Spring 1917

Refutation Of The Mechanistic Conception Of Life

Walter Steidle
Carroll College

Follow this and additional works at: https://scholars.carroll.edu/philosophy_theses
Part of the Catholic Studies Commons, Philosophy Commons, and the Religious Thought, Theology and Philosophy of Religion Commons

Recommended Citation
Steidle, Walter, "Refutation Of The Mechanistic Conception Of Life" (1917). Philosophy Undergraduate Theses. 76.
https://scholars.carroll.edu/philosophy_theses/76

This Thesis is brought to you for free and open access by the Philosophy at Carroll Scholars. It has been accepted for inclusion in Philosophy Undergraduate Theses by an authorized administrator of Carroll Scholars. For more information, please contact tkratz@carroll.edu.
THESIS.
Refutation of
THE MECHANISTIC CONCEPTION OF LIFE.

Walter L. B. Steidle

May, 15th, 1917
In studying the history of philosophical thought, one fact seems to be conspicuous by its absence. That is, we find very little speculation regarding the origin of life. Ancient philosophy is distinctly religious, this being markedly so in the early history of Egypt, China, India, and Persia. Even pagan Greece and Greco-Roman philosophy was concerned mainly with the Creation of the World and the existence of a Supreme Being. However, the question was not unknown, for the writings of Aristotle, Vergil, and Origen reveal speculation concerning the origin of life.

It is only within recent years that investigations concerning the first origin of life became so general as to arouse heated controversies among scientists. This remarkable fact can be accounted for by three very evident reasons.

First—The early Fathers of the Church found their time occupied with the resurrection of the pagan Gods. They had not gone beyond the contemplation of the origin of the universe.

Second—Science had far simpler problems to solve. This is evident when we consider that before the Thirteenth Century little was known of a scientific nature, as compared with the progress since then. The world was thought to be flat, it was held the sun went around the earth, little was known of anatomy, alchemists who dabbled in chemical experiments were burnt as sorcerers.

Third—Philosophers and scientists suspected the teachings of Holy Mother Church and the holy Bible to such an extent that they did not even dream of questioning the mode of creation. It is only since the baneful influence of Luther's schism that has whelped a brood of unbelievers, that these godless men have arisen who first establish their thesis, "There is no God", in justification of their lawlessness and depraved lives or of their perversity, and then attempt to accumulate scientific evidence in support of their stand.
Thus we have the Evolutionistic Theory, a theory that has suffered many mutilations. Webster defines evolution as: "the development of a race, species; or life in general, by descent from a very few simple organisms", or the abiogenetical theory; as opposed to the biogenetical theory, or the separate creation of each species.

Evolution, resting on a Theistic foundation which "postulates an intervention on the part of the Creator in the production of the first organisms" is entirely compatible with Christian teaching since it "demands a creative act for the origin of the human soul since the soul being spiritual cannot have its origin in matter." (Catholic Encyclopedia Evolution. #2, p.655.)

The Evolutionistic Theory resting on a Materialistic and/or Atheistic basis, holding as its first principle the denial of a First Cause or a Creator, has merited an avalanche of refutation. This theory rejects the idea of an immortal soul separate from matter and thus falls into the blank despair of Materialism. Lamarck and Geoffroy de Saint-Hilaire evolved the theory of evolution in 1809. Darwin gave it an entirely new aspect in 1859, by attempting to explain the origin of species by means of the natural selection theory, which seems to be justified by the close study of nature, which shows the survival of the fittest in the struggle for existence. At present the evolutionistic theory is regarded with askance by logical scientists for lack of unquestionable evidence.

Atheistic Evolution has endeavored to establish itself by many ingenious arguments of a morphological, embryological and palaeo-ontological order. But could it be proven, the progress of tracing this decent would be stayed at reaching the first principle, or the first cause of life, and as the theory precludes any extrinsic or Omniscient agency, it necessarily follows that this first life must have come by itself, that is by spontaneous generation. This conclusion brings us to our subject, namely, that modern atheistic scientists in recognizing the futility of successfully proving the evolutionistic theory by tracing
by tracing the relation of species backwards attempt to establish their
idea of a Godless Creation by going directly to the root of the matter,
that is, they endeavor to prove spontaneous generation or the mechanistic
conception of life.

The mechanistic conception of life is the theory of those who
hold, that we, ultimately, will be able to explain the sum of all life
phenomena in physico-chemical terms. Webster defines mechanistic as,
"pertaining to mechanics," or "pertaining to natural or mechanical forces
viewed in all phenomena of nature." In the present instance, mechanical
philosophy is, "a system of metaphysics which employs only the principles
of mechanics to explain known phenomena." Mechanics is the application
of the laws of force and motion. In this instance, "to life. Hence, the
mechanical pertains to those forces which tend to produce changes in
matter. These mechanical forces are natural and are not to be confused
with the supernatural. Thus, for example, it is an application of a
natural force that causes water to run down hill or the tide to rise.

Conception, "is the fertilization of the egg and the beginning of life."
Life, "is the activity by which a being moves itself." (Scholastic): "Life
is the sum of the functions which resist death." (Bichat): "Life is the
continuous adjustment of internal relations to external relations."

Phenomena is anything observable by experience or reality, thus life
phenomena is all forms of life from the lowest types such as germinal
or cell life, and vegetative life, to the highest types as are exemplified
by animals. Physico-Chemical relates to both physics and chemistry,
or physical chemistry. Terms are rules or laws which limit the extent of
anything. Physico-chemical terms are those expressions which insist on
the natural cause of any observable fact. In other words, the Mechanistic
Conception of Life is a theory which holds that the beginning of all
life and its continuation can be explained by physics and chemistry.

This theory assumes two principles in starting its investigations,
namely, that the Creation theory is an inadmissible hypothesis, and
that evolution is the only explanation of the present state of the cosms.
This spontaneous generation is the basis postulate of the mechanistic conception of life. A refutation of the positive principle will necessarily strengthen the stand of those who profess the existence of an all powerful "Cause Incausa." Our first task will be to establish definitively the modern conception of life. Life or vital activity is defined by J.B. Burke thus, "Life is an actual flux or continuous change of substance in a specialized unstable state of motion." (Origin of life, p. 25.)

St. Thomas agrees with Aristotle who holds that the essence of life consists of the ability of self movement. "A living being is a substance which can move itself" according to its own nature?, or "That which we properly call living is that which has in itself the principle of motion or of its own operations." Rhein stadler defines it as "the operation by which a being of its own motion tends to a higher state of its own perfection or acts immanently." The similarity of the above definitions leaves no ground for dispute on this point. Life exists in organic bodies or animate matter as opposed to inanimate matter or inorganic bodies. The predominant characteristic of inanimate matter is its tendency to a state of rest or of greatest stability, or an equilibrium which will withstand possibility of change. Thus the phenomenon of allotrophy reveals that crystalline bodies, in their proper environment, will solidify in the geometrical forms peculiar to the particular substance, and in a minimum of space or compactness, for example, a bit of falling water or molten lead will assume a globular or spherical shape. Although in some instances inanimate matter can grow larger, this accretion consists of additions from the outside, that is, transeuntly or extrinsically. Thus in crystalline bodies, the crystal grows larger by superimposed layers of new substance. An easily understood example of this is found in stalagmitic and stalagtitic formations. Nowhere do we find any other example of the growth of inanimate matter "ab extra," on the contrary, on every hand we witness its diminution, rocks are rent by the action of heat and cold, by wind and rain, mountains are worn down, and valleys are gouged
out by irresistible glaciers.

Animate matter or organic bodies, on the other hand, are distinguished by the immanence and continuity of their vital functions. Animate matter is never at rest, if considered materially, it is constantly changing. Any individual or any plant cannot be recognized as the same after a period of growth. Thus a flower just peeping forth will be entirely changed after a few weeks of growth, branches will develop leaves and buds and flowers will burst forth. A young child will mature rapidly, the muscles of his youth have no comparison with his flabby flesh when a mere baby. The vital operations or growths of organic bodies are conducted from within. That is, plants, through their roots, absorb suitable elements from the soil which are carried through the plant by a capillary circulatory system, building new and increasing growth. Animals carry on this process of intussusception to a vastly higher degree of perfection, and differ from vegetants in that they have the power of locomotion.

The example of the locomotive is often urged as having the power of locomotion, therefore it lives. An engine or any other machine of a similar nature can be used only for the purpose for which it has been built. Thus an engine can move on rails, can turn machinery etc. But this motion is the result of a series of transitory causes, that is, in an engine, fire is kindled in the firebox, the heat is transmitted to the water in the boiler, the molecular activity of the water is increased causing steam to form, the pressure of the steam is directed against the pistons causing motion. Living beings, on the contrary, can manifest their powers of activity in many different ways. LeDantec says, "Circumstances so vary around any given animal and the animal itself changes so quickly that we may say without exaggeration an animal never does twice the same thing in the whole course of its existence." (Origin and Nature of Life, p. 67.)

It is a generally accepted theory that the condition of the
earth would permit of no life whatsoever in its earliest state. It was a molten mass, so scientists theorize, which gradually cooled off until the conditions were such that life could exist. Hence life must have developed after the world had been in existence for millions of years.

The origin of life has been explained by the following theories.

First—The preexistence of rudimentary life in the primitive nebula.

Second—The spontaneous generation or abiogenetical theory, or life from non-life.

Third—The creation theory or the acknowledgement of an extra-mundane cause, which postulates an Omniscient Power.

St. Augustine is the proponent of the first theory. He held, "The least animal was not formerly created on the sixth day, but the potentiality, as if with seminal power" seminali rationes. Thus when matter with the potentiality to produce living matter was placed in a suitable environment life was the result. St. Thomas and the Schoolmen favored the Hippo Bishop's view but they introduced a new factor into this hypothesis. They attributed to the planets a higher state of perfection than the condition of the earth at the time of the beginning of life, and thus contributed to a great extent to the spontaneous generation of life. Not as though the power possessed by water or earth of producing all animals resides in the earth and water themselves, as Avicena held, but in the power originally given to the elements of producing them from elemental matter by the power of seed or influence of the star-stones. But to attribute any influence to the planets would be to place the question in the same category with that of the famous query of the hen and the egg. Life could not have come from the planets because while in transit the friction is so terrific from impact with the air that meteors blaze brilliantly and the heat is so intense that any possible life in the falling body is destroyed. On the other hand, if life did come to this planet from the constellations the question arises "From where and how did life originate on these planets?" St. Augus-
time's definition, however, admits of a Creator and thus his system is really included in the third system.

The sponsors of the Creation theory in explaining the biblical account of Creation give a vastly different meaning to the modern use of the word "day". Day, in the Egyptian language of the Bible denoted a period, a length of time. Therefore a day might have been a million of years. In this the Creationists agree with the evolutionists, admitting that the living may have originated in the non-living, but they deny that the power of bringing this about is in the non-living, but insists that it rests on something extraneous or in a Supreme Power. They also admit that man may have evolved from the lowest type of life by successive stages but they postulate the necessity of the Creator's act in infusing an immortal soul into man's body at some period of this evolutionistic process.

The theory of spontaneous generation was generally accepted until 1650, when the contrary doctrine was proclaimed. The former did not lose all of its sponsors. With the invention of the microscope a vast field of information was opened to the efforts of scientists. Innumerable living organisms, now known as germs, were revealed by the wonderful instrument. Surely these were the product of spontaneous generation! But this conclusion likewise won its opponents. The discussion became so heated and the interest so widespread that in 1862, the French Academy of Sciences offered a prize for an unquestionable solution of the bone of contention. Louis Pasteur the eminent French scientist proved that life could not generate from non-life. Taking a peace of fresh meat, he placed it in a glass vessel, the air contents of which had been thoroughly sterilized, and closely observed it for months without any change being noticeable. Baptian objected to the methods used by Pasteur in that they destroy all possible life, and rendered the medium incapable of supporting life. "Bacteriologists, as a result of repeated processes of heating, a process of bringing about complete sterilization, not only kill
all pre-existing micro-organisms, but also destroy any potential germin-
ality of the media themselves. " Pasteur did not sterilize the meat, that is, did not boil it to destroy any potentiality of life existing in the
meat. He merely sterilized the air that is laden with myriads of float-
ing organisms, so that no life could be generated in the meat by their
operations. Thus it was proven that a living corporial being does not
generate except from the division or scission of living beings, but
never from an inorganic or non-living being. Which conclusion gives
rise to the philosophical axiom, " Omne vivum ex vivo."

A new solution was thought to have been found with the discove-
very of radium and radio-active substances. In summing up his conclusions
concerning the new experiments Burke writes, "As radiobes do not possess
all the properties of bacteria they are not what are understood by this
name, and obviously lie altogether outside the beaten track of living
things. This, however, will not prevent such bodies from coming within
the realm of biology, and in fact, they appear to possess many of the
qualities which enable them to be placed in the border land, so to speak
between crystals and bacteria, possibly the missing link between the ani-
mate and the inanimate. — For our own part the gap, apparently insuper-
able, between the organic and the inorganic world, seems however roughly,
to be bridged over by the presence of these radio-organic organisms
which at least may give a clue as to the beginning and the end of life." (Origin of Life, p.109.)

The burden of proof for the abiogenetical theory rests upon
its adherents but they have not, so far, offered incontrovertible scientific
evidence, on the other hand their efforts are marked by dissension in
their own ranks and they have not been able to produce life from non-life
life. "Many have been the attempts to generate life "de novo", By pack-
ing together suitable materials, but where all germs of pre-existing life
have been rigorously excluded, the attempts hitherto have always been
failures, so far, no life has made its appearance under observation,
except from antecedent life." (Lodge, Life and Matter, p.171.)
Wilson writes, "The cell has on the whole seemed to widen rather than to narrow the enormous gap that separates even the lowest forms of life from the inorganic world." (Cell in Development and Inheritance, p. 303.) Virchow has similar views, "Never has a living being or even a living element, let us say living cell been found, of which it could be predicated that it was the first of its species. Nor have any fossil remains ever been found of which it could ever be likely that it belonged to a being the first of its kind, or produced by spontaneous combustion." Moore is equally antagonistic to the idea of spontaneous generation, "The mode of production of living matter is characteristic, and cannot be brought about by the action solely of inorganic forms of energy. Living matter is produced only by the action of other living matter upon the materials and forms of energy of the non-living world. Nowhere else in nature does a similar process appear to that of the production of living structure and by no combination or application of the forms of energy apart from life can it be repeated or assimilated. From the above conclusions it is evident that empirical proof for the abiogenetical theory is wholly lacking, and that nothing has been proven that will dispense with our belief in the creative act of God.

One of the latest adherents of the Spontaneous Generation theory is Jacques Loeb, who has published a book entitled "The Mechanistic Conception of Life", in which he details many of his experiments that lead him to join the ranks of the atheistical scientists. He holds that all the phenomena of life, even our inmost spiritual operations and the action of our senses, the emotions, such as, love, hate, anger, joy, etc., can all be explained by chemical reactions as yet undiscovered. We shall endeavor to refute his conclusions which he has promulgated from the results of some of his most evident false deductions.

We know that every living being is able to transform food-stuffs into living matter, and we also know that not only the compounds which are formed in the animal body can be produced artificially, but that chemical reactions which take place in living organisms can also be repeated.
at the same rate and temperature in the laboratory. Nothing indicates, however, at present that the artificial production of living matter is beyond the possibility of science.---we must either succeed in producing living matter artificially, or we must find the reason why this is impossible. (The Mechanistic Conception of Life, p.5-6.) Lobe is ridiculous in the perversity of his blindness, he says that science can repeat the same operations of the living body artificially. Science may be able to do so but they cannot explain the process of diffusion by which the cells absorb the necessary elements for its own preservation, for example, that muscles absorb that which is necessary to repair muscles; bones absorb their constituents, nerves likewise etc. Scientists can "tear down" a piece of meat and give its exact constituents but they cannot build it up, they cannot even manufacture the simplest kind of tissue found in the living. They will not recognize a power greater than that of puny men's feeble efforts. It has been established that all life has its inception in the egg, and that the majority of of animals originate only when the sperm of a male, or a sex-cell, a spermatozoon enters into the egg. Why the spermatozoon causes life to develop is a phenomenon shrouded in mystery, although "the activation of the egg is for the most part reduced to physical and biochemical terms. "(p.6.) Lobe caused unfertilized eggs of the sea-urchin to develop into swimming larvae by treating them with concentrated sea-water. The sea-urchin is one of the lowest forms of life and this activation of the egg by artificial means proves nothing, for the potentiality of life exists in the egg and artificial or unnatural fertilization can be explained on purely mechanical grounds. Why cannot scientists manufacture an egg? They know their exact constituents but they cannot make an egg and cause it to develop into life. He takes an egg and assists its development. But we ask, does he successfully explain what makes it and how does it develop into life? If this or that kind. Surely not the merely mechanical introduction of sperm! It is the union of the two, and deducing from his own experiments wherein he caused eggs to develop without the introduction of sperm, we can infer that the
principle of life is within the egg. It lies dormant, we may say, and only needs to be awakened by the sperm.

The use of the sperm of different animals does not necessarily prove anything. The results only demonstrate the similarity of the sperm of different animals. There is a similarity in this one respect only, namely, that the sperm of one animal will cause fertilization in an animal of an entirely different species. But a momentous difficulty makes its appearance here that ought to confound and effectively silence those misled scientists. As in the matter of hybridization he writes, "The possibility of hybridization goes much farther than we have thus far assumed. It is, therefore, no exaggeration to state that the number of species existing today is only an infinitely small fraction of those which can and possibly do originate, but which escape our notice because they cannot live and reproduce. Only that limited fraction of species can exist which possess no coarse disharmonies in its automatic mechanism of preservation and reproduction." (p. 25) There seems to be a Providence guarding the perpetuation of species, for the crossing of species can be carried out only once, for example, the offspring of a jackass and a horse are sterile. It occurs to us that if hybridization was possible, what a jumble the animals of the earth would have long since been in. The line of demarkation between the different species would be entirely obliterated and we can question whether man would have also lost his distinguishing marks.

Leeb sums up his egg experiments in the following words, "We therefore see that the activation of the egg, by the spermatozoon, which twelve years ago was shrouded in complete darkness, is today practically completely reduced to a physico-chemical explanation." (p. 14.) The phrase, "practically completely" leaves room to squeeze out. It is not an unshakeable assertion. "The contents of life from the cradle to the grave are wishes and hopes, efforts and struggles, and unfortunately also disappointments. And this inner life should be amenable to a physico-
chemical analysis? In spite of the gulf which separates us today from such an aim I believe that it is attainable. "(p.25) The statement above could come from no one except a materialistic scientist. He would drag man down to a level with the brutes. He holds that man has no immortal soul, hence, of what use is it to obey laws whether civil or moral? All law, he says, has only an economic or a social basis, a mere matter of convenience. But how explain the misery of the poor, the suffering of the unfortunate as contrasted with the luxuries and pleasures of the rich? Were we no more yhan animals this state of affairs could not exist for among the animals there are no class distinctions in their midst all fare alike, if there is any supremacy it is only physical. We see no remorse or any other emotions in animals we witness no struggles to overcome temptations or indulgence in the lascivious. Animals are content with their lot, man never is. He is always striving. The student is a student all day, death only, puts an end to his researches. The miser is never satisfied with what he has, he hoards every cent. His miserliness ends only with his last gasp. The king or emperor never is satisfied with his inherited provinces. He must needs cast his eyes about for additional territory. Death only puts an end to his intrigues. The pleasure seeker at last forsakes his haunts, disgusted with the hollow mockery of it all. Man is never satisfied with the natural and perishable, the supernatural, the imperishable alone can satiate his desires.

From the earliest days of antiquity the people of every age and nation nourished a belief in another life after death. This was even held among nations that never received no teachings of divine revelation concerning the supernatural. Thus our American Indians had a firm belief in a happy hunting ground and this wonderful land could be attained only by a rigid observance of a recognized code of morals. In darkest Africa and in every land similar views of a supreme power are held and this Supreme being will reward the good and punish the wicked. A faith, so firm, so constant, and so universal cannot be explained otherwise than
by something inherent in man or by a voice of nature. We will heed the voice of the millions who have existed from the days of Adam rather than the rantings of a few misguided scientists who have thriven only a few years comparatively. The world will regard with hostility any system that must necessarily abandon all belief in a hereafter. Such a system destroys all morality, and corrupts the notion of good and evil, justice and injustice, the true and the false. It would destroy the present social order, the result of centuries of growth. It would destroy all virtue, religion and all pertaining to God would be in vain. The voice of that great teacher, The Holy, Catholic, and Apostolic Church, has been heard concerning this matter. The Lateran Council has declared the following concerning the spirituality of the soul: "We firmly believe and simply confess that the one and only true God—who by virtue of His Own Omnipotence made both the spiritual and the corporeal creatures simultaneously, namely, the angelical and the mundane (or the worldly); and finally He made man, EX SPIRITU ET CORPORE CONSTITUTAM; (from a spirit and a body Pope Leo X in the same council stated the following, "The sacred council approving, we dam and reprove all asserting that the intellecitive soul is mortal."

Loeb gives an ingenious explanation of the movements of helio-tropic animals. He aver that they contain photo-chemical substances and the light rays cause a certain stimulation or physico-chemical reaction that cause the animal to proceed to the source of the light. If these motions are explainable on purely physico-chemical grounds we hold that the light, in striking one side on the animal, would accelerate the molecular activity on that causing the animal to curve with the convex side toward the source of the light and hence any forward motion would cause the animal to move further away from instead of nearer to the light. They seem to ignore a vital principle here, as previously they ignored a Divine Providence. They try to explain by physical phenomena these movements which are purely instinctive, which rest on the fundamental
Principle of Life. We can explain the expansion and contraction of a tire on a wagon wheel by physics. But why bugs and insects, even the large or animals and man also, if you wish, are found on the sunny side of a building is a question that can be explained far simpler than by highly complicated physical-chemical formulas. Light and heat are synonymous to all living things. Heat is one of the characteristics of life and motion or exercise generates heat but by the expense of body tissue or of stored up energy, hence if it is possible to keep warm without any expenditure of energy the instincts of self-preservation or conservation of energy will cause us to seek that means.

"Our wishes and hopes, disappointments and sufferings have their source in instincts which are comparable to the light instinct of animals. The need of and the struggle for food, the sexual instinct with its poetry and its chain of consequences, the maternal instincts with the felicity and the suffering caused by them, the instinct of workmanship and some other instincts are the roots from which our inner life develops. For some of these instincts the chemical basis is at least sufficiently indicated to arouse the hope that their analysis, from the mechanistic point of view, is only a question of time." He would measure a mother's love by the chemical reactions within her body. One of the most wonderful things of the world is love that is manifested in dumb brutes, and even he would calculate and represent by symbols of salts, acids, and bases! If our existence is based on the play of blind forces and only a matter of choice; if we ourselves are only chemical mechanisms -- how can there be any ethics for us? The answer is that our instincts are the root of our ethics and that the instincts are just as hereditary as in the form of our body. The mother loves and cares for her children because the instinct of taking care of the young is inherited just as distinctly as the morphological characteristics of the female body. We seek and enjoy the fellowship of human beings because hereditary conditions compel us to do so. We struggle for justice and truth since we
are instinctively compelled to see our fellow beings happy. Economic, social, and political conditions or ignorance and superstition may warp and inhibit the inherited instincts and thus create a civilization with a faulty or low development of ethics.---Not only is the mechanistic conception of life compatible with ethics; it seems the only conception of life which can lead to an understanding of the source of ethics."(31)

He places us on a level with animals, he excuses abnormalities on the ground of "economic, social, and political conditions or ignorance and superstition." How explain the unnatural satiation of the passions? Animals do not offend on this score. Why care for the weaker? Animals drive the weaklings and the wounded from out their midst to perish. If we are instinctively compelled to see our fellow beings happy his conclusions are clearly set to be to wrong when we consider the untold misery and suffering in the world.

In summing up our deliberations we can posit that---

First—Science cannot explain the origin of life. Because life was not here at the first beginnings of the world, and there is now we cannot conclude that Spontaneous Generation is the cause.

Second---The origin of species is likewise unknown. Not a single species has been proven conclusively to have been derived from other species.

Third---Modern evidence does not favor evolution. Todayman is a weakling compared with the past. His term of life is shorter. Some even hold that he has even deteriorated mentally.

Fourth---Paleontological proof does not support man's animal origin. Human fossils and bones are distinctly classed as of "HomoSapiens in every instance on record when any such relics have been discovered. There seems to be a dead line between man and animal.

We would caution those misguided scientists to seek for something that would benefit humanity. We would suggest as an exemplar one whose name will resound deservedly one whose discoveries have benefited
not only a nation but also the people of the entire world: we meant that eminent scientist—LOUIS PASTEUR.

Walter L. B. Steidle.
Bibliography.

Elementa Philosophiae Scholasticae.......................... Reinstadler
Catholic Encyclopedia............................................ On Evolution
Lectures on Cosmology............................................ Selisker Ph.D.
The Mechanistic Conception Of Life.......................... Leeb M.D., Ph.D.
The Dynamics of Living Matter.................................. Leeb M.D. Ph.D.
Descent of Man ..................................................... Darwin
Origin of Species .................................................... Darwin
Last Words on Evolution.......................................... Haeckel
Psychology............................................................. Michael Maher SJJ
History of Philosophy............................................. Turner