

BL 240
.W64
Copy 1

The University of Chicago

THE RELATION BETWEEN RELIGION
AND SCIENCE: A BIOLOGICAL
APPROACH

A DISSERTATION
SUBMITTED TO THE FACULTY
OF THE GRADUATE SCHOOL OF ARTS AND LITERATURE
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF SYSTEMATIC THEOLOGY IN THE
GRADUATE DIVINITY SCHOOL

BY
ANGUS STEWART WOODBURN

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS
1920

98

The University of Chicago

**THE RELATION BETWEEN RELIGION
AND SCIENCE: A BIOLOGICAL
APPROACH**

**A DISSERTATION
SUBMITTED TO THE FACULTY
OF THE GRADUATE SCHOOL OF ARTS AND LITERATURE
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY**

**DEPARTMENT OF SYSTEMATIC THEOLOGY IN THE
GRADUATE DIVINITY SCHOOL**

**BY
ANGUS STEWART WOODBURNE**

**THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS**

1920

B6240
W69

COPYRIGHT 1920 BY
THE UNIVERSITY OF CHICAGO

All Rights Reserved

Published January 1920

Gift
University
1920

Composed and Printed By
The University of Chicago Press
Chicago, Illinois, U.S.A.

PREFACE

The attempt is made in this thesis to examine the age-long problem of the interrelationship of religion and science from a new angle, namely that of psychology considered as a biological science. There is a general recognition today that the elements common to the religions and those common to the sciences are psychological. The facts of religious experience and the facts of scientific experience are so multiform that the only place to discover a common basis is in the attitudes of consciousness giving rise to these variant concrete expressions. Furthermore there is a general recognition among psychologists that the genesis of all the attitudes, including the religious and the scientific, is localizable in the instinctive behaviors of the psycho-physical organism.

It seems only fair that psychologists should recognize that those best equipped to define instinctive behavior are the biologists. On the basis of a biologically acceptable definition, a sound theory of the origin of religion and science is possible. The theory proposed is that these attitudes have their roots in behavior which, while instinctive, is multiple. In proof of the contention, reference is made to many of the rites and practices of primitive peoples which are recorded in the source books on anthropology. It is the hope of the author that this effort may contribute in some small measure to the solution of a great problem.

A. S. WOODBURN

CAMP DODGE, IOWA
January, 1920

CONTENTS

CHAPTER	PAGE
I. CONCERNING METHOD	I
II. A HISTORICAL SURVEY OF THE INFLUENCE OF PSYCHOLOGICAL THEORY ON THE PROBLEM	10
III. THE DIFFERENTIA OF RELIGION AND SCIENCE	31
IV. THE SEARCH FOR A SCIENTIFIC DEFINITION OF INSTINCT	44
V. THE THEORY OF SPECIFIC RELIGIOUS AND SCIENTIFIC INSTINCTS	56
VI. THE EFFORT TO IDENTIFY RELIGION AND SCIENCE WITH CER- TAIN SPECIFIC INSTINCTS	63
VII. THE MULTIPLE INSTINCTIVE ORIGIN OF RELIGION AND SCIENCE	69
VIII. THEOLOGICAL IMPLICATIONS	91
BIBLIOGRAPHY	96

CHAPTER I

CONCERNING METHOD

It is the aim of this chapter to set forth in outline the development of a scientific method. The deductive method of Aristotle dominated the thinking of the Middle Ages and was ecclesiastically sanctioned in Catholicism. But the needs created by scientific progress made the evolution of a better method inevitable. The seventeenth century witnessed the rise of induction which in its developed form is the method of modern science. But induction, to be complete, must make use of the genetic method, involving history and psychology. Thus this sketch (1) indicates the cause and nature of the long conflict between science and theology, and (2) furnishes a vindication for the study of the relation of religion to science from the point of view of psychology.

The attainment of a method for a scientific approach to our human problems has a history which takes us back to the Greeks. The beginning of logic is to be found in Aristotle. It was his theory that reality is to be found in particulars, and that these particulars have universals and attributes attached to them. He was the first to conceive of reason (*λόγος*) as a definite subject of investigation. The process of reasoning, he taught, was a combination of premises (*συλλογισμός*) to produce a new conclusion. Logic was thus for him a science of deductive inference. He can hardly be said to have a logic of induction. His universals were obtained by a process of analysis and abstraction in which differences were eliminated and particulars were grouped according to their homogeneity into classes. Accordingly science, which was selective, picked on a specific object, which it handled with the tools forged for the purpose. Its abstract universals were obtained in the analytical fashion, and were then made the major premises in a deductive process which led to a definite conclusion. Any reasoning which could not be put thus in the form of a syllogism was regarded as imperfect.

Following upon the period of Greek scholarship came a long period when scientific learning made no progress. The achievements of the Greeks had been absorbed in the utilitarian spirit of the Roman Empire. Then followed that period of political and social corrosion known to history as the "Dark Ages," a period noteworthy for its lack of creative thought. It is to the Arabians that we owe the dawn of a new interest in both science and philosophy. These men, though Moslem, had come under the influence of Greek thought, and were the means for a revivification of Aristotelianism through the channel of a Semitic language. In Persia and in Spain, then under Saracen control, from the ninth to the twelfth centuries these men championed the mediaeval renaissance of science and philosophy. From the Arabians the renewed interest in Greek thought rapidly spread. The fact that the King of Sicily, Roger II (1093-1154), and the emperor, Frederick II (1194-1250), called numbers of these Arabian scholars to their courts gave to the movement a new impetus. Translations of Aristotle were made, and the universities at Paris, Bologne, and Oxford began to study Aristotle with zest.

The spread of Greek thought meant that it soon found its way into Christian circles. The later scholastics were acquainted with and largely influenced by the new movement. At first the effect was an unsettling of the orthodox views of the time, and a type of mystical pantheism arose. This resulted in the University of Paris, with papal sanction, placing a ban on Aristotle (1215), but in less than half a century the ban was removed, and the Aristotelian system became the church's best tool chest. Alexander of Hales (d. 1245), Robert Grosseteste (d. 1253), and John Rochelle (d. 1271) were among the first ecclesiastics to make use of Aristotle. Albertus Magnus (1193-1280) was "the first scholastic who reproduced the whole philosophy of Aristotle in systematic order with constant reference to the Arabian commentators, and who remodelled it to meet the requirements of ecclesiastical dogma."¹ But it is to Albert's great pupil, Thomas Aquinas (ca. 1227-74), that we owe a thoroughly digested and ecclesiastical rendering of

¹ *Encyclopaedia Britannica* (11th edition), XXIV, 353, article "Scholasticism," by A. S. Pringle-Pattison.

the Aristotelian system. In his *Summa Theologica* Aquinas has made use of the conceptualist machinery of the Greek thinker. The form of the propositions with which he dealt is syllogistic. The content is intended to cover the range of human knowledge arranged according to the method of the subsumptive logic and subordinated to the church. It made use of all sources of ecclesiastical authority, Scripture, conciliar decisions, patristic comments and tradition, and thus built up a work which soon became the theological dicta of the Catholic church. So that the test of Catholic orthodoxy from that day until this is agreement with Aquinas.

The effect of this movement upon the church was to be seen in the attitude which it assumed throughout the Middle Ages. The effort was made to maintain an ecclesiastical standardization of all the departments of human life, science, and ethics, no less than religion and theology. The church claimed that she had received her knowledge by a supernatural revelation. The supernatural character of church knowledge thus placed it in a class independent of and superior to scientific knowledge, the source of which is fallible human reason. In case of a disagreement between ecclesiastical and scientific findings the course of conduct was logically plain. Remembering the source of church knowledge and that quality depends on origin, the inevitable rejection of scientific knowledge followed. Thus it was that the Catholic church maintained its authority over science, and the bitter conflict between science and theology ensued. It ought to be evident that the conflict was virtually between two types of science. Theology, as we have seen, rested upon the whole framework of the Aristotelian deductive schema. But the physical sciences have never made any clear progress under the régime of deduction.

The heroic struggle of science for emancipation in the use of a method which would insure the most trustworthy results met with dogged and prolonged opposition. A beginning was made by Roger Bacon, who was a contemporary of the great Aquinas. But for two hundred years after Roger Bacon the church completely dominated the situation and no appreciable progress was made. In the sixteenth and seventeenth centuries certain epoch-making

events transpired which, on the one hand, compelled the church to take a less dictatorial attitude toward the sciences, and, on the other hand, made the evolution of a new method inevitable.

First there occurred the two great discoveries which gave rise to the great extension of navigation—the discovery of America by Columbus in 1492 and the circumnavigation of the globe by Magellan, 1519–21. The necessities of the expansion of navigation called for a new cosmology. The Ptolemaic hypothesis posited a flat and stationary earth at the center of the cosmos. Magellan proved that the earth was round by sailing around it. Copernicus (1473–1543) was the framer of the heliocentric cosmology which recognized the rotundity and motion of the earth.

The astronomical theory of Copernicus was opposed by Catholic and Protestant alike. The Protestant Reformation antedated the birth of induction, so that the Reformers were as bitter as the church in the invectives which they hurled at the new science, which conflicted with the scriptural cosmology to which the church had lent its imprimatur. Bruno, the Italian philosopher and scientist, was burned as a martyr to the new science in 1600. But the telescope of Galileo, ten years later, proved the truth of that for which Bruno had been compelled to lay down his life.

The importance of Galileo was twofold. Not only did he establish beyond a peradventure the heliocentric cosmology, but he discovered that the motion of the earth was self-induced and self-sustained. This was a double attack on church doctrines. First, the church anthropology made man the center of creation, but even the earth which he inhabited was now seen to be eccentric. The dissolution of that doctrine was completed in the nineteenth century with the advent of Darwinianism. Secondly, the hypothesis of self-motion was a death-dealing blow to the doctrine of absolutes and apriority. Statics gave way to dynamics.

The work of Galileo was continued by Johann Kepler (1571–1630), Issac Newton (1642–1727), and Laplace (1749–1847). Newton formulated the doctrine of gravitation by which the motions of the various planets are attributed to an inner pervading force, thus encountering opposition from the theological doctrine of a creating Providence. Laplace's nebular hypothesis afforded

a causal explanation of the origin of the heavenly bodies which still further retired the theological explanation.

Every step of advance was made at the cost of a struggle. The older method was entrenched with all the fortifications of an organized and supermundanely authenticated system. But for all that, events proved that the source of the old knowledge was no guaranty of its truth. So the work of these astronomers along with the accomplishments of men in the other sciences, such as Leonardo da Vinci in the geological realm, made insistent the evolution of a method which should do justice to things as they are.

It remained for Francis Bacon to make the first formulation of the inductive method. Beginning with the hypothesis that the knowledge of nature depends on observation and experience, he proposed to observe and collect a vast number of facts, and then to follow the inductive method of getting universals from this mass of particulars. The aim was to acquire a command over nature by knowledge. He was therefore opposed to the syllogistic method which accepted its major premises from science on trust.

Descartes in his *Discourse on Method* attempted with mathematical precision to attain a basis for knowledge in the indubitable facts of experience. He carried into the field of the mental processes the method of natural explanation which the astronomers had introduced in the explanation of cosmic processes, in contradistinction to the supernaturalism of the Middle Ages. So that Francis Bacon and Descartes both insisted on the banishing of theology from science, thus freeing science to work out a new method as it substituted mechanical for final causation in the explanation of phenomena.

From the seventeenth century the inductive method has gradually become dominant in science, until today we may say that science is coterminous with induction. To be sure, the inductive method in our day has become something more scientific than it was in the days of Francis Bacon. Baconian induction was too atomistic and lacked a means of testing its conclusions. That has been remedied in the use of hypotheses and the trial-and-error plan for testing them. We are able to take the past up

into the present in this way, and through the difference with the past we realize the present. The scientist finds an exception to a rule and sets about the formulation of a new rule that will include the exception. In this way the conclusions of science are attained experimentally and afford a legitimate means for the explanation and interpretation of human institutions, including religion. Science uses the research method, which includes the recognition of a problem and the finding of a solution thereto by the employment of hypotheses and tests.

With the evolution of a scientific method it was inevitable that sooner or later it should be employed in the study of religion. So long as religion was equated with revelation a science of religion or a historical study of religion was impossible. A beginning was made when David Hume in 1755 published his *Natural History of Religion*, giving it a historical and psychological basis. For more than a hundred years after that progress was slow. Here and there a scholar attempted to study religion more scientifically. But as a rule the method was the examination of a non-Christian religion and a comparison of it with Christianity with a view to showing the spuriousness of the former. It was a contrast between a human invention and a divine revelation.

It was not until the nineteenth century that the historical method really came to its own. That was consequent upon the rise of induction. A thoroughgoing observation of any human institution involves an investigation into the matter of how it came to be in the historical process, of the social substratum in which it was created, and of the order of sequence in its development. The first chair in the History of Religions to be established in a university was in the Collège de la France in 1884. Since then progress has been so rapid that the historical method has become synonymous with scholarship in the study of religion.

The historical method furnishes a survey of the way or ways in which any human product has functioned and has changed to meet the exigencies of social situations. It also furnishes data for the work of classification and appraisal. By the use of historical analyses one is compelled to understand the social and functional worth of all human creations. The older method tried to give an

account of the truth of an idea by a syllogistic process; the new method leads to a study of the worth of an idea in the historical process. That means an appreciation of the relativity of all thought-products and the necessity of working with a true organon. And the organon to which the historical study of either religion or science leads is not conformity to an authoritative standard, but competency to do something for man which he needs to have done in his struggle for existence.

Notwithstanding the Catholic theory of an unalterable system of religious truth, the actual history of beliefs shows constant experimentation and mutation, an unconscious recognition of the scientific method. Contingency has played comparatively little part in the development of scientific thought as it has in religious thought. Actual problems demanding solution, concrete needs demanding satisfaction, social tensions demanding adjustment—these have been the historical progenitors of scientific laws and discoveries as well as of religious doctrines.

The historical method is the effort to be honest. It is the recognition that every development in history is determined by sociological and psychological influences. The deductive method is essentially normative. It works well so long as the major premise is scientifically credible. But when the universal scorns to account for the exceptions the method breaks down. The historian is just as much interested in exceptions as in rules. He seeks to know the facts and to adjust his theory to the facts rather than the facts to his theory. So that the historical method is the only method for objectivity. It recognizes that the life-processes cannot be confined within the bounds of the syllogism. Hence it takes cognizance of things as they occur, regardless of their place in logical processes. Scholasticism worked on the assumption that the criterion for religion must be logical, which in the last analysis is an attempt to locate the seat of religion in the intellect. But the historical and psychological study of religion shows that its locus is rather in deep-seated, felt needs of life which find their roots in the instincts.

The historical study involves the application of the genetic method. An interest in the functional value of an institution leads

to the functional problem of how it came to be as the product of an evolutionary process. So that the natural complement of a historical study leads into the field of social psychology. "The past is involved in the present in the case of human history as much as in that of geological evolution."¹ Social psychology is one of the best tools that modern thought has invented for the interpretation of human institutions. It helps to an understanding of the place of religion in the social current and of the functional relationship between the facts of religion and the larger social whole in which religion operates. Historical study proves that there is no period which has a monopoly of spiritual values *sui generis*. Social psychology shows that it is as fruitless to seek to understand any religious reaction by itself as to visit a fossil museum without an understanding of geology. History gives us the records; social psychology helps us to relate religion to the stream of thought and life.

So then the deeper problems of life urge us on from a historical to a psychological study. History may be able to supply us with the order of sequence of religious happenings, but even here there are *lacunae* to fill in which the historian is dependent on the psychologist. In addition there are the further problems of (1) the determinants of the sequence of religious occurrences, and (2) the cause of the genesis of the religious phenomena themselves, and these are functional problems which it is not the province of history to solve. History is concerned with the external forms and products of religion and science. The study of the mental processes, individual and social, which gave birth to those externals is a psychological study. Consequently the last quarter of a century has witnessed the application of a psychological method to a study of these human institutions, particularly of religion.

The immense advance in the study of psychological science itself is fortunately coincident with its being used as a method for studying religion and other disciplines. Of especial import for the religious problem is social psychology, through which we are learning that the individual comes to mental and moral consciousness only

¹ F. A. Tennant, "Historical Fact in Relation to the Philosophy of Religion," in *Hibbert Journal*, VIII, 177.

in a social world. The rise of religion is in the corporate life of the group. And, as Durkheim has shown,¹ the religion of a folk is a socializing of the supermundane world on the analogy of its own social structure.

The data for the historian and the psychologist alike are what people do. But behavior is socially determined both as to origin and to direction. So that history and psychology both lead to a social investigation. It is in the life-experiences of folks, considered historically and spiritually, externally and internally, that we seek to locate the genesis and value of both religion and science. Religion and science are both of them social facts inasmuch as they originated in the folk experiences to meet human needs.

It is only by the use of psychology that we can hope to make any adequate analysis of the phenomena of religion and science as human institutions. Historical observation furnishes us merely with the external phenomena. Cults and ceremonials, rites and rituals in religion, and laws, theories, and laboratory materials in science are not the stuff which afford us the differentia and the common elements for definitive purposes. The hopelessness of getting definitions on the basis of mere externals has been substantiated by their very numbers. The basis is a psychological one,² and it is to be found in the study of the history of human endeavors in their actual situations. The unifying principle which underlies the multiplicity of religious phenomena, the synthesis by which we abstract meaning from the facts of religious development, must be psychological. In precisely the same way the unity behind the multiplicity of scientific phenomena is psychological. So that we are driven into the use of a historico-psychological method for an appreciation at once of the differentia and the genesis of religion and of science.

¹ *Les Formes Élémentaires de la Vie Religieuse*, pp. 56, 57.

² Cf. Galloway, *The Philosophy of Religion*, section B of the Introduction, where the author discusses the problem of method. He points out very lucidly that an understanding of religion is only possible through psychology, because its expressions are those of a conscious mind which it is the province of psychology to interrogate. If, as Galloway points out, "the unifying principle which underlies the religious phenomena is the psychical nature of man" (p. 31), so too we may contend that the unifying principle beneath the multiform activities and creations of science has its seat in man's psychical nature. To that problem chapter ii is addressed.

CHAPTER II

A HISTORICAL SURVEY OF THE INFLUENCE OF PSYCHOLOGICAL THEORY ON THE PROBLEM

In an examination of the problem of the relation between science and religion, it would be difficult to exaggerate the importance of the psychological bearing of the problem. A survey of the history of the relationships which have existed between these two disciplines reveals the fact that the prevalent psychological theory and method which were dominant in each period were two of the most important factors in determining the viewpoint of the scholars of that period toward this specific problem. Before passing to a consideration of the approach to the problem which is obtained through contemporary psychology it is the purpose of this chapter to indicate the bearing of the theories of the past upon our problem.

I

An investigation into the behavior of primitive peoples discloses the fact that there was no such thing as a science, mental or physical. There was no such thing as religion in the differentiated sense that we use the word today. There was no such thing as magic, as sophisticated people use the term. What we see is a vast complex, a heterogeneous mass of all the stuff out of which life is made. In other words, it is an undifferentiated complex of materials. One of the difficulties against which we need to guard is the danger of reading back into the activities of primitive man the differentiations which mark an age of culture.

The behavior of primitive man approximates to that of his animal ancestors in that it is more instinctive than reflective. His nervous system is as yet not developed to the degree that he has attained control over his motor activity, but that motor activity is simple and is spontaneously discharged in response to the stimuli which irritate his sensory organs. The attainment of control over those motor reactions is a part of the process through

which there emerges intelligence and the power of reflection. The differentiation between the neurosis and the psychosis was evolved in this primitive stage of the life-process.

In this early period of the history of the race man did not make the difference which he came to make later between himself and the lower animals. The dominant needs of life which he experienced, nutrition and reproduction, were characteristic of the animals of the other genera. They were possessed of qualities, such as celerity in the deer, strength in the tiger, or cleverness in the fox, which he deemed to be decided advantages in the struggles of life. In that primitive stage when his brothers were often a prey to other animals, there was no overmastering evidence that he was getting the best of it. He belonged to a *subaltern genus* (man) in the *summum genus* (animal). It was, in brief, a pre-dualistic age.

In this primitive period there were certain phenomena, such as dreams, sleep, death, the visibility of the breath on a cold day, which played an important rôle in the evolution of man's reflective processes. One of the first evidences which we have of a dualism resultant therefrom was the difference which he made between the seen and the unseen. The phenomena mentioned helped him to the conclusion that there must be an unseen world which he imaginatively peopled with life such as existed in the seen world, with the exception that the life there was disembodied, which gave to it an undue advantage over him. These animistic conceptions were at first very vague, as were indeed all of his primitive reflections. They were the reflections which belonged to a pre-scientific and therefore pre-psychological age. In the seeking for the satisfactions for his primitive wants, about all the distinction which he made was a distinction between things or powers which helped and things or powers which hindered him in the procuring of those satisfactions. The unforeseen phenomena of life would call forth instinctive reactions. The stubbing of his toe on a protruding stone or root would cause him to react to the stone as though it were animated, and he would never quite recover from that attitude growing out of his first reaction. In that way the objective world would very gradually become for him animated

with helpful and harmful spirits. His own desire to help his friends or to hinder his enemies in the struggle to procure the satisfaction of their wants contributed to the association of his helps and hindrances which were to him inscrutable with some other *animus*. Here we have another factor which played its part in the development of animism. It would be assuming too great sophistication, however, to say that here we have primitive man's scientific category of causality. It was simply his distinctions between helps and hindrances toward the satisfaction of pressing needs, the helps being gradually associated with a friendly *animus* and the hindrances with a hostile *animus*. Neither can we say that this belief in *animi* was due to the fact that man was "incurably religious," to use the phrase of Sabatier,¹ but it was rather the beginnings of the reflective process trying to solve the problems of life with its demands for means to meet its recurring needs.

The age of primitivity, then, is not to be studied with the object of procuring data to substantiate a preconceived theory which we desire to have confirmed. If we approach the facts as they are presented in experience in the history of the race, we do not find primitive man making those differentiations which we sometimes assume are as old as the race, the distinctions between the physical and the psychical, between the human and the lower animal, between religion and science and art. We are able, indeed, to find a great deal of the material out of which these differentiations developed, but the process of making those distinctions belongs to a subsequent age, and the fact that man did learn to apprehend the differences noted proves that he has transcended the age of primitivity.

II

In Greek thought we meet with the development of a thorough-going dualism. And the great names with which this development is associated are, of course, Plato and Aristotle. Plato arrived at his dualistic hypothesis through a consideration of the cognitive problem. He set out with the conviction that knowledge is attainable only through deduction, and set for himself the problem

¹ *Outlines of a Philosophy of Religion*, p. 3.

of discovering why knowledge comes through conception. He concluded that the value-judgments of truth, beauty, and goodness do not arise from experience. So he was forced to posit a supersensible world as the source of those value-judgments. In that way he had the supersensible world as the intelligible world, the real world, the world of ideas. Over against it was the world of experience, the sensible world, or the phenomenal world. The latter he conceived to be a copy of the former; the latter was the particular and the former the universal. Plato gave metaphysical value to the world of ideas and had an aversion to the natural order. His process was the very opposite of ours. He knew the supersensible world through knowledge (*ἐπιστήμη*) and the sensible world through faith (*πίστις*), thus reversing our order of faith and certainty. Plato was certain of God, and he accepted the phenomenal world by faith. We are sure of the world, and we know God by faith. For him the Idea was being; matter was non-being (*τὸ ὄν* and *μὴ ὄν*). In this way Plato arrived at dualism as an epistemological device.

Aristotle attempted to overcome the difficulty inherent in the dualism of Plato. He accepted the point of view of his predecessor that the beginning must be made from conceptual knowledge. The knowledge of real being, he agreed, is the knowledge of universals. But he saw that Plato's theory of Ideas was inadequate to explain the world of experience. So he tried to identify the two worlds of Platonic thought by saying that real being is in the particular, in which the universal is also present. To discover the relationship of the universal to the particular he founded the science of logic. Aristotle asked the question, What are the generative causes of real being? His answer was that there are four causes, viz., material causes (*ύλη*), formal causes (*εἶδος*), efficient causes or moving causes (*ἀρχή*), and final causes (*τέλος*). As the reflection went on there came to be a practical identification of the formal, efficient, and final causes in one constituent general principle. This meant a reduction of generative causes to two, Idea or form (*εἶδος*) and matter (*ύλη*). The former is the essential or cause proper, while the latter is the secondary cause. Aristotle formed a conceptual pyramid with his one eternal, actual Being,

the uncaused Cause, unmoved Mover, pure Form without matter, at the apex of the pyramid.

So we see as a development of Greek thought a dualism whereby the material world was made secondary to the ideational world. Mind is in control. Mind was the form of organized matter, which Baldwin takes to be a "restatement of the hylozoism and animism of the Ionic thinkers."¹

When Aristotle comes to discuss the individual he is controlled by this same dualistic viewpoint. He refers to the relationship between the body and the soul as that which exists between matter and form, capacity or potentiality, and function or actuality (*δύναμις* and *ἐντελέχεια*). The soul dominates the body which exists only for the sake of the soul. At the same time he makes a differentiation in the soul itself, there being a part which, like the body, is mortal, i.e., sensation, imagination, memory, and will, but also a part which is immortal, viz., the active intellect (*νοῦς ποιητικός*). In this active intellect he posits actual existence and describes it as immaterial, imperishable, impassive, and eternal. Yet this active intellect is something which is external to man and is not an organic part of him. It comes to him from without. It appears from his descriptions to be in no wise different from the absolute intellect. In this way he seems to make the immortal part of the human intellect, active intellect, a gift of the Absolute, if he does not identify it virtually with the Absolute. Absolute's love of scientific knowledge might be called a passion, and, as Weber says, his "theology is at bottom an apotheosis of *νοῦς*."²

III

The theoretical dualism of the Greek thinkers furnished a mode of thought for the Christian thinkers of the *New Testament*, *patristic*, and *scholastic periods*.

In Thomas Aquinas we reach a man who had all the inheritance of the biblical and patristic writings upon which he meditated with a mind trained in the subtleties of Greek thought. His great teacher, Albertus Magnus, had been a pupil of Avicenna, the Arabian philosopher who had been foremost in the revivification

¹ *History of Psychology*, II, 184-97.

² Weber, *History of Philosophy*, p. 134.

of Aristotle. In the time of Albertus there was already emerging the perplexity over the opposing truths of revelation and of natural science. He tried to effect a *modus vivendi* by asserting that "revelation is above but not contrary to reason." Yet he concluded that the ideas of a creation in time, of the miraculous, and of such elements in doctrine as those which have to do with the soul, sin, grace, etc., are incapable of harmonization with reason. They must be accepted as given by a higher authority. So he used a method which made a reconciliation of science (reason) and religion (revelation) impossible. His attempt to apply the Aristotelian logic consistently meant that he made a breach between Jewish supernaturalism and Greek rationalism which was irreparable. "By the false antithesis thus raised between reason and revelation, he prepared the way for the long conflict between theology and science, of reason and dogma, of naturalism and supernaturalism, of individual judgment and collective authority."¹

Aquinas was a greater pupil of a great teacher. As we have seen, like Albertus, he made diligent use of the tools which had been forged in the workshop of Aristotle. Aristotle had worked out a scheme whereby you proceed from class-concept to larger class-concept up the line until you reach ultimate class-concept. The only way to understand the particular was by realizing that the universal was contained in it. This gave to Aquinas the mold into which to run the stream of his theological thought. It was his purpose to trace the passing of revelatory knowledge from the higher to the lower in ecclesiastical authority. The system of Aquinas was essentially a hierarchy. He posited a hierarchy of bodies in nature, the consummation of which is the natural life of man which on its part became the starting-point for a higher spiritual life which is developed under church supervision. He had two realms, the realm of grace and the realm of nature. The intellect is governed by the reason which it cannot evade. The will tends to be governed by the principle of the good in which its freedom is established. But evil comes when the efforts of the will are paralyzed by sensuality. So we see the beginning of the division of the psychic life into intellect, senses, and will. Wherever

¹ Beckwith in *New Schaff-Herzog E.R.K.*, I, 110, article "Albertus Magnus."

we have that division made in a mechanical way, some power of control is necessary to prevent inner chaos. Here Aquinas resorted to the technique of Aristotle in an ecclesiasticized form. The church must be in control. Reason must be under the domination of revelation, as Albertus had said. Science must be dominated by theology which, of course, was that theology which the church sanctioned as orthodox. Thus we see the beginnings of the assertion of religious authority over psychology, science, and all the other disciplines, a characteristic tendency of the whole mediaeval period. "During the greater part of the Middle Ages to be learned in science meant to be learned in the sacred text. . . . The scientific textbooks were based upon the Bible, at least in considerable part."¹ And the spirit of the Middle Ages was made vocal in such books as *Ymago Mundi*, written by Cardinal D'Ailly in 1410—a geographical work in which the author "gives us one of the most striking examples in history of a great man in theological fetters."² Another book of the same type is Vincent's of Beauvais, *Mirror of Nature*, in 1244. It was a book of amazing erudition in which the author had gathered materials from all sorts of sources, and then proceeded to show that the church is dominant over all, whether it be in matters of astronomy, physics, botany, geology, anatomy, psychology, physiology, zoölogy, geography, law, art, mathematics, economics, or religion. Still another example is to be found in the work of Samuel Bochart in 1712 on *The Animals of the Holy Scripture*, in which all the investigations of the naturalists are used to corroborate his theological interest. Every book which attempts to use the Bible as a source book for the deduction of science is, whatever be the date of its publication, a work of mediaevalism.

IV

The advent of Descartes (b. 1596) marks for us the dawn of the modern period, the beginnings of the release from mediaevalism. Here the distinction between the subject-self, or the self as the thinking and judging principle, and the object-self, or the self as

¹ A. C. McGiffert, *The Rise of Modern Religious Ideas*, p. 26.

² A. D. White, *History of the Warfare of Science with Theology*, I, 107. Cf. also pp. 32-36 for reference to the *Physiologus* and *Bestiaries*.

the object of thought, whether representing mind or ideas, first emerges. In short, Descartes marks a transition, viz., a shift in the point of interest from the divine to the human, from the supernatural to the natural. He was led to this point of view from the fact that he was primarily a scientist and a mathematician, and secondarily a philosopher. His interests in the problems of philosophy and psychology grew out of his speculations with his scientific data. He made a critical examination of the process of human thinking, giving it a natural basis as over against the supernatural basis accorded to it in the Middle Ages. The merit of his critical work is that he gives the beginnings of the freedom of our modern world. The unfortunate thing is that he reduced man to a logical entity, and made religion and science both to consist in ideas. However, he was moving in the direction of freedom, so that for him science was no longer in the control of theology. Both religion and science were left free within the distinctive sphere to which each belonged, religion to the sphere of the supernatural destiny of the soul, and science in the sphere of nature. "Between science and faith, thus conceived, a bargain was struck. Hands off; each to his own was the compact; the natural world to intelligence, the moral, the spiritual world to belief."¹

We have seen that the psychological thought of Descartes was rationalistic. Leibnitz and Wolff were psychologists of the same type. Kant criticized this rationalistic system on the ground that there were unwarranted metaphysical assumptions involved, as, e.g., when Descartes said, "I think, therefore I am," he mentally added, "a substance." The conclusion from a logical subject to a metaphysical one is unwarranted. So Kant criticized that very reasoning process which Descartes and the other rationalists had taken as a point of departure.

The modern period brings us to that very interesting development in psychological theory known as faculty psychology. To be sure, there are traces of it before the modern period. As we have seen, even the Greeks, Plato and Aristotle, had divided the soul into "parts." And Thomas Aquinas talked of the "*lumen*

¹ John Dewey, *The Influence of Darwinism on Philosophy*, pp. 180 ff.

supernaturale to receive the unchangeable concept or essence of an object, and of a *lumen naturale* to conceive the nature of a species by sense presentations, regardless of individual characteristics."¹ The faculty concept had been used by Leibnitz, but he had along with it a conception of a pre-established harmony, and his approach toward the problem of the relation between religion and science was an effort to overcome the dualism of that of Aquinas and the other Schoolmen. Wolff was a follower of Leibnitz, and he posited the faculty theory, saying that the faculty of knowledge comprises a well-ordered combination of facts and theories. Wolff stated the law of association, which was that "every idea tends to recall to the mind the total idea of which it is a part."² The theory of Wolff was that the activity of the soul is distinguishable in various directions which may be called "faculties," and of which he makes the logical faculty the primal. He had also the active faculty or will, and the imaginative faculty which produces representations connected by the law of association, to which reference has just been made.

The faculty concept was sharpened up still more in Kant (1724-1804), who made distinctions between the sensibility or faculty of perception, understanding or the faculty of rules, and reason or faculty of principles. "Sense gives order to objects in space and time, intelligence relates them in synthetic categories, and reason imposes the regulative ideals of all knowledge."³

The most consistent and logical of the psychologists of this type was Lotze. Baldwin sums up the matter in connection with him as follows:

Put on the defensive in the matter of determining the fundamental functions or faculties, Lotze accepted the consequences of his view. Herbart and Brentano had argued that if once we admit different faculties, there is no stopping anywhere; every distinguishable mode of mental process may be described as a separate faculty; color-perception and piano-playing no less than feeling and will. Lotze did not deny this, but claimed that certain generalizations were possible which permitted the valid demarcation of the great functions recognized in the Kantian threefold division.⁴

¹ Max Dessoir, *Outlines of the History of Psychology*, p. 65.

² *Ibid.*, p. 136.

³ James Mark Baldwin, *History of Psychology*, II, 34.

⁴ *Ibid.*, p. 86. Lotze's date was 1817-81.

There are two reactions, in general, which have come about in relation to our problem as a consequence of the domination of faculty psychology. In the first place, wherever we have the mental processes divided in a mechanical fashion into faculties, it means that some device must be sought in order to secure a unity of the psychical life. We have seen that in the mediaeval scholars this unity was secured by the positing of an external control in the Catholic church. We have seen also that with Descartes we pass out from this external control and seek for a human way of dealing with our data. The next point of interest for us is to be found in the fact that first one and then another of these faculties of the mind or soul is made the regnant influence. For example, in Descartes ideas are uppermost, and religion and science are given their place in accordance with the domination of the faculty of judgment. And the God of Descartes was born in the matrix of his need, to be sure, but that need was not the usual religious need, but the need for a bridge by which he might be able to pass from the self over to the world. So much does Descartes emphasize this point of view that he reduces man to little more than a cognitive somewhat.

The reaction away from this domain of the reason is to be seen in Paschal (1623-62), the French scientist and religious philosopher. He was far from locating religion in the domain of reason, and his conception was that of a diametrical opposition of the one to the other. This did not result in his throwing religion overboard because he could not make it conform to the demands of reason. But rather he determined to hold to religion and to defend it in the face of the difficulties which it encountered from the side of reason. This he did by giving to reason what he considered to be its rightful place in the realm of feeling. We are familiar with his famous dictum: "Le coeur a ses raisons que le raison ne connaît pas." But the fact that he finds a legitimate place for religion in the domain of the faculty of feeling does not prevent him from being a first-rate scientist. In the spheres of mathematics and physics his discoveries were epoch-making.

In Immanuel Kant we come to the man who stood for the domination of the third faculty, namely, that of the practical

reason or will. Descartes had criticized ideas; Kant criticized ideational processes. He knocked the bottom out of all the stock intellectualistic arguments for the existence of God. He also argued that God cannot be an object of sensuous perception either to men or to himself, so that disposes of the faculty of reason and sensibility as spheres within which to get a basis for religion. And he resorts to the will or practical reason as the guaranty of our faith in God, in freedom, and in immortality. It was the urge of the moral problem which drove him to the conclusion to which he eventually came. We must have God or there is no sufficient guaranty of the existence of the moral order in the universe and of the ultimate victory of the good over the evil.

Thus we have in Descartes, Paschal, and Kant the experiment of trying out successively the three faculties of judgment, sensibility, and volition as a means of securing a unity of the psychical processes and as a basis for religious assurance. And the interesting observation which we may make is that all three men were in favor of giving to science a free hand in proceeding with the work which belonged to its sphere. Each of them was a man of wide scientific knowledge, an authority in his own sphere in the day in which he lived. Descartes was learned in mathematics, being one of the founders of analytical geometry, and also learned in anatomy and physiology; so that his science gave to him the method with which he proceeded to carry on his philosophical speculations. In Paschal, too, we have a man of great learning as a mathematician and a physicist. His name is connected with the science of hydrodynamics as one of its founders, and stands high in the annals of the mathematical sciences as a contributor to progress in more than one direction. Immanuel Kant was also an authority in matters of science as well as philosophy in his day. Among the subjects which he taught in the University of Königsberg were logic, metaphysics, and cosmography. He attained special distinction for his work in physical geography, the well-known nebular hypothesis being associated with his name.

Other names might have been added to those cited to show that the tendencies to make one of these three faculties as the dominant one is a recurring tendency. We might have included

Hegel in the group of those who emphasize the intellectual element; and Schleiermacher with his definition of religion as "a feeling of absolute dependence" might be placed in the group of those who put the emphasis on the sensibilities; and Royce, who thought of religion as the will to be socially minded in terms of the "beloved community," is a type of those who emphasize the will.

We owe to the faculty psychologists a second reaction which has direct bearing on our specific problem. Reference has already been made in the discussion regarding Descartes to the relationship which Dewey describes as a compact between science and religion that each would not infringe upon that territory which was held to be sacred by the other.¹ And this seems to be the general position assumed by men of that type of thought, excepting, of course, those who seek for a harmonizing device among the faculties in the form of an external control, such as Bible or church. But men of the type to which reference has been made—Descartes, Paschal, Kant—represent faculty psychology with a thoroughly human reference. And the tendency among all men of the type is to assume that religion and science each dwells in a glass house at which the other dare not throw stones. There is a legitimate sphere for each of them in the processes of life, and no occasion for any cross-fertilization.

In the system originating with Albrecht Ritschl (1822-89) we have a splendid example of the manner of dealing with the problem of the relation of science to religion from the point of view of faculty psychology. For Ritschl religion was antithetical to mechanistic science. It was a spiritual freedom which comes through communion with the one God in the person of Jesus and in the living community of God to which the Scriptures refer as the "Kingdom of God." Ritschl acknowledged that he was a disciple of Lotze, and we have already noted that he was the most radical of all the faculty psychologists. The result, it would seem, of Ritschl's discipleship to Lotze is that he has acquired a faculty theory of the functions of religion and science. He distinguished them by saying that science gives us existential judgments, whereas religion gives us value-judgments. The aim of the religious man

¹ Page 19 above.

is entirely at variance with the aim of the man of science, the former being interested in the conservation and interpretation of established values, while the other desires rather to interpret reality mechanistically in the terms of causal relationships. To explain a thing scientifically means that you show the causal nexus, so that if science accomplished its task fully it would give us the complete explanation of phenomena in terms of causality. Ritschl places these two realms in such marked antithesis to one another that he thinks a scientific attempt to deal with the values of religion would put religion out of business. A man working in the realm of science might come to the conclusion that there is no adequate ground for a belief in God. But even then the fact of Jesus will make such an impression on his emotional experience that he will be compelled from the point of view of value-judgment to make an affirmation. In this way Ritschl makes religion independent of science. At the same time he is willing that the scientist should enjoy the fullest liberty within his own field, which field he marks off very concisely by calling it the sphere within which existential judgments are made. The following quotations from his own words will show explicitly how he has dealt with the matter:

Scientific knowledge is accompanied or guided by a judgment affirming the worth of impartial knowledge gained by observation. In Christianity, religious knowledge consists in independent value-judgments, inasmuch as it deals with the relation between the blessedness which is assured by God and sought by man, and the whole of the world which God has created and rules in harmony with his final end.¹

The lordship over this world which Christianity bestows upon men is not to be taken in an empirical sense. So that it is of no consequence what position the planet, with which our existence is bound up, occupies in the universe. . . . It is impossible to perceive how this should invalidate the estimate of self which Christianity leads men to form. . . . Our spiritual life is subject to laws which are not related to known natural laws as their consequences, but come under an exact opposite category. . . . Collisions between religion and science, especially natural science, are only when laws which are valid for narrower realms of nature or spirit are erected into world laws.²

¹ Albrecht Ritschl, *Justification and Reconciliation*, p. 207.

² *Ibid.*, pp. 614-16.

The criticism of this position is that it is so dualistic that it keeps religion and science in two separate and distinct planes. Science is in the plane of existence. Religion is practically supernatural; at least it is placed in a sphere of reality which is unique and which does not supply any data with which science can deal. Science moves altogether in the realm of the objective, whereas religion has a right to put up a sign over the subjective sphere: No trespassing allowed. Moreover, the distinction between existence-judgments and value-judgments can hardly be validated. Experience does not find any such antithesis between the two kinds of judgments. The judging process means the classification of certain things, which means that you have evaluated them according to certain standards. It is also true that any judgment, whether it be one of value or not, implies the existence of that which is being judged. The truth of the matter is that, as there can be no valid line drawn between existence-judgments and judgments of value just because they are constantly intermingling, so there is a constant intermingling of the religious and scientific interests, and the differentiation will have to be sought in another direction.

Professor Ames has keenly criticized the approach of the faculty psychology to the problems of life when he stated that this particular form of psychology arose "historically with individualism, while individualism in turn accompanied the differentiation of the old social unity into various activities."¹

Before passing to a consideration of the functional psychology with its implications for our problem, there are still some movements that are out of the general stream of thought that we should note.

1. In the first place, positivism is a movement with which we shall have to reckon. Positivism owes its genesis to Auguste Comte (1798-1857), who began by saying that human thought had passed through two stages and is now entering a third. Of these the first is the theological stage, the chief characteristic of which is animism. The second is the metaphysical stage when things that exist are accounted for by philosophical substances. The third stage, which

¹ E. S. Ames, *The Psychology of Religious Experience*, p. 289.

is the one upon which the race is now entering, is the positive. We do not look for spirits nor metaphysical substances nor gods, but we try to discover empirically the laws which bind us together. On this basis Comte proceeded to a classification of the sciences, in which he begins with mathematics and ends with sociology. But the striking thing is that in his classification of the sciences Comte did not find a place for psychology. The mechanical way in which he has dealt with the history of the race is evidence of his lack of psychological sympathy. And the result is just what we might expect of one who neglects psychology. God is ruled out of the game, and religion is curbed by an over-intellectualism. The center of interest is humanity, which he capitalizes as "Le Grand Etre" and elevates to a place of worship. In this way Comte attempts to keep religion in the real world in which science also moves, and attempts to find a synthetic relationship between the two disciplines. When human culture attains its highest level, then religion will pass away. Its place will be taken by sociology, which is the Rome to which all the roads of the sciences lead. In the meantime Comte recognizes the utility of the religious illusion, and he himself proceeds to build up a cult of humanity by a wholesale borrowing from the Catholic liturgy.

2. Scientific agnosticism is the name which has been given to the system which has been propounded by Herbert Spencer (1820-1903). The contribution to thought for which his name is famed is the doctrine of the Unknowable. In his *Principles of Psychology* Spencer proposes to explain the activities of human mind genetically, but in the question of the relation between psychosis and neurosis, of mind and matter, he is vague. His mechanical evolutionary scheme leads him to suggest that the mind is composed of homogeneous units of consciousness, similar to nervous shocks, each of which finds a parallel in the physical movements of nature. At the same time he posits substance as an unknowable substratum of phenomena, and speaks of the relation of the mind to matter as a relation of two unknowable substances, and therefore something which is to be left to the province of the Unknowable. This unknowableness which he finds in his psychological investigations he carries into his other fields, where he deals with our problem of

the relation of religion to science. It is his conviction that science and religion alike must reach the conclusion that the "most certain of all facts is that the Power which the universe manifests to us is utterly inscrutable." Religion is the unknown and unknowable mystery. Science too has to recognize that the ultimate source of things is unknowable. For Spencer science is positive and religion is negative. It is sufficient from his point of view to demonstrate that positive science is unable to cover the whole range of experience. Religion is a sense of mystery, and that involves an agnostic element. In science the more our knowledge increases, the larger seems the field of nescience. So Spencer found that a reconciliation between these two spheres is possible only as each of them realizes that neither of them can dominate over the other, and that both in the end have to come to the ultimate reality of things to find their legitimate place, and, as we have seen, that ultimate reality is Unknowable. So we find in Spencer the same sort of agnosticism in his attempts to deal with the problem of the relationship between science and religion as have characterized his psychological dissertations.

3. Another movement that demands attention is evolutionistic monism, of which the leading exponents are Haeckel and Ostwald. Monism means the fundamental unifying of all thinking and acting. It desires to eliminate root and branch the last vestige of supernaturalism. Science insists on having the whole field to itself. Religion is not to be permitted to enjoy an independent field at all. Haeckel proposes a monism of substance. Under the laws of substance he would unite the scientific laws of the conservation of energy and of the conservation of matter. Matter and energy, he claimed, are two separate attributes of the fundamental substance. He arrives at a virtual hylozoism, since he regards energy and spirit as one. According to his system, psychology is merely a branch of physiology, and psychical activity is nothing more than a group of vital phenomena which depend entirely on physiological and material changes that are taking place in the protoplasm of the organ. He says:

Scientific psychology is a part of physiology, the doctrine of the functions and the life-activities of the organisms. The psychology and psychiatry

of the future, like the physiology and pathology of today, must take the form of cellular study, and in the first instance investigate the soul-functions of the cells.¹

Again he says:

Consciousness, like feeling and willing, among the higher animals is a mechanical work of the ganglion-cells, and as such may be carried back to chemical and physical events in the plasma of these.²

So that for Haeckel every living cell was regarded as possessing psychical properties. In the case of Haeckel we have that happening which we might expect of one who places physiology completely over psychology. Religion is ruled out by science in the same summary fashion that psychology was ruled out by physiology. Haeckel was a biologist, and he was interested in getting an unbroken chain of causal connectedness on the basis of biological evolution. And for him the biological causal explanations of phenomena, which must form an unbroken series, does away with the necessity of or the place for a God. Religion, he takes for granted, deals with the miraculous, and since science by organizing a complete chain of causes does away with the miraculous, religion is left stranded on a shore that is barren of any material for the continuation of its work.

The work of Haeckel has been carried on by Ostwald. The former was a biologist; the latter is a chemist. So that the fundamental difference between the two men is to be found in the science in which each is interested. The constant factor is monism. Ostwald declared the laws of energy to be the laws of reality. These he summarized as (1) the law of the conservation of energy, and (2) the law of the dissipation of energy. The sum-total of energy remains the same, but there are some processes which cannot be reversed. For Ostwald energy was a sufficiently spiritualized concept that it was able to take care of all the phenomena of both the physical and psychical spheres. He even imitated Kant's categorical imperative with his energetic imperative: "Economize energy." So that Ostwald in his system, which is an attempt to do away with the necessity of religion, is required to read into the mechanical concept emotional significance. In other words, he

¹ Ernst Haeckel, *Monism*, pp. 42, 43.

² *Ibid.*, pp. 47, 48.

has to borrow from that very field of life which in the beginning he had repudiated. And in the case of both of these evolutionistic monists, Haeckel and Ostwald, we see that the reduction of psychology has been accompanied with a reduction of religion, an apparent neglect to take account of all the facts of life resulting in this parallel reduction.

V

Contemporary psychological thought introduces us to a new stage in the history of the science. The change has been on the way ever since the time of Charles Darwin.

With the coming of the evolution theory, especially in the form of the "natural selection" hypothesis of Darwin, considerations of origin, development, and growth came systematically into the natural sciences. Psychology in time felt the impulse; and gradually the genetic concept and method became current. The progress of Darwinism in the mental and moral sciences shows itself in certain of the departments of psychology in which specialization has recently taken place: normal genetic psychology, child-psychology, animal-psychology, and race-psychology.¹

Thus we see that the change is one of methodology. The evolutionistic hypothesis has worked its way into the study of the mental processes, as well as into the other biological processes. And the study of how things came to be is essentially a functional study. It is through the understanding of functions that we appreciate the evolving structures. We regard psychology now as taking its place among the biological sciences. The antithesis which was once thought to exist between the physical and the psychical has disappeared. The rationalistic philosophy of the seventeenth and eighteenth centuries had as its corollary a rational or faculty psychology. Rationalism is logical; psychological science today is biological. The adoption of this biological point of view implies that consciousness must be studied in connection with the psychological processes with which we have learned to deal genetically. The gist of the matter is that—

the real human organism is a psycho-physical organism, and that the mental portion of it is not to be completely or correctly apprehended without reference to the physiological portion. The psycho-physical organism is, moreover,

¹ James Mark Baldwin, *History of Psychology*, II, 94.

a real unit. The separation of the mind from the body which we commonly make in thinking about them is a separation made on behalf of some one of our theoretical or practical interests, and as such the separation is often serviceable. In actual life experience, however, the two things are never separated.¹

Professor Angell gathers some of the evidence to establish his thesis of the essential unity of the psychical and the physical. Of the points of evidence he mentions (1) "that our consciousness or knowledge of the world depends primarily on our use of the senses," (2) "that the expressions of the mind ordinarily take the form of muscular movements which we call acts," (3) that a pathological condition of the brain is accompanied by a pathological condition in some portion of the conscious life.² When a man acts, we do not think of saying any more that his action is to be traced to some one of the life-processes which in that particular action shows itself to be evidently dominant at the time that the action takes place. But action is the result of the unified life-process responding to some stimulus. One element may be more affected than the other in the reaction to the stimulus, but the organism which responds is a unity. The reaction is the reaction of a single organism. As we shall presently see, this unity of the psychophysical organism can scarcely be exaggerated in its importance for the specific problem which we are considering.

That leads to the further remark that functional psychology is behavioristic. Formerly psychology was regarded as that science which, as Professor Ladd said, deals with the states of consciousness as such. But today, though it is still regarded as the science of consciousness, it is not the science of *states* so much as a science of phenomena. It deals with facts, and attempts to classify its observations in much the same way that the botanist or the zoölogist deals with his materials. The life-processes are motor as well as mental, and the motor phenomena give us the key to the mental, so that human behavior furnishes psychology with the data for the interpretation of human creations. The study of that which is done is the primary thing. The social psychologist helps us materially at this point with his description of the rise of

¹ J. R. Angell, *Psychology*, p. 8.

² *Ibid.*, pp. 13-15.

consciousness. He deals with behavior, with the act as the starting-point. Action is determined by the instinctive impulse directed toward the satisfaction of some felt need. There are certain influences which tend to reinforce and others which tend to inhibit the impulse. Sometimes by association one impulse will tend to call forth another. Again, one impulse may function as an inhibition to another. Now consciousness arises from the necessity for a selective process, picking out the impulse which it will set free, and also the forms which it will utilize for the satisfaction of the impulses. Thus consciousness arises in a social process, whereby the act, which is social, is made the bond of connection between the subject-self and the object-self. This means that there is a whole mass of data, which hitherto psychology has passed over superficially, which now affords the psychologist a laboratory in which to work, viz., the study of the instincts, impulses, habits, attitudes, actions, functions, etc. In other words, the data of functional psychology are concrete and biological, whereas those of the older psychology were abstract and logical.

The conception of psychology as a biological science carries with it certain implications for us. It is, to be sure, a part of that larger movement which makes all science biological in the sense that it is a servant of life, so that the only excuse for scientific labor in any field is that it may minister to and enrich life, giving it a better technique of control over the mechanical environment. But, to be more specific, the treatment of psychology as a biological science means that the mind is to be regarded not as an entity but as an instrument, "an instrument of adaptation by which the organism adjusts itself to the environment. . . . The conception of the mind as an instrument of adjustment and adaptation is a biological conception, and marks the radical transformation which psychology has undergone through the influence of the science of biology."¹ We have a parallelism in the pragmatic notion of the instrumental character of ideas. In theology it gives us an instrumental doctrine of the character of religious dogmas and formulas. The meaning of this doctrine of instrumentalism, whether it be employed in psychology, philosophy, or theology, means that life

¹ E. S. Ames, *The Psychology of Religious Experience*, p. 15.

is made the center of interest, and that all these instruments are so named from their ability to function as ministers to the developing life-processes. This gives to us a method for dealing with religion and science. The instrumental doctrine is valid here also, as in all other spheres. Our religious knowledge and our scientific knowledge, and equally art, morality, politics, etc., are instruments in the service of life as it makes its adjustments and adaptations within the environment which is the sphere of experience. Religion and science arose biologically as ministers to life, just as surely as did the eye or the ear. They do something for life which life needs to have done for it. "That ye may have life, and that ye may have it more abundantly" is the underlying motive of both religion and science.

The thesis which I propose is that religion and science are differentiable attitudes toward the extra-human environment, involving specific ends and techniques for the attainment of those ends, and that these attitudes are the outgrowth of those ineradicable tendencies of life which we call innate and instinctive, so that both genetically and functionally they may be said to be biological.

Inasmuch as the differentiation of the various disciplines of life—religion, science, aesthetics, ethics, *et alia*—has a functional evolution, and is not localizable in the behavior of primitive peoples, the order of procedure is determined for us as:

1. An attempt to define the differentia of the religious and scientific attitudes, or the question of their psycho-physical functions.
2. An endeavor to discover the genetic elements in the innate and instinctive behavior out of which these differentiated attitudes have evolved, or the question of their psycho-physical genesis.

CHAPTER III

THE DIFFERENTIA OF RELIGION AND SCIENCE

The differentiation between religion and science, on a psychological basis, is to be made in the realm of attitudes. It is the intent of this chapter to make such an examination of these attitudes as will make clear in what respects they may be differentiated:

A functional point of view in psychology, as we have observed, is concerned with an organism which is regarded as a unity. It is impossible to separate man in the ways that either the dualists or the faculty psychologists tried to do. The psychical and the physical aspects of life are inextricably woven together. So the cognitive, the affective, and the conative phases of the mental processes are strands interwoven in the warp and woof of a unified life. Religion and science are to be interpreted in that light as products of human life which is regarded as an organic unity. There are no mental compartments or pigeonholes which have served as molds for these two disciplines, and into which they may be fitted *ad libitum*.

The real differentiation of religion and science, considered psychologically, is to be found in the realm of attitudes. By an attitude I mean a disposition to attend or to act in a specific manner. Contemporary psychologists regard attitudes as the unifying agency in mental life, and the attitudes of habit (i.e., of conserving the type) and of accommodation (i.e., of modifying the type) as the manner in which mental development proceeds through the organization of experience. The religious attitude is, therefore, a habitual disposition to seize upon the spiritual elements of the extra-human environment and to organize and conserve them in the interests of life. In differentiation from that, the scientific attitude may be described as the habitual disposition to make adjustment to and to gain control of the mechanical forces in the extra-human environment for the sake of life.¹

¹ To be sure, there are other attitudes which may be and are assumed under certain circumstances; as, e.g., the moral, which is the disposition to enter into mutually desirable social relationships with the human environment; and the aesthetic, which is the disposition to appreciate the beautiful in the environment.

1. It will be apparent that the position adhered to is in harmony with that so ably defended by Dr. Watson in tracing the differentia in terms of a "social" as against a "mechanical"¹ attitude toward the non-human environment.² I choose this differentiation as basic because, in the first place, it is broad enough and generic enough to present the psychological difference between religions and sciences, speaking collectively; and in the second place, because the definitions include all the historical phenomena with which we have to deal. Many of the so-called definitions of religion are selective rather than definitive. An extreme illustration is in the statement of the fabled bishop who said: "By religion, I mean the Christian religion; by the Christian religion, I mean Protestantism; and by Protestantism, I mean the Church of England." This is simply an absurd illustration of a selective process determining a man's definition. In a similar way some have called everything pseudo-science which does not harmonize with revelation and tradition.

Spencer and Gillen in their work on the tribes of Central Australia refer to one particular tribe, the Aruntas, who, so far as they could discover, had no gods. Yet they had a totemistic system with elaborate ceremonials, such as the "intichuima" ceremony for the increasing of the supply of the totem animal, in their case the kangaroo or emu.³ This is a definite attempt to socialize with the extra-human environment, and who shall deny that the attitude is religious?

Again let me refer to Hinayana Buddhism. Many of the definitions of religion which have been formulated have been forced to regard Hinayana Buddhism as merely a philosophy and to reject it as a religion, the reason being that the definition of religion

¹ The words "mechanical" and "mechanistic" are used in this thesis in the philosophical rather than the physical sense, i.e., as antithetical to organic.

² A. C. Watson, "The Logic of Religion," in the *American Journal of Theology*, II, 81-101, 244-65. The definition of religion used by C. H. Toy is in agreement with this position: "Religion is man's attitude toward the universe regarded as a social and ethical force; it is the sense of social solidarity with objects regarded as powers, and the institution of social relations with them."—*Introduction to the History of Religions*, p. 1.

³ Spencer and Gillen, *The Northern Tribes of Central Australia*, pp. 288 ff.

used called for a deity or deities which did not come into Buddhism until the Mahayana period. Yet it seems to me that a careful reading of such literature as the *Dhamma Pada* must impress the reader with the fervor of a soul striving to make a real religious adjustment—a social attitude toward the cosmos. No definition of religion is big enough which excludes Buddhism, even in its earlier form.

So too the definition of science may be defended for its breadth as well as its precision. Astrology was superseded by astronomy, and alchemy gave way to chemistry. Nevertheless each of these were expressions of a mechanical attitude toward the extra-human environment which it would be incorrect to leave out of account in a historical account of the sciences. Science is not confined of necessity to that which is true, any more than religion, but a scientific attitude is assumed in all the efforts to gain control over the non-human environment by the use of a mechanistic technique, however imperfect.

In religion and science we are not dealing with two separate environments, but we have two techniques for dealing with the same environment. The assumption of one attitude does not preclude one from assuming another toward the same object. Nor does the use of one technique prevent the other. Consider the rainbow as an example. The scientist with his mechanical outlook is able to explain it as the result of the refraction of light on water. The artist with his aesthetic point of view sees it to be a thing of beauty. The Hebrews, with their religious attitude, interpreted it as the sign-language of Yahweh in social relationship with his people. Analogously in time of war the different attitudes appear with reference to the course of events. The religious interpretation sees a victory or a defeat as an indication of the presence of God in vindication of the right or in the humiliation of the erring. A scientific point of view measures victory or defeat in terms of preparedness and strategy. The differentia is in the type of the attitudes, both of which are perfectly legitimate because both are serviceable.

Leuba explains the differentiation between religion and science behavioristically. He says: "Anthropomorphic behavior becomes

religion when it is directed to gods, and the mechanical becomes science when the principle of quantitative proportion it implies is definitely recognized."¹ Doubtlessly he is on the right track, but his conclusions are all of them discounted somewhat because his definition of religion restricts it to a belief in supernatural agencies of ontological reference to which man relates himself.²

The objection may be raised that the differentiation of religion and science on the basis of a social versus a mechanical attitude breaks down when one comes to examine such sciences as sociology, ethnology, and anthropology where the subject-matter is persons, not things. The answer is that the sociologist, the ethnologist, and the anthropologist have, to be sure, to adopt a social attitude when in the practical business of collecting their data. But the scientific task itself is not concerned with people but with the data, the objective facts which the scientist has gathered and which he treats quite mechanically. If he is unable to abandon, even temporarily, his social attitude, he may be a good social worker, but he vitiates his ability to become a thorough scientist.

It seems to me to be another way of describing the same situation to say that the religious attitude is one of participation as against the scientific, which is analytical.³ The gain of control over all forces in the environment to aid in the struggle for existence is the purpose of both. Religion seeks to obtain that control by means of a social participation with the process, conceived in personal terms. Science, by means of analysis and reflection, puts us in a position to deal more efficiently by mechanical means with a fragment of experience. The technique developed in the former instance is the cult; in the latter case it is the intellectual and material tools of the theoretical and practical sciences.

2. Another point of differentiation between religion and science is that religion is concerned with life in its totality, whereas science concerns itself with certain specific situations. It is a characteristic of the social attitude which men take toward the

¹ J. H. Leuba, *The Psychological Origin and Nature of Religion*, p. 75.

² *Ibid.*, p. 44.

³ This distinction was unfolded by Professor E. S. Ames in his lectures in the Psychology of Religion, Philosophy 60, University of Chicago, autumn, 1916.

extra-human environment that they regard it in the aggregate. In worship and in all his endeavors to establish a spiritual fellowship, man acts as though he regarded the power or powers toward whom he assumes the social attitude as of cosmic significance. Whether the supermundane world be considered monotheistically as in Christianity and Mohammedanism, pantheistically as in Stoicism and Brahmanism, or pantheonically as in the Vedic and Roman religions, religion is regarded as putting one into relationship with the extra-physical environment in its wholeness. The means employed to establish that relationship vary with the cultural state of the people from flattery, bribery, and gaudy gifts to social and missionary service, ethically conceived. Religion thus interprets the world as a totality in terms of social relationships which are with a view to living with it in such a way as to secure satisfaction for the spiritual life.

In contrast with the religious attitude, the scientific attitude concerns itself with only a fragment of life. The sciences are only developed sufficiently to provide man with a technique for a mechanical manipulation of a small percentage of his environment. And any one science concerns itself with a still smaller group of phenomena within that range. So that the scientific attitude at any one time is necessarily selective. One evidence of the selective process in science is that a thoroughly scientific manipulation depends upon the situation being repeated frequently enough to enable observation that will lead to generalization and the development of a technique. The scientific attitude is one of observation in the interest of mechanically calculable manipulations, and the human powers of observation imply a process of selection. As Professor Mead has said: "The scientist always deals with an actual problem, and even when he looks before and after he does so far as he is facing in inquiry some actual problem. No actual problem could conceivably take on the form of a conflict involving the whole world of meaning."¹

3. Another way of expressing the differentiation between the religious and scientific attitudes is to say that the former is an evaluatory and the latter an explanatory attitude. Professor

¹ G. H. Mead, chapter on "Scientific Method" in *Creative Intelligence*, p. 219.

Höfding has the merit of making that distinction clear in the epistemological section of his great work on the philosophy of religion. "Only against their will," he says, "was it gradually borne in on the representatives of religion that it was no part of the work of religion to supply a scientific explanation of the world. What is now commonplace in the mouth of theologians, viz., that we must not look to the Bible to teach us natural science, could not get a hearing in the days of Bruno, Galileo and Spinoza."¹ The scientific temperament is historically a later development than the religious. It was impossible, as we have seen, to have a thoroughly scientific attitude so long as the deductive method held the field. But the introduction of induction involved a more mechanical way of approach, as it freed man for untrammelled observation and experimentation leading to a mechanical technique, whereas deduction meant subjugation to authority, and in that sense had sometimes a measure of social reference. Science was under the domination of the church, and the earliest scientists were priests. It was only gradually that science won her freedom. The result has been that some scholars have declared religion to be the mother of science as well as of art, philosophy, and their sister-disciplines. Historically there is a measure of truth in the idea, for it was out from the church that the sciences gradually gained their emancipation, until the scientific attitude came to be regarded as having a right to an independent existence.² On the psychological side, however, it would be better to speak of the gradual differentiation of the two attitudes, one from the other, than of the evolution of one of them out of the other.

The result of the long domination of the church over science, coupled with the use of the deductive method, meant that religion was continually trying to assume a scientific rôle. It indulged in the business of explanation, i.e., of placing phenomena in their

¹ Harold Höfding, *The Philosophy of Religion*, pp. 14, 15.

² Friedrich Daab, in his essay, "Religion und Wissenschaft," in *Das Suchen der Zeit*, V (1909), 123, quotes with approval from Friedrich Ritzel: "Die Religion der Kulturarmen Völker faszt alle Keime in sich, die später den herrlichen, blutemreicher Wald des Geisteslebens der Kulturvölker bilden sollen; sie ist Kunst und Wissenschaft, Theologie und Philosophie zugleich, so dasz es nichts von noch so ferne her auf Ideales Hinstrebendes in diesem armen Leben gift, das nicht von ihr umfasst würden."

causal sequence, with the results which are too well known to need delineation. The real interest of religion was a socialization of the environment, so that explanation became a reference to God, and the tools were Aristotelian. The First Person of the Christian Trinity was described as the Prime Mover, himself unmovable, the First Cause, himself uncaused. Consequently a thoroughly scientific explanation of phenomena was not forthcoming because the attitude of religion was social and not mechanical. It was due to the observations and hypotheses of Galileo, as we have seen, that this old world of thought eventually passed away. He stated the law of the pendulum, which furnished an instance of self-motion in opposition to the mediaeval notion of God-originated motion. And from the self-motion of the pendulum there began to evolve the scientific notion of causality, the conception of relativity, and the age of freedom. Likewise the reference of phenomena to a First Cause was seen to be simply an acknowledgment of scientific agnosticism, and with the progress of scientific knowledge the plausibility of religious explanations was hazarded.

Those who are fearful that the advance of science carries with it as a necessary corollary the corrosion of religion are under the domination of that mediaeval conception of the business of religion, viz., that religion is concerned with ultimate causes, in contrast with science, which was deemed to be concerned with proximate causes. Should science make such strides of progress that the time would come when she would be able to give a thorough causal account of phenomena, what would become of religion? If her business were to give a religious explanation as against a scientific explanation, she would be in danger of being retired. But religion has discovered that there are things to be done about phenomena other than explaining them. Science deals with time, space, cause, motion, number, etc., and there is no appraisal in any of these concepts. After science has finished her task, be it ever so complete, in explaining any phenomenon, there still remains the religious task of evaluating it for human life. So that advancement of science has meant in the long run the emancipation of religion for her real task, as well as the liberation of science for greater efficiency within her own domain.

Now the religious attitude is one of evaluation, in which the subject seeks to appreciate the significance or extract the meaning from phenomena as instruments for the furtherance of human welfare. This point has been so ably developed by recent writers¹ that it seems to be unnecessary for the purposes of this thesis to do more than make a statement. The valuational attitude is essentially one of appreciation of worthfulness which grows as the environment is related socially to the individual or the group. "Certain elements in the life of a people come to consciousness as having peculiar value, and therefore the religious attitude is a special case of the larger sense of value."² The "peculiar value" which these elements possess by virtue of which they give rise to the religious attitude is that they are serviceable to the individual or to the group in the business of obtaining spiritual reinforcement by the use of a social technique. Value is essentially a relativized social concept, and it takes the character of a religious value when that social relationship is given cosmic reference. Certain events make such impress on a man and influence him in such a way that those events have the value of God to him. He sees in them more than the mechanism of law, more than determinism, though he may at the same time accept the causal explanation which is presented as he views the events scientifically. When a great catastrophe occurs, the scientist seeks the causal sequence of events leading up to the catastrophe with a view to preventing a recurrence, in the belief that "prevention is better than cure"; but the religious man, while accepting the explanation of the scientist as quite satisfactory, still claims the legitimate right to obtain spiritual worth from the event by interpreting its significance in terms of a vocal expression in a social relationship. Science provides the explanation; religion extracts the meaning. And again I say the evaluatory attitude of the religious consciousness is every whit as legitimate as the explanatory attitude of the scientific temperament because it functions as a powerful aid to man in the struggle for existence.

¹ Cf. Höffding, *The Philosophy of Religion*; Irving King, *The Development of Religion*; Ames, *The Psychology of Religious Experience*; Watson, *The Logic of Religion*; and Wright, *The Evolution of Values from Instincts*.

² Irving King, *The Development of Religion*, p. 215.

Höffding has formulated his definition of religion in terms of value, defining it as "the conservation of value."¹ He was doubtless right in conceiving the question of value to be a great concern of religion. But the difficulty is that the definition rests upon the assumption that values are already in existence, and leaves no room for the achievement of new values. It fails to provide for the creative element in the religious valuational attitude. We may apply to the question of values one of the differentiations which Professor Daab makes between religion and science, viz., "Die Religion schafft; die Wissenschaft entdeckt."²

4. Herbert Spencer answered the query as to the possibility of religion and science coexisting by saying that it is possible, since it is a fact that they do co-exist. He differentiated the attitudes, making religion qualitative as compared with the quantitative attitude of science. Religion has for its object the Absolute, and hence deals with the inscrutable. The sciences attempt a classification of objects and data according to their resemblance. Thus the religious attitude is essentially qualitative, whereas the scientific attitude is rather quantitative or mathematical.

It is something of the same idea which Professor Daab has in mind in saying: "Die Religion erhebt; die Wissenschaft berechnet. Die Religion wagt; die Wissenschaft wägt."³ It should be fairly clear that if science is to furnish us with a mechanical technique of control, it must work that out by a consideration of mathematical relationships, by calculating and weighing the data with which it has to deal. Especially is this illustrated in the mathematical and physical sciences. On the other hand, the way to the organization of a social control is by taking a risk, if need be, and living through experience, and then seeking to interpret its significance in terms of cosmic relationships.

It is of the nature of science to calculate as accurately as possible, to endeavor to understand causal relationships as logically and chronologically as possible, and then to organize a technique by means of hypotheses and laws, which are its tools for controlling the future. But the tools for future control are forged out of the

¹ Höffding, *The Philosophy of Religion*, p. 12.

² Daab, *op. cit.*, pp. 123 ff.

³ *Ibid.*

calculated materials of the past. Religion, on the other hand, is more ready to venture to manipulate tools forged out of untried materials. True, science has its faith and makes ventures in formulating hypotheses, but science as a rule does not attempt to construct machinery except with materials brought from the past. Religion is constantly constructing new machinery, but frequently goes farther and creates the materials that it puts into the machinery. The calculations of science are determined by the past; the adventures of religion are frequently in the face of a past which seems to insure failure.

There is a good reason for the venturesomeness of religion in spite of the calculations of science, viz., that in religion we are dealing with relationships that are social as against the mechanical in science. Science handles its materials as things; religion regards both subjects and objects as social. It is a characteristic of personality that future behavior is only partially determinable by past behavior. When we are dealing with the inorganic world, and when we are dealing with reflexive and instinctive behavior in the organic world, we are able to tabulate our results pretty accurately, so that we can predict the future with reference to the past. But this method breaks down when we are dealing with the conscious behavior of human beings. The conative process of consciousness enables a man to do something quite different, under the same stimulus, from what he had done previously. The religious attitude, involving as it does a relationship conceived in personal terms, dares to neglect the quantitative element and to venture upon a line of action, urged on the one hand by the felt needs of life and on the other hand by its conception of the nature of that person or power with whom it is socializing. So we conclude that the differentiation into qualitative and quantitative relationships is a corollary of the social and mechanical.

5. There is another way in which we may express this differentiation, viz., by stating that the religious attitude is subjective and the scientific attitude is objective. For the simple reason that scientists are human, it is impossible to deny that there is a subjective element in the attitude of many scientists. Indeed, the very selective process which belongs to the work of the scientist is

in a measure subjective. On the other hand, I do not wish to deny by this statement the validity of the religious object. The latter belongs to the metaphysical implications of our problem and does not concern us at this point. But the point which I wish to make clear is that science tries to deal at first hand with the actual data under consideration, and in a thoroughly objective way. And because the attitude of science is mechanical, there is less of the affective element and more of the cognitive. On the contrary the religious object is an idealization, and consequently the felt needs involve the introduction of an affective element.

The historic struggle between science and religion has been in reality a struggle between two world-views. Science offers to us a naturalistic world-view, presents us a world calculated in the formulas of determinism. Religion offers to us an idealistic world-view, presents a world formed out of images created in response to our felt needs. In either case there is teleology to this extent, that the formulation has resulted from the struggle for existence, and that both are instrumental and functional, and are serviceable to the individual and to society in the expansion of the life-processes.

The differentiation between religion and science, stated in psychological terms, is a matter that concerns the types of images employed. The primal form of ideas in human experience is the sense-idea which originates as a direct image of the sense-object. Sensations are the first ways in which consciousness functions, the simplest form of cognition. The association of ideas has its correlate in brain activity. So that when two simple brain-processes have been contemporaneous or one immediately succeeds the other, the recurrence of the first tends to stimulate the recurrence of the second. The principle of association affords an explanation of the reproduction of an idea or image in memory. The chain of ideas by which an occurrence in the past is imaged in consciousness is simply the operation of the machinery of association which has its physiological correlate in neural processes. Sensations are regarded as so modifying the organism that copies of them arise in consciousness even when the original stimulus is lacking. No ideas and no images ever occur within consciousness which have

not sometime had an external stimulus. Sometimes returning images are simply reproductions of the original sense-images; at other times they combine elements original to various sense-experiences. When the image is reproductive of the past in some detail, it is known as a memory-image or recollection; when it is a picture combining elements from various past sense-images, it is given the name of imagination. The memory-image is a recall in as much concrete detail as possible of the original sense-image, whereas in imagination it is not possible to trace the details to any one original sense-object. Yet the function of imagination is just as real as that of recollection.

It is accepted by a large school of psychological scholars that there can be no thinking apart from the use of images. The thought-processes may be described as a flux and flow within consciousness of images of varying types. In other words, images are the stuff of which thoughts are constituted. That which differentiates is the end or purpose of the thinking process. It is the desire of science to scrutinize and observe its objects as closely as possible with the aim of attaining a causal explanation and ultimately a mechanical technique with which kinetically to manipulate the future. The scientist aims to preclude as completely as possible the subjective element, and yet at times when he is formulating a hypothesis he purposely combines imagery in the trial-and-error method of seeking a solution to his problem. On the other hand, the effort of the religious man to socialize the extra-human environment involves a continual interplay of images. Sense-experiences give rise to images, some of which by association are connected with pleasurable and others with painful experiences. In religion the elements of sense-images are combined in accordance with felt needs, the process of combination being determined in considerable measure by the social mind. The ideas of a devil or a hell of torment are images; the elements of which are painful sensations in the experiences of the past. The conception of a heavenly city or a heavenly Father are constructions of the image-making disposition of consciousness, the elements of which are sense-images which have been associated with experiences of pleasure or comfort. Psychologically speaking, the imagery involved in the scientists'

hypothesis is of a piece with that involved in the faith of the religious man.

We have here also an explanation of the social character of Christian doctrine which Professor Mathews has pointed out so clearly.¹ Theological expression hinges upon the prevalent social concepts for the precise reason that imagination depends upon sense-images for its building material. An image of a tiger-god could never arise where people had no sense-images of tigers. A conception of a god of thunder implies the sense-image of thunder. So also the conception of the Christian God such as Anselm presents in terms of feudalism was the necessary product of an age when the sense-images of the people were formed in a feudalistic environment.

This fundamental difference between religion and science enters into our approach to actual problems. The business of the scientist, as we have seen, is to take an objective, analytical attitude in obtaining a mechanical technique. If he admits any fantasy into the data with which he is dealing, his work will be jeopardized, and he is liable to be drawn into making metaphysical assumptions. The only legitimate place for the scientist to create new imagery out of sense-experiences is in the hypothesis-forming activity. On the other hand, the religious attitude involves the facing of problems with which scientific technique cannot help us. The question of immortality, e.g., is not one about which we can make observations in the scientific sense because it takes us into the realm of the imagination where the technique which was designed for the world of purely sense-experiences does not function. Religion interprets the meaning of human life no less really than science, but it does so by the use of a different sort of technique. Moreover, the difference in technique was necessary to cope with the different situations arising because of different attitudes. But the social attitude and its imagery are as truly the servants of life as the mechanical attitude and its imagery.

¹ Shailer Mathews, "Theology and the Social Mind," in the *Biblical World*, XLVI, 201-48.

CHAPTER IV

THE SEARCH FOR A SCIENTIFIC DEFINITION OF INSTINCT

As stated in the conclusion of the second chapter, the proposition of this thesis is that the religious and scientific attitudes have their psycho-physical genesis in the innate and instinctive behavior of life. As a basis for inquiry into this problem it is necessary to obtain a scientific definition of instinctive behavior. This chapter is devoted to that attempt.

The attempt to find the genesis of religion and science in the instinctive life of the race is by no means novel. But the accounts which have been given have been disparate because of the changing content of the concepts employed. There has been no unifying conception as to what is meant by the words "instinct" and "instinctive," so that the relative bearing of instinctive behavior in the formation of the religious and scientific attitudes has not been treated with any degree of uniformity.

It will be of service to us in the delineation of our task if we can come to an understanding of the sense in which the term "instinct" is used by contemporaneous scientists. Let us assume that the phenomena of instincts are physiological, and that they "represent structurally preformed pathways in the nervous system."¹ On this basis it should be apparent that biology is the science which should decide for us what content we shall put into our definition. The use which psychology should make of the term is fundamentally dependent on the findings of biology. Since the days of Charles Darwin a great deal of valuable experimentation has been conducted in this field, but so much remains to be done that it will be well to recognize the tentative character of any hypotheses that may be set forth.

The works of such men as Jacques Loeb, Father Wasmann, G. A. Reid, C. Lloyd Morgan, C. S. Sherrington, R. M. Yerkes, and H. S. Jennings are helping toward the formation of a correct

¹ Angell, *op. cit.*, p. 339.

definition from a biological standpoint. The laboratory investigations of scores of scholars are all bringing light to the problem. Unfortunately the conclusions of some men are discounted in biological circles because their treatment of instincts is set by a preconceived philosophical theory. Lloyd Morgan, whose work¹ in the biological treatment of instincts is reckoned by scientists as the most authoritative, criticizes the conclusions of Hans Driesch as dominated by his idea of "entelechy," those of Henri Bergson as shaped by his "*élan vital*," and those of William McDougall as unduly influenced by his animistic theory of a "psychic entity." All such ideas, like Plato's Idea, Berkeley's Eternal Spirit, and Kant's Transcendental Ego, are concerned with a source or agency underlying the process, creating it, and directing its course. They are metaphysical questions and hinder an absolutely objective treatment of the subject.² The purely scientific attitude, as we have seen, is analytical and logical, but not interpretative. Consequently metaphysical considerations must not enter into a thoroughly scientific definition of instinct.

Some definitions have been criticized because they are too simple. Herbert Spencer's "compound reflex action" is too meager.³ Other definitions need to be remodeled because of the light shed from subsequent laboratory experimentation. Darwin, if still alive, would probably see that it was a doubtful procedure to apply the term "instinctive" to the emotions, unless in a secondary sense. It is somewhat surprising to find Driesch including in his definition of instinct as a complicated reaction the phrase "that is perfect the very first time,"⁴ which would a priori spell the impossibility of modifiability and of progress.

Still another group of definitions is criticized because they tend to be over-psychological, to the neglect of the data which are furnished by biology. William James defined instinct as "the faculty of acting in such a way as to produce certain ends, without

¹ *Habit and Instinct*, 1896; *Animal Behavior*, 1900; *Instinct and Experience*, 1912; "Instinct," in the *Encyclopaedia Britannica* (11th ed.), XIV, 648 ff.

² Lloyd Morgan, *Instinct and Experience*, pp. viii, 137.

³ Herbert Spencer, *Principles of Psychology*, I, 427.

⁴ Hans Driesch, *The Science and Philosophy of the Organism* (1908 volume), p. 110.

foresight of the ends, and without previous education in the performance."¹ Parmelee trenchantly criticized this definition because (1) it is so vague that it "might cover a tropism or a simple reflex action," (2) "it makes instinct necessarily purposeful in its character," which is very objectionable, and (3) it is not explicit in showing the hereditary character of instinct.² The definition of William McDougall is a good example of an over-emphasis of the psychic element. His conclusion is that we "may define an instinct as an inherited or innate psycho-physical disposition which determines its possessor to perceive, and to pay attention to, objects of a certain class, to experience an emotional excitement of a particular quality upon perceiving such an object, and to act in regard to it in a particular manner, or, at least, to experience an impulse to such action."³ Parmelee again has the credit of pointing out the weakness in this definition: (1) He regards instinct as *psycho*-physical, and his definition includes cognitive, affective, and conative elements, but biological investigation has shown that instinctive action is sometimes devoid of any psychical element. (2) The terms "to perceive" and "to pay attention" involve a consciousness which is not necessarily present. (3) The "emotional excitement" which McDougall posits is not the concomitant of all instincts.⁴

Biological investigation has reached certain conclusions as to the characteristics of instinctive behavior which lead to definiteness:

1. It is a congenital mode of behavior in differentiation from an acquired mode which involves intelligence. Driesch thinks that it is "perfect the very first time."⁵ Lloyd Morgan would modify that by saying that it is "serviceable on the occasion of its first appearance."⁶ But that it is congenital, biologists agree. It is characteristic of the species, and hence it is hereditary and structural. It requires no foresight before the behavior takes place, and hence is independent of prior experience.

¹ William James, *The Principles of Psychology*, I, 383.

² Maurice Parmelee, *The Science of Human Behavior*, pp. 223, 224.

³ McDougall, *Social Psychology*, p. 29.

⁴ Parmelee, *ibid.*, pp. 218-21.

⁵ Driesch, *op. cit.*, II, 110.

⁶ Lloyd Morgan, *Instinct and Experience*, p. 22.

2. It is characteristically performed by all the members of the group, and tends toward the well-being of the group or of the individual components of the group.

3. Nevertheless it is capable of adaptability and modification under the guide of experience, in the same way that the structures themselves have the power of variability and adaptability. It is capable of stimulation and of obstruction whereby reinforcement or inhibition may take place, a fact of importance in the development of the various attitudes.

4. It is relatively complex. In the words of Lloyd Morgan: "Such behavior is a more or less complex organic or biological response to a more or less complex group of stimuli of external and internal origin, and it is, as such, wholly dependent on how the organism and especially the nervous system and brain-centres have been built through heredity under the racial preparation which we call biological evolution."¹

As to the matter of the neurosis of instinctive behavior, much work has been done, but the conclusions do not lay claim to finality. The fact that instincts are congenital dispositions to relatively definite types of behavior puts them on the same plane with tropisms and reflexes. This has led Loeb to an identification of the three. We have noted the definition of Herbert Spencer in which he makes instincts compound reflex actions. Some writers, such as Romanes, have found the differentia by positing a conscious element in instinctive behavior which is absent from reflex action.² The position which was taken by Spencer has been adopted by Lloyd Morgan,³ Parmelee,⁴ and Hobhouse,⁵ viz., that instincts are complexes or co-ordinates of reflexes. Lloyd Morgan makes a further differentiation in claiming that instinctive action would involve the organism as a whole, whereas reflex action would not.

Experiments in regard to the neural bases of reflexes, instincts, etc., are leading biologists to the conclusion that the lines of demarcation are by no means sharp, and the distinctions may be a

¹ *Op. cit.*, p. 5.

² G. J. Romanes, *Animal Intelligence*, pp. 3, 17.

³ Lloyd Morgan, *Instinct and Experience*, chap. iii.

⁴ M. Parmelee, *op. cit.*, p. 203.

⁵ L. T. Hobhouse, *Mind in Evolution*, p. 53.

matter of relative complexity. At the same time they are finding neural explanations for these distinctions. The simple reflex is a reaction due to the environmental stimulus of some afferent nerve which conducts the excitement through the spinal cord to the efferent nerves, which in turn connect with the muscles or glands where the action is effected. The reflex arc or path through which the stimulus is conducted from the sensory neurone to the motor neurone does not pass through the cerebrum. On the other hand, intelligent or voluntary behavior for the obtaining of precision necessitates the passing of the stimulus over pathways which lead to the cerebral centers. The property of consciousness has been located in the cerebral cortex, and hence behavior which involves experience and which is conative is due, on its neural side, to the functional activity of the cortical brain centers. Between these two types of behavior is the instinctive, which is more complex than reflexes and less so than intelligence. How is that to be explained physiologically? On the one hand, there is a practical agreement that instincts are co-ordinated reflexes. On the other hand, there is the problem of their relation to intelligence. On this latter point Lloyd Morgan and C. S. Sherrington have the credit of putting forth an attractive hypothesis. Morgan states it as follows:

Intelligent guidance is the function of the cerebral cortex with its distinguishing property of consciousness; the co-ordination involved in instinctive behavior, and in the distribution of physiological forces to the viscera and vascular systems, is the primary function of the *lower brain-centres*; in instinctive behavior as such, consciousness correlated with processes in the cerebral cortex is, so to speak, a mere spectator of organic and biological occurrences at present beyond its control; but, as spectator, it receives information of these occurrences through the nerve-channels of connexion between the lower and the higher parts of the brain.¹

This hypothesis, whereby he locates the co-ordinations involved in instinctive behavior in the subcortical brain centers, in the case of the higher vertebrates, is substantiated by experiments conducted by many biologists on decerebrate animals, i.e., animals which have had the cerebral hemispheres and cortex destroyed, but have the subcortical region and spinal cord intact. And so far as the investi-

¹ Lloyd Morgan, *Instinct and Experience*, pp. 7, 8.

gations have been carried out, they have led to the conclusion that such animals are capable of behavior which, in the biological usage of the term, may be called instinctive.

The importance of locating the neural center of instinctive behavior is apparent. If Morgan is correct, then we must conclude that there is a considerable amount of instinctive behavior from which psychical elements are lacking. It does not deny, however, that when the cerebral cortex is present it functions in the assimilation of instinctive experience, thus conserving a "changing continuum of experience."¹ So that the control of instinctive behavior by the cerebral centers must be an "extension of the same processes as are operative in simultaneous and successive combinations of reflexes."²

The relative character of reflex, instinctive, and intelligent behavior leads some scientists to urge that it is more advisable to use the adjectival rather than the substantive form of the word. It is better to speak of instinctive behavior or tendencies or dispositions than of instincts. There are no instincts *per se*. The word should be employed in a descriptive sense rather than as denoting an entity. The use of the word in this qualifying sense has the advantage that certain behavior may be described as instinctive, in a primary and direct or in a secondary and indirect sense, whereas the use of the word "instinct" would involve a restriction to a limited type of activity.

It is surely more scientific to use the terminology in this sense than to try to make a catalogue of instincts, especially when a comparative study of the lists prepared reveals the fact that scarcely any two of them correspond. There can be no doubt that much of the difference is due to the fact that there has been no uniform sense in which the word has been employed. When writers like Thomas³ and Ames⁴ refer to hunger and sex as two primal instincts, they are not using the word in its biological connotation, but with reference to the great life-interests, viz.,

¹ *Op. cit.*, p. 81.

² C. S. Sherrington, *Integrative Action of the Nervous System*, p. 390.

³ W. I. Thomas, *Sex and Society*, pp. 97-99, 118-19.

⁴ E. S. Ames, *op. cit.*, p. 34.

the struggle for food and rivalry for mates in the interests of reproduction. Doubtless it was out of the needs created by these interests that much instinctive behavior has resulted. The opposite tendency is shown in William James, who held that the number of human instincts is much larger than the number of animal instincts. Thorndike has drawn up a list¹ of all that James would include under instinct, and the list covers three pages, including what Thorndike would break up into reflexes, instincts, and inborn capacities, as well as other types of behavior of a more complex character.

Between these two examples there are lists that vary in length in accordance with the content which the author places in the word "instinct." Angell, e.g., includes fear, anger, shyness, curiosity, affection, sexual love, jealousy and envy, rivalry, sociability, sympathy, modesty (?), play, imitation, constructiveness, secretiveness, and acquisitiveness.² McDougall has seven primary instincts and four others which are more complex. The first list includes flight, repulsion, curiosity, pugnacity, self-abasement and self-assertion, and the parental instinct; the supplementary list includes the instincts of reproduction, gregariousness, acquisition, and construction.³ Kirkpatrick prefers to group the instincts as the individualistic or self-preservative, the parental, the social, the adaptive, the regulative (under which he includes the moral and the religious tendencies), and resultant or miscellaneous instincts.⁴ Marshall makes a threefold classification of the individualistic instincts, those relating to the persistence of the species to which the individual belongs, and those relating to the persistence of social groups.⁵ He also refers to a group of regulative instincts.

Such a wide variety in the treatment of the subject is evidence of the complexity of ideas about the subject under treatment. There is a further difficulty in the fact that scholars have not always been faithful to their own definitions. Parmelee has criticized Angell's list, e.g., from the point of view of the author's

¹ E. L. Thorndike, *The Original Nature of Man*, pp. 17-20.

² Angell, *op. cit.*, p. 349.

³ McDougall, *op. cit.*, chap. iii.

⁴ Edwin A. Kirkpatrick, *Fundamentals of Child Study*, pp. 51-63.

⁵ H. R. Marshall, *Instinct and Reason*, pp. 103-59.

own definition that instincts "represent structurally preformed pathways in the nervous system, and stand functionally for effective inherited co-ordinations made in response to environmental demands."¹ In the light of this definition Parmelee asserts that "it is strange that he should include as instincts such general tendencies as imitation and play, which do not represent any specific pathways or co-ordinations in the nervous system, but which manifest themselves through many reflexes and combinations of reflexes."² A grouping of the instincts, such as in the classification of Kirkpatrick, has its advantages, and the interest of this author is, of course, pedagogical. Marshall's analysis is in the interest of proving the presence of a specific religious instinct, a matter for later consideration.

Let us observe again that the definition underlying the discussion is largely determinative of what the scholar will include in his list of instincts. Lloyd Morgan's suggestions for a scientific approach seem to me to be entirely justifiable. He says:

I suggest that, for the biologist and the psychologist, a criterion—not the only criterion, but a criterion of instinctive behavior—is that it is serviceable on the first occasion. But the biologist for the purposes of his interpretation of animal life will ask: Serviceable to what end? First of all, serviceable as affording the congenital foundations for an improved superstructure of behavior. That is one way in which instinctive behavior is serviceable—the way which is of special interest to the psychologist. From the more distinctly biological point of view, instinctive behavior is broadly and generally serviceable for survival to which sundry bodily activities contribute. In further detail, instinctive behavior is serviceable for avoiding danger, by shrinking, quiescence or flight; serviceable for warding off the attacks of enemies; serviceable for obtaining food, capturing prey and so forth; serviceable for winning and securing a mate, for protecting and rearing offspring; in social animals, serviceable for co-operating with others, and so behaving that not only the individual but the social group shall survive. But it will be said, these are the very ends for the attainment of which intelligence is serviceable. Unquestionably it is so. It is just because the many and varied modes of instinctive behavior are serviceable for the attainment of the same ends for which intelligence is serviceable, that their consideration is essential to the right history of experience. Instinctive behavior, which has its roots in organic evolution, affords the rude outline sketch of that far less imperfect and far more fully serviceable behavior, the finishing touches of which are supplied by practice

¹ Angell, *op. cit.*, p. 339.

² Parmelee, *op. cit.*, pp. 243, 244.

under the guidance of intelligence. The net result (what is for popular speech the perfected instinct) is a joint product of instinct and intelligence, in which the co-operating factors are inseparable, but none the less genetically distinguishable.¹

From the biological point of view, then, we may speak of an instinct as a *congenital co-ordination of reflexes, neurally integrated and effecting an organic response characteristic of and serviceable to the species and in some manner² capable of subsequent modification*. The character of the response depends on the character of the stimulus and the presence or absence of any obstruction to its normal expression.

As we move into the field of psychology, we must proceed to the tasks set before us in that field with the realization that we are dependent on the biologist for the scientific understanding of instinctive tendencies and behavior. In the matter of instinct we may say that the psychological task is interpretative rather than definitive. Functional psychology is behavioristic and is not concerned with "states of consciousness," as were the associationalists, but with behavior, with what is done. The act is the starting-place, and action is determined by instinctive behavior directed to the satisfaction of some felt need. Sometimes one instinctive tendency functions in inhibition of another; sometimes they reinforce one another. Social psychology has helped us to an understanding of the rise of consciousness as due to the necessity of a selective process which will choose the impulse to be set free and the forms which it will utilize for the satisfaction of the need. In that way experience has its genesis in instinctive behavior, which is regarded as including all the primal and congenital types of behavior which in any manner are synthesized in experience. And here we are in the field of intelligent behavior, the physiological correlate of which is to be seen in neural processes which involve the cerebral cortex.

¹ Morgan, *Instinct and Experience*, pp. 25, 26.

² The biological debate as to the manner in which modifications take place in the evolutionary process does not necessarily affect our problem. Darwinianism, Lamarckianism, the mutation theory of de Vries, and the germ-plasm theory of Weissmann are all attempts to account for the unanimously recognized phenomena of modification and variation.

We need to remind ourselves, however, that there is another type of activity which is so characteristic of the species or race that we may deem it to be innate, and which nevertheless is too complex to be classified as instinctive. Some psychologists, as we have seen, make their treatment of instinct so broad that all these innate tendencies, such as the tendencies to imitate, to sympathize, to play, to respond to suggestions, to experience emotions, are included under instincts. Thorndike and others have done valuable work in pointing out the necessity of a differentiation. For certain psychological purposes, such as the task before us, these innate tendencies afford data which may be treated on the same plane with instinctive behavior, because instinctive tendencies are also innate. I need only refer to the fourth chapter of McDougall's *Social Psychology* for a valuable treatment of this subject. It would be difficult to give a physiological account of all innate tendencies. Each would require individual treatment. Moreover, the behavior lacks that definiteness which characterizes the instinctive. "The tendency is to an extremely indefinite response or set of responses to a very complex situation,"¹ and the final form in which the tendency expresses itself is more largely determined by experience and intelligence. Innate tendencies correspond to instinctive behavior in being congenital responses, but differ in that they depend upon having connections in the cortical regions.

Another problem which commands attention is that which concerns the instinctive basis of the emotions and sentiments. There are some instinctive reactions which occur so quickly in response to their stimuli that they are almost entirely reflex, and emotional quality is almost entirely lacking. On the other hand, there may be some cases where the instinctive reaction and its emotional correlate seem to be simultaneous. In the majority of cases the action precedes the emotion, as has been indicated in the James-Lange theory. The instinctive response is accompanied by a characteristic quality of emotional tone. Now this emotional experience has its neurosis corresponding to the neurosis of the instinctive experience. It has already been indicated that under

¹ Thorndike, *op. cit.*, p. 5.

the proper environmental stimuli there issue from the subcortical region of the brain characteristic types of instinctive behavior which include muscular and glandular reactions. It is to be observed further that some of the motor responses are themselves described as emotional expressions. But in addition there take place certain visceral disturbances, such as alterations in the heart-beat, in the respiratory rhythm, and in the digestive and glandular functions, changes which influence the general coenesthesia; and these disturbances also are efferent reactions to the stimuli in the same sense as the motor reactions. The physical changes resultant from these two types of instinctive reaction give rise to afferent impulses which come into the central nervous system with the result that the experience of the situation is qualified as the impulse reaches the cerebral cortex. And this qualification is what gives the instinctive experience its emotional tone. Lloyd Morgan says: "I regard it as probable that, in its primary genesis, the emotional tone is in large measure correlated with cortical disturbances due to stimulation which is visceral and coenesthetic in origin."¹ After the emotional tone has been experienced and has been integrated, the subject is able to recall the affective meaning without going through the whole neurosis as first experienced. Instinctive tendencies may receive a reinforcement or an obstruction by the emotion which is called forth, and this gives rise to the regulative processes which characterize morality and religion. The position which Mr. Shand takes is practically the same as that of Professor Lloyd Morgan. He explains² the organic sensations which characterize the intense emotions by the alteration of the function of different organs, causing either a depression or a stimulation of the normal functions. He points out further³ that the primary emotions have the ability to organize into their system all instincts that are serviceable to their ends, and are not confined each to one characteristic instinct.

In complexity the sentiments mark a stage more advanced than the emotions. They may be defined as a synthesis of emotional

¹ Morgan, *Instinct and Experience*, p. 113.

² A. F. Shand, *The Foundations of Character*, pp. 193, 194.

³ *Ibid.*, p. 192.

qualities which are organized about the ideas concerning objects, relationships, or values. A sentiment is capable of much greater complexity than an instinct or an emotion, as we may see in the moral, aesthetic, and religious sentiments. Yet its genesis is plainly traceable to the combination of emotions, the physiological connections of which with instinctive reactions have been shown. References may be made to the works of McDougall,¹ Shand,² and Ribot³ for psychological discussions of the origin and functions of the sentiments. The significance for our task consists in the instinctive origin of the sentiments, and in the evolution of the religious and scientific attitudes which are characterized by the presence of certain specific sentiments.

¹ McDougall, *Social Psychology*.

² Shand, *The Foundations of Character*.

³ Ribot, *The Psychology of the Emotions*.

CHAPTER V

THE THEORY OF SPECIFIC RELIGIOUS AND SCIENTIFIC INSTINCTS

Having secured a working definition of instinct, the next part of the task is to endeavor to discover the bearing of that upon the problem of the relation of religion and science, especially in respect to their genesis in the instinctive life. The fifth chapter proposes to examine the hypotheses put forth by various writers that there are specific religious and scientific instincts, on the basis, of course, of the definition proposed in the previous chapter.

The next part of our task is to inquire into the instinctive origin of religion and science in the light of what biology has taught us as to the nature of the instincts, innate tendencies, emotions, and sentiments. The purpose of the discussion concerning the nature of instinct was to attain that clarity that is necessary to avoid the danger which Mr. McDougall so rightly deprecates, viz., of using the words "instinct" and "instinctive" in such a loose sense as almost to spoil them for scientific purposes.¹ Alongside of that danger is the other, which we have already noted, of using the terms without a proper conception of their significance in biological thought.

Some scholars, having first concluded that religion and science were of instinctive origin in the race, have jumped to the inference that there must be correspondingly specific instincts. The question has been discussed by those interested in accounting for the origin of religion more frequently than in regard to the beginnings of science. The Deists, who appeared in England in the seventeenth and the first half of the eighteenth centuries, in their efforts to establish the certainty and sufficiency of natural religion as against revelatory religion, declared religion to be a human instinct.²

¹ McDougall, *op. cit.*, p. 21.

² Lord Herbert of Cherbury (1583-1648) taught that there were certain mental faculties, of which the fundamental group were the natural instincts which are innate and of divine origin.

Reimarus, the German rationalist who was contemporaneous with the Deists, upheld the same position in the *Wolfenbüttel Fragments*. Religion he declared to be an instinct, therefore requiring no revelation. Boutroux, in stating the position of Auguste Comte, represents him as holding that "the heart possesses an instinct, called the religious instinct, in virtue of which the individual is able to live with the dead, and to assimilate their excellences."¹

So eminent a scientist as Romanes wrote of "the religious instincts of the human race," with the comment:

Elsewhere in the animal kingdom we never meet with such a thing as an instinct pointing aimlessly, and therefore the fact of man being, as it is said, "a religious animal"—i.e., presenting a class of feelings of a peculiar nature directed to particular ends, and most akin to, if not identical with, true instinct—is so far, in my opinion, a legitimate argument in favor of the reality of some object toward which the religious side of this animal's nature is directed.²

The position of Max Müller, one of the great pioneers in the field of the history of religions, is in intent the same as that of the writers who posit a definite religious instinct, although he uses the word "faculty" in lieu of the word "instinct." He states his conviction that "as there is a faculty of speech, independent of all the historical forms of language, there is a faculty of faith in man, independent of all historical religions." Müller explains the function of this faculty of religion as enabling man "to apprehend the Infinite under different names, and under varying disguises." Under the historical expressions of religion he thinks that he detects "a groaning of the spirit, a struggle to conceive the inconceivable, to utter the unutterable, a longing after the Infinite, a love of God."³ Although the author uses the word "faculty," it will be seen that he uses it in the same sense as he does when referring to the power of speech, which of course can only be conceived with a biological reference. Professor Tiele, who follows Max Müller in his interpretation of the origin of religion, has interpreted him as I have done. Tiele, of course, interprets "the Infinite" in the Hegelian

¹ Emile Boutroux, *Science and Religion in Contemporary Philosophies* (English translation by J. Nield), p. 66.

² Romanes, *Thoughts on Religion*, essay on "The Influence of Science on Religion," p. 86.

³ F. Max Müller, *Introduction to the Science of Religion*, pp. 13, 14.

fashion as being within rather than without. So for him "the origin of religion consists in the fact that man *has* the Infinite within him, even before he himself is conscious of it, and whether he recognizes it or not." He then proceeds to say that "Whatever name we give it—instinct, or an innate, original, and unconscious form of thought, or form of conception—it is the specifically human element in man, the idea which dominates him."¹

Jastrow is another author who gives expression to this theory. "The origin of religion," according to him, "so far as historical study can solve the problem, is to be sought in the bringing into play of man's power to obtain a perception of the Infinite through the impression which the multitudinous phenomena of the universe as a whole makes upon him. . . . He contemplates with a certain awe both himself and the world outside of himself, and the religious instinct thus stirred up leads him to realize his insignificance," etc. Thus by this writer the "perception of the Infinite" is used synonymously for "the religious instinct." Indeed, in one passage he expressly states that "the faint perception of the Infinite . . . strikes a responsive chord in what, for want of a better name, we may call man's religious instinct."² The point of view which finds expression in Brinton seems to be similar. He suggests a "universal postulate" which is the "psychic origin of all religious thought," and "a religiosity in man as a part of his psychic being," which is surely not far removed from the theory of a religious instinct.³

The outstanding example of an elaborate argument to establish the theory of a religious instinct is the attempt of Marshall.⁴ Marshall's argument is as follows: (1) The universality of religious expression argues for its instinctiveness. Given the appropriate stimulus, the instinctive response is assured. (2) It is developed in man in whom ethical impulses and other social instincts are well developed. (3) Religious expressions are spontaneously developed. (4) Activities involved in religious expression have some biological

¹ C. P. Tiele, *Elements of the Science of Religion*, II, 230-31.

² Morris Jastrow, *The Study of Religion*, pp. 196-98.

³ D. G. Brinton, *Religions of Primitive People*, p. 47.

⁴ H. R. Marshall, *Instinct and Reason*, chap. ix.

function, some import to the race. (5) The rise of religious activities is anterior to the speculative, intellectual life. He then proceeds to the assumption of the existence of a religious instinct which expresses itself in ascetic practices, fasting, prayer, sacrifice, making of pilgrimages, etc. He sums up his thesis in the statement: "Religious activities are the expression of a true instinct; and the religious instinct must be looked on as our highest instinct because its function is regulative of reason, tending to bring about subordination of variation to the typical reactions lower than those expressive of the religious instinct itself, in case variation becomes over-influential."¹

Renan is another writer who upheld the theory in question. He said that religion was as instinctive in man as the nest-building instinct in the birds.²

Starbuck, in his well-known book on *The Psychology of Religion*, in one of the opening paragraphs makes the statement that "religion is a life, a deep-rooted instinct,"³ which expresses itself as certainly as hunger and the desire for exercise. But we shall find this author taking a position in the latter part of the book which is not quite the same as this.

One of the most recent expressions of this hypothesis is to be found in these words from the pen of Professor W. E. Hocking: "Religion is to be understood as a product and manifesto of human desire. . . . Religion is a reaction to 'our finite situation,' a natural reflex of small and highly aspiring beings in a huge—perhaps infinite—arena. This reaction seems to be, at its heart, as instinctive as a start or a shudder."⁴ In other passages also he makes reference to "the religious instinct."⁵ The external expressions of religion, such as prayer and worship, are also spoken of as instinctive.⁶

¹ Marshall, *op. cit.*, p. 528.

² E. Renan, *Studies of Religious History*, pp. xxiv and 153. He also uses the expression, "the eternal instinct which induces man to adopt a religious belief." Cf. Ribot, *Psychology of the Emotions*, p. 307.

³ E. D. Starbuck, *The Psychology of Religion*, p. 7.

⁴ W. E. Hocking, *The Meaning of God in Human Experience*, pp. 49-50.

⁵ *Ibid.*, pp. 43, 151, 474.

⁶ *Ibid.*, pp. 341, 342, 358.

There are some authors who have postulated a religious instinct who would not do the same for science because they take the ground that the differentiation between religion and science consists in the fact that religion is instinctive, while science involves intellection. The position that instinct and intelligence produce two sorts of knowledge which may be kept apart is an epistemological position dependent upon a faculty psychology. Biology, in proving the unity of the neural processes, has given psychology a unifying conception of the mental processes which is functional, thus retiring the epistemology which would assign religious knowledge and scientific knowledge to separate faculties. Even if we grant that the scientific attitude has in it more of the cognitive element than the religious attitude, we are still able to find the instinctive genesis of cognition.

There are a few writers who have referred to a scientific instinct. It may be that it is due to a loose manner of writing, but we are justified in criticizing their use of the term, whatever may have been the motivation. In this way we find Starbuck speaking of a psychical instinct and an intellectual instinct.¹ So also in Professor Hocking's book there appears this curious combination of words: "It is not our religious instinct alone, but something much like an acquired scientific instinct which sends us looking today among the feeling-roots of religion for its essence. Into the building of that scientific instinct have entered many strands."²

The statements which express or infer the existence in man of specific religious and scientific instincts are at variance with a scientific understanding of all three terms, science, religion, and instinct. It has been shown that the differentiation between religion and science is to be made psychologically in the realm of attitudes. From the psychological point of view, attitudes are much higher up the scale than instincts. We may state it somewhat as follows: The conflict which takes place between the instinctive and innate tendencies, or between the means available for the satisfaction of those instinctive and innate tendencies, results in the emergence of

¹ Starbuck, *op. cit.*, p. 339, the impulse to know is called a "psychical instinct"; p. 270, the author speaks of the "intellectual instinct."

² W. E. Hocking, *op. cit.*, p. 42.

a desire toward the realization of an end of which man is conscious. In the next stage we meet with a conflict of these desires which induces a further operation of the selective process. Certain desires are emphasized and cultivated; others are obstructed and inhibited. This means that attitudes and habits are formed. And here we arrive at the field in which we have located the differentiation of the two disciplines. In their present manner of functioning, both religion and science belong to a more complex sphere of life than that characterized by simple instinctive behavior. The attitudes have evolved from a complex of desires which go back to a further complexity in which various instincts interact.

For criticisms of the theory of a specific religious instinct reference may be made to the works of Irving King¹ and Coe.² The criticism of Coe is especially of interest and value as coming from one who, in one of his earlier publications, spoke very decidedly of the religious instinct and the intellectual instinct.³ But in the later book he has completely abandoned that hypothesis. It is evident from the phenomena of religion that there is no specific set of stimuli which incites a religious reaction, and, further, that there is no typical reaction which may be called religious. And the criticisms apply with equal cogency to the notion of a scientific instinct.

From the point of view of our working definition of instinct, the refutation of the hypothesis of a specific religious instinct or a scientific instinct should be quite feasible. The religious and the scientific attitudes may be compared to instincts in that they are characteristic of and serviceable to the species and capable of subsequent modifications. But these attitudes are both characterized by an element of intelligence, and religion especially by an emotional tone, neither of which belong to behavior, which finds its physiological correlate in neural processes involving only the sub-cortical regions. If religion be put in the same class as "a start or a shudder," as we noted Professor Hocking placed it, then it is

¹ Irving King, *The Development of Religion*, pp. 25 ff.

² G. A. Coe, *The Psychology of Religion*, p. 323.

³ G. A. Coe, *The Religion of a Mature Mind*, pp. 52, 58, 247.

a type of reaction which involves the afferent and efferent nerves and the spinal cord and does not require the brain at all.

If the conclusions of the biologists are correct, as their experiments seem to show, then a decerebrate animal is capable of all known instinctive reactions. That being the case, there seems no good reason why the person who is defective in cerebral matter, according to the theory of a religious instinct, should not be capable of being religious in the same way as a person of normal capacities. But the truth is that there is no combination of reflexes which have been integrated by the nervous system in such a way that it effects an instinctive reaction that can be designated as specifically religious. Neither is it possible to find a specifically scientific instinct as a result of a neural integration of a certain group of reflexes.

The assumption of Marshall and others who hold to a religious instinct is tied up with the idea that there is an element of consciousness in all instinctive behavior. But our biological observations have precluded an acceptance of that theory. Consciousness is present when the activity includes cerebral cortical processes, while instinctive behavior in its primal form is subcortical. The religious attitude involves an element of consciousness, and it is difficult to understand how any scholar can reduce it to the simplicity of "a natural reflex . . . as instinctive as a start or a shudder," as we have observed to be the position of Professor Hocking.

CHAPTER VI

THE EFFORT TO IDENTIFY RELIGION AND SCIENCE WITH CERTAIN SPECIFIC INSTINCTS

The last chapter was engaged with a discussion of the hypothesis of specific instincts for the religious and scientific reactions. This chapter is intended to serve as criticism of the theories which endeavor to account for the rise of religion and science by reference to specific instincts with which they are identified.

A further approach toward the solution of the genetic problem is in the direction of identifying one or both of the religious and scientific disciplines with specific instincts. This is not the same position as that of those who posit religious and scientific instincts, though it has this in common with that hypothesis that it resolves both of them to a single root.

Campanella Tommaso, the Italian philosopher who was a contemporary of Giordano Bruno, 1568-1639, declared religion to be an inherent part of existence, and identified it in its lowest form with the instinct of self-preservation.¹ A somewhat similar position is taken by Auguste Sabatier, who speaks of faith as "the higher form" of the instinct of conservation, and of man as "incurably religious," and again of the religious need as a manifestation of the "instinct of every being to persevere in being."²

Reference has already been made to the position of Professor Hocking in positing a religious instinct which is compared to behavior as instinctive as starts and shudders. In other passages the author virtually identifies this religious instinct with the instinct of self-preservation. He quotes from Lippert's *Kulturgeschichte*, chapter i, where that author derives religion from the fundamental need of "Lebensfürsorge," and says that this deep-set desire which we call religious may "be represented as an ultimate

¹ *Encyclopaedia Britannica* (11th ed.), V, 121, 122, article "Campanella, Tommaso."

² Auguste Sabatier, *op. cit.*, pp. 3, 9, 21.

demand for conscious self-preservation."¹ Again he describes the religious passion as seeking to secure satisfaction for the "instinct of self-preservation."² Further he refers to this instinct as prompting the search for the Absolute.³ And yet again worship is delineated as "a spontaneous impulse for spiritual self-preservation."⁴

The history of biological evolution leads to the conclusion that instinctive action is characterized by the ability to be serviceable on the first occasion to the organism or to the species: Darwin would have explained it on the theory of natural selection in the struggle for existence. Some would deny the existence of a specific instinct of self-preservation, and use the term for a group of instincts, as, e.g., Kirkpatrick.⁵ Others would take the ground that the preservation of the self and of the species is the end of all instinctive behavior. Those who admit of a specific instinct of self-preservation usually connect it with physiological processes such as are designed to maintain nutrition, expel poison, and ward off danger. Ribot points out that this instinct on its offensive side gives rise to the emotion of anger, and on its defensive side to the emotion of fear.⁶ Doubtless the desire for self-preservation is one of the contributory causes, but it would require an unwarranted breadth to the definition of the instinct of self-preservation to justify an identification of religion with it.

Another theory which has been advanced is that which finds the source of religion in the sexual instinct. Students of the sociology of religion find that there is a kinship between the religious and the sexual life. As we shall see, there are many points of contact as, e.g., in the adolescent experiences and the initiation ceremonies which were so often observed at that period. As Starbuck points out with reference to the attainment of puberty: "The physiological birth brings with it the dawning of all those spiritual accompaniments which are necessary to the fullest social activities. . . . This is the time biologically when one enters into deep relation with social life."⁷ So marked is the kinship

¹ Hocking, *op. cit.*, p. 49.

² *Ibid.*, p. 106.

³ *Ibid.*, pp. 202, 203.

⁴ *Ibid.*, p. 366.

⁵ Kirkpatrick, *Fundamentals of Child Study*. See his classification of the instincts.

⁶ Ribot, *op. cit.*, pp. 207, 218.

⁷ Starbuck, *op. cit.*, p. 401.

that it has led the author to conclude that "in a certain sense the religious life is an irradiation of the reproductive instinct."¹ He makes it clear, however, that the sexual instinct is to be considered rather as a condition of growth than as a cause. "The sexual life, although it has left its impress on fully developed religion, seems to have originally given the psychic impulse which called out the latent possibilities of development, rather than to have furnished the raw material out of which religion was constructed. . . . Although the reproductive instinct may be primal, it seems to have been entirely superseded as a distinct factor in religious growth by other elements."² In another passage Professor Starbuck makes reference to two works—Havelock Ellis, *Man and Woman*, p. 295, and Burnham, *A Study of Adolescence*, Pedagogical Seminary, I, 181, which base the phenomena of the religious life largely on the sexual.³

The view to which Professor Starbuck has given expression is quoted by Professor Ames, and with a more precise definition he approves of it. He points out the importance of recognizing that it is the social character of the sexual life that is important for religion, and in that sense may be regarded as "an irradiation of the reproductive instinct."⁴ Bearing in mind that Professor Ames makes the food-seeking and reproductive instincts basal to all, we can appreciate the reason that he traces the genesis of the social life to the sexual instinct, as against the position of many other psychologists who affirm that there is a specific instinct of gregariousness. In his definition he identifies it with the highest social values.⁵ Consequently he is entirely consistent in tracing the genesis of religion to the sexual instinct.

Professor Thomas seems to take a somewhat similar position. He is quite explicit in defining the food and sex instincts as elemental.⁶ And again he bases the social life on the sexual.⁷ He does

¹ *Ibid.*

³ *Ibid.*, p. 207.

² *Ibid.*, p. 402.

⁴ Ames, *op. cit.*, pp. 221, 222.

⁵ *Ibid.*, p. 168: "The religious consciousness is identified with the consciousness of the greatest values of life."

⁶ W. I. Thomas, *Sex and Society*, pp. 97-99.

⁷ *Ibid.*, p. 107.

not make any extended reference to the matter of religion, but he makes this statement: "The appeal made during a religious revival to an unconverted person has psychologically some resemblance to the appeal of the male to overcome the hesitancy of the female . . . in both cases the appeal is an intimate, sympathetic, and pleading kind."¹

The connection between religion and the sexual life is one which can be readily demonstrated, and we shall endeavor to show that in the genesis of religion an important rôle may be assigned to the behavior which was originated by the reactions connected with the sexual life. However, our biological considerations preclude us from an acceptance of the theory. The instinctive reactions are of such a nature that it would be difficult to make a list that would be agreeable to everybody. Even though we may be prepared to admit that the elemental interests of life are the struggle for food and the rivalry for mates, those interests cannot be shown to be the only specific groups of reflexes which have been integrated by the nervous system. There are other reactions which can be shown to be instinctive, yet which serve these elemental interests only in an indirect way. The cortical regions are marked by the tendency to make use of the data which are secured by the automatic responses which center in the subcortical regions. In this way behavior that at first is entirely automatic may be made to serve specific ends. But in their primal forms these instinctive reactions cover a wide range of activity in which there is action and interaction, marked by variety and complication. These tendencies include, to be sure, behavior that is serviceable in the obtaining of food and in mating and procreating. But they include also behavior that serves the purposes of self-protection either by flight or pugnacity, of associational life in flocks, herds, and social groups, and of prying into that which is strange, etc. The length of one's list depends upon whether the dominating interest is to analyze or to classify.

Another example of an unscientific use of the word "instinct" in applying it to the genesis of religion and science is to be found in Hardy, *The Religious Instinct*. The title would seem to suggest

¹ W. I. Thomas, *Sex and Society*, p. 115.

that there is a specific religious instinct; but not so the argument. He states his theory on pp. 41 ff., that

what we call the instinct of approach—of which propitiation is one expression—must be accepted as the source of the whole active religious phenomena of the race. Here we have something as fundamental as the instincts of causation and self-preservation. If the former of these—that of causation—has proved the basis of all intellectual advance, and the latter—the instinct of self-preservation—the mainspring of all man's social organization, why should not the instinct, so universal, so ineradicable, as this of "approach" prove as valid in its direction as its kindred instincts have done in theirs?

It is apparent that in the sense in which the author uses the word "instinct" he is thinking of something involving conscious experience, much more complex than behavior, which may technically be called instinctive.

There is a similar tendency, though of perhaps less frequent appearance, to identify science with a specific instinct. May it not be that there are fewer tendencies to speculate about the genesis of science than about the genesis of religion because the scientist is more interested in functions than he is in origins? The scientific method has long been in vogue in science itself. But the subjective nature of the material and the a priori conceptions of its divine origin have prevented a thoroughly objective treatment of religion. We are only beginning to apply the scientific method to religion, and thus to get a science of religion. Science has become completely emancipated from the view that the validity of her knowledge is determined by reference to its source.

Shand traces the genesis of science to the instinct of curiosity. The definition of curiosity as an instinct is in the sense that its end is innately determined, and not in the sense that its "behavior which is instrumental to this end is also innately determined." The behavior which is the correlate of curiosity is distinguished, not by a special set of movements, "but by the way in which they are combined."¹ He admits, however, that in some of the simpler and earlier forms the movements are quite instinctive.² Curiosity having been shown to be instinctive, the author follows McDougall in making wonder the primary emotion which accompanies it.³ Then he proceeds to show that wonder reacts in two

¹ Shand, *op. cit.*, p. 439.

² *Ibid.*, p. 440.

³ *Ibid.*, p. 442.

diverse ways. In the one case it becomes the source of the love of knowledge, basic to science and philosophy. In the other it gives rise to the love of mystery, an element in religion. Wonder, he says, "is the force and principle of the mind which leads us to pursue truth for itself as an end. . . . In wonder curiosity is freed from alien control, and pursues knowledge as an end."¹

Ribot also, in his account of the genesis of "the intellectual sentiment," says: "This feeling, like all the others, depends on an instinct, a tendency, a craving. . . . This primitive craving—the craving for knowledge—under its instinctive form is called curiosity." In the evolution of this sentiment, the writer distinguishes three stages, the first being the utilitarian and practical, the second disinterested and scientific, and in the third it becomes a passion.² Whatever we may think of his third stage, we must admit that he is correct in finding the genesis of the scientific attitude in the practical.

There is a tendency in some quarters to find the origin of science connected with the behavior resulting from the instinct to obtain food. Professor Ames, e.g., makes reference to "science exemplifying the insight and mastery worked out in connection with the food process."³ Professor Thomas finds that the "strain on the attention in the food and conflict side of life involves the development of mental impressionability, particularly of an impressionability on the side of cognition."⁴

The same arguments which prevented the acceptance of the theories which proposed a single root for the origin of the religious attitude apply in the case of the genesis of the scientific attitude. The complexity of life and the variety of instinctive responses lead to the conclusion that the root of science, as well as of religion, is analogous rather to the fibrous than to the taproot, is multiple rather than unitary. The statements of Shand and Ribot on the curiosity origin, and of Ames and Thomas on the food origin of the scientific attitude, are both true, and because they are both true, each of them expresses only a part of the matter.

¹ Shand, *op. cit.*, pp. 449, 450.

³ Ames, *op. cit.*, pp. 416, 417.

² Ribot, *op. cit.*, pp. 368, 369.

⁴ Thomas, *op. cit.*, pp. 118, 119.

CHAPTER VII
THE MULTIPLE INSTINCTIVE ORIGIN OF RELIGION
AND SCIENCE

It is the ambition of the present chapter to present and defend the thesis that the origin of both the religious and scientific attitudes, while instinctive, is at the same time multiple. This is done by a reference to the differentiation proposed in the fourth chapter, and then by an attempt to show that such a differentiation may grow out of the instinctive behavior connected with any set of instincts. In this case illustrations are drawn from the instinctive reactions in connection with five of the leading types of stimuli.

The great truth which lies behind the theories that we have noted is that the religious and scientific attitudes have their genesis in the innate and instinctive dispositions and behavior of the race. The thesis which I propose is that the origin of both religion and science, while instinctive, is multiple. We must bear in mind that there are no such things as religion and science, in the sense of species. Both are generic terms. There are religions and sciences. We may say of both what William James said of religion, viz., that they are "collective names like government."¹ The various species of these two genera are so multiform that it has been difficult to get a definition of religion. Most definitions have been in terms of the species in which the author was especially interested. The common element in all religions, as Dr. Watson has pointed out, is "the social attitude toward the non-human environment," and the common element in the sciences is the "mechanical attitude toward the non-human environment."²

Therefore we are concerned with a variety of phenomena that are connected with the rise of these attitudes. The history of religions furnishes us with a heterogeneity of data, representing

¹ William James, *The Varieties of Religious Experience*, p. 26.

² A. C. Watson, "The Logic of Religion," *American Journal of Theology*, XX, 98.

interests as varied as life itself. Whatever may be one's theory of man's origination of an extra-human environment, it must be evident to the student of history that he has associated almost all of the interests of life at some time with that environment in his struggle for existence. So too the history of the sciences furnishes evidence of a progressive attempt to gain dominion by mechanical means over the forces by which he was environed. Man, in his achievement of religion and science, was not dealing with phenomena which he was able to differentiate under these two captions. They are both of them human products, arising in a human environment by the effort of man as he attempted to gain control in the great struggle for existence. They represent variant attitudes toward the extra-human environment in accordance with whether that environment was conceived to be amenable to social relationships or to be wholly under mechanistic law. So that they involved, to a considerable extent, the same human interests, and arose as differentiable techniques in the struggles and conflicts of life which was characterized by a unified type of instinctive behavior.

This thesis may be illustrated by reference to different types of instinctive behavior, and I shall attempt to illustrate it by a brief treatment of the instinctive reactions connected with (1) the obtaining of food, (2) mating and procreating, (3) self-preservation, (4) contact with the strange and unusual, and (5) gregariousness.

I. THE INSTINCTIVE REACTIONS CONNECTED WITH THE SECURING OF FOOD

The importance of the supply of food is apparent, for with that is tied up the existence of the individuals of the group. The necessity of food underlies the total economic life, and it is to the ordinary man the all-absorbing interest. In prehistoric times anthropologists conclude that primitive man inhabited the equatorial regions where his wants were simple, and nature offered an ample supply to him of those things which were necessary to his existence. But as time passed there came about critical situations in this phase of the struggle for existence. We have observed that the reflective process was a product of a conflict of instincts or of conflicting ways of securing satisfaction for those instincts. When

the natural supply of food failed, or became limited, and man had to go into unexplored regions to supply his needs, he faced crises which induced reflection. When a choice was presented to him, because of the luxuriance of the available supply, he was compelled to call into being a selective process, and so the conflict realm induced reflection. The latter situation was not one in which he needed to seek for any outside assistance, for it was simply a matter of gratifying his particular taste. But the former situation constituted a crisis and demanded action. It called for the creation of some technique to help him over such critical experiences.

If we go into the accounts of the ways in which primitive peoples actually met such situations, we find a considerable degree of uniformity in the techniques which they worked out. The first of the techniques to be mentioned is *magic*. Magic is an attempt to get satisfaction for a desired end by reference to some occult powers. It is an attempt at coercion, and is based upon the belief that if one knows the proper occult means the securing of the desired end is inevitable. Hence magical behavior is intended to coerce the occult powers to do the thing needed. It is not necessary for our purposes to go into an extended discussion of magic, the attempted classifications, etc. The point of importance for us to note is that it arose as a technique to help man over critical situations, many of which arose in connection with the supply of food. How was a good crop of grain or fruit, or a good catch of fish, or a plentiful supply of rain to be secured? Magic was one solution. The system was completely wired so that, if you knew how to turn on the switch, the circuit was complete and the result inevitable.

The question that concerns us is the question as to the connection of magic with religion and science. Magical practices arose in an age prior to the differentiation of the various attitudes. It was a pre-psychological period. We are not compelled to try to identify magic with one human attitude to the exclusion of the others. On the one hand, if the conception of religion as a social attitude toward the extra-human environment be correct, magic has elements that are decidedly religious. If the definition used the phrase *superhuman* instead of *extra-human*, magic would have

to be excluded in the majority of cases. Magical practices were sometimes directed to the object directly; sometimes to a spirit or god, when it was tied to animism. The very recognition of an occult power which man is endeavoring to coerce implies a socializing tendency which is at least on the way to religion.

On the other hand, magic is also prescientific. It was man's endeavor to get over the critical situation by the use of a mechanical means. In many instances the social element was absent, especially in private magical ceremonies and formulas, and indeed in many instances of public magic. If the performance of a ceremony or recitation of a formula was regarded as productive of the desired end, we have here primitive man's first conception of cause and result. It was by no means a regular and orderly form of the causal category, but it was a beginning, and in that sense it was a precursor of a scientific explanation.

The use of magical practices for the securing of an abundant supply of food may be illustrated from scores of sources. We need only refer to the rain-making ceremonies which are practiced in Central Africa among the Agoni people, in India, in Russia, and in Australia.¹ Similarly the Indians of British Columbia resort to magical practices to insure the supply of salmon.² In Central Australia sympathetic magic is systematically used to insure the supply of the totem animal or plant, which is, in the majority of cases, the chief article of diet.³ Frazer has some interesting accounts of ceremonial dances and other practices observed in certain parts of Europe—Transylvania, Baden, and Macedonia—to make the crops grow high.⁴

The connection between the food interest and religion is further observable in a multiplicity of ceremonials connected with various primitive peoples. With the evolution of a supermundane world, peopled with spirits, some benignant and some malignant, the human task was to relate one's self in such a way to that world as

¹ Cf. J. G. Frazer, *The Golden Bough*, Part I, Vol. I, pp. 249, 250, and D. G. Brinton, *Religions of Primitive People*, pp. 173, 174, for accounts of rain-making ceremonies.

² Frazer, *op. cit.*, p. 108.

³ *Ibid.*, p. 85.

⁴ *Ibid.*, pp. 137-39.

to avoid the displeasure and to procure the aid of these spirits in securing the satisfaction for felt needs. Hence the cult arose as a technique for operating on the wills of such spirits so as to enlist their sympathy and procure their assistance. In their elemental forms the ceremonials connected with the cult were designed to secure satisfaction for those needs which grew out of instinctive behavior. Illustrations are available in abundance. Ceremonials connected with the mother-goddess associated her with the idea of fertility. Oases were the sacred spots to the Arabs. Sacrificial rites were connected with edible animals. The images and objects of worship are in numerous instances the characteristic food objects for the geographically defined region where the worship prevails. Totem objects are in the majority of cases the most staple food objects of the totem clans. Spencer and Gillen give a list of tribes in Central Australia with their respective food objects. The totem of the Ainus was a bear; of the Hopi Indians, maize; of the Arabs, the date palm; of certain Babylonian people on the Persian Gulf, the fish.

Reference has been made to a suggestion by Professor Ames that science illustrates "the insight and mastery worked out in connection with the food process,"¹ and to a similar position taken by Professor Thomas. There seems to me to be no doubt of the correctness of this theory. With the development of the observational processes, man would note that certain fruits and certain grains came only at certain seasons, and that during the remainder of the year there was no supply. Fisher folk would observe that certain meteorological conditions were favorable and others unfavorable to a good catch. Hunting people would find climatic and other conditions affecting the supply of game. Thus a sense of regularity, of conditionality, and hence of causality, gradually evolved in connection with the food supply. The occurrence of critical situations, as the natural supply became insufficient and man had to evolve mental powers to help him over the crises, would only serve to make his observation keener as to conditionality and causality. With the progress of time this led to practical reactions in the evolution of primitive agriculture and horticulture

¹ *The Psychology of Religious Experience*, p. 416, note.

as techniques by which man might gain control over the food supply. So that the reactions of the food instinct led in this way to the beginnings of a scientific attitude.

II. INSTINCTIVE REACTIONS CONNECTED WITH MATING AND PROCREATING

The other dominant life-interest is that of reproduction. If food is essential to the existence of individuals, mating and procreating are necessary to the preservation of the species. It was to be expected that man, in his desire to obtain control over the forces by which he was environed, should so organize his techniques as to obtain help in matters relative to these two primal life-interests. We have seen how that worked out in regard to the food interest. It may be shown in an analogous way that he used both the social and the mechanical processes in attaining control of the sexual interests.

The argument has been presented for an understanding of magic which involves both the prereligious and the prescientific elements. The theory which was applied to magical practices in connection with the food process applies in precisely the same way in respect to magical practices connected with the reproductive process. Frazer has recounted various instances where the resort has been to sympathetic magic to secure the ends served by the procreative instinct. In Sumatra a make-believe child is used for a barren woman who desires children. In Greece, Bulgaria, and Bosnia there is a make-believe ceremony of restoring dead persons to life. There is also an Indian practice of shooting darts at a clay image in order to win the love of a woman.¹

In some instances the magical practices involve both the food and the reproductive interests. It is a carrying over of the idea of fertility from the region of the sexual life to those activities connected with the food supply. "The Greeks and Romans sacrificed pregnant victims to the goddesses of corn and of the earth, doubtless in order that the earth might teem, and corn swell in the ear."² Analogously the magical value of pregnant women to communicate fertility was a widespread belief. Austrian and

¹ Frazer, *op. cit.*, pp. 70-77.

² *Ibid.*, p. 141.

Bavarian peasants gave the first fruit to a pregnant woman to make the tree bear abundantly. Nicobar Islanders have pregnant women and their husbands, and Orinoco Indians have pregnant women, sow the seed to insure a good crop. In some tribes the blood shed at the circumcision and subincision of boys and also the foreskin are regarded as possessing fertilizing value, and so are buried in proximity to the crop which it is desired to cultivate.¹ In other cases circumcision is regarded as in the nature of a sacrifice to the goddess of fertility, securing the protection of the goddess for the child, and putting the child's reproductive powers at the command of the deity.²

In this connection reference may be made to "taboo," which has been rightly described as "negative magic."³ Taboo has its origin in the social structure, and its origin is purely human. But in animism it came to be associated with the rights of gods and demons which were not to be infringed upon, without the transgressor endangering himself by the infringement. It has been associated with food objects, with sexual functions, and with dead bodies. The uncleanness that rests with all sexual functions is most marked. Marriage, a woman in her courses, a man with an issue, and the birth of a child are all curiously tabooed. "This is because birth and everything connected with the propagation of the species . . . seem to him to involve the action of superhuman agencies of a dangerous kind."⁴ Thompson gives a number of instances of sexual taboo, as (a) menstruation taboos, (b) cohabitation taboos, (c) childbirth taboos, (d) girls of irregular menstruation supposed to be possessed of supernatural power, and (e) men fearful of interfering with the harem rights of gods and goddesses.⁵ Here we have, as in positive magic, the social attitude toward powers considered to be extramundane, and also a primitive approximation toward a causal explanation of certain mysterious phenomena.

¹ *Ibid.*, pp. 95 ff.

² Barton, *Semitic Origins*, p. 100.

³ Ames, *op. cit.*, p. 88; N. W. Thomas, "Taboo," in *Encyclopaedia Britannica* (11th ed.), XXVI, 337 ff.

⁴ Thompson, *Semitic Magic*, pp. 113, 114.

⁵ *Ibid.*, pp. 131-33.

The ceremonies connected with the attainment of puberty afford another example of the connection between sex and religion. The phenomena in connection with puberty were mysterious and seemed to involve the coming to birth of an ability to perform certain instinctive reactions hitherto impossible. It is the period when the boy or the girl sees the dawn of the adult life, and involves the birth of the youth's appreciation of his or her part in the group life. Consequently it has been a custom, widespread both chronologically and geographically, to mark the transition by certain sacred rites, almost invariably attended with an element of mystery.¹

Another example of the connection between religion and sex is phallicism. Examples of phallic worship, or worship of the generative power of nature as symbolized in the phallus, may be seen in the history of the religions of Greece, Phoenicia, Rome, Mexico, Peru, India, and Japan.²

Still another group of phenomena may be cited as illustrating the bond of connection between religion and sex. I refer to the conversion phenomena in connection with the Christian religion. Those who have made thorough investigations in this field have come to the conclusion that conversion is a distinctly adolescent phenomenon. From the biological standpoint we have noted that the adolescent period is the time when the procreative instincts are awakened. It is also a well-known fact that adolescence is the period of life in which the majority of conversions take place. The philosophy of the situation has been treated in the works of Starbuck, Stanley Hall, Coe, Ames, Leuba, and others, and need not concern us here. But the fundamental connection between the religious awakening and the birth of the sexual instinct seems to be proven by their synchronous appearance.

It is interesting to note that man, in picturing to himself the world of the gods, has carried over the elements which were of

¹ Examples of ceremonials connected with puberty and initiation abound. Cf. Brinton, *Religions of Primitive People*, pp. 197-200; Jane Harrison, *Ancient Art and Ritual*, pp. 106-13; Frazer, *The Golden Bough*, copious references.

² See art. "Phallicism," in *Encyclopaedia Britannica* (11th ed.), XXI, 345, and art. "Phallism" in Hastings' *Encyclopedia of Religion and Ethics*, IX, 815 ff., by Hartland.

paramount interest in human life. Surely the gods must be like men, possessed of like interests and desires. In Assyrian mythology the goddess Ishtar is pictured as conducting amorous relationships with men. In Indian literature Krishna is portrayed as sporting with shepherd girls. The Mohammedan idea of heaven is a carrying over into the other world the degradation of womanhood in sensuous pictures.

The association between activity connected with behavior induced by the sexual instinct and religion is established by an abundance of historical evidence. There is not so much data to show the connection between the beginnings of science and procreative activity. At the same time there is evidence that cannot be overlooked. From the point of view of magic and taboo the material is abundant to show the connection with the reproductive life. We have already observed that magic implies a mechanical technique for avoiding dangers and overcoming crises, so that in magical practices we have the prescientific view of man toward the sexual life. The progress of more exact conceptions broke down magical causality and paved the way for a scientific causality.

Barton gives it as his opinion that among the Semites "the beginnings of intelligent life, the knowledge of clothing, agriculture, and the arts of civilization,"¹ were attributed to the sexual relation. Thomas, as we have seen, attributes the development of mental impressionability to the strain on the attention in connection with food and reproduction.² From the sexual instinct arises a susceptibility to the opinions of others, resulting in the mental activity of comparison and selection.

One of the best evidences for the theory proposed is the growth of the primitive conception of paternity.³ Anthropologists find that in primitivity the birth of children was a mystery. In the beginning the father of the child did not understand that he had a part in the reproductive process, owing to ignorance concerning the nature of physiological processes. But as the understanding

¹ Barton, *op. cit.*, pp. 101, 102.

² Thomas, *Sex and Society*, pp. 118, 119.

³ A thorough elaboration may be consulted in the work of E. S. Hartland, *Primitive Paternity*, 2 vols., London, 1909.

came, it meant the birth of a primitive conception of causality in respect to the procreative process. The first discovery of the part played by the father in the reproductive process led to the strange "couvade" ceremony among certain primitive peoples, an illustration of the crudity with which they formed their first mental tools. Nevertheless, it marks the beginning of the displacement of mythological knowledge by scientific knowledge in regard to the sexual processes and relationships.

III. THE INSTINCTIVE REACTIONS ASSOCIATED WITH SELF-PRESERVATION

Some psychologists would include self-preservation under the instinctive behavior connected with the obtaining of food. If they are to be considered together, I would prefer to include the food-getting instinct under self-preservation, because the latter is the more generic term and might be taken to include a larger scope. It is even possible to use the term "self-preservation" in a sense wide enough to include all instinctive behavior. But in this instance I propose to use it in a narrower connotation as applying to two types of reaction, the aim of which is to avoid dangers and to overcome opposition to the normal operation of the life-processes. These are flight or the defensive reaction with its accompanying emotional tone of fear, and pugnacity or the offensive reaction with its concomitant emotion of anger. These two types of behavior are the characteristic expressions of the instinctive tendency toward self-preservation. We might say that they are the organism's way of expressing the will to live in the face of circumstances ready to crush it. To be sure, we may include the instinctive disposition to procure food to satisfy the felt needs in this organic will to live. Indeed the instinctive behavior of self-preservation may be associated with many other circumstances of types of behavior. Circumstances connected with the securing of food, with mating, with procreation, with curiosity, and with gregariousness may be the stimuli calling forth flight or pugnacity, with their emotional tones of fear or anger.

Starbuck sees in religion a response to the instinct of self-preservation and the desire for the fulness of life on the physiological

plane.¹ Hocking, as we have seen, identified the two instincts.² Herter finds in religion, as well as in music, painting, and literature, a human product which represents "the fusion of self-preservation and the sexual instincts."³

There is no doubt that much of the ceremonial originated by primitive people was designed to help them in thus determining to persevere in life, in the struggle for existence. That fact may be illustrated from almost any ceremonial. Moreover, the struggle for existence lies behind the evolution of both the religious and the scientific techniques. Socially and mechanically they are designed to help man satisfy the felt needs of life in the struggle against the opposing forces. Primitive man's ceremonial was indicative of a fear lest he should lose out in the struggle for existence. The ritual was an expression of the felt emotion, often by a mimetic representation of the desired result which enhanced the desired end or object. This factor in the process, whereby that which was felt would satisfy the need was mimetically enacted beforehand, illustrates the indistinguishable beginnings from which art and religion originate. Jane Harrison has presented the matter in *Ancient Art and Ritual* with typical illustrations.⁴ Thus also many of the dramatic representations which enter into religious ceremonial are illustrative of the emotion of fear lest they should not pass the crisis in safety. Miss Harrison presents an account of a traveler in Euboea during Holy Week who was

struck by the genuine grief shown at the Good Friday services. On Easter eve there was the same gloom and despondency, and he asked an old woman why it was. She answered: "Of course I am anxious; for if Christ does not rise tomorrow, we shall have no corn this year." The old woman's state of mind is fairly clear. Her emotion is the old emotion . . . fear, imminent fear for the failure of food. The Christ again is not the historical Christ of Judaea, still less the incarnation of the Godhead, proceeding from the Father; he is the actual figure fashioned by his village chorus and laid by the priests, the leaders of that chorus, in the sepulchre.⁵

¹ Starbuck, *The Psychology of Religion*, p. 403.

² Hocking, *The Meaning of God in Human Experience*, p. 106.

³ Herter, *The Biological Aspect of Human Problems*, p. 285.

⁴ See pp. 24-27, where she refers to the prayer-disks of the Huichol Indians, which as prayers may be classified as ritual, and as decorated surfaces are specimens of primitive art.

⁵ *Ibid.*, pp. 73, 74.

Farther down in the scale of civilization the fear element is to be seen operative in many ways. It is tied up with animism in the majority of cases. So prevalent is this element of fear in the primitive forms of religion that many have seen in it the origin of religion. Lucretius said: "It is fear that engenders the gods." Thomas Hobbes said: "The feare of things invisible is the natural seede of religion."¹ David Hume said: "The first ideas of religion arose from a common concern with regard to the events of life and fears which actuate the mind."² Ribot finds the emotion of fear in varying degrees in all religions, "from profound terror to vague uneasiness, due to the faith in an unknown, mysterious, impalpable Power, able to render great services, and, more especially, to inflict great injuries."³

The source books furnish us abundant illustrations of the fear motive in religion and in other social customs. Mary H. Kingsley cites examples of the influence of fear among the people of Guinea. She describes it thus:

I have often seen on market roads in many districts but always well away from Europeanized settlements, a little space cleared by the wayside, and neatly laid with plantain leaves, whereon were very tidily arranged various little articles for sale. . . . Against each class of articles so many cowrie shells or beans are placed, and always hanging from a branch above, or sedately sitting in the middle of the shop, a little fetish. The number of cowrie shells or beans indicates the price of the individual articles in the various heaps, and the little fetish is there to see that anyone who does not place in the stead of the articles removed their proper price, or who meddles with the till, shall swell up and burst.⁴

The element of fear led not only to a socializing attitude toward the extra-human environment, but the mechanical attitude also was developed in the struggle of life to dominate in the face of dangers and crises. This is exemplified in the use of magic, counter-magic, and sorcery as techniques which were thought to furnish

¹ Cf. Thomas Hobbes, *Leviathan*, p. 73.

² Quoted by Leuba, *The Psychological Origin and Nature of Religion*, p. 81.

³ Ribot, *Psychologie des Sentiments*, 4th ed., 1903, p. 309.

⁴ Mary H. Kingsley, *West African Studies*, pp. 248, 249. Other illustrations may be found in Frazer, *The Golden Bough*; Tylor, *Primitive Culture*; Spencer and Gillen, *The Northern Tribes of Central Australia*.

the individual with a mechanism for controlling those environmental forces which were otherwise able to work him ill. The formula of the magician or sorcerer as a mechanism of this type is illustrated in the life of the Todas of South India, whose whole social fabric is bound up with the life of the buffaloes. An example of the sorcerer's formula is as follows:

For the sake of Pithiotea, Öm, Teikirji and Tirshti, by the power of the gods, if there be power; by the gods' country, if there be a country; may his calves perish; as birds fly away, may his buffaloes go when the calves come to suck; as I drink water, may he have nothing but water to drink; as I am thirsty, may he always be thirsty; as I am hungry, may he also be hungry; as my children cry, so may his children cry; as my wife wears only a ragged cloth, so may his wife wear only a ragged cloth.¹

When the sorcerer is uttering this incantation he holds in his hand five small stones tied together by a hair and all tied in a cloth. Then they are hidden in the thatch of the house of the man on whom he desires the misfortunes to fall. Thus satisfaction for the instinct for self-preservation is sought by a mechanical means which is supposed to operate in removing the danger which the individual fears is imminent. As we have observed in analogous circumstances, the breakdown of the magical conception of causality was what led to the search for a scientific explanation and a scientific technique.

The instinct of self-preservation reacts at other times in pugnacity, and this is the activity which is basal to war. Sometimes fear enters and may serve either to stimulate the anger and fighting power or at other times to inhibit it. Professor Ames has rightly emphasized war as one of the occasions giving rise to the ceremonial. "In carrying out any interest savage tribes usually find innumerable occasions for war. The war ceremonies are therefore much in evidence. They consist of councils, assemblages, decorations, fasts, parades, manoeuvres, dances, triumphal processions, feasts."²

Tylor points out how these savage races create divinities for special functions, including war. One of the numerous illustrations which he records is cited: "Areskove, the Iroquois War-god, seems to be himself the great celestial deity; for his pleasant food they

¹ W. H. R. Rivers, *The Todas*, pp. 256-58.

² *Op. cit.*, p. 75.

slaughtered human victims, that he might give them victory over their enemies; as a pleasant sight for him, they tortured the war-captives; on him the war-chief called in solemn council, and the warriors, shouting his name, rushed into the battle he was surveying from on high."¹

But man did not depend exclusively on the spirit world to help him to win his battles. His need for self-preservation urged him to seek mechanical means also. At first he found his implements and tools and utensils and weapons in nature. Nature provided him with the grubbing-stick to enable him to handle the soil, with a round stone to serve as a hammer, with a cave or a thickly befoliated tree for a shelter, with a rough stick for a club, and with a sharp stone for a knife or a spearhead. The critical situations with which he was surrounded led to the birth of intelligence and selection. These tools and weapons were improved and his mechanistic technique made increasingly efficient. In proportion to his advancement in this direction, he approached in the direction of a scientific conception of causality.

IV. THE INSTINCTIVE REACTIONS STIMULATED BY CONTACT WITH THE STRANGE AND THE UNUSUAL

It will not be necessary for my purpose to go into an elaborate discussion concerning the problem as to whether curiosity is an instinct or not. Some psychologists deny that it is. Many claim that it is, among whom some classify it as a compound or secondary instinct. Biologists are agreed that there are in man and in many of the lower animals tendencies to distinctive reactions in the presence of the strange and the unusual. The behavior of dogs, of water snakes, and especially of monkeys is illustrative. The same disposition is apparent in little children. I do not know of any word which my daughter has used more frequently during her fourth and fifth years than "Why?" For this type of behavior, whereby there is a disposition to pry into the strange and the unknown and which is indeed complex, we may apply the name "curiosity" in a generic sense. In another connection, where the discussion was concerned with the reference of science to a specific instinct, a

¹ Tylor, *Primitive Culture*, II, 306, 307.

brief statement was made of the positions of Shand and Ribot.¹ The analysis of Mr. Shand seems to me to be keen. His position, it may be observed, is close to that of Mr. McDougall, whose discussion of curiosity² is good. The point which has interest in this connection is that both of these psychologists find curiosity as one of the roots appearing both in religion and science. Men of the greatest intellectual and spiritual vigor are men in whom the disposition to inquiry is most marked. To the impulse of curiosity we surely "owe most of the disinterested labors of the highest types of intellect. It must be regarded as one of the principal roots of both science and religion."³ Mr. Shand's theory, by which he traces elements of both religion and science to curiosity, has already been stated.

The result of this prying into the unusual and the unknown, like other instinctive behavior to which we have given our attention, has been the development of two distinctive attitudes. One is the attempt to establish a personal relationship with the power which the mind of man has posited as an *animus* in the unknown. This is a religious conception because it is a socializing concept and man tries to establish communion with this power. It is a prescientific concept because it is an effort to explain the inexplicable by reference to a First Cause. Such an idea finds expression among many primitives, such as the Dakota Indians' *wakan*, the Polynesian *mana*, and the Algonquins' *manitou*. We have an expression of the same attitude in a more sophisticated environment in the concept of an *Unknowable* presented by Herbert Spencer. The desire to pry into the sphere beyond experience, the meta-empirical or metaphysical, is accompanied by the effort to establish social relationship therewith, or an element of mysticism.

The other attitude is evidenced in the insatiable desire to add to the stock of human knowledge by the paths of investigation and experimentation. It is the basis of many of the most brilliant achievements of the human race. It has led to our scientific conception of causation and mechanical control through its accompanying technique. It has retired much that is magical and many

¹Pp. 67, 68, above.

²*An Introduction to Social Psychology* (10th ed.; Boston, 1916), pp. 57-59, 315-20.

³Shand, *op. cit.*, p. 59.

animistic conceptions through the splendid discoveries which it has made possible.

In this connection it is of interest to note that the mystical temperament is more characteristic of people in tropical climates than of those in the temperate zones, whereas the scientific temperament has had a richer development in the temperate climes. It leads to the conclusion that among the stimuli which affect the reactions of the organism the climatic forces play an active rôle. The warmer the climate, the greater the *ennui*, and *ennui* is no friend to science. At the same time, the warmer climates have given birth to more mystical types of religion, as witness Hinayana Buddhism, the *bhakti* development of Hinduism, the Sufi sect of the Mohammedans, and the ascetic ideal of Christianity developing on Egyptian soil. Theologies or scientific treatments of religious development have largely originated in the temperate climes where the climatic conditions seem to favor the development of a colder, more objective type of intellectual acumen. So also the larger developments of the other sciences have had their history in the temperate zone, and particularly in the north temperate zone.

V. THE INSTINCTIVE REACTIONS CONNECTED WITH GREGARIOUSNESS

Psychologists are not in perfect unanimity as to whether gregariousness is an instinct or not. Sometimes it is interpreted as intelligent behavior growing out of the needs created by the hunger and sex instincts.¹ Those who argue for the instinctive character of gregariousness refer to such phenomena in the lower animals as the swarming of bees, migrations of birds, colonies of ants, packs of wolves, herds of deer, flocks of sheep, droves of cattle, shoals of fishes, and the like. Among primitives the characteristic form of life is the group life of a clan or a tribe. In many cases the unity of the group is preserved by means of a totem animal with which the life of the group is identified. Among children the disposition to form cliques and gangs is further evidence of this tendency. The disposition for large numbers of people to herd in towns and cities is another link in the chain of evidence.

¹ Ames and Thomas find the origin of the social bond in the sexual life. See Ames, *The Psychology of Religious Experience*, p. 37; Thomas, *Sex and Society*, p. 56.

From the biological point of view the evidence points to the belief that there are certain co-ordinations of reflexes which have been neurally integrated in such a way that the behavior is serviceable in helping not only the individual but the group in the struggle for existence, i.e., serviceable for co-operation. Professor Brooks has shown convincingly that a study of the adaptations that are developed in the various species leads to the conclusion that such adaptations are "for the good of the species and not for the individual" as such. Moreover, he argues that "the law is universal, but since the welfare of the species is usually identified with that of the constituent individuals it is not obvious unless the good of the species demands the sacrifice of the individuals." The general law of nature which refers the properties of all living things to a social, utilitarian basis affords an explanation, he claims, for such varied gregarious activities as the migrations of salmon and the altruistic moral sense of man.¹

The question at issue is as to which is the dominant principle in biological evolution, struggle or co-operation. Does the struggle for existence mean a ruthless struggle in which only the fittest individuals survive, and the less fortunate are destroyed by cruel competition? There are some phenomena in nature, such as the struggle between different species of ants for mutual extermination, which afford evidence that certain biologists consider to be sufficient for the adoption of mutual struggle as a principle of biological evolution.² But the evidence seems to point more conclusively in the direction of the principle of mutual aid. There is more of co-operation than of cruel competition among the lower animals as well as in human society, and the biological justification for making sociability a law of nature is quite as sound as the argument for mutual struggle. The struggle for existence is not to be interpreted as a struggle to exterminate the unfit, but as a collective struggle. Gregariousness is the rule in animal behavior, and not the exception. Association is to be seen in every stage of the evolutionary process. Decay and extermination are phenomena much

¹ W. G. Brooks, *The Foundations of Zoölogy*, pp. 117-19.

² Cf. the argument of the German biologist in "Headquarters Nights" by Vernon Kellogg in the *Atlantic Monthly*, August, 1917. Also Kropotkin, *Mutual Aid, A Factor in Evolution*, chap. i.

more characteristic of unsociable than of gregarious animals. "Students of animals under domestication have shown us how the habits of a gregarious animal, taken away from his kind, are shaped in a thousand details by reference to the lost pack which is no longer there. . . . It is a strange thing, this eternal hunger of the gregarious animal for the herd of friends who are not there."¹ There is good reason to believe that the non-social animal is a decadent type, the gregarious animal being antecedent and truer to type.

The collective activities of the lower animals are almost as varied as in the case of primitive man. The animals co-operate with others of the same species for warding off inclement weather, guarding against danger, fighting, playing, dancing, singing, obtaining nutriment, migrating, procreating, and for the elimination of competition. So, too, primitive man lives an associated life. He is never characterized by individualism, but frequently by communism. The most primitive people observable, such as the Todas of South India, the Bushmen of South Africa, and the aborigines of Australia, show a well-developed tendency to sociality.

The higher up we proceed in the scale of culture and sophistication, the more evidence do we see of man's social nature and the more complex become the co-ordinations of men. Among mammals, the nearest akin biologically to man, association is present, but the organizations are developed very meagerly in comparison with man. Where the gregarious tendencies are most highly cultivated, there appears a better foundation for happiness and morality. Duty, morality, culture, happiness, love, sacrifice, service, truth, religion—these are all terms meaningless apart from social relations.

We have, therefore, a biological justification for using the word "gregariousness" as a generic term for all the instinctive reactions which are serviceable to the group in the struggle for existence. Gregariousness has not always been regarded as an instinct, because in the case of "mammals at any rate the appearance of gregariousness has not been accompanied by any gross physical

¹ From Gilbert Murray's lecture on "Stoicism," quoted by H. G. Wells in *God the Invisible King*, pp. 88, 89.

changes which are obviously associated with it.”¹ On the other hand the cumulative results of gregariousness are so great as to really overbalance the most pronounced structural variations, so that, as Trotter points out, we find a state, frequently thought of as an acquired rather than as a congenital mode of behavior, “capable of enabling the insect nervous system to compete in the complexity of its powers with that of the higher vertebrates.”² One might say that the whole structure is such that its functions and adaptations are quite as serviceable to the species as to the individual, and that includes the co-ordination and integration by the nervous system of reflexes; so that we are justified in urging that gregarious behavior is instinctive to the human organism as well as to the lower animals.

The psychologist today is emphasizing as never heretofore the significance of gregariousness. Since man is a social animal, all psychology is, of necessity, the psychology of a social animal. There is no human psychology of an unadulterated individualism, since man as a solitary animal does not exist. On that account Professor Cooley is inclined to believe that all the instincts are social and holds that “social or moral progress consists less in the aggrandisement of particular faculties or instincts and the suppression of others, than in the discipline of all with reference to the progressive organization of life.”³ He believes, however, that social behavior is of such a nature that it may be classified as instinctive. He says:

I take it that the child has by heredity a generous capacity and need for social feeling, rather too vague and plastic to be given any specific name like love. It is not so much any particular emotion or sentiment as the undifferentiated material of many, perhaps sociability is as good a name for it as any. And this material, like all other instinct, allies itself with social experience to form, as time goes on, a diversifying body of personal thought in which the phases of social feeling developed correspond, in some measure, to the complexity of life itself.⁴

The reference of religion to gregariousness may be substantiated by an abundance of material. It has been noted already that in

¹ W. Trotter, *Instincts of the Herd in Peace and War*, p. 19.

² *Ibid.*, p. 20.

³ Cooley, *Human Nature and the Social Order*, p. 12.

⁴ *Ibid.*, pp. 50, 51.

primitivity human life is a group life, so that human interests and human needs are all tinged with a social element. Men went in groups to hunt and fish. Women went in groups to gather fruits. Men carried on war as groups. The group camped together, lived together, worked together, played together, fought together, and together they carried out their mimetic dances and other ceremonials. There would never have arisen a ceremonial or a cult had life been always and only individualistic. The struggle for existence was a social struggle, calling for co-operation on all sides. The connection between the gregarious tendency and the social life is so close that, as we have seen, some psychologists and sociologists find its origin there. Thus the need for food, the business of mating and procreating, the urge toward self-protection and preservation by means of war, and the search for a larger life by prying into the strange—all these interests have contributed to the understanding of human life as essentially, indeed as instinctively, gregarious.

Among the evidences of the connection between religion and gregariousness we need only remind ourselves of a few, such as totemism and its concomitant ceremonial, animism and its extension of the social bonds beyond the mundane, group magic, ancestor worship, mimetic dances and ceremonials connected with war, mimetic ceremonials and sacrificial rites connected with the supply of food, and ceremonies connected with the normal occupation of the group, such as the Toda dairy rites. Among the more sophisticated races the connection is no less apparent, as witness the caste system and Hinduism, monasticism in various religions, religious festivals, churches and church services, revival meetings, sacred meals in the Greek and Christian religions, and social and missionary propagandism.

But in another sense still, religion may be considered as an "irradiation," to borrow Starbuck's word, of the social instinct. The reference of religion to the limits of the human group is too narrow. The cult did not arise solely as a mimetic expression of group activities. It conveyed also the yearning of the group to enlist the aid of the extra-human power or powers in whose existence it believed. It was the *mutual-aid* principle carried into the life

of a people which did not believe that it was bounded by the ordinary human group limits. It was the attempt of the group to make vocal its groping for the power or powers with which it would fraternize and co-operate. The prayer of the religious man is characteristic, like the call of the bird that has lost its mate or the lonely animal that has strayed from the herd, of a gregarious nature.¹ Religion is the socializing of man, the social animal, with that which is beyond human society.

On the other hand the evolution of a technique for mechanical adjustment and control has been within the social group. Human needs and human struggles are social because they are human. Thus the urge for the organization of a technique of a mechanistic type as well as of a technique of a socializing character is the urge which man, the social animal, has experienced as he, an individual within a group, struggled for existence. The advance of the sciences, progress of any kind of knowledge, depends upon the social structure. We may interpret co-operation as a big historical sweep by which the various members of the race in different groups and in different periods of history have entered into one another's labors for the great good of the social whole. The heritage of a scientific past is a conservation of energy, releasing the power of the present for new tasks, fresh achievements. Progress is a child of gregariousness.

The foregoing discussion is not intended to be an exhaustive treatment of instinctive behavior. I think, however, that the principal types have been treated. The investigation has led to two conclusions, the first of which concerns the complexity of instinctive behavior, and the second showing that the origins of religion and science are traceable to a multiple causality.

1. In dealing with the five types of instinctive reactions with which we were concerned, it was impossible to deal with any one of them without finding one's self in contact with behavior which belonged to one or more of the other types. In the reactions resulting from the efforts to obtain food, ceremonies arose which

¹ The parables of Jesus in Luke, chap. 15, are illustrative. Here religious need and religious longing are compared to the needs and longings of the sheep which had strayed from the flock, and the prodigal who had abandoned the privileges of home.

involved gregarious activity. Crises in regard to the supply of food sometimes called forth flight; sometimes pugnacity. Necessity of providing for women and children developed a social disposition. The sexual life with its mating and procreating activities involved gregariousness, the provision of food, curiosity as to the reproductive process, and flight or pugnacity in the interests of preservation. Self-preservation involved a demand for food, a satisfaction for the normal sexual desires, a search into the strange and unknown, and co-operation. Curiosity might arise as to whether a fruit were food or poison, or over the behavior of animals, and be akin to fear. It also called forth a group co-operation to procure satisfaction for its needs. Gregariousness involved a group need for food, the mating and parental relationships, a social demand for preservation, and a common desire to satisfy the human craving to increase the stock of knowledge by investigation and experimentation. Thus we come back to the conclusion that the organism is a unity and that the dominating urge is its struggle for existence. The end of each type of instinctive behavior appears to be a co-operation with the other types in the human struggle.

2. Furthermore it is the struggle for existence to which the instinctive behavior is constantly contributing which has urged man to the formation of the two techniques of control which we call religion and science. By religion he seeks to establish social adjustments and relationships with the extra-human environment, and by science he endeavors to create mechanical adjustments and relationships to that environment. The purpose of both is the same—that he may “have dominion.”¹

¹ Gen. 1:28.

CHAPTER VIII

THEOLOGICAL IMPLICATIONS

The application of the historico-psychological method to the problems of the functions and genesis of religion and science is not without certain results of which the theologian must take cognizance. It is the purpose of this chapter to summarize the significance for theology in relation to the problems of authority, of the task of theology, of theological method, and of apologetics.

It remains for us to observe of what significance it is for theology that we have established the genesis and functions of religion and science in the psycho-physical organism and its modes of behavior. For it must be evident that the significance is far-reaching.

1. We have seen that it is possible to trace the origin of science and religion to certain typical methods of instinctive reaction to external stimuli. We are able also to trace with some degree of clarity the development of the attitudes from the instincts. Thus we have a genetic account of both religion and science as *human* attitudes. In that way the inductive approach has made it apparent that the differentiation is not between science, the human creation, and religion, the heavenly donation. Both are of human origin and both of them function to human needs. Hence both are developmental. We look for the beginnings of religion as well as of science in the behavior of primitive peoples where life is least complex, and not in an ecclesiastical Adam. We find that their function is to meet the insistent needs of man for control by the social and mechanical techniques which men have evolved in the religions and sciences. The whole conflict which raged so long between science and theology was due to the ecclesiastical self-assurance that theology possessed all the weight of divine authority behind it, whereas science was an impostor of human invention. If the conclusions of this thesis be correct, it means that the question of authority must be interpreted, not in the sense of

conformity to ecclesiastical standards, but with reference to efficiency and ability in satisfying the needs of a progressing humanity.

2. The ecclesiasticizing of religion, which was the work of the Middle Ages, and the rationalizing of religion, which was attempted in the seventeenth and eighteenth centuries, were both of them of a piece with deductive science. The presupposition was that truth was ready-made and unalterable. The laws of science and the dogmas of religion were alike everlasting. Man's task was one of discovery. What becomes of that conception as we historically and psychologically observe man in his struggle for existence and dominion actually participating in the making of truth? It means that the task of theology is not simply the discovery and classification of never-to-be-altered dogmas, but is creative and serviceable. It too must accept the universal challenge to prove its worth by its ability to minister to man's religious needs.

In the examination of the instincts it was observed that the findings of biology include the modifiability and adaptability of the instincts. But in the instinctive reactions we have the simplest, least complex type of human behavior. If even the instincts are modifiable and adaptable, surely the life-processes *in toto* must be likewise. It ought to be apparent that a static theology cannot hope to satisfy a kinetic world in which human nature itself is always in process of change. The future of theology is tied up with the recognition of its creative task as a ministrant to an evolving life.

Theology is an interpreter of religion. Its purpose is instrumental and functional rather than dictatorial and dogmatic. The only adequate criterion for testing and revising theology must be an appreciation of religion as we study it in actual social experience. The theology of the experience of an age of feudalism cannot do justice to the experiences of an age of democracy. It was out of the question that Anselm and Aquinas should write a theology for all time. Theology is always in the making even as religion itself is always in the making, or, still more fundamentally, as human life is conceived in terms of process. The theological task is never com-

plete; so that a study of the religious life as evolving from the instinctive life constitutes a challenge for theology to face the situation in a time when experimental science, democracy, war, industrial expansion, and rapid transportation have created a new world with social, ethical, and religious problems demanding the creative efforts of serious-minded men.

3. The biocentric theory of the genesis and function of religion and science involves important consequences for the student of theological method. If the criterion be biocentric, then the demand is for co-operation between the two disciplines in the interests of the highest good for life. That means that theology becomes more ethical in proportion as it becomes scientific. Ritschl, as we have seen, tried to protect religion by saying that it is independent of science, and he argued that collisions occur only when a law of science, which obtains in the narrower field of nature, is erected into a world-law. His faculty psychology and dualism worked hand in hand. But the development of the organism as a unity suggests the impossibility of making such sharp lines of demarcation between the religious and scientific interests that the one can develop regardless of the other. In that way theology may be protected against the danger of making statements which would be annulled by the known findings of science. The purpose of the theological doctrine is as truly functional as the scientific theorem. The needs of life demand of each of them a regard for the other.

4. The apologetic possibilities of theology are immensely increased by the conclusions of this thesis. Some attention was given to the positivistic movement in its leading representative, Auguste Comte. It was Comte's contention that the history of man begins with a mythological stage, passes through a metaphysical stage, and is entering upon a positive stage. At the bottom we have cultureless religion, and at the top we shall have religionless culture. So also M. Guyau in his *Non-Religion of the Future* argued that civilization was moving toward a higher plane where it would be independent of religion. Thus these positivistic writers argued for the ultimate disintegration of religion. But if religion be a social attitude toward the extra-human environment having its

roots in the instinctive life, as we have shown, we have an argument for its ineradicability and against any liability of corrosion. There will have to be a much greater modification in man's way of functioning than has yet taken place before religion is in danger of passing away.

The evolutionistic monism of Haeckel and Ostwald was another effort to deny to religion any legitimate sphere. Their attempt was to work out a monistic system on the basis of science which should do everything for life that religion has done in the past. Their work was based on the fundamental misconception that religion deals only with the supernatural, and is therefore retired when scientific causality upsets miracle. But the work that was done by Höffding is the best defense against such an attack. He showed that the whole question of miracle was due to a confusion of the religious and scientific tasks. When we conceive of religion as an evaluatory attitude as against the explanatory attitude of science, we see at once that the relegation of the question of miracle to the domain of the scientist is the most scientific procedure, since science deals with causes, while it emancipates religion for its real task of evaluating and interpreting the phenomena of experience in terms of our cosmic relationships.

Naturalism has sometimes attacked religion on the ground that it is too metaphysical. All the truth of which we can be sure, says the naturalist, is that which we can prove in the laboratory. Thus the differentiation is made: religion deals with the metaphysical and hypothetical, whereas science deals with the physical and demonstrable. This is made the basis for a scientific agnosticism as to the questions of God, freedom, and immortality. Religion has at least the *argumentum ad hominem* that science too has its metaphysics in the aeons, electrons, atoms, and molecules of the scientist. When scientists attempt to furnish a philosophy of life which shall take the place of and function for us as religion has done in the past, they become every whit as metaphysical and hypothetical as any religionist. The naturalistic theories are all of them capable of criticism at this point, as Professor Ward has shown in his epoch-making critique of *Naturalism and Agnosticism*.

Moreover, the new emphasis in religion on function as against ontology means that the force of this attack is largely spent on a phantom enemy.

The persistence of religion, the truth of religion, the adequacy of doctrinal statements, and the uniqueness of Christianity—these are all of them questions with which we deal functionally today. Our defense is in terms of their serviceableness to life rather than their superior origin. The imperishable values are the achieved values rather than the donated. Against such an epistemology science has no case, and let us hope for her own sake that she desires none.

BIBLIOGRAPHY

- Abbott, Lyman. *The Theology of an Evolutionist*. New York, 1897.
- Adamson, Robert. "Bacon, Roger," in *Encyclopaedia Britannica* (11th ed.), III, 153-56.
- Adamson, Robert, and Mitchell, J. M. "Bacon, Francis," in *Encyclopaedia Britannica* (11th ed.), III, 135-52.
- . "Bruno, Giordano," in *Encyclopaedia Britannica* (11th ed.), IV, 686, 687.
- Ames, Edward Scribner. *The Psychology of Religious Experience*. Boston, 1910.
- Angell, J. R. *Psychology* (4th ed.), London, 1908.
- Baldwin, James Mark, et alii. *Dictionary of Philosophy and Psychology*. New York, 1911.
- . *History of Psychology*. New York, 1913.
- Barnett, Lionel D. *The Bhagavad Gita*. London, 1905.
- Barton, George A. *A Sketch of Semitic Origins*. New York, 1902.
- Beazley, C. R. "Columbus, Christopher," in *Encyclopaedia Britannica* (11th ed.), VI, 741-46.
- . "Magellan, Ferdinand," in *Encyclopaedia Britannica* (11th ed.), XVII, 302-4.
- Beckwith, C. A. "Albertus Magnus," in *New Schaff-Herzog Encyclopaedia of Religious Knowledge*, I, 110.
- . "Authority in Present-Day Religious Teaching," in the *American Journal of Theology*, XVI, 501-27.
- . "The Influence of Psychology on Theology," in the *American Journal of Theology*, XV, 194-204.
- Bergson, Henri. *L'Évolution Créatrice*. English translation, *Creative Evolution*. New York, 1911.
- Bloomfield, M. *The Religion of the Veda*. New York, 1909.
- Boas, F. *The Mind of Primitive Man*. Washington, 1902.
- Bonney, T. G. *The Present Relations of Science and Religion*. New York, 1913.
- Bousset, W. *Das Wesen der Religion*. Tübingen, 1906. English translation, *What Is Religion?* New York, 1907.
- Boutroux, Emile. *Science et Religion dans la Philosophie contemporaine*. Paris, 1906. English translation, *Science and Religion in Contemporary Philosophy*. London, 1909.
- Boxall, George Eedes. *L'Évolution de la Science et de la Religion*. Paris, 1911.
- Breasted, J. H. *The Development of Religion and Thought in Ancient Egypt*. New York, 1912.
- Brinton, D. G. *Religions of Primitive People*. New York, 1897.

- Brooks, William Keith. *The Foundations of Zoölogy*. New York, 1907.
- Caird, Edward. "Cartesianism," in *Encyclopaedia Britannica* (11th ed.), V, 414-26.
- . *The Evolution of Religion*. 2 vols. Glasgow, 1907.
- Caird, John. *Introduction to the Philosophy of Religion*. Glasgow, 1880.
- Campbell, Lewis. "Plato," in *Encyclopaedia Britannica* (11th ed.), XXI, 808-25.
- Carpenter, J. Estlin. *Comparative Religion*, in the "Home University Library." New York, 1912.
- Carus, Paul. *The Dawn of a New Religious Era*. Chicago, 1917.
- Case, S. J. *The Evolution of Early Christianity*. Chicago, 1914.
- Case, Thomas. "Aristotle," in *Encyclopaedia Britannica* (11th ed.), II, 501 ff.
- Chrystal, G., and Saintsbury, G. "Paschal, Blaise," in *Encyclopaedia Britannica* (11th ed.), XX, 878-81.
- Clayton, A. C. *The Rig Veda and Vedic Religions*. Madras, 1913.
- Clerke, A. M. "Copernicus, Nicholas," in *Encyclopaedia Britannica* (11th ed.), VII, 100, 101.
- . "Galileo, Galilei," in *Encyclopaedia Britannica* (11th ed.), XI, 407-11.
- . "Kepler, Johann," in *Encyclopaedia Britannica* (11th ed.), XV, 749-51.
- . "LaPlace, Pierre Simon," in *Encyclopaedia Britannica* (11th ed.), XVI, 200-203.
- Clodd, Edward. *Animism*, in the "Open Court Series." Chicago, 1905.
- Coe, George A. *The Psychology of Religion*. Chicago, 1916.
- . *The Religion of a Mature Mind*. New York, 1902.
- Colvin, S. "Leonardo da Vinci," in *Encyclopaedia Britannica* (11th ed.), XVI, 444-54.
- Colvin, Stephen Sheldon. *The Learning Process*. New York, 1913.
- Comte, Auguste. *Cours de philosophie positive* (5th ed.). Paris, 1893-94.
English translation, London and New York, 1896.
- Cooley, C. H. *Human Nature and the Social Order*. New York, 1902.
- Creighton, J. E. *An Introductory Logic*. New York, 1901.
- Cross, George. "The Attitude of the Modern Theologian toward Jesus Christ," in the *Biblical World*, XLVI (1916), January.
- . *The Theology of Schleiermacher*. Chicago, 1911.
- Daab, Friedrich. "Religion und Wissenschaft," in *Das Suchen der Zeit*, V, (Grieszen, 1909), 123 ff.
- Darwin, Charles. *Origin of Species*. London, 1859.
- . *The Descent of Man*. London, 1871; new ed., 1886.
- Dessoir, Max. *Outlines of the History of Psychology*. New York, 1912.
- Dewey, John, et alii: *Creative Intelligence*. New York, 1917.
- Dewey, John. *The Influence of Darwinism on Philosophy*. New York, 1910.
- Drake, Durant. *Problems of Religion*. New York, 1916.
- Draper, J. W. *History of the Conflict between Science and Religion*. New York, 1893.

- Driesch, Hans. *The Science and Philosophy of the Organism*. 2 vols. London, 1907, 1908.
- Drummond, Henry. *The Natural Law in the Spiritual World*. New York, 1885; 41st ed., 1905.
- Durkheim, E. *Les Formes élémentaires de la Vie religieuse*. Paris, 1912. English translation by J. W. Swain, *The Elementary Forms of Religious Life*. London, 1915.
- Encyclopaedia Britannica* (11th ed.), Vol. V, pp. 121, 122, article "Campanella, Tommaso."
- . Vol X, pp. 79-80, article "Exogamy."
- . Vol. XXI, p. 345, article "Phallicism."
- Farnell, L. R. *Evolution of Religion*. New York, 1905.
- Foster, G. B. *The Finality of the Christian Religion*. Chicago, 1906.
- . *The Function of Religion in the Struggle for Existence*. Chicago, 1909.
- Frazer, J. G. *The Golden Bough*. London, 1911-15.
- Galloway, G. "Religious Experience and Theological Development," in the *American Journal of Theology*, XV, 599-608.
- . *The Philosophy of Religion*. New York, 1914.
- Guyau, M. J. *L'Irréligion de l'Avenir*. English translation, *The Non-Religion of the Future*. New York, 1897.
- Haddon, A. C. *Magic and Fetishism*, in the "Open Court Series." Chicago, 1906.
- Haeckel, Ernst. *Monism as Connecting Religion and Science*. English translation by J. Gilchrist. London, 1895.
- Hall, G. Stanley. *Adolescence: Its Psychology, etc.* New York, 1904.
- Hardy, Thomas J. *The Religious Instinct*. London, 1913.
- Harnack, A. *Lehrbuch der Dogmengeschichte*. Tübingen, 1909. English translation, *History of Dogma*. Boston, 1896-1900.
- Harrison, Jane. *Ancient Art and Ritual*, in the "Home University Library." New York, 1913.
- Hartland, E. S. "Phallicism," in Hastings' *Encyclopedia of Religion and Ethics*, IX, 815 ff.
- . *Primitive Paternity*. 2 vols. London, 1909.
- Hastings' *Encyclopedia of Religion and Ethics*, Vol. IV, pp. 125-79, article "Cosmogony and Cosmology."
- . Vol. VIII, pp. 245-321, article "Magic."
- Hegel. *The Philosophy of Religion*. English translation by G. Bolland, 1902.
- Herrick, C. J. *An Introduction to Neurology*. Philadelphia, 1916.
- Herter. *The Biological Aspect of Human Problems*. New York, 1911.
- Hobbes, Thomas. *Leviathan*. Cambridge, 1904.
- Hobhouse, L. T. *Mind in Evolution*. London, 1901.
- Hocking, W. *The Meaning of God in Human Experience*. New Haven, 1912.
- Höfding, Harold. *Religionsphilosophie*, 1901. English translation by B. E. Meyer, *The Philosophy of Religion*. London, 1903.

- Holmes, S. J. *The Evolution of Animal Intelligence*. New York, 1911.
- Horne, H. H. *The Philosophy of Education*. New York, 1904.
- James, William. *A Pluralistic Universe*. New York, 1909.
- . *Pragmatism*. New York, 1902.
- . *The Principles of Psychology*. 2 vols. New York, 1890.
- . *The Varieties of Religious Experience*. London, 1902.
- . *The Will to Believe*. New York, 1897.
- Jastrow, Morris. *The Study of Religion*. London, 1901.
- Jennings, H. S. *Behavior of the Lower Organisms*. New York, 1906.
- Jevons, F. B. *Introduction to the History of Religions*. 2 vols. London, 1896.
- Johnson, F. H. *God in Evolution*. New York, 1911.
- Keane, A. H. *Man, Past and Present*. Cambridge, 1899.
- Kellogg, Vernon. "Headquarters Nights," in the *Atlantic Monthly*, August, 1917.
- Keyser, Cassius J. "The Message of Modern Mathematics to Theology," in the *Hibbert Journal*, VII, 370-90, 623-38.
- King, H. C. *Reconstruction in Theology*. New York, 1901.
- . *Theology and the Social Consciousness*. New York, 1902.
- King, Irving. *The Development of Religion*. New York, 1910.
- Kingsley, Mary H. *West African Studies*. London, 1899.
- Kirkpatrick, Edwin A. *Fundamentals of Child Study*. New York, 1908.
- . *Genetic Psychology*. New York, 1911.
- Kropotkin, P. *Mutual Aid, A Factor of Evolution*. New York, 1902.
- Lang, A. *Magic and Religion*. London, 1901.
- . *Myth, Ritual and Religion*. London, 1887.
- . *The Making of Religion*. London, 1898.
- . "Totemism," in the *Encyclopaedia Britannica* (11th ed.), XXVII, 79-91.
- Leuba, J. H. *A Psychological Study of Religion*. New York, 1912.
- . "The Psychological Nature of Religion," in the *American Journal of Theology*, XIII, 77-85.
- . *The Psychological Nature and Origin of Religion*. London, 1909.
- Lodge, Sir Oliver. *The Substance of Faith Allied with Science*. New York, 1907.
- Lyman, E. W. *Theology and Human Problems*. New York, 1910.
- Mackintosh, H. R. "Does the Historical Study of Religion Yield a Dogmatic Theology?" in the *American Journal of Theology*, XIII, 505-19.
- McDougall, William. *An Introduction to Social Psychology* (10th ed.). Boston, 1916.
- McGiffert, A. C. "How May Christianity Be Defended Today?" in the *Hibbert Journal*, VII, 152-62.
- . *Protestant Thought before Kant*. New York, 1911.
- . *The Rise of Modern Religious Ideas*. New York, 1915.
- Marrett, R. R. *Anthropology*. New York, 1912.

- Marrett, R. R., and Carpenter, J. E. "Religion," in the *Encyclopaedia Britannica* (11th ed.), XXIII, 61-76.
- Marshall, H. R. *Instinct and Reason*. New York, 1898.
- Mathews, Shailer. "The Evolution of Religion," in the *American Journal of Theology*, XV, 57-82.
- . *The Gospel and The Modern Man*. New York, 1910.
- . "Theology and the Social Mind," in the *Biblical World*, XLVI, 201-48.
- Merz, John Theodore. *Religion and Science: A Philosophical Essay*. Edinburgh, 1915.
- . *History of European Thought in the Nineteenth Century*. 4 vols. Edinburgh and London, 1903-14..
- Metchnikoff, Élie. *The Nature of Man*. English translation by P. C. Mitchell. New York, 1908.
- Mitchell, H. B. *Talks on Religion*. New York, 1908.
- Moore, A. W. *Pragmatism and Its Critics*. Chicago, 1910.
- Moore, E. C. *Christian Thought since Kant*. New York, 1912.
- Moore, G. F. *History of Religions*. New York, 1912.
- More, L. T. *The Limitations of Science*. New York, 1915.
- . "The Occult Obsessions of Science, with Descartes as an Object Lesson," in the *Hibbert Journal*, X, 626-41.
- Morgan, C. Lloyd. *Animal Behavior*. London, 1900.
- . *Habit and Instinct*. London, 1896.
- . "Instinct," in the *Encyclopaedia Britannica* (11th ed.), XIV, 648 ff.
- . *Instinct and Experience*. New York, 1912.
- Moulton. *Religions and Religion*. New York, 1914.
- Muir, M. M. Pattison. "Can Theology Become Scientific?" in the *Hibbert Journal*, IX, 470-76.
- . "The Vain Appeal of Dogma to Science," in the *Hibbert Journal*, X, 824-34.
- Mueller, F. Max. *Introduction to the Science of Religion*. London, 1882.
- Osborn, H. F. *From the Greeks to Darwin*. New York, 1899.
- . *The Men of the Old Stone Age*. New York, 1915.
- Otto, Rudolph. *Naturalische und religiöse Weltansicht*. Tübingen, 1904. English translation by Thomson, *Naturalism and Religion*. New York, 1907.
- Overstreet, H. A. "God as the Common Will," in the *Hibbert Journal*, XIII, 155-74.
- . "The Democratic Conception of God," in the *Hibbert Journal*, XI, 394-411.
- Parmelee, Maurice. *The Science of Human Behavior*. New York, 1913.
- Perry, R. B. *Present Philosophical Tendencies*. New York, 1912.
- Pfleiderer, O. *Religionsphilosophie* (3d ed., 1896). English translation, *The Philosophy of Religion*. 3 vols. London, 1886.
- Pratt, J. B. *The Psychology of Religious Belief*. New York, 1907.

- Pratt, J. B. *What Is Pragmatism?* New York, 1909.
- Rauschenbusch, Walter. "The Influence of Historical Studies on Theology," in the *American Journal of Theology*, XI, 111-27.
- Renan, E. *Studies of Religious History*. London, 1893.
- Rhys Davids, T. W. *Buddhism: Its History and Literature* (2d ed.). New York, 1904.
- Rhys Davids, Mrs. C. A. F. *Buddhist Psychology*. London, 1914.
- Ribot, Th. *Psychologie des Sentiments* (4th ed., 1903). English translation, *Psychology of the Emotions*. London, 1898.
- Rice, W. N. *Christian Faith in an Age of Science*. New York, 1903.
- Riehl, A. *Introduction to the Theory of Science and Metaphysics*. 1894.
- Ritschl, Albrecht. *Die Christliche Lehre von der Rechtfertigung und Versöhnung*. Bonn, 1889. English translation, *The Christian Doctrine of Justification and Reconciliation*. Edinburgh, 1900.
- Rivers, W. H. R. *The Todas*. London, 1906.
- Romanes, G. J. *Animal Intelligence*. New York, 1883.
- . *Thoughts on Religion*. Chicago, 1895.
- Russell, Bertrand. "The Essence of Religion," in the *Hibbert Journal*, XI, 46-62.
- Sabatier, Auguste. *Esquisse d'une Philosophie de la Religion*. Paris, 1892. English translation, *Outlines of a Philosophy of Religion*. New York, 1902.
- . *Religions of Authority and the Religion of the Spirit*. New York, 1904.
- Sacred Books of the East* (in translation). 50 vols. 1879 onward.
- Schiller, F. C. S. *Humanism*. London, 1903.
- . *Studies in Humanism*. London, 1907.
- Schmid, Rudolph. *The Scientific Creed of a Theologian*. English translation. London, 1906.
- Shaler, N. *The Interpretation of Nature*. Boston, 1893.
- Shand, Alexander F. *The Foundations of Character*. London, 1914.
- Sherrington, C. S. "Brain," in the *Encyclopaedia Britannica* (11th ed.), IV, 391-413.
- . *Integrative Action of the Nervous System*. New York, 1903.
- . "Spinal Cord," in the *Encyclopaedia Britannica* (11th ed.), XXV, 668-84.
- Simpson, Sir James Y. *The Spiritual Interpretation of Nature*. New York, 1912.
- Smith, Gerald Birney. "Christianity and Critical Theology," in the *Biblical World*, XL, 385-96.
- . *Social Idealism and the Changing Theology*. New York, 1913.
- . "Theology and Scientific Method," in the *Biblical World*, XL, 236-47.
- Smith, G. B., et alii. *A Guide to the Study of the Christian Religion*. Chicago, 1916.

- Smith, Norman Kemp. "The Middle Ages, the Renaissance, and the Modern Mind," in the *Hibbert Journal*, XII, 537-56.
- Smith, W. Robertson. *The Religion of the Semites*. London, 1894.
- Spencer and Gillen. *The Northern Tribes of Central Australia*. London, 1904.
- Spencer, Herbert. *Principles of Psychology* (2d ed.). 2 vols. London, 1872.
- Starbuck, Edwin W. *The Psychology of Religion*. London, 1899.
- Stratton, G. M. *Psychology of the Religious Life*. London, 1911.
- Sutherland, Alex. *The Origin and Growth of the Moral Instinct*. London, 1898.
- Swing, A. T. *The Theology of Albrecht Ritschl*. New York, 1901.
- Taylor, H. M. "Newton, Sir Isaac," in the *Encyclopaedia Britannica* (11th ed.), XIX, 583-92.
- Taylor, H. O. *The Mediaeval Mind*. New York, 1911.
- Ten Broeke, James. *A Constructive Basis for Theology*. New York, 1914.
- Tennant, F. A. "Historical Fact in Relation to the Philosophy of Religion," in the *Hibbert Journal*, VIII, 166-86.
- Thomas, N. W. "Magic," in the *Encyclopaedia Britannica* (11th ed.), XVII, 304-10.
- . "Taboo," in the *Encyclopaedia Britannica* (11th ed.), XXVI, 337-41.
- Thomas, W. I. *Sex and Society*. Chicago, 1907.
- . *Source Book for Social Origins*. Chicago, 1909.
- Thompson, R. C. *Semitic Magic*. London, 1908.
- Thomson and Geddes. *Evolution*, in the "Home University Library." New York, 1911.
- Thorndike, E. L. *Educational Psychology*. Vol. I, "The Original Nature of Man." New York, 1913.
- Tiele, C. P. *Elements of the Science of Religion*. 2 vols. New York, 1897 and 1899.
- Toy, C. H. *Introduction to the History of Religions*. Boston, 1913.
- Troeltsch, E. *Protestantism and Progress*. New York, 1912.
- . "The Dogmatics of the Religionsgeschichtliche Schule," in the *American Journal of Theology*, XVII, 1-21.
- Trotter, W. *Instincts of the Herd in Peace and War*. New York, 1916.
- Tufts, J. H., Lyman, E. W., and Sneath, E. H. "The Ultimate Test of Religious Truth; Is It Historical or Philosophical?" in the *American Journal of Theology*, XIV, 16-46.
- Tylor, E. B. *Primitive Culture* (3d ed.). 2 vols. New York, 1887.
- Vernon, A. W. "Can an Efficient Theology Be Dependent on Historical Facts?" in the *American Journal of Theology*, XVII, 161-72.
- Wagisara and Saunders. *The Buddha's Way of Virtue*; translation of the *Dhammapada* in the "Wisdom of the East Series."
- Wallace, William. "Descartes, René," in the *Encyclopaedia Britannica* (11th ed.), VIII, 79-90.
- . *The Logic of Hegel*. Oxford, 1874.

- Wallace, William, and Thatcher, G. W. "Arabian Philosophy," in the *Encyclopaedia Britannica* (11th ed.), II, 276-83.
- Ward, J. *Naturalism and Agnosticism*. 2 vols. New York, 1909.
- Ward, Lester. "The Essential Nature of Religion," in the *International Journal of Ethics*, VIII, 169-92.
- Warfield, B. B., Brown, W. A., and Smith, G. B. "The Task and Method of Systematic Theology," in the *American Journal of Theology*, XIV, 192-233.
- Waterhouse, Eric S. *Modern Theories of Religion*. London, 1910.
- Watson, A. C. "The Logic of Religion," in the *American Journal of Theology*, XX, 81-101 and 244-65.
- Watson, John. *Selections from Kant*. Glasgow, 1908.
- Weber, Alfred. *History of Philosophy*. English translation by F. Thilly. New York, 1901.
- Westermarck, E. *Origin and Development of the Moral Ideas*. 2 vols. New York, 1908.
- Whetham, W. C. D. "Science," in the *Encyclopaedia Britannica* (11th ed.), XXIV, 396-404.
- Whewell, W. *History of the Inductive Sciences*. 2 vols. New York, 1901.
- White, A. D. *A History of the Warfare of Science with Theology in Christendom*. 2 vols. New York, 1896.
- Whitehead, Henry. *The Village Gods of Southern India*. Calcutta, 1916.
- Windelband. *A History of Philosophy*. English translation by J. H. Tufts. New York, 1901.
- Wright, W. K. "A Psychological Definition of Religion," in the *American Journal of Theology*, XVI, 385-409.
- . "Instinct and Sentiment in Religion," in the *Philosophical Review*, XXV, 28-44.
- . "The Evolution of Values from Instincts," in the *Philosophical Review*, XXIV, 165-83.
- Wundt, W. *Elemente der Völkerpsychologie*. Leipzig, 1913.
- Youtz, H. A. *The Enlarging Conception of God*. New York, 1914.

LIBRARY OF CONGRESS



0 029 822 256 5

LIBRARY OF CONGRESS



0 029 822 256 5