it is said to be a substance *complete in substantiality and in species*. Such a substance is, for example, an angel. But if a spiritual substance be made for substantial union with another substance,—so that the two, when united, constitute a compound but *single* complete essence or species,—it is said to be *incomplete in species*, or *incomplete as a species*. Such a substance is the human soul. For, taken alone, the soul is not the complete human essence; the soul is not the complete man; in order to constitute the complete human essence or species (the complete man) the soul must be substantially united with the body.

But the human soul, although it is incomplete as a species, is complete as a substance, or, to adopt a more usual phrasing, the soul is complete in point of substantiality, or *in the order of substantiality*. It is a complete spirit; it is a complete soul. And it has the operations proper to a spiritual substance of its kind. The human soul does not, therefore, require the body in order to exist and to perform those operations which are proper to it as a human soul, to wit, the operations of understanding and willing.

The vegetal soul in a plant and the sentient soul in an animal are *material* souls, and not *spiritual*. They are material inasmuch as they depend upon matter for their existence and operations. These vital principles have no operations proper to themselves considered independently of the organic bodies which, respectively, they vivify or vitalize. A vegetal or a sentient life-principle has no operation *of its very own* which it does not exercise by the instrumentality of a bodily organ. Such a life-principle is indeed the first principle of the vital operations performed *by the organism* which it actualizes and vivifies; but these operations are, without exception, organic operations; they are operations which cannot be discharged except in and by means of the body and its organs. And therefore we know that the vegetal and the sentient life-principles have no existence apart from their respective organisms. For if such a life-principle had existence, it would have activities; since *every* substance



has activities once it is constituted in actual existence. The vegetal and the sentient life-principle are therefore incomplete both in point of substantiality and in point of species; they cannot, without their respective organic bodies, exist as substances or as plant or animal. But the human soul is incomplete in point of species only; it is complete in point of substantiality. The human soul *can* (and when a man dies it *does*) exist independently of the human body, and in its separate existence it exercises its own proper operations of intellect and will. And this is so because the soul is *spiritual*, and not *material*.

How shall we prove that the human soul is spiritual? We shall see what the soul does; we shall notice its operations. Operations follow essence and indicate the nature of that essence. If the operations of the human soul are of a spiritual nature, they infallibly prove that the soul which operates is a spiritual substance. But how shall we come at the soul to observe its operations? We shall observe the operations of *man*, the substantial composite of body and soul. We shall study the human operations and discover whether these could all be exercised without a spiritual life-principle or, on the other hand, whether some of these operations require a spiritual principle as their sufficient explanation and reason. And what must our conclusion be? If we find that all man's vital operations are such as require a bodily organism for their exercise (as is the case with vegetal and sentient op-

erations) we shall have no choice but to conclude that man's soul is *material* in the sense that it depends essentially on matter for its operations, and hence also for its being or existence. But if we find that some of man's operations are supra-organic, that is, are of such character as precludes the possibility of their being exercised by bodily parts or organs, we shall be forced to conclude that man's soul is independent of matter in these operations, and (since operation follows and indicates essence) independent of matter in its essence. But a substance which is essentially independent of matter is a *spiritual* substance. Therefore, if we find that some of man's operations are supra-organic or spiritual in character, we have proof incontestable that *the soul is spiritual*.

Now, as a matter of fact, man *has* operations which are independent of matter, which are supra-organic, which are of spiritual character. Therefore, he has a soul which,—since it is a *substantial* principle,—is a *spiritual substance*. We shall investigate some of the operations of man which prove our point.

A man can *think*, and *reason*, and *reflect*, and *exercise acts of the will*. These acts or operations are absolutely independent of time and place and concrete circumstances. But an organic operation is not independent of time, place, and concrete circumstances. Nutrition, for example, is an operation which involves definite individual materials worked upon, here and now, within the living body, and transformed