

## The Renaissance philosophy of Giordano Bruno.

Horowitz, Irving Louis.

New York, Coleman-Ross Co., 1952.

<http://hdl.handle.net/2027/uc1.32106000029915>

# HathiTrust



[www.hathitrust.org](http://www.hathitrust.org)

**Public Domain, Google-digitized**

[http://www.hathitrust.org/access\\_use#pd-google](http://www.hathitrust.org/access_use#pd-google)

We have determined this work to be in the public domain, meaning that it is not subject to copyright. Users are free to copy, use, and redistribute the work in part or in whole. It is possible that current copyright holders, heirs or the estate of the authors of individual portions of the work, such as illustrations or photographs, assert copyrights over these portions. Depending on the nature of subsequent use that is made, additional rights may need to be obtained independently of anything we can address. The digital images and OCR of this work were produced by Google, Inc. (indicated by a watermark on each page in the PageTurner). Google requests that the images and OCR not be re-hosted, redistributed or used commercially. The images are provided for educational, scholarly, non-commercial purposes.

UNIVERSITY OF CALIFORNIA, SANTA CRUZ  
  
3 2106 00002 9915

B  
783  
Z7  
H6

RENAISSANCE PHILOSOPHY OF  
GIORDANO BRUNO

Generated for eijk6c (University of Virginia) on 2018-09-23 02:11 GMT / <http://hdl.handle.net/2027/uc1.32106000029915>  
Public Domain, Google-digitized / [http://www.hathitrust.org/access\\_use#pd-google](http://www.hathitrust.org/access_use#pd-google)

LIBRARY  
UNIVERSITY OF  
CALIFORNIA  
SAN DIEGO





LIBRARY  
UNIVERSITY OF  
CALIFORNIA  
SANTA CRUZ







**THE RENAISSANCE PHILOSOPHY**  
*of*  
**GIORDANO BRUNO**



**THE RENAISSANCE PHILOSOPHY OF  
GIORDANO BRUNO**

**by**

**IRVING LOUIS HOROWITZ**

**COLEMAN-ROSS COMPANY, INC.**  
**New York** **1952**

**Copyright, 1952, by I. L. Horowitz, All rights reserved including the right to reproduce this book in any form. Typography by Peter Bergman. Manufactured in the United States of America. Published by Coleman-Ross Co., 25 W. 45 St. New York**

B  
783  
Z7  
H6

**TO RUTH**



## PREFACE

The following study is divided into two main sections. The first part is intended as a general introduction to Giordano Bruno's natural philosophy, his ontology; while the latter part is devoted to a more detailed analysis of the interaction of philosophic system and method.

It has been essential to my purpose to confine this study, as far as was possible, to the dominant theme of "system and method" (the infinite structure of the universe and the infinite number of changing things in this system). And if the Renaissance scholar who may come across this work should be inclined to complain of omissions, evasions or generalizations I should request him to remember the object of this study and to judge it according to its fitness for its own end.

Whatever opinions may be held as to the value of extensive use of quotations, it seems clear that it is the best way, if not the only way, a majority of readers, unable to plough through the original Italian and Latin texts, can attain to any direct knowledge of what Bruno himself believed. I have hoped that such an attempt as the present to give some general idea and orientation on Bruno's natural philosophy will not be regarded as labor wasted.

I must confess that the title "The Renaissance Philosophy of Giordano Bruno" is but partially accurate; in the sense that an analysis of Bruno's social and ethical philosophy and the consequent examination of the social influences which shaped his thoughts are mentioned all too briefly, and even then in terms of their relation to Bruno's central metaphysical ideas. In the near future, I hope to supplement this work by publishing an analysis of the above aspects of Bruno's philosophy. Until then, it is my fondest hope that the "Prologue" will serve, in some small measure, to point up the social role and influences of Bruno's world outlook.

In a certain sense, the second portion of the work is little more

than a repetition of the first on a more intricate level. There are two main reasons why I have done this: The first, and most significant, was the necessity of demonstrating that irrespective of the topic Bruno dealt with, he was forced by the logic of his metaphysical commitments to ultimately gear the discussion around the problem of the changing and the fixed, and to resolve all problems in terms of this paradox of fixed system and dialectical method. The second reason is that the very restatement of this thesis in the various guises it assumes will serve to clarify and deepen the meaning attached to the central thread in Bruno's theory of reality.

Although responsibility for what is presented in the book is entirely mine, it is a pleasure to acknowledge the generous contribution made to it by a considerable number of persons. I am happy to express loving appreciation to my wife, Ruth Horowitz, for spending many hours helping me solve problems of the form and content of this study, in addition to providing the material and psychological security which enabled me to complete this book. I am grateful to the faculty members of the Department of Philosophy at Columbia University, for their direction and suggestions for this book, particularly by Professors Kristeller and Friess. For encouragement and efforts to facilitate the writing of this work, I would like to thank Professor Edel of the City College of New York; and to Dr. Selsam and Dr. Wells of the Jefferson School of Social Science, who read the manuscript and discussed many of its problems with me. For their guidance in the selection and interpretation of Italian and Latin source material, I am indebted to Messrs. John Chiaradia, John Cappazolli, Louis Nathan, Irving Kisner and Bruno Guarino. Arthur Diener of the Philosophy Library at Columbia University showed me every kindness in getting the necessary reference material.

The Columbia University Press, Citadel Press, The Houghton Mifflin Company, Henry Schuman and Company, and the Macmillan Company have graciously granted me permission to extract passages from books they have published.

I. L. H.

## CONTENTS

<b>Prologue: A Sixteenth Century Martyr and the Struggle For Intellectual Freedom</b>	<b>3</b>
<b>Introduction</b>	<b>17</b>
<i>Part I. Science and Natural Philosophy</i>	
<b>Chapter 1. The Revolution in Cosmology</b>	<b>21</b>
<b>Chapter 2. The Heritage of Greek and Medieval Philosophy</b>	<b>32</b>
<b>Chapter 3. Nature, Man and the Infinite Universe</b>	<b>52</b>
<b>Chapter 4. Dialectics and Reality</b>	<b>69</b>
<i>Part II. The Paradox of System and Method</i>	
<b>Chapter 5. Substance and the Problem of Permanence and Change</b>	<b>81</b>
<b>Chapter 6. Mechanism, Pluralism and the Monad</b>	<b>92</b>
<b>Chapter 7. The Category of Process</b>	<b>106</b>
<b>Chapter 8. The Reign of Reason</b>	<b>119</b>
<b>Notes</b>	<b>131</b>
<b>Index of Names</b>	<b>145</b>



**THE RENAISSANCE PHILOSOPHY**  
*of*  
**GIORDANO BRUNO**



## PROLOGUE

### A SIXTEENTH CENTURY MARTYR AND THE STRUGGLE FOR INTELLECTUAL FREEDOM

The gems of philosophy are no less precious because they are not always understood . . . we must with all our power defend them and make them defend, liberate them, and free them, from being trampled under the feet of the hogs. And so may the gods be favorable to me, as it is certain that I never committed such vengeance, neither through sordid love of myself, nor through a base care for some particular lesson; but I did so only through my love of "my so beloved mother philosophy" and through zeal for her offended majesty, which on account of her false friends and sons (because there is no vile pedant, idle phrasemaker, stupid faun, or ignorant horse, who does not wish to be considered one of the family, either by exhibiting himself loaded down with books, or by making himself grow a beard, or by other apparent means of masquerade) is reduced to such a state that among the common people a philosopher is tantamount to an imposter, an idler, a common pedant, a faker, a charlatan—good because he serves as amusement in the house and as a scarecrow in the country.

True philosophers . . . even though they have been elevated from a humble condition, cannot help but become ennobled and civilized, because science is an excellent way to make the human soul heroic.<sup>1</sup>

**THE STRUGGLE** to secure intellectual freedom has a long, bitter history. And one of the earliest and most glorious chapters in this struggle was waged by a small, frail man who was destined to become the greatest philosopher of the Renaissance, Giordano Bruno.

Rather than present any lengthy analysis concerning the polemics Bruno carried on against the witch-hunters of his day, it would prove more fruitful to let him speak for himself wherever possible. And if what follows sounds a familiar chord, then take courage in

this fact: Bruno's persecutors and prosecutors have long since been consigned to the ashes of history, and, if they have been "immortalized" it is only by virtue of their infamous deeds. At the same time, Bruno and the host of courageous thinkers who followed in his footsteps have been the carriers of intellectual progress, and the message of freedom such progress bore.

It was an Italy torn asunder by bitter class and national antagonisms, by revolution and counter-revolution, into which Bruno was born. The objective social conflicts left Bruno no alternative but to choose ideological sides. Starting at first within the frame-work of Scholastic thought as a Dominican monk who stemmed from a humble family background, he soon was forced to abandon any attempt to reconcile the naturalist strain in his philosophy and cosmology with Thomist doctrine. After formally breaking his ties with religious orthodoxy Bruno pursued his views with the passion and partisanship characteristic of every phase of life in the Italian Renaissance. The mutually existing hostility between Bruno and the ecclesiastical authorities was nothing but a particular illustration and reflection of the contradiction between the *haute bourgeoisie*, that sought in a scientific world outlook the means to its goal of economic independence, and the papal authorities who acted as the intellectual foils of feudal domination.

Bruno was at least partially aware of his position as a spokesman of a new and rising class. This is made quite explicit in his "Introductory Epistle" to the work, *Concerning The Cause, Principle, and One*, in which he aligns himself against the "servants," . . . "slaves," and "mercenaries." Much of this may be interpreted in terms of Bruno's pronounced appreciation of himself, but the brute fact remains that Bruno sees himself as being on the side of the "gods" and the "wise and powerful," or put in present-day language, on the side of the bourgeoisie. It would do well to cite Bruno's "Epistle" dedicated to "the most illustrious Sir de Mauvissiere" at some length in order to garner the full impact of Bruno's intellectual struggle against medieval ideology.

. . . you are my efficient and solid defender against the unjust

outrages which I suffer . . . which are such that a truly heroic spirit was necessary in order not to abandon the work, nor to despair, nor to give up as conquered to such a rapid torrent of deceitful crimes, with which they had attacked me with all the power at their command: the envy of the ignorant, the presumption of the sophists, the censure of the malicious, the murmuring of the slaves, the whispers of the mercenary, the objections of the servants, the suspicion of the stupid, the apprehension of the informers, the zeal of the hypocrites, the hatred of the barbarous, the fury of the vulgar, the lamentations of those that I have resisted, and the cries of those whom I castigated . . .

. . . I see you as that solid, firm and inviolable rock, which emerges again and again, and shows its crest above the agitated sea; and is neither moved nor shaken, neither by a menacing sky, nor by the horror of the winter. You are therefore endowed with a double virtue—through which the liquid and pleasant drops become most powerful, and the violent and tempestuous waves become vain; through whose work against the drops, the violent rock becomes so bland; and against the waves, the battered cliff arises so powerful . . . I, hated by the fools, depreciated by the vile, censured by the ignoble, dishonored by the wicked, and persecuted by the beasts; I, loved by the wise, admired by the learned, celebrated by the great, esteemed by the powerful, and favored by the gods . . . I shall not become submerged in the unjust, turbulent, and hostile ocean.<sup>2</sup>

Bruno's ability to write such a declaration of intellectual independence was due in no small part to the successes of capitalism and its religious off-spring, Protestantism. The huge breakthrough in thought allowed Bruno, although himself neither a capitalist or Protestant, to achieve the earliest philosophical synthesis of bourgeois thought.

The rejection by Bruno of a supernaturalist or mystical world-outlook earned for him the lasting animosity of all foes of social and scientific progress, which in his epoch was the feudal nobility

buttressed by the Roman Catholic hierarchy. Bruno's insistence that the universe, contrary to Aristotle's teachings, was infinite and contained an infinite number of constantly moving solar systems; coupled with his belief that God was to be found in nature and its material objects, immediately placed him in sharp conflict with the carriers of Aristotelian and Thomist philosophy. Such philosophy in Bruno's age had already been exposed as an ossified dogma calculated to maintain the existing social equilibrium. The anti-scientific state of affairs extant in institutions of "higher" learning was revealed by Bruno himself. With a trace of bitterness he writes that "no one is to be promoted to the degree of master and doctor of philosophy and theology unless he will have drunk from the fountain of Aristotle."<sup>3</sup>

Economic and social conditions generate ideas and thoughts in the brains of men that reflect such conditions either correctly or incorrectly. Because Bruno was "unfortunate" enough to put forth concepts which more accurately reflected the objective social and scientific situation than most of his contemporaries, views not sanctioned by ecclesiastical authority, he was forced to become a wanderer, relentlessly seeking places of exile where he could pursue his philosophical speculations without fear of excommunication, imprisonment or death. Needless to say, such a place was not to be found in sixteenth century continental Europe. Wherever he travelled, which usually was from one center of learning to another, Bruno was feared because of his encyclopaedic knowledge and despised because of his intellectual integrity. Never tarnishing his beliefs for the sake of satisfying "corrupt doctors of philosophy," it was not long before "the unfortunate Bruno was burned in Rome on red-hot coals" as Johannes Kepler sadly reflected.<sup>4</sup>

While still in the Dominican monastery, Bruno already displayed definite signs of intellectual independence. He, like all others studying for the priesthood, read the orthodox preparatory texts. However Bruno did not stop here. By reading such dangerous material as the fragments from pre-socratic materialist philosophy and the works of the great humanist, Erasmus, Bruno could hardly fail to come into conflict with the rather single-

mindful monastic authorities. He admitted to the Venice Inquisition (the trial which was the immediate cause for Bruno's exile from Italy), that proceedings were twice taken against him in the Naples convent "first for having cast away certain images of the Saints and retaining only a Crucifix, thus coming under suspicion of despising the images of the saints. And another time for having . . . recommended a novice who was read the *Istoria delle sette allegrezze* (The Tale of the Seven Joys) in verse that he should throw this away and read some other work such as the Lives of the Holy Fathers." <sup>5</sup>

With such uncommon ideas it is not surprising to find Bruno leaving Italy in 1576, when the afterglow of the Italian Renaissance was fading to the dusk. The Catholic Counter-Reformation, before the turns in Spanish fortunes occurred and the increasing strength of Holland and England became evident, could no longer afford to make even superficial concessions to "heretics" like Bruno. It relied increasingly on the Inquisition, the Index, and the questionable methods of the Jesuits, to enforce cultural homogeneity. Bruno was twenty-eight when he escaped from Italy in order to avoid persecution for his revolutionary ideas. He travelled throughout continental Europe, but his definitive works were written somewhat later; in England. These were the years just before the defeat of the Armada, when the approaching showdown with Spain encouraged an attitude of defiance to Scholastic authority.

Avignon, Padua, Wittenberg and Oxford were but a few of the intellectual centers that Bruno came to. The stir he created reverberated throughout Europe. It became uncomfortable to have him around. Those people who did show Bruno personal kindness usually made clear that this kindness could be repayed in full merely by repudiating his subversive and unconventional views. To one such gentleman, the Marchese de Vico of Naples, he replied, "I do not intend to adopt the religion of the city. I desire to stay here only that I might live at liberty and in security." <sup>6</sup> It is quite interesting to note the attitude Bruno takes towards preaching his doctrine in strange places, for it reflects not merely the intensity with which he propounded his beliefs,

but more profoundly, it reflects his belief that knowledge and truth know no national or regional boundaries. Bruno is thus one of the first thinkers to assert the international character of ideas. Feudalism constricted the dissemination of knowledge by emphasizing the "traditions of the past." Capitalism saw in the past only a tool for reshaping the future, and was thereby led to adopt an expansive, universal view concerning the character of scientific knowledge.

**Arm:** It is said that one must not be a reformer in a foreign country . . .

**Fil:** And I assert two things: first, that one must not kill a foreign doctor, because he intends to perform those cures which those of this same country do not perform; and second, I declare that, to a true philosopher, every land is his fatherland.<sup>7</sup>

Bruno was no more prepared to exercise constraint in the face of academic reaction than he was towards ecclesiastical reaction. To be sure, the two forms of reaction were by no means separated from each other. In May 1579, he inscribed his name in the Rectors Book of Geneva University, and three short months later we already find Bruno publishing a violent attack on Antoine de la Faye, a distinguished professor of philosophy at the university, a close friend of the rector, and a learned translator of the Bible. Bruno exposed what he felt to be twenty errors in a single lecture delivered by this influential professor. From this philosophical controversy proceeded the first in a series of arrests, each time Bruno pleading that the interpreters of what he had written and spoken were stultified pedagogues who could not help but misunderstand the meaning of his views.

Just as there can be little question as to Bruno's intellectual integrity, so too, there is little doubt that he was far from being a great tactician or that he even gave the question of tactics any consideration. Bruno epitomizes the future bourgeois romantic individualist, defying all physical and spiritual odds for the pur-

pose of presenting his principles irrespective of the consequences. His great polemical shortcoming was the naive faith in the power of abstract truth; if only the doctrines he taught were listened to they would be understood. The assumption governing this approach is that ideological discourse is the prime thing in determining man's consciousness, when, in fact, just the converse is true. Ideology is ultimately molded and determined by the social relations human beings enter into. In all truth, it has to be said that Bruno's antagonists understood far better what it was they were defending than Bruno knew what it was he attacked. To be sure, Bruno was aware of the immediate, concrete situation, but not so was his understanding of the broader consequences of his philosophical concepts. His failure to view things in their broader socio-political aspects proved costly on more than one occasion.

Although Bruno may not have been the most popular lecturer on philosophy with the academicians at the universities where he taught, he must have been extremely popular with the student body, for having hastily acquired his doctorate in theology he was immediately elected by the students of Toulouse to the faculty.<sup>8</sup> Bruno's detestation of hypocrisy and quackery in the moral fibre of philosophers and theologians, in addition to their corrupt teachings, was a perennial theme throughout his vast writings, and we may be sure the same was true of all his academic activities. It is no wonder then, that he came to be despised by the dogmatic philosophers he criticized and at the same time welcomed by the uncorrupted, truth-seeking student-body.

In a fierce indictment of the undemocratic character of institutions of higher education, Bruno contrasts two types of professors he came in contact with.

. . . doctors are as cheap as herrings; for just as they are bred, found, and fished with very little effort, so they are also bought at a low price. Such being, then, the multitude of doctors among us in this day and age—though saving the prestige of some who are celebrated for their eloquence,

their doctrine, and their exceptional civil courtesy, for example, a Tobias Matthew, a Culpepper, and others whom I cannot mention—it has come about that having the title of doctor, far from being entitled to a new grade of nobility, is rather suspected to be of a contrary nature and condition.<sup>9</sup>

No more incisive attack on the stiflers of academic freedom exists than Bruno's impression of the general characteristics of the faculty members at Oxford University.

They spoke Latin well, they were proper men, . . . of good reputation . . . fairly competent in learning but mediocre in education, courtesy and breeding . . . , well furnished with titles . . . for 'tis 'yes my master; yes my Father or my mistress; yes sir forsooth;' . . . elect indeed, with their long (academic) robes, clad in velvet. One wore two shining gold chains about his neck while the other, by God, whose precious hand bore twelve rings on two fingers, had rather the appearance of a rich jeweler who would wrench eyes and heart from the amorous beholder . . . Did they know aught of Greek? Aye and also of beer . . . One was the herald of the idol of Obscurity and the other the bailiff of the goddess of Presumption.<sup>10</sup>

Go to Oxford and let them recount to you what happened there to the Nolan when he disputed publicly with those doctors of theology in the presence of the Polish prince Alasco (sic) and others of the English nobility. Would you hear how they were able to reply to his arguments? How fifteen times by means of fifteen syllogisms, a poor doctor who on this solemn occasion they had put forward as a very Corypheus of the Academy, was left standing like a chick entangled in tow! Would you learn with what incivility and discourtesy that pig comported himself, and the patience and humanity of him who showed himself to be born a Neapolitan and nurtured under a more benign sky? Are you informed how they closed his public lectures, both those on the Immortality of the Soul and on the Five-fold Shpere?<sup>11</sup>

Bruno contrasted his own teachings with the dogma of the doctors of philosophy and theology. Against the obscurantism of the medieval Aristotelians he would pit clarity and precision. Against the prevailing emphasis on empty phrases, he would emphasize the things themselves. Against the esoteric speech of the aristocracy he would invoke the language of the people. Bruno was deeply concerned with giving philosophy back to those who create it, the common people.

. . . I shall make you listen to words, which do not have to be deciphered,—not being distilled, nor passed through a retort, not through a water glass, nor sublimated through the prescription of the quintessence. I shall speak such words as my nurse taught me—my nurse who was as greasy, as big-bosomed, as big-bellied, as big hipped, as big rumped, as only that Londoner was . . .<sup>12</sup>

Those who are well versed in phrases and names, and do not preoccupy themselves with things themselves, ride the same mule as that revered father of mules.<sup>13</sup>

The struggle to secure academic recognition and independence, was a battle Bruno did not wage alone; although at times he may have thought so. Bruno had the support of an important segment of the rising burgher class, the *haute bourgeoisie*, a group that proved essential in the drive to free science and philosophy from the fetters of medieval ideology. The power and influence of political figures such as Sir Philip Sidney and Sir Fulke Greville were large factors in ensuring a wide and sympathetic audience for Bruno's philosophy of the universe. Correspondingly, intellectuals such as Tobias Matthew and Martin Culpepper, through their constant help and encouragement, enabled Bruno to deliver his devastating attacks on the dogmatic metaphysics of the Schoolmen.

Bruno unified the humanist aspirations of the Italian Renaissance into an organic system of thought; crystallizing the viewpoint of the social class which intended to profit by the limited and careful application of the "law of reason." Bruno's natural

philosophy, whether consciously or otherwise, led to the advancement of very concrete class interests. This is not to imply that the classes which built capitalist society were themselves without their contradictions. Even at this early period they were split at the economic foundations of society as well as in their ideological and intellectual pursuits. There was a profound difference in the social role of a financier, a farmer working for the market, a wool merchant, or a feudal lord turned mine owner. The promotion of secular ideas was not dear to the heart of any of these sub-classes of the bourgeoisie. They preferred the "divinely inspired" philosophy of Thomas Aquinas to the "base materialism" promulgated by Bruno. It was primarily the aforementioned *haute bourgeoisie*, often allied with elements of the old nobility turned capitalist, which promoted new ideas. The petty merchant may have had his share in the promotion of arithmetic or navigation, but we find the great intellectuals and scientists identifying themselves with the Italian patrons, the French noblesse de robe, the retainers of the Charleses in England, the Dutch patriciate and the Spanish government officials. Bruno came under the guidance and protection of the French Ambassador to London, Marquis de Mauvissiere. Newton became a high-placed representative of the Whigs, Leibniz a servant of those Guelfs whom these same Whigs called in to be their kings. It is clear then, that Bruno was expressing the outlook not even of the bourgeoisie in the abstract, but of a concrete segment of the rising classes in sixteenth century life.

The very position of Bruno, coming as it did in a period of social revolution and counter-revolution, made him prey for all kinds of scoundrels, charlatans and informers. And after years of warding off prison sentences, excommunications from the major established churches and ceaseless defamation of character, the consequences any individual faces who presents ideas which represent a serious threat to the old social order, Bruno was delivered into the hands of the none too merciful Inquisition.

Ever since the days of another great Italian intellectual, Francesco Petrarca, national unity had been a dynamic theme in Italian thought. And now, more than two centuries later, the

national hopes were still being blighted. In terms of national interests, the arrest of Bruno, when he returned to Italy in the final decade of the sixteenth century, was more than the persecution of an individual. It was the suppression of the creative force that had made Italy the most productive and technologically advanced nation in Europe.

The history of informers has a biblical derivation. And in all ages since the Bible's account of Judas was first presented, the position of the informer has been similarly sordid. The pattern of "stool-pigeoning" has changed little in three-thousand years. After having been lured back to Italy, from many years of exile, by the wretched informer Mocenigo, Bruno was turned over to the Inquisition. State and church cooperated both to arrest and confine Bruno to prison. At Bruno's trial, Mocenigo crudely stated that he "acted by the constraint of his conscience and by the order of his confessor" in turning Bruno over to the ecclesiastical authorities.<sup>14</sup> Mocenigo felt it necessary to explain that when he hired Bruno to teach him the art of learning, he was unaware of Bruno's "truly heretical views." But when he heard these unorthodox views during the two months that Bruno spent at his house, he determined to incarcerate and at the same time denounce him.<sup>15</sup> The informer's real scheme, however, was presented by another of the prosecution's witnesses: it seems that Mocenigo had "doubts" about Bruno, but he was anxious to absorb what he could of Bruno's wisdom; this would then be considered full payment for his material support of the philosopher. Then Mocenigo would denounce him before the Holy Office thereby allaying all who might have held him (Mocenigo) in suspicion.<sup>16</sup>

The rest of this famous trial of ideas was nothing but a series of denunciations, a fervent attempt to get Bruno to recant his "godless" cosmology and philosophy. Upon his refusal to do so, on the grounds that he did not in the least consider his views heretical or impious, Bruno was convicted by the Venice Inquisition. It was not enough for the inquisitors to kill Bruno's body. First they had to make an effort to kill his soul.

They took him to Rome. The Roman inquisitors were not will-

ing to yield such splendid prey to the inquisitors of Venice. They realized how powerful Bruno's mind was, how great his knowledge. The philosopher had not yet been born who could best him in philosophical argumentation. So he must refute himself. He had praised science, he had defended her. Then let him spit in his beloved's face in the presence of all, let him call her names, let him forsake her forever. But there was no torture that could make Bruno do this. He had been made ready for his ultimate test by years of battle. More than once he had said: "Be persistent. Do not lose your courage. Do not retreat, even if the court of ignorance threatens you and tries to destroy your noble labor. There is a high tribunal of reason which can distinguish light from darkness. True and incorruptible witnesses and defenders will rise to your cause. And your enemies will find your avengers in their own consciences."<sup>17</sup>

And after nearly a decade of frustrating physical and mental torture, the verdict was declared. It was death. This was a significant result of the re-emergence of Catholic power in Italy. The church acted against him at the moment when the Medici's economic alliance with France strengthened the papacy and distracted attention from the incredible trial. The progenitor of the rationalist philosophy of capitalism faced his accusers in February, 1600, when arrangements for the coming alliance was completed. Having waited for seven years, the Inquisition proceeded with indecent haste. Sensing that the Inquisitors were fearful of the possible repercussions his execution would have among the people, Bruno, with a threatening gesture addressed the judges: "Perchance you who pronounce my sentence are in greater fear than I who receive it."<sup>18</sup> Nevertheless, the death sentence was carried out on the seventeenth of February, all the while the papal authorities were admonishing Bruno to recant. He died with these brandishments ringing in his ears.

The struggle to secure intellectual freedom is simply part and parcel of the fight for an extension of human freedom, merely a segment of the whole front. It is an especially vital segment because it concerns the ideological fibre of an entire people. The brutal censorship imposed on the concepts formulated by Bruno

helped to inhibit the growth of science and philosophy in Italy for over a century. Contemporary victims of the ideology of repression, and all who cherish the quest for truth are in some form victims, may derive courage and hope from knowing that on the very site of Bruno's humiliation and martyrdom there gathered to do him honor in 1889, representatives from almost every nation. This served as one more vindication that ideas which truly represent the course of nature and society can no more be permanently stifled than the natural and social processes themselves. At the dedication of Bruno's statue in the Piazza dei Fiori on this occasion, speeches swelled with the noble sentiments, seemingly more easily aroused for past spokesmen of freedom and science than for present-day sufferers of a similar variety of tyrannical suppression of thoughts untrammelled by dogma. "Farewell ye ashes, yet in these ashes is the seed which renews the whole world."<sup>19</sup>

Not even three centuries cooled the ardor of the pious children of the Inquisition. On the day thirty thousand people paid homage to Bruno, Pope Leo XIII fasted. It is said he issued an address to the Curia which was to be read in all churches. One discovers therein an important echo of that species of Christian charity and understanding that was exercised so freely in the sixteenth century. Bruno was denounced as "a man of impure and abandoned life:

a double renegade, a heretic formally condemned, whose obstinacy against the Church endured unbroken even to his last breath. He possessed no remarkable scientific knowledge, for his own writings condemn him of a degraded materialism and show that he was entangled in commonplace errors. He had no splendid adornments of virtue, for as evidence against his moral character there stand those extravagancies of wickedness and corruption into which all men are driven by passions unresisted . . . His familiar accomplishments were insincerity, lying and perfect selfishness, intolerance of all who disagreed with him, abject meanness and perverted ingenuity in adulation,"<sup>20</sup>

Were Bruno to hear this, he would have probably answered in the manner of Galileo, but courageously, not in whispers, "all that you say may be true, but the universe is still infinite and it still contains an infinite number of changing phenomena." And while the Pope wept, Rome sang its praises to Italy's great philosopher of the Renaissance. Berti, Bruno's biographer, said: "Monuments are our great instructors: I would that from this statue of Bruno our youth learn the quality and the amount of sacrifice which is the price of loyalty to our conscience. It behooves us all to see that the grand records be not lost and that every nation pay regard to them."<sup>21</sup>

Bruno teaches us a supremely valuable lesson: that a life of loyalty and devotion to the cause of science and man, who is the great benefactor of this science, may not result in immediate egoistic pleasures so highly prized and praised by bourgeois moralists. It is rather a life rewarded by a far greater pleasure, the knowledge that the ultimate victory belongs to those that carry and generate a truer and deeper understanding of the material universe. "The world will know that this noble and divine product has not died in its swaddling clothes, but has been promised a long life, that is, as long as this earth, with its living back, goes on revolving in the eternal sight of the rest of the stars."<sup>22</sup> The twentieth century most certainly has had its share of informers and despoilers of intellectual integrity, but at the same time, this century also bears witness to the inevitable victory of science and life over dogma and death.

## INTRODUCTION

IN GATHERING MATERIALS for a projected history of the ontological status of dialectics, I was led in the course of research to examine Renaissance thought, particularly the philosophy of Giordano Bruno. I discovered that unfortunately, the dialectical method had not received any sort of comprehensive treatment at the hands of American and British scholars. It was necessary to draw the further conclusion that as a result of this neglect, the entire system of the infinite universe evolved by Bruno could not help but be presented in a one-sided fashion. This is the prime reason for writing this study on the interconnection of philosophic system and dialectical method in Giordano Bruno. However valuable many of the books on Bruno's philosophy and cosmology may be, they all exhibit a virtual paralysis when dealing with the following five topics.<sup>1</sup>

First, all studies are agreed that the revolution in the natural sciences had a thorough-going effect on Bruno's system of "the infinite universe containing an infinite number of worlds." But none have tapped the Copernican discoveries, which was the earliest phase in the conquest of a scientific world outlook. This would have made them better able to comprehend the effect it had on his conception of dialectics. While it is true that the *origins* of Bruno's dialectical method stem from Heraclitus, Pseudo-Dionysius and Nicholas of Cusa, the *outcome* of Bruno's method, as this author will attempt to show, transcends all previous use of dialectic. The main reasons for this are the advances in sixteenth century cosmology, physics and mathematics, and the corresponding qualitative changes in the mode of production brought about by the disintegration of medieval society and the rise of capitalism. Because of these profound developments, Bruno was able to formulate, for the first time in the history of philosophy, a dialectical theory of evolution based not on Platonic idealism or Plotinian mysticism, but on the results of science.

Second, none of the English speaking commentators have done any sort of justice to the powerful, and at times, dominant materialist strain in Bruno's philosophy. Bruno has been classified as a "theist," . . . "mystic," . . . "pantheist," . . . "eclectic," . . . "idealist," and as a last resort a "theistic-pantheist," whatever this may signify. The two chief consequences this empty labelling has resulted in, is confusion and one-sided interpretations. It is little wonder, therefore, that Bruno's materialist strain, however inconsistently developed and thought out it may be, remains buried beneath this heap. It is not improper, even at this point, to say that Bruno's interpreters, in general have failed to see that with the rise of capitalism in Italy, philosophy not only became more "dialectical" but increasingly came to rest on a materialist footing.

Third, while Bruno's polemics against the Aristotelian cosmological order has been accorded adequate treatment, the reverse side of Bruno's attack on Aristotle has all but been ignored. Bruno understood far more keenly the link between theory and method, than do his interpreters. And so in the process of demonstrating the archaic character of Aristotle's views on cosmology he was forced to oppose Aristotle's method of formal logic with its metaphysical insistence on the "law of identity." The net result of the neglect of method in Bruno has been either to ignore the dialectical method entirely, or to deal with the dialectic as a "point" in an endless chain of "points" in Bruno's cosmological-ontological system. Hence, there appears a bifurcation of system and method, a division which Bruno himself rejected. Bruno's dialectical philosophy is pregnant with meaning, not merely in terms of his theory of the universe, but especially because of its influence on the course of more recent dialectical thought.

Fourth, Bruno's philosophy has been treated more as the efforts of an antiquarian alchemist, than as the work of a great philosopher who developed a vital and dynamic body of ideas, many of which remain in the forefront of philosophical analysis. Sterile biographical treatments, or studies which emphasize a single work of Bruno's to the virtual exclusion of all others, this

has been the net result of treating Bruno as some sort of historical peculiarity. Both types of analysis, the "single work" and "biographical," have but limited value. It would be amusing even to suggest that a mere biographical treatment of the Platonic dialogues, or the isolation of any single dialogue, would yield the richest philosophical harvest. The same is of course true for Bruno; to reap the greatest understanding, his philosophy has to be treated as a unified and systematic whole. It is, to be sure, important to know that Bruno was burned at the stake, but it is of greater importance to see what it was in his doctrines that made such brutal reaction inevitable.

Fifth, all work on Bruno's philosophy claims to be written with the "impartiality" and "objectivity" of Olympian gods. One author even goes so far as to claim that he is completely avoiding interpretation, not even realizing that the very process of sifting and selecting material contains the element of theoretical assumption. As I once had occasion to say in a paper on Plato: ". . . it is necessary to show the systematic unity of a philosopher's thought . . . such a logical and historical systematization is a necessary test of any interpretation. Those who believe that they do not need an interpretation, that they can know a philosopher through his work and take him "just as he was" are mistaken. They cannot but interpret both the man and his work; but since they are not aware of this fact, their interpretation is necessarily naive and uncritical. A critical evaluation, however, must try to reconstruct the philosopher's thought as a consistent edifice."<sup>2</sup> This reconstruction must have its roots in the economic, scientific and philosophical currents of the historical epoch in which the philosopher lived.<sup>3</sup>

It is with the above criticisms of other efforts to understand the philosophy of Giordano Bruno that this study is submitted. This work is not offered as a definitive analysis of the whole of Bruno's philosophy, or even of a single aspect. My book is intended as a broad survey of the interconnection and interaction of system and method in Bruno's philosophy in the light of the scientific and historical forces which shaped his views. The would-be reconstructor of Bruno's system of thought must not

be content to dwell among the incidentals of the system but must seek to lay bare his central thought. Having done this, he must fix the system as a moment in a larger historical-philosophical development. Finally, having grasped the system in itself and in its context, he must record exactly what he finds, neither adding nor altering but concerned only with making an accurate transcript.

In so far as my efforts in these directions are successful, this work can serve as a slight corrective measure in future treatments of the greatest philosopher of the Italian Renaissance.

# PART I

## SCIENCE AND NATURAL PHILOSOPHY

### *Chapter One*

#### *The Revolution In Cosmology*

"MODERN NATURAL SCIENCE, the only one which comes into question *qua* science as against the brilliant intuitions of the Greeks and the sporadic unconnected investigations of the Arabs, begins with that mighty epoch when feudalism was smashed by the Burghers."<sup>1</sup> In view of the thoroughly revolutionary character of the "new science" it is hardly possible to deal with such an all-embracing topic in a single volume,<sup>2</sup> much less in a single chapter. However, the two questions which can be resolved here, are: How great an impact did the revolution in science have on Bruno's world-outlook? And, what was the precise nature of that impact on his system and method?

We may perhaps gain some insight into the first aspect of the problem by dealing with the earliest phases of the conquest of science, namely, the development in cosmology. There can be little doubt that the "Copernican revolution" had a profound effect on Bruno's philosophic framework. He says of Copernicus:

This important, subtle, diligent and mature mind was ordained to exist as the dawn heralding the re-emergence of the sun of the true philosophy.<sup>3</sup>

Cosmology and philosophy, particularly metaphysics, have in all ages been closely linked. And as I hope to demonstrate, the views Bruno derived from the new cosmology are crucial to both his vision of infinity and to his dialectical method.

For two thousand years the Platonic-Aristotelian conception of the cosmos reigned supreme. With slight modification it dominated European thought down to the Renaissance.<sup>4</sup> In the Aristotelian framework, the universe is treated as a series of concentric spheres with a central motionless earth. Immediately enveloping this anthropocentric world are "Spheres" of the three other elements, arranged from within and moving outward in order of decreasing density. These were Water, Air and Fire. The

outermost limit of these is the limit of the mundane or sublunary sphere. Beyond is a further series of seven concentric spheres, each the abode of a single planet, moon and sun being reckoned as planets. Outside these planetary spheres is the sphere of the *Primum Mobile* which has motion imparted to it by divine power, thus causing it to move each of the spheres within.<sup>5</sup> In the passages accessible to medieval writers, the general view of the universe which Aristotle propounds, these are the ideas that were emphasized:<sup>6</sup> the concept of the perfect nature of circular motion,<sup>7</sup> the natural position of the earth as central to the universe and of the elemental spheres just outside it,<sup>8</sup> as well as the necessity of postulating an unmoved mover beyond the whole.<sup>9</sup> Aristotle further explains that the heavenly bodies must themselves be firmly attached to the rotating spheres.<sup>10</sup> In discussing the motions of the planets he puts forth the view that each planet must be moved by several concentric spheres whose equators are, however, not parallel but inclined to one another. Aristotle thus attributes fifty-five spheres to the planets, or by another calculation forty-nine.

Aristotle was neither astronomical observer nor mathematician.<sup>11</sup> His relatively simple scheme, integrated into his philosophy which had become dominant in Medieval thought, had been elaborated, through necessity, by certain of his successors among the ancients who were both astronomical observers and constructive mathematicians. That these early revisionists were equal to the task is attested to by the fact that thinkers right up to the publication of Kepler's *Astronomia nova*, including Copernicus and Tycho Brahe, believed that all heavenly bodies move in circles. All held this type of motion was "perfect," that is, always moving equal distances in equal times.

But the Aristotelian scheme in its various presentations was soon found inadequate to explain all the observed motions of the planets. For this purpose two mathematical devices were invoked, the excentric, or circle with a movable center, and the system of the epicycle on a deferent. The excentric circle was the name given to the path of a planet which revolved uniformly about a center that itself moved in a relatively small circle

around the earth. A fundamentally similar device provided for each planet a small circle, known as the epicycle, on which the planet revolved around a center which itself was carried around a larger circular orbit called the deferent. Thus every point along the circumference of the deferent became in turn the center of the epicycle. This mathematical theory of the universe was brought to highly complicated perfection by Claudius Ptolemy, the astronomer, geographer and mathematician. He gave a complete and lucid compendium of the entire range of astronomical science up to his era in the *Mathematical Syntaxis*.<sup>12</sup> Ptolemy specifically explains that either of the two mathematically devised systems described above can be used inter-changeably; but where it is necessary to explain two divergent movements, the two methods are to be combined.<sup>13</sup> During many centuries Ptolemy's scheme worked satisfactorily for the purposes of astronomical prediction. With the expansion of industry and commerce, the errors in his Tables gradually accumulated over a period of time so as to make them seriously inaccurate for astronomical prediction. Spurred on by the increased demands of a more developed technology, the difficulty was patched up by a group of astronomers assembled at Toledo by King Alphonso of Castille. They were given the task of making a fresh series of observations on which were based the "Alphonsine Tables" which were issued about 1270. Thus modified, the scheme of Ptolemy remained the generally accepted conception of the universe until Copernicus' revolution in astronomical theory.

What was the challenge that Copernicus "after thirty years' hesitation threw down to ecclesiastical superstition?"<sup>14</sup> His work was, in fact, much less revolutionary than is often supposed. Copernicus still maintained the general Ptolemaic view of a series of concentric spheres in circular motion around a motionless center and limited by a sphere of fixed stars. The "revolution" Copernicus achieved was putting the sun in place of the earth as the motionless center of the universe. He conceived of the earth as the occupant of one of the rotating planetary spheres. The core of the new approach to cosmology was stated by Copernicus himself:

First and above all lies the sphere of the fixed stars, containing itself and all things, for that very reason immovable; in truth the frame of the Universe, to which the motion and position of all other stars are referred. Though some men think it to move in some way, we assign another reason why it appears to do so in our theory of the movement of the Earth. Of the moving bodies first comes Saturn, who completes his circuit in thirty years. After him, Jupiter, moving in a twelve year revolution. Then Mars, who revolves biennially. Fourth in order an annual cycle takes place, in which we have said is contained the Earth, with the lunar orbit as an epicycle. In the fifth place Venus is carried round in nine months. Then Mercury holds the sixth place, circulating in the space of eighty days. In the middle of all dwells the Sun. Who indeed in this most beautiful temple would place the torch in any other or better place than one whence it can illuminate the whole at the same time? Not ineptly, some call it the lamp of the universe, others its mind, and others again its ruler—Trismegistus, the visible God, Sophocles' Electra, the contemplation of all things. And thus rightly in as much as the Sun, sitting on a royal throne, governs the circumambient family of stars . . . We find, therefore, under this orderly arrangement, a wonderful symmetry in the universe, and a definite relation of harmony in the motion and magnitude of the orbs, of a kind it is not possible to obtain in any other way.<sup>15</sup>

Neither mathematically nor philosophically was the change considered profound by sixteenth century thinkers. Copernicus still considered the stars as really fixed and motionless in their unchanging position in the eighth sphere. The universe remained finite and an affair of circles and geometric constructions. Copernicus maintained that the rotation of the earth's sphere carried the earth to perform one revolution around the sun in the course of a year. He further ascribed to the earth a spinning motion around its own center as the cause of the phenomena of alter-

nating day and night. This is the general cosmological conception which Copernicus presented to mankind.<sup>16</sup>

All this was accepted by Bruno, but for him it was but an elementary stage in the search for a more exact, and yet more comprehensive cosmological science. The universe Bruno envisioned is not merely of different arrangement but of a completely different order to that pictured by Copernicus. Bruno revolted against the Aristotelian world picture in a far more conscious and thorough-going manner than did the extremely cautious Copernicus. For Bruno space was infinite. The sun was merely another star and the stars were in reality suns, each with its own train of planets moving about freely, with an animation common to all living things.<sup>17</sup> In view of all this movement, inter-relatedness and unity it would not be incorrect to say that Bruno had an organismic conception of the inorganic world.

The universe exhibited a pattern that was endlessly repeated throughout space like a design on wallpaper. Bruno's chief argument for the existence of an objectively boundless universe proceeded from the notion that the powers of God are unlimited and therefore they must find expression in an infinite work of creation. Otherwise His capacities would be realized only partially. Bruno hypothetically stated many cosmological propositions that experimental science has since proven to be accurate: That the stars are not fixed in a sphere, that the solar system contains an infinite number of planets, that a comet is a sort of planet, and other discoveries of a somewhat less important character.<sup>18</sup>

It was truly a remarkable intuition of Bruno that the new framework sketched by Copernicus was transformed into but part of a great cosmological system. It is true enough that this system had been glimpsed by certain thinkers, notably the ancient mechanists. But both critics and followers of Copernicus in the sixteenth century saw in his work only a re-arrangement of the well established world scheme which dated back to Plato's *Timaeus* and Aristotle's *De coelo*. "To Bruno and to Bruno alone the suggestion of Copernicus entered into the pattern of a completely new cosmological order. In this sense Bruno not only

anticipated Galileo and Kepler, but he passed beyond them into an entirely new world which had shed all the dross of tradition. It was a great vision which, from the very nature of the case, could not be shared in full neither by his own nor by the succeeding generation."<sup>19</sup>

We can therefore assert unqualifiedly that the revolution in the natural sciences, particularly in cosmology, had not only a profound effect on Bruno's philosophy, but that he in turn exerted a mighty force in releasing cosmology from its medieval fetters and in further grounding his theory of an infinite universe on a scientific basis.

Still to be examined is the precise character of the impact of the new cosmology on Bruno's system and method. It is on this problem that we must now focus our attention. The entire fabric of Bruno's philosophic edifice rests on the idea that there exists an infinite universe containing an infinity of solar systems. Bruno looked upon the universe as a vast interrelationship throughout space, rising and decaying in time, including all phenomena, material and formal. Bruno's conceptualization of a new and vaster universe which was suddenly bared to man, brought about the further ontological realization that the universe can be grasped as a substantive unity; as an entity qualitatively different than any of its parts. The universe was thought to be a great organism whose dwelling place is the infinite reaches of space. For this philosophical realization of the infinity and divinity of the universe, a view which helped sweep away the blinding barriers of theology, Bruno is very much indebted to the revolution which was taking place in astronomical knowledge during his lifetime.

By this knowledge we are loosened from the chains of a most narrow dungeon, and set at liberty to rove in a most august empire; we are removed from presumptuous boundaries and poverty to the innumerable riches of an infinite space, of such beautiful worlds.<sup>20</sup>

**Nothing** can be viewed as limited and restricted. No particle

of matter is devoid of self-motion. As one looks out towards the infinite stretches of the universe, man everywhere comes in contact with a power akin to him, which is nearer to him, in fact, than he is to himself, and yet which pulsates through the remotest regions of the heavens, and informs all things.

It is not reasonable to believe that any part of the world is without a soul-life, sensation, and organic structure. From this infinite All, full of beauty and splendor, from the worlds which circle above us, to the sparkling dust of the stars beyond, the conclusion is drawn that there are an infinity of creatures, a vast multitude, which, each in its degree, mirrors forth the splendor, wisdom, and excellence of the divine beauty.<sup>21</sup>

Accordingly, we must rid ourselves of the paltry notion that it is for us that all things are created. Bruno completely rejects a metaphysics which is "man-centered" and subjective. Rather, he adopts one which is "universe-centered" and objective.<sup>22</sup>

Only one bereft of his reason could believe that those infinite spaces, occupied by vast and magnificent bodies, are designed only to give us light, or to receive the clear shining of the earth . . . it is a feeble human creature that fancies himself the only object worthy of the care of God. The earth is but a planet, the rank she holds among the stars is but usurpation; it is time to dethrone her. The ruler of our earth is not man, but the sun, with the life which breaths in common through the universe. Let the earth eschew privilege; let her fulfill her course and obey. Let not this contemplation dispirit man, as if he thought himself elevated beyond measure, and his intelligence is no longer deprived of breathing space beneath a sky, meagre, narrow, and ill-contrived in its proportions. And better still, if God is everywhere present in the whole of the world, filling it with His infinity and with His immeasurable greatness, if there is in reality an innumerable host of suns and stars, what of the foolish distinction between the heaven and the earth?

And so the distinction between the divine, and the secular, or earthly, disappears before a wider knowledge. This is that philosophy which opens the senses, which satisfies the mind, which enlarges the understanding, and which leads man to his only true beauty; for it frees him from the solicitous pursuit of pleasure, and from the anxious apprehensions of pain, seeing that everything is subject to a most good and efficient cause.<sup>23</sup>

In Bruno's conception of the universe it will be observed that he stresses two distinct aspects. On the one hand, Bruno insists upon the unity of the whole. Reality is an eternal spirit, one and indivisible, and as such it alone possesses truth. All things that appear in sense perceptions are but images of this ultimate reality. Bruno propounds a "picture theory of reality" to account for the primitive acquisition of knowledge. But since only reason can set factual knowledge in order, it alone possesses the ability to know the objective universe truly, absolutely. Consciousness or spirit is, in the opinion of Bruno, objectively diffused throughout the universe. And to grasp this objective spirit one has to employ his faculties of reason, for the senses are inept in the face of this "essence." This is a characteristic feature of Bruno's idealist strain, a feature which greatly attracted the attention of the German classical idealists; particularly Schelling and Hegel.

From this spirit, which is One, all being flows; there is one truth and one goodness penetrating and governing all things. In nature are the thoughts of God. They are manifest in figures and vestiges to the eye of the sense; they are reproduced in our thoughts, where alone we can arrive at consciousness of true being.

We are surrounded by eternity and by the uniting of love. There is but one celestial expanse, where the stars choir forth in unbroken harmony. From this spirit, which is called the Life of the Universe, proceeds the life and soul of everything which has soul and life, the which life, how-

ever, I understand to be immortal, as well as in bodies as in their souls, there being no other death than division and congregation.<sup>24</sup>

All opposition ultimately is taken up by this eternal and universal synthesis. Unlike present day materialist dialectics, Bruno has the *unity* rather than the *struggle* of opposite forces the central factor of the external "real" world. In this, he may be said to anticipate the *causa sui* doctrine of Spinoza, but definitely not the *struggle of opposites* doctrine of Marx and Lenin. His ontology has also the other, equally important aspect which tends away from mere abstract formal unity. The infinite universe is the whole, but its unity consists of opposite tensions co-existing in time. The universe is therefore complete in every finite part as a result of its interconnection with the infinite whole. Infinity is in the blade of grass, in the grain of sand, in the atom that "floats in the sunbeam," as well as in the boundless All. Each man is a point (monad) in which the fullness of infinity is reflected. The universe is represented by each one of its finite parts. It is the microcosm which in miniature reproduces the great infinite macrocosm. With Bruno, "man is a mirror within a mirror," and his perception of things is a reflection of infinity, which in turn is a reflection of the thought of God, "the spirit animating nature." Such a view has a good deal in common with panpsychic idealism which regards activity, movement, vitality as the characteristic of spirit. It regards everything as alive in this sense, treating all matter as imbued with spirit. It is Bruno's close connection with panpsychism that has led some interpreters to believe that Bruno is a pantheist. But this term (pantheism) often serves to muddle the issues involved rather than clarify them.

How it happened that Bruno completely transcended the cosmological theories of his time is intimately linked up with his ontology: with his system of an infinite universe, and with the theory of the dialectical motion *within* this universe. The exact manner in which Bruno deals with these problems we must reserve for a later section. However, one thing can be stated with

assurance: namely, that there are two themes playing upon each other in Bruno's philosophical analysis. The first is the system of the one, absolute infinite universe. The other is the dialectical method he adopts to deal with the system.

In formulating his system and method, both the contributions of past philosophy and the discoveries of contemporary experimental science were incorporated by Bruno with great skill. To present, as some contemporary commentators have, Bruno's system and method as being devoid of scientific content, is to deprive Bruno of the very interconnection which elevates his philosophy above simple medieval speculative thought. The charge of "unscientific" may be justified when dealing with Ficino or Paracelsus, or even Ramus, but it is unwarranted and untrue for the philosophy of Bruno. What makes Bruno's dialectics so radically different from that of Nicholas of Cusa is the huge advances in scientific knowledge during the hundred years separating the two dialecticians. And what makes his cosmological views so different from those of Copernicus is the dialectical method. To write, as Arthur O. Lovejoy has, that "in the essential outlines of his (Bruno's) system, and especially in the dialectical method which determined these outlines, Bruno is neither more nor less than a Neo-Platonist of the Renaissance," cannot but lead to a total mis-evaluation of Bruno's philosophy.<sup>25</sup> To discuss Bruno's dialectical method in terms divorced from his conception of the inorganic, physical universe, provides as Heraclitus had occasion to say: "a wisdom of one's own,—much learning, bad science."<sup>26</sup> This is not to deny the role that Neo-Platonist philosophers like Plotinus, Pseudo-Dionysius and Cusanus had in shaping Bruno's ideas concerning dialectics. But if his philosophy did no more than comment on, or even synthesize previous uses the dialectical method was put to, Bruno would have stature only as a commentator, not as a philosopher.

The broadest ontological lesson that Bruno gleaned from the revolution in cosmology was the conception that the natural universe is an infinite variety of phenomenal occurrences in which all things live and move in diversified and rational patterns. For Bruno, as for Hegel, the real was the rational, and

the rational was the real. From this Bruno concludes that ontology has for its sole object of investigation the infinite universe; characterized by the rational harmony of the whole through the dialectical motion of all its parts.

A perspective has now been developed from which an evaluation of the impact of Greek and Medieval philosophy on Bruno's system and method can be ascertained.

## Chapter Two

### *The Heritage of Greek and Medieval Philosophy*

**THE RISE** of experimental science generated the search for adequate philosophic generalizations. For these generalizations more than the corpus of Aristotle's and Aquinas' writings were required. The re-introduction of materialist ideas filled this need. The more inroads science made upon theology, the more pressing became the need to formulate a philosophic synthesis based on the new science. Thus we find that Renaissance philosophy has as its general theory, materialism; and for its method of analysis, rationalism. The rise of capitalism in Italy produced for the first time a search for the principles of the science of *social* movement, i.e. Machiavelli. The growth of the experimental natural sciences witnessed a corresponding search for the basic principles of the laws of matter and motion, i.e. Bruno.

The role given to the ethical and religious considerations so all-pervasive in the idealist philosophy of the Feudal era progressively decreased in importance with the revolutions in society and science that took place in the sixteenth century.<sup>1</sup> Knowledge of the material universe appeared once more as the ultimate goal of philosophic research. As was the case with the pre-socratics, Italian Renaissance thinkers focused their attentions on supplying science with broad generic concepts. These revolutionary ideas came about not as a result of "pure thought," but out of the requirements of an economic and social situation. Materialist philosophy and materialist views of matter developed by men who were not materialists themselves, became an important cog in the rising town civilization of the Renaissance. Manufacture was developing. Comfort was growing and men took more interest in civilization and less in the world to come. But the rising burgher class had a stiff fight with the feudal lords, who represented the dominant social force of the preceding period; and on the side of feudalism was the Church.

The sharpness of the socio-economic conflict in Italy resulted in an equally fierce struggle between philosophic materialism and philosophic idealism. The very existence of the rising classes dictated that objective reality be placed in the forefront of all investigation and experimentation. In so far as Renaissance philosophy pressed towards the liberation of scientific and social ideas from ecclesiastical domination it bore the ripest of fruits. With many qualifications and exceptions, and acknowledging much actual confusion of interests, it may be said that the struggle for a new philosophical foundation that took place in sixteenth century Italy, accompanied and assisted the struggle of a new class for economic and political power. The philosophic struggles of Renaissance Italy offers abundant evidence that there is no philosophy that is not part of a social system.

The bourgeois scholars, in their revolutionary search for the *new* as a means of bursting theological fetters, seized at first upon the *oldest* philosophical ideas. The re-evaluation of ancient philosophy generated by the Humanist movement was eagerly taken up and pushed even further by Renaissance philosophers. They revived interest in the fragments of the Greek natural philosophers for the very practical reason that it seemed the best way to combat the Scholastic (Aristotelian-Thomist) tradition. As Goethe accurately stated: "the way to Nature led through Greece." By drawing upon the writings of the ancient materialists, Renaissance philosophers were better able to reflect the basic transformations unfolding in their own epoch. Reinterpretation and re-introduction of Greek thought was heuristically employed to beat down the ceaseless attacks of the Scholastics, as well as for the purpose of successfully overcoming the challenges of the new civilization. The more philosophy established itself as an independent secular discipline, devoid of extra-philosophical commitments to theology, the more its peculiar task was held to be knowledge of the material universe. "Philosophy shall be natural science, this is the watchword of the time."<sup>2</sup> The history of philosophy in the Italian Renaissance is, broadly speaking, the history of the conquests of a materialist ontology and a rationalist method.

The transcendence of Medieval philosophy did not mean its utter and complete negation. The very fulfillments of the tasks of Renaissance philosophy historically necessitated that it proceed along the traditional medieval modes of thought. The characteristic metaphysical conflicts of scholastic philosophy: rationalism vs. empiricism and nominalism (a nascent and at times disguised form of materialism), vs. realism (objective idealism), were never resolved by Medieval scholastics. Hence, in addition to the more significant and qualitatively new problems generated by capitalist relations of production and advances in the natural sciences, Renaissance philosophy had the task of patching up as best it could the "traditional problems" of philosophy. The fact that Medieval philosophy could not resolve its conflicts, is indicative of the general inability of feudalism to resolve its contradictions at the economic base. A society which demands that its philosophy regard man as a volcanic force to be kept in subjection, that it should serve as an instrument of class oppression, can never overcome its contradictions. It must regard any views which threaten to destroy an implicit trust in the philosophic framework of society as not only false but highly dangerous. When this takes place on a large scale the knell of the old order is sounded; as indeed it did for feudalism. Hence, it became a central task of Renaissance philosophy to resolve, or to discard if the situation demanded it, the major philosophic questions of the medieval period.

In general, then, it may be stated that philosophical conceptions have always in the last analysis reflected the economic development of society and therefore the standpoint of definite classes which have been the principle protagonists in that economic development; but this reflection is a complicated and indirect process, mediated by the personalities of the philosophers; by the pre-existing ideas which they have received from their predecessors; by the entire complex of the political, legal and moral development of society; by the progress of technical invention and scientific discovery; and, in the bourgeois epoch, by the peculiarities of national development in the various countries.

The career of Bruno attests to the accuracy and significance of these introductory statements. The contributions of all past cultures, and the contemporary developments of science and society, found expression in Bruno's encyclopedic philosophy. His cosmological vision provides a vivid illustration of this. The two philosophers who most influenced his ideas on an infinite universe, Lucretius and Cusanus, occupy contrasting poles in philosophy. Lucretius, the atomistic materialist, denied the validity of theological and metaphysical thinking. Cusanus, the dialectical idealist, sought in his cosmology and even in his physical experiments a reinforcement of his mystical and theological views. The polar concepts of these two thinkers yet provided the very fabric of Bruno's systematic edifice concerning the infinite universe.

Bruno, like many Renaissance philosophers, had a profound understanding of the role past ideas must play in the formation of any genuinely new world outlook. To illustrate this we have only to see what thinkers Bruno constantly emphasizes. In terms of his philosophic system, the figures who emerge and re-emerge are Democritus and Epicurus, from whom Bruno received his ideas of the material character of the infinite universe.<sup>3</sup> For the monistic conception of the universe he is indebted to Parmenides. And for the "theory of universal forms" Bruno drew heavily from the writings of Plato and the medieval Platonists.<sup>4</sup> He steeped his dialectical method in the works of Heraclitus, Plotinus, Pseudo-Dionysius, and most especially in the work of Nicholas of Cusa. Broadly viewed, the focal point of Bruno's system of infinity is ancient classical idealism, while the locus of his method is late medieval philosophy and Greek materialism.

If a new conception of philosophy was to be framed, Bruno clearly recognized that the huge impact of Aristotelianism could not be ignored; it had to be fought. To the task of vanquishing both the system and method devised by Aristotle, Bruno applied himself most dilligently. There is scarcely an area of philosophy that Bruno grappled with that does not contain at least an implicit critique of Aristotelianism. With reasoned and systematic resoluteness he tears away the mask of Aristotle's metaphysics,<sup>5</sup>

logic and cosmology in a manner excelled only by Francis Bacon for thoroughness and balance.<sup>6</sup> The main difficulty in Bruno's polemics against the various phases of Aristotelian system and method is his retention of the very categories he condemns Aristotle and his followers for holding. This is not merely a linguistic or semantical difficulty. For the retention of Aristotle's categories of Form, Matter and Substance reflects a fundamental weakness in Bruno's own philosophic edifice, namely, his inability to make a complete and thorough-going break with an essentially fixed view of objective reality. The problem is not in the retention, for these categories are essential in philosophy, but in Bruno's failure to give new meaning to these concepts. This failure to deepen plays no small role in accounting for the paradoxical relationship of a method which postulates motion as endless and immutable, and a system that postulates an infinite universe as unchanging and immutable.

The point of departure for the materialist strain in the Nolan's ontology are "the propositions of Democritus and Epicurus." Bruno believed that "there is an infinite plenum, and vacuum, the one situated in the other, and some relating to the other."<sup>7</sup> However, the material universe is not merely the beginning of Bruno's philosophic enterprise, it is the entire fabric of it.

Nature makes everything out of its matter by way of separation, birth and effusion, as the Pythagoreans understood, Anaxagoras and Democritus comprehended, and the sages of Babylonia confirmed.<sup>8</sup>

Implicit in Bruno's rejection of the Aristotelian final cause, is the belief that matter is a primary category in the finite aspects of reality. Form receives its content from matter. For Bruno, the assumption that an "Idea" or "Form" of a thing can exist without matter being already presupposed is fallacious. Bruno inherited from the Arabic thinkers, Avicenna especially, the proposition that "matter contains the seeds of all forms."

. . . nature needs to have for its operations a matter; because it is not possible that there be an agent which, when it

wishes to make something, does not have that out of which it can make it: or likewise, if it wishes to work, does not have that on which to work. There is then a kind of substratum from which, with which, and in which, nature effects its operations and its work; and which is by nature endowed with so many forms that it presents for our consideration a variety of species.

. . . nature so to speak, works from within its subject or matter, which throughout is formless. Therefore, the subjects of art are manifold, but the subject of nature is one; because the former being diversely formed by nature, are different and variegated; the latter, being formless, is entirely indifferent, since all difference and diversity stem from the form.<sup>9</sup>

Matter may take on a variety of forms but it is still prior to and independent of any particular formation it may receive. Bruno makes clear that matter is not “passive” or “dead.” It is constantly in motion; it is a changing flux. This concept Bruno also attributes to the Greek mechanists, using them as a weapon in opposition to Aristotle’s view of matter as mere potentiality.

Democritus and Epicurus, who maintained that everything throughout infinity suffers renewal and restoration, understood these matters more truly than those who at all costs maintained belief in the immutability of the universe, alleging a constant and unchanging number of particles of identical material that perpetually undergo transformation one into another.<sup>10</sup>

It cannot be alleged that Bruno’s rejection of the Democritian edict, “that which is not corporeal is nothing,” that he automatically rejected materialism as a philosophy. For as Bruno himself asserts: “the word (matter) has different meanings in many schools.”<sup>11</sup> Bruno is more concerned with the crudities in the *mechanism* of Leucippus and Democritus than he is in opposing their *materialism*. It is really out of his criticisms of mechanism that Bruno constructs his system of cosmological wholeness. He

points out than an organic whole is always more than the simple sum of its parts. A living organism is something more than an aggregate of physico-chemical processes. The task of knowledge, as Bruno sees it, is not to analyse a whole into its parts, but to note the characteristic features of the entire phenomenon as a whole. This strict regard for the whole is in flat opposition to the crudities of mechanism, yet it can fall into an even worse crudity itself. This Bruno aptly demonstrates. In his hands the theory of absolute wholeness excludes the development of the universe. Although Bruno recognizes the wholeness of the universe to exist in conflict, he does not see that replacement and destruction are by no means absolutely harmonious. Bruno closes his eyes to the sharp breaks, the destruction of the old, and the contradictions that generate development. Thus to account for an evolved whole that is now in a static condition it becomes necessary for him to invoke some kind of miraculous intervention. Bruno contrasts vitalism with the ancient brand of mechanism without realizing that both exist in unbroken unity. Each one possesses in the other "its other." In their conflict is disclosed their internal kinship.

It is in Bruno's use of ancient materialism that the significance of his "inverted Aristotelianism" becomes manifest. He clearly holds the view that the totality of reality is more than corporeal reality. This view, taken by itself, does not rule out materialism, for the basic conflict between materialism and idealism is not whether matter is the totality of existence, but whether matter is *primary* in existence. The great divide in philosophy is between those who assert that matter exists objectively and independent of any mind or spirit, and those who believe that mind or spirit is primary in existence. The answer given to this problem makes one either an idealist or materialist. As Engels notes: "The answer which philosophers gave to this question split them into two great camps. Those who asserted the primacy of spirit to nature and therefore, in the last instance, assumed world creation in some form or other . . . comprised the camp of idealism. The others, who regarded nature as primary, belong to the various schools of materialism. These two expres-

sions, idealism and materialism, primarily signify nothing more than this; and here also they are not used in any other sense.”<sup>12</sup>

For Bruno, matter in a sense, is primary. It is actuality while form is potentiality.<sup>13</sup> Form is thus a derivative, the specific organization, of the material substrate, while both are seen as derivatives of a Spinozistic type of substance. The thing to note about Bruno is his many-sided, eclectic development. The seeds of both materialism and idealism exist side by side. However, the strictures of his system of the universe make him wind up in the labyrinth of objective idealism.

The materialist strain in Bruno is most evident when the relation of form to matter is under consideration.

... matter contains the forms and implies them, this is more appropriate than to think that it is empty of them and excludes them. That matter, then, which unfolds what it has enfolded must be called the divine and excellent progenitor, generator and mother of natural things; or in substance, the entire nature.<sup>14</sup>

What characterizes this materialist strand in Bruno (and modern materialism in general), irrespective of what its detractors make of it, is not that everything must be reduced to material particles, as Democritus taught. Obviously on such reductionist grounds one could not adequately account for the genuine existence of ideas, concepts, beliefs, ideologies and all other *reflective* phenomena which exist truly in human consciousness as reflections of material reality. The standpoint of a materialist theory of reality is that matter, in its philosophic usage, must be considered independent of and prior to human or transcendental cognition; that consciousness owes its existence to this prior existence of a material universe. In so far as Bruno satisfies this criteria he must be viewed as a progenitor of materialist philosophy. To the extent that he allows a “universal substance” and a “spirit emanating all of nature” to become dominant, he is an idealist. ➔

The determination of Bruno as materialist or idealist is a highly complex problem, and terming Bruno a pantheist tends to obfuscate rather than clarify the issues involved. Before the ad-

vent of dialectical materialism all materialist philosophy is shot through with importations from idealism. At the same time, those idealisms which are dialectical are to a large degree progressive in that they lead to a solution of problems of movement and development.

Any study of idealism and materialism will show that, although each has a broad distinctive unity, each likewise has many divergent forms. There are some questions on which there is more agreement among some types of idealism and some types of materialism than among all within each group. In pre-Marxist philosophy there were idealist tendencies in some types of materialism, and materialist tendencies in some types of idealism. Thus the supernaturalist may regard pantheism as materialistic since it refuses to admit of disembodied spirits, while the materialists may regard pantheism as idealistic in view of its adherence to an objective spirit or consciousness that exists independently of the material world.

Therefore, even though a clear idea of what is meant by materialism and idealism can be established, the question of whether Bruno is an idealist or materialist is far more intricate a problem than the determination of some present-day philosophy, since it was only in the modern era that there was a consistent formal analysis as to the nature of philosophic materialism and idealism.

The very polarization of trends in contemporary philosophy makes a solution of this problem easier. These difficulties make it imperative to discuss Bruno concretely, weeding out the different strands in his thought. Only by so doing, can a true estimation be made of Bruno's contribution to materialist or idealist philosophy.<sup>15</sup>

Another large debt Bruno owes to ancient materialism is his central doctrine of an infinite number of worlds within an infinite universe.

. . . we declare that there are an infinity of earths, an infinity of suns, and an infinite ether—or as Democritus and Epicurus have it, an infinite plenum and an infinite vacuum, the one placed within the other.<sup>16</sup>

There is, however, a distinctly new aspect of Bruno's idea of a plurality of worlds existing in one infinite universe, an aspect that is alien to the Greek mechanism of Democritus and Epicurus. Bruno regarded the plurality of worlds not as a mechanical juxtaposition, but as an organic living whole. Like Heraclitus, he taught that the process of growth and decay in worlds was an organic part of the "one divine All-life." This offers a fitting parallel to Heraclitus' "all in one."

Bruno's infinite universe is limitless. It is that which is simply and absolutely perfect. The measure of its possibility corresponds to the measure of its actuality. This being the case nothing greater or more perfect can exist. Power, Being, volition and action are identical in the realm of infinity. The nature of universal substance makes it imperative that an infinity of things and worlds exist in all possible modes, for if they did not exist the primary conception involved in the necessity and perfection of an infinite and perfect substance would be contradicted.

All Greek philosophy, up to and including Plato, subscribed to the view that the universe is rational in every way. Heraclitus sought the rational in the changing, Plato in the unchanging. The Platonic conception of universal harmony appears to have had a particularly profound influence on Bruno's idea that the potentiality of all phenomena is implicit in the already completed universe. From the proposition that "everything is interconnected" he is led to assume that "all things are in all."<sup>17</sup> Bruno's search for an all-governing principle that can reconcile the contradictions in things, is at the root of his conclusion that the rational universe is harmonious in its "essence" and changing only in its infinite manifestations. In this search the Platonic "receptacle" looms large in Bruno's reconciliation of the problem of changing worlds in an infinite and unchanging universe.

There is still another aspect of Plato's metaphysics that influenced Bruno, namely, Platonic imagery. There can be little doubt that Platonic dialogues such as the *Cratylus*, *Parmenides* and *Timaeus* greatly influenced the poetic temper of Bruno's philosophy. The ideal of uniting science and poetry was common to both thinkers. Indeed, not since Plato had such poetry and im-

agination been incorporated into a philosophic system with such success. Of course, the extent to which Bruno's mythological imagery can be directly attributed to Plato is difficult to estimate with any degree of exactness, for imagery and poetry is a characteristic trademark of almost all philosophers who influenced him from Lucretius to Cusanus.

For the "key" to Bruno's rationalism, one has to see the systems of Democritus and Plato not only with their differences, which, to be sure, are fundamental, but also with their similarities of method. It is a fallacy to suppose that mechanism has nothing in common with absolute idealism. For example, both Democritus and Plato are outspoken rationalists in their epistemology and ontology. Both held that there exists two different types of reality: to perception, a relative and transient reality; to thought (conception), a reality which was homogenous, abiding and absolute, a unity which transcends all differences. Bruno's outlook clearly parallels this cardinal belief of Greek rationalism. Bruno accepted in large measure the rationalist method of Plato and Democritus, however, he leaves none doubt his preference for the scientific rationalism of the atomists as against the ethical rationalism of the Platonists. The reason for this is easy enough to understand: ancient mechanism had its base in materialism, while Plato's rationalism was unscientific in the sense that it was anchored to an objective idealism. The disturbing impact of experimental science and capitalist social relations made it impossible for Bruno to be simply a "neo-platonist of the Renaissance."

Rationalism as a theory of knowledge, because of its cancellation of the practical and empirical basis of reason, led Bruno into many one-sided and forced conclusions. Though Bruno grasped, in a nascent and rudimentary form, many of the concepts of materialist dialectics, a crucial dialectical epistemological idea which he failed to grasp was the interconnection and interpenetration of sense evidence and reason, and the verification of all concepts in social and scientific practice. This failure proved costly, for it led Bruno to sacrifice dialectics on the altar of a fixed, immutable system of infinity.

Like Plato, Bruno attempted a "reconciliation" between the

Parmenidean doctrine of an unchanging substance, and the Heraclitian teaching of an ever changing flux. Bruno had to bring about "harmony" not by a bifurcation of reality into matter in motion as the degenerate "appearance" of a higher order of perfect "Forms" and "Ideas" as Plato had. The central role Bruno gave to matter made such a synthesis impossible. The Platonic resolution merely skirted the problem of change by the simple expedient of denying its reality. Bruno, too, had to ultimately deny the reality of change. But he had to do it by *transcending change*, not merely by denying its real existence. Bruno found a solution in combining the categories of "unity" and "opposition" in such a way that they would mutually interpenetrate. The "many" are perfectly taken up in the "one." Only by so doing could Bruno's monistic world structure be preserved in the face of the endless motion posited by dialectics. Bruno's "harmony of strife" is felt to be insufficient in accounting for the existence of an infinite universe. The grandeur of the universe demands a "harmony without strife". In an analysis of substance and change which takes place in the last dialogue of *De la causa*, Bruno says that:

. . . . that which is generated and generates (either be it an equivocal or univocal agent, as those who philosophize commonly say) and that of which the generation is made are always of the same substance. And thus, it will not sound hard to your ears to hear the statement of Heraclitus, who said that all things are one, which through its mutability has in itself all things, and since all the forms are in it, consequently all definitions are conformable to it, and all contradictory propositions are true. And that which makes for multiplicity in things is not being, is not the thing, but that which appears, that which is represented to the senses, and that which is in the surface of the thing.<sup>18</sup>

From this we can gather that Bruno, while retaining the traditional Platonic notion of "appearance and reality", rejects a dualistic ontology in favor of a monistic conception of the universe

which contains within its bosom all plurality. In the same discussion, Bruno gives his impression of what the nature of Being (or Substance) is.

. . . that as the soul . . . is in all the great vastness to which it gives being, and is in itself indivisible, and consequently the same throughout all, and in whatsoever part entirely, so also the essence of the universe is one in the infinite, and in whatsoever thing taken as a member of that; so that in fact, the whole and every part of that, comes to be one according to substance; therefore, Parmenides has not unsuitably called this one, infinite, and immobile: be it as you wish with his intentions—which is uncertain because it has been related by a not too faithful historian.<sup>19</sup>

The attempted synthesis by Bruno of the views of Heraclitus and Parmenides serves well his efforts to account for the contradictions we observe in nature. All he did was follow in Plato's footsteps by supposing to exist an underlying "unity" which takes up the contrary features of the "many." It is this distinctly Neo-Platonist use of the dialectic that has come to be termed the "resolution of the closed triad." That is, the view that all contradictions and conflicts are synthesized forevermore in the harmonious wholeness of universal substance. Bruno made the classic mistake of supposing that the unity of development implies the identity of all things.

From the foregoing, it seems that Plato and Bruno are in agreement in so far as they both elevate "universal substance" to the status of "reality," and attribute dialectical movement only to phenomenal "appearance." However, many passages can be cited to show that this agreement to relegate dialectical laws to the realm of the spurious is not consistently followed out by Bruno. The unity of opposite forces becomes quite "real" and "objective" when he discusses problems more centrally related to science and method.

You have heard more than once that some, in whose compo-

sition fire doth predominate, are by their own quality bright and hot. Others shine by reflection, being themselves cold and dark, for water doth predominate in their composition. On this diversity and opposition depend order, symmetry, complexion, peace, concord, composition and life. So that the worlds are composed of contraries of which some, such as the earth and water, live and grow by help of their contraries, such as the fiery suns. This I think was the meaning of the sage who declared that God createth harmony out of the sublime contraries;<sup>20</sup> and of that other<sup>21</sup> who believed this whole universe to owe existence to the strife of the concordant and the love of the opposite tensions.<sup>22</sup>

Certainly Bruno means his doctrine of the unity of contraries to be taken in its full dialectical sense when he reproaches Aristotle for his "narrow minded adherence to the principle of contradiction." The Stagirite "wandered farther from the goal at every step when he said that contraries could not co-exist at the same time in the same subject."<sup>23</sup> At this point in the essay it would be neither prudent nor convincing to attempt a resolution of the ontological status of dialectics in Bruno. Any adequate conclusion to this problem must await an analysis of Bruno's distinctions between "form and matter," "potency and act," "Intellect and Being," and the distinction between "intensive and extensive infinity." Only at the point where the dialectical method is examined concretely is it possible to determine whether Bruno attributes contradiction to the infinite universe, the parts of the universe, or to specious subjective apprehensions. Questionable though the ontological *status* of the unity of opposites is in Bruno's philosophy, there is no doubt concerning the ontological *resolution* Bruno offers on the relationship of system to method.

Bruno arrived at a wide-spread concept of medieval metaphysics when he upheld the existence of an ultimate synthesis (be it called Nature, God, Infinity or Substance, be it in an objective or subjective realm), which permanently and immutably cancels and takes up all contradiction and diversity. This synthesis is itself a unity without opposition, for it transcends all of

its contradictory parts. It is the totality of being taken as an "identity." It thereby becomes ridiculous to talk of that which is "more than totality" for the One unified whole of necessity transcends any of its parts because it is greater than any of its parts. This thesis was held in common by Pseudo-Dionysius, Proclus, Cusanus and Bruno; it is the resolution of the closed triad. For these dialecticians, the triadic relation of "thesis, anti-thesis and synthesis" is not an endless or "open" process generated by opposite forces, instead it is a process that reaches a definite point of absolute culmination. At that culmination point, the dialectic of movement ceases to operate; process becomes transformed into non-process. Bruno's commitments to a closed system of the universe compels him to negate dialectical movement itself. If Bruno had seen infinity as *nothing but* the totality of finite things in motion this problem could have been avoided. But since he saw infinity as the sole reality, as that which is *greater than* the totality of finite things, he would either have had to abandon his concept of infinity altogether, or abandon the concept of the objective reality of motion. Bruno chose this latter path.

The concept of "unity" which Bruno adheres to, extends far beyond the attempted resolution of a metaphysical conflict between Heraclitus and Parmenides. The categories of necessity, fate, will, and nature itself, are all believed to comprise a single unity when viewed in terms of the highest category, God or Substance. The reminder is clearly of the Plotinian statement that to reach the "ineffable One" it is necessary to pass through diverse stages or forms in order to ultimately attain to the divine. For Plotinus as for Bruno, the divine whole comprises all of its parts, and at the same time, is greater than any of its parts. The Nolan writes:

Is then the body not the final habitation of the soul? No, for the soul is in the body not as location but as intrinsic form, extrinsic formative influence . . . The body is in the soul, soul in mind. Mind either is God or is in God, as said Plotinus; and since the mind as essence is in God, which is the life

thereof, similarly by the act of mind, and by the consequent act of will, the mind turns to His light and to His beautiful object. Worthily then is the passion of heroic inspiration nourished on so exalted an enterprise. Nor is this because the object is infinite, in act most simple, and our intellect unable to apprehend the infinite save in a certain manner of thought, that is, as potentiality, even as he who is at the edge of an immense wave pictures to himself an end where no end is. For indeed there is no final end.<sup>24</sup>

While it is obvious that Bruno accepted the Plotinian idea that the One resolves all diverse manifestations of itself, this does not necessarily include any commitments to supernaturalism. Bruno is in no sense a transcendentalist. He investigates God, or the One, only in so far as some all-synthesizing principle is supposedly revealed to us in the natural universe. If Bruno were pressed to explicitly state what he meant by God or the Universal Intellect, his reply would have to be that "He" is nothing more than Nature taken as a totality. This "God-intoxicated" philosopher is more truly intoxicated with the grandeur and magnitude of infinity.

God is therefore the universal substance in existing things, a being who comprises all things, who is the fountain of all being, in whom exists everything that is . . . just as the nature of a thing is the foundation of its being, so, more profoundly, God is the foundation of that very nature itself.<sup>25</sup>

There is little doubt that Plotinus greatly influenced the character of the idealist strain in Bruno's ontology. However, ascribing to Bruno a doctrine of transcendence which "is as fully determined by the 'negative theology' as that of Plotinus, of the Areopagite, or of any theologian or mystic,"<sup>26</sup> is as close to a total misconception of Bruno's ontology as one can get. Such a view misses two essential things. One, the obvious quest for "unity" which is central in Bruno's monistic universe. Second, the framework which he places a dominant emphasis on excludes supernaturalism and mysticism.

Nicholas of Cusa exercised a more profound influence on Bruno than any other medieval philosopher. It is not difficult to find reasons for this. Cusanus rejected the formal logical method and "faith" philosophy common to scholasticism. He placed his complete trust in the rationality of the universe and all its creatures. He was able to express himself in exquisite poetical and imaginative fashion. Above all, Cusanus developed a conception of the unity of contraries which was to have a marked influence on Bruno's method.

As flavored as was Cusanus' outlook with mystical idealism, he did not allow his dialectical method to become totally submerged in ecstatic visionism. "Wisdom is the son of God and where it is received there is received also Filiation to God."<sup>27</sup> He propounded the view that since infinity cannot be grasped by mere feeling, there is needed a love of reason, the love of that which we have recognized and known as good. Cusanus says that knowledge and ignorance become united, and that to attain a glimpse of infinity human faculties must employ their "intellectual vision."<sup>28</sup> For the Cusan "the instrument of reason is mathematics," because it provides a basis of framing a logical method consonant with the glories of an infinite universe.<sup>29</sup> Mathematics is introduced to display the validity of the dialectical method. If all things proceed through contradiction, it is obvious to Cusanus that the law of non-contradiction and the structure of lower mathematics does not provide a suitable ground for understanding the infinite universe.

Nicholas of Cusa followed in the rationalist tradition. Perceptual apprehension does not admit one to the kingdom of rational, hence true knowledge. Experiences derived from sensory observation are, at best, hypothetical and conjectural. In this idea of "conjecture" the Cusan finds the link between creator and creation, ideas and their manifestations, and absolute and relative truth. "Conjecture is a positive assertion in place of truth, having some part in truth."<sup>30</sup> Single truth can only be manifested to us in difference, but there is no difference which does not in some way attain to and have part in this unity of the whole.<sup>31</sup> From this, Cusanus concludes that in the realm of the

absolute, instead of having identity of contrary forces we have "infinite inter-relationship," which in the providence of God results in a synthesis of all contradiction and opposition.<sup>32</sup> The close proximity between the views of Cusanus and Bruno results in their mutual attempt to save the closed system of the universe by negating dialectical movement. Cusanus makes this quite clear when he says:

Howbeit, this coincidence is a contradiction without contradiction, even as an end without an end. And thou, Lord, sayest unto me that, just as otherness in unity is without otherness because it is infinity. Infinity is simplicity itself; contradiction exists not without becoming other. Yet in simplicity otherness exists without becoming other because it is simplicity itself, seeing that all that is said of absolute simplicity coincides therewith, because therein having its being. Within being, the opposition of opposites is an opposition without opposition, just as the end of things infinite is an end without an end. Thou, O God, art the Opposition of opposites, because Thou art infinite; and because Thou art infinite Thou art infinity itself. And in infinity the opposition of opposites exists without opposition.<sup>33</sup>

"There cannot be a great multitude without great diversity."<sup>34</sup> By this edict Cusanus unites all opposition in the infinite God. He found in the figure of Christ the reconciliator of all contradiction between finite and infinite, sense-perception and soul-reason, and mind and matter. "Christ synthesizes everything."<sup>35</sup>

The conception of contradiction worked out by Bruno will be gone into more fully in a later section. For the present it suffices to say that Bruno places his dialectical method in a framework not too different from the Cusan's. With the very central difference being that Bruno strips from dialectic the mystical idealist interpretation. In this fact alone the one-hundred years that separate Bruno from Cusanus plays no small part in our evaluation. Cusanus was a philosopher of feudalism in a period of its decay. Bruno was a philosopher of capitalism in a period of intensive

growth. Cusanus knew nothing and cared less for the revolution taking place in the inorganic sciences. Bruno, on the other hand, was a leading figure in ensuring the success and further development of this scientific revolution. Bruno's natural philosophy was the foundation of his social orientation. It placed great stress on motion and change, a stress that was alien to medieval traditions. It is not a farfetched inference to claim that his emphasis on change corresponded to the needs of a growing bourgeois class. For medieval philosophy, the earth stood still, therefore society also was without motion. For the Renaissance philosophy of Bruno, the earth was in constant flux. Social systems as part of this world flux must also be in constant change.

The similarities and differences between two figures such as Cusanus and Bruno become evident when one compares Bruno's ideas on the dialectic of infinity with the above excerpts from Cusanus' writings.

Our philosophy . . . reduces itself to a single origin and relates to a single goal, and makes contraries to coincide so that there is one primal foundation both of origin and end. From this unity of opposites, we deduce that ultimately it is divinely true that contraries are within contraries; wherefore it is not difficult to compass the knowledge that each thing is within every other, an idea which Aristotle and the other Sophists could not comprehend.<sup>36</sup>

Bruno continuing in the same vein declares that:

All power and act which in origin is complicated, united and one is in other things explicate, dispersed and multiple. The universe, the great figure . . . the only begotten nature, is also all that it can be through the species and principle members and content of all matter; to which naught can be added and from which nought is wanting, a form complete and unique. But it is not yet all that it can be owing to differences, modes, qualities, individuality: indeed it is but an umbra (shadow or reflection) of the primal act and primal power.

Wherefore power and act are not in it absolutely the same,  
for no parts thereof is all which it can be . . .<sup>37</sup>

A general description of the social, scientific and philosophic influences which were absorbed by Bruno, consciously or otherwise, is no longer sufficient to gain an understanding of Bruno's philosophy. For in the very process of absorbing the thoughts and actions of others he affected a thorough-going transformation. The system and method which Bruno developed was not the system of Lucretius or the method of Cusanus, but was distinctively that of Bruno.

## Chapter Three

### *Nature, Man and the Infinite Universe*

The philosophical system which Bruno develops is as boldly conceived a venture in "system building" as any developed by the ancient systematic philosophers. The universe Bruno holds to be infinite in space and time. It is also infinite in the sense that it contains an infinity of solar systems.<sup>1</sup> Included in this universe is every kind of phenomena, both physical and spiritual. A problem which commanded Bruno's attention at the outset was the relationship between infinity taken as infinite, that is, taken as a totality; and infinity in its finite and changing and limited manifestations. The solution to this question of the interrelationship of finite and infinite was crucial, for immediately implicated is the larger problem of the relation between a motionless universe and the motion of the parts in the universe. Although the conception of the infinite universe worked out by Bruno sundered motion from the fundamental "stuff" of reality, it does not, however, rule out motion in its entirety. For each of the infinitely numerous solar systems is in motion on its course in relation to other parts of the universe. Motion is thus seen as internal to the phases of the infinite universe. As a consequence of this theory Bruno was able to grant the reality of motion *within* the infinite universe, although not *of* the universe.

Before an exposition of Bruno's concept of an infinite universe can be made in any detail, it must be made clear that he treated two separate problems under the same category of infinity. For the sake of this discussion we may call the two, "Nature and the Infinite" and "Man and the Infinite." The former deals with the precise character of the infinite universe and its relation to the infinitely numerous things contained in the universe. This does not mean that Bruno consciously separates the theme of the infinite universe from the theme of man in this universe. Where the one begins and the other leaves off, is often difficult to as-

certain. Yet, there does seem to be a recognition on Bruno's part that the operations of the universe are in no way dependent upon human cognition of these operations. The existence of an infinity of worlds in an infinite universe is held as prior to and independent of man's ideas concerning his place in this objective framework. Therefore, the separation of these two themes is not at all arbitrary, but is a natural development flowing from the content of Bruno's writings on the subject.

Since Bruno disposes of the notion that any particular aspect of infinity is "more special" than any other part, either ontologically or ethically, his position gives rise to the second general aspect, namely, the relation man has to the universe.<sup>2</sup> Dethroned as the "center of attraction," what then remains of human importance when man is but a speck in the infinite cosmos?

These two themes hold Bruno's attention in many of his major works.<sup>3</sup> He not only worked out a daring scheme of great cosmological importance, but he drew conclusions from it that most astronomers, less courageous souls, were fearful of coming to grips with. *On The Infinite Universe and Worlds* is concerned mainly with the problem of the relation that infinity bears to the infinitely numerous worlds. The analysis is begun by defining the limits of sensory data and the role of human reasoning. Although the senses cannot by themselves lead anyone to "see" an infinite existence, it does allow of the possibility, and in fact, the necessity, of drawing inferences from such an infinite reality.

. . . the inconstancy of sense-perception demonstrates very well that sense is no source of certainty, but can attain thereto only through comparison and reference from one sensible percept to another, from one sense to another, so that truth may be inferred from diverse sources.<sup>4</sup>

None of our sense perceptions are opposed to the acceptance of infinity, since we cannot deny infinity merely because we do not sensibly perceive it; but since sense in itself is included in infinity, and since reason does confirm infinity, therefore needs must that we posit infinity. Moreover, if we consider well, sense does present to us an infinite universe.

For we perceive an endless series of objects, each one contained by another, we do not ever perceive either with our external or our internal sense, an object which is not contained by another or similar object.<sup>5</sup>

If sense perception allows us to formulate a theory of an infinite universe, then there is no reason why it can prevent us from further positing the nature of infinity to be both extended and material.<sup>6</sup> Everything which exists objectively, whether it be material or spiritual, occupies some spatio-temporal position according to Bruno. (Although the meaning of an "objective spirit" is far from clarified). Space being infinite it also follows that the universe too, is infinite. For to put forth a finite universe amidst infinite relations of space and time is a contradiction in fact as well as in terms. Here Bruno attempts to demonstrate the epistemological impossibility of a purely finite world.

. . . it is unfitting to name the world finite, and contained within itself, since this condition belongs only to immensity, as shown by the previous argument. Moreover, the third argument is based on the inconvenience and indeed impossibility of imagining the world to occupy no position. For inevitably it would follow that it was without being, since everything whether corporeal or incorporeal does occupy corporeally or incorporeally some position.<sup>7</sup>

Our own surrounding space which appears to us so immense is neither part nor whole in relation to the infinite, nor can it be patient of infinite activity; compared to such activity, indeed, that which can be comprehended by our imbecile minds is merely non-being. And to a certain objection it may be replied that we base our argument for infinity not on the dignity of space but on the dignity of the natures (of worlds), since for the same reason that our space is held to exist, so also should exist every other possible world . . .<sup>8</sup>

The fact that the power which generates the natural universe is seen as limitless and endless and therefore infinite, necessarily

involves Bruno in the further assumption that the universe as infinitely generated must itself be infinite. If this were not so "there would be derogation from the nature and dignity both of creator and of creation."<sup>9</sup> Aristotle's declaration that an infinite agent can bring into existence a finite universe, cannot be taken seriously. Bruno criticizes such an approach as both poor astronomy and still poorer metaphysics.

... no less from lack of will than from lack of power, omnipotence comes to be blamed (by the Aristotelians), for the creation of a finite world, the infinite agent acting on a finite subject.<sup>10</sup>

... if omnipotence does not make the world infinite it is impotent to do so; and if it does not have the power to create it infinite, then it must lack vigour to preserve it to eternity. And if finite in one respect, it would be so in all, for every object and every mode are the same, the one as the other.<sup>11</sup>

Bruno put forth the idea that the motion of the infinitely numerous worlds is not the result of some external force acting upon the universe, as the Aristotelian category of the "prime mover" has it, for this would allow only a change of location not an actual change of the parts of infinity themselves. Motion which is genuine is "intensive," that is, internal to the very structure of the infinity of worlds. This self-generation, declares Bruno, takes place within an infinite "motor-force," which is itself a perfect "unity" devoid of motion. Bearing in mind Bruno's concept of motion within, but not of infinity, his ideas on generation and degeneration becomes relatively simple to grasp. Whitehead had his "eternal objects" (plural) and the "changing events." Bruno, in a somewhat similar manner, but guided by a monistic theory of cosmology, has an "eternal object" (singular) and the "changing things." The metaphysical foundation of objective idealism has apparently changed little in the three hundred years separating the two philosophers.

In spite of his intense opposition to Aristotle's system of cosmology, Bruno, on more than one occasion, is led to "drink from

the well of the Areopagite." Hence, like Aristotle, Bruno effects a bifurcation of motion and reality, into *that which generates* and *that which is generated*, still further, into the *immutable* and the *changing*.

. . . the motion of the infinity of worlds is not the result of external motive forces, but of their own nature, and that despite this there exists an infinite motor force.<sup>12</sup>

. . . infinite motion may be intensively verified in each of the worlds. To this we should add that since each moving body at the same time moves itself and is moved, needs must that it may be seen in every point of the circle that it describes around its own center.<sup>13</sup>

The infinite universe is not a single and undifferentiated whole. To be sure, only infinity taken as whole comprises a "unity without opposition." But the infinite number of parts, organically connected by dialectical opposition must be eternally in motion. The motion of infinity *qua* infinity is "instantaneous." It thereby reduces itself to non-motion; the whole is the "eternal object." The same does not hold true for the motion of the parts because being "limited" by spatio-temporal relations, the finite *qua* finite, lacking the quality of "immutable wholeness," must be in motion; the parts are the "changing things." This classical idealist approach was, interestingly enough, invoked against the Aristotelians. If the motion of infinity differs from the motion of the parts of the universe, then "that beautiful order and ladder of nature (devised by Aristotle) is but a charming dream, an old wives' tale."<sup>14</sup>

. . . every star has motion even as does our own, and those others which are so near to us that we sensibly perceive the differences in their orbits and in their motions: but those suns, bodies in which fire predominates, move differently to the earths in which water predominates; thus may be understood the derivation of the light diffused by stars, of which some glow of themselves and others by reflection.<sup>15</sup>

Motion of the various phases of the innumerable worlds tends toward infinity and to the formation of infinite numbers of compounds. The complexity of nature is due to the ever-constant emergence of new things and events. Bruno is not, however, content with this thoroughly materialist explanation of development. It fails to answer the supposed existence of an immutable reality. More basically, it fails to satisfy Bruno's quest for metaphysical certainty. The motion of a particular set of finite relations, because they preserve their nature as finite, cannot themselves be infinite. This is so, irrespective of the fact that the existence of finite relations are realized within the larger context of infinity. In spite of, or rather because of, Bruno's distinctions between "motion in" though not "motion of" infinity, the dilemma of postulating an infinity of worlds in motion and at the same time an infinity that is unlimited and complete in all ways, constantly rears its paradoxical head to cause Bruno no end of difficulty. This paradox between the changing and the fixed, which is nothing but part of a larger conflict between system and method, led Bruno to deny the existence of *qualitative* change even for finite events. The only kind of motion that Bruno ultimately can allow is change of location. This, in spite of his efforts to avoid such a solution, led Bruno to declare that:

. . . the proper *motion* of each star *results from the difference in position*. (My emphasis)<sup>16</sup>

The calling forth of Cusanus' closed dialectic enables Bruno to grant movement to the aspects of infinity, but since this motion is cancelled by the infinite as infinite, his system of the universe remains devoid of genuine motion and development.

A mechanistic conception of infinity can never yield an adequate theory of the universe. Bruno writes that a mechanical or arithmetical theory may lead to a logically coherent concept of infinity, but it cannot possibly result in an accurate description of the infinity of worlds in an infinite universe.<sup>17</sup> From "conceptual addition" it may be possible to reach an infinite body of a certain kind. The ultimate outcome, however, of such a procedure is a knowledge of an infinite number of finite particles,<sup>18</sup> which, although discrete, find themselves naturally in one con-

tinuous infinite that is the space, the location and true dimension capable of containing all of these "infinite number of finite parts."<sup>19</sup> A mechanistic conception of the infinite universe leads to the absurd consequence of positing "infinite weight" and "infinite lightness." Of still greater consequence, one is nonsensically led to speak of the "place" of the infinite.<sup>20</sup> In this devastating critique of mechanism, the more penetrating side of Bruno is revealed. In a manner of speaking, Bruno anticipates Engels' commentary on the mechanical-mathematical conception of infinity. Writes Engels:

Footnote - Engels

It is clear that the infinity which has an end but no beginning is neither more nor less infinite than that which has a beginning but no end. The slightest dialectical insight . . . (would show) . . . that beginning and end are necessarily interconnected like the North Pole and the South Pole, and that if the end is left out, the beginning just becomes the end—the *one* end which the series has; and *vice versa*. The whole fraud would be impossible but for the mathematical usage of working with infinite series. Because in mathematics it is necessary to start from definite, finite terms in order to reach the indefinite, the infinite, all mathematical series, positive or negative must start from 1, or they cannot be used for calculation. The abstract requirements of a mathematician are, however, very far from being a compulsory law for the world of reality.<sup>21</sup>

Had Bruno thought through his positive philosophy with the same perceptiveness he did his critical philosophy, many mistakes could have been avoided. More attention to Lucretius and less to Cusanus would have provided Bruno with a solid theory of the infinite, because it would have anchored him closer to *material* reality. Herein lies the great strength of the Marxian approach, the approach taken by materialist dialectics. It further reveals the shortcomings of Bruno's analysis.

Engels, basing himself on the positive side of Hegelian philosophy and on the materialism of Lucretius, pointed out that it

is the nature of the finite to pass beyond itself, to negate its negation and to become infinite. The infinite does not stand above the finite as something complete in itself. It is inseparably linked to the finite, the bound. Infinity in general is not created by the cancellation of finitude in general. Because the finite is just that which itself becomes infinity through its own nature. There is then a reciprocal determination of the finite and the infinite. Infinity is the unbounded, while the finite is the bounded. It is the movement of the finite towards "unboundedness" that reveals their indissoluble unity. This unity is manifested through the eternal opposition of the two. Such a conception avoids the dualism inherent in Bruno's cosmology, for it demonstrates the unity of the general and the particular, the infinite and the finite.

Bruno points out that if infinity does not have a specific weight or place, neither is it reasonable to speak of the "motion of" the universe. In rejecting the absurdities of mechanism, Bruno went to the other extreme of accepting a philosophy of substance which denies the reality of motion. The infinite universe does not move either potentially or actually. It therefore becomes increasingly urgent for Bruno to reiterate "that it is different to speak of parts within and parts of the infinite."<sup>21</sup> For it is upon this distinction that the entire fabric of Bruno's immutable universe is woven. If he had postulated motion *of* as well as *in* the infinite universe the entire system evolved would have toppled over for lack of a foundation. Bruno had not effected the clear-cut "break" with Aristotelianism he imagined. Basically he was forced to accept Aristotle's postulate that:

. . . it would not be possible that the infinite should move at all. If it did, it would move either naturally or by constraint; and if by constraint, it possesses also a natural motion, that is to say, there is another place, infinite like itself, to which it will move. But that is impossible."<sup>22</sup>

The insistence by Bruno that "by my teaching . . . you may escape from the innumerable pitfalls" of Aristotle's metaphysics is but partially correct. For although Bruno's system of infinity brought about many revolutionary developments in cosmological theory, the metaphysical conclusions drawn made him

easy prey for the very "innumerable pitfalls" of Aristotle's thought he so desperately sought to avoid.<sup>23</sup>

But once again we have to return to the more "solid" side of Bruno's theory; the more materialistically oriented. Bruno indicates that if infinity has no bounds, if the universe is without finite restrictions and limitations, then it must follow that no particular aspect of the universe can be termed "higher" or "lower", nor can there be any metaphysical "center" or "circumference." Eternity in time, infinity in space, means simply that there is no end in any direction, neither forwards nor backwards, upwards or downwards, to the right or to the left. This infinity is something quite different from that of an infinite series, for the latter always starts from one, with one first term when the fact of the matter is that infinity has no such mathematical "starting point."<sup>24</sup>

"To a body of infinite size there can be ascribed neither center nor boundary . . . Just as we regard ourselves as at the center of that universally equidistant circle, which is the great horizon and the limit of our own encircling ethereal region, so doubtless the inhabitants of the moon believe themselves at the center (of a great horizon) that embraces this earth,<sup>25</sup> the sun, and the stars, and is the boundary of the radii of their own horizon. Thus the earth no more than any other world is at the center; moreover no points constitute determined celestial poles for our earth, just as she herself is not a definite and determined pole to any other point of the ether, or of the world-space; and the same is true of all other bodies. From various points of view these may all be regarded either as centers, or as points on the circumference, as poles, or zeniths and so forth. Thus the earth is not in the center of the universe; it is central only to our own surrounding space."<sup>26</sup>

Precisely because the universe is infinite Bruno insists that we disavow any notion that sets up one finite segment (such as the earth or moon) as occupying a more "esteemed" position than

any other segment. The universe is absolute; but the finite parts are relative in space, time and in human cognition. Thus, the alteration and disintegration of any finite part does not imply an alteration or disintegration of the infinite universe as a whole. This is so because the finite parts of the universe are limited and hence subject to death. The infinite whole, because it "transcends" such spatio-temporal limitations, is unlimited and eternal.<sup>27</sup>

It is then necessary to investigate whether there beyond the heaven Space, Void or Time. For there is a single general space, a single vast immensity which we may freely call the Void; in it are innumerable globes like this on which we live and grow. This space we declare to be infinite; since neither reason, convenience, possibility, sense-percepts nor nature assign to it a limit. In it are an infinity of worlds of the same kind as our own. For there is no reason nor defect of nature's gifts, either of active or passive power, to hinder the existence of other worlds throughout space, which is identical in natural character with our own space. . . Beyond the imaginary convex circumference of the universe is time. For there is the measure and nature of motion, since similar moving bodies are there.<sup>28</sup>

In his cosmology, Bruno sought the solution to the most perplexing problem of classical idealist metaphysics, namely, how to account for change in a universe which boasts of a fixed structure. Bruno's comprehensive and realistic answer is that in the One realm there exists the fixed universal and the changing properties and relationships of this universal object. On a more complex metaphysical plane, Hegel was saying the same thing: that the dialectical processes culminate in the absolute idea, and this "Idea" was for Hegel, as for Bruno, objective and absolute in design. The common error committed by Bruno and Hegel, and in antiquity by Plato, was their insistence on a world which is in some major, focal respect, fixed. Whether it be the Platonic "Form", Bruno's "Infinite Substance" or the Hegelian

“Idea”, some stable entity, some tautological identity, is sought after for the purpose of reconciling dialectical motion. Their mistakes were made on different levels of analysis, but the quest of each to locate the missing link in the “great chain of Being” cannot be ignored even by themselves.

The contemporary scientific emphasis on a theory of process owes a lasting debt to Bruno’s microcosmic theory of dialectics. His emphasis however, on the abstract rational character of process only resulted in his concealing it behind a metaphysically “perfect” structure. It is not until the emergence in the nineteenth century of a thoroughly scientific *materialistic* theory of dialectical evolution, that the “kernel of truth” inherent in past dialectical philosophies (the truth of the dialectical nature of change), is made the central feature of an ontology. The structural foundation is seen not as something standing apart from change but as the process of development itself. Bruno’s difficulty was that he operated with two sets of postulates: one that laid stress on the eternal character of the whole universe, the other emphasizing the lasting nature of change. The antagonistic content of the two sets of postulates made it inevitable that process be ultimately declared incomplete and unreal.

1. Renaissance culture was saturated with this problem of the “parts and the whole”. For example the great synthesizer of Renaissance culture, Leonardo da Vinci, had the following to say: “Every part is disposed to unite with the whole, that it may thereby escape from its own incompleteness,”<sup>29</sup> Bruno too, turns dialectical change into an instrument for demonstrating the imperfectibility of the parts of the universe as against the perfect nature of the universe taken in all its completeness.

Scholasticism as interpreted by Thomas Aquinas preserved a belief in the intelligibility of nature, amid the welter of magic, astrology and superstition, mostly relics of Paganism, which enmeshed the medieval mind. But Thomist philosophy included the geocentric astronomy of Ptolemy, and the anthropomorphic physics of Aristotle with his many erroneous ideas, i.e. that motion implies the continual exertion of force, and again that things are essentially heavy or light and seek their natural places. Hence

the Scholastics opposed the theory of Copernicus, refused to look through the telescope of Galileo, and denied that things heavy and light could fall to the ground at the same rate, even when Stevinus of Bruges and Galileo had demonstrated that fact experimentally.

And an even deeper divergence lay behind these differences. To Aquinas and his contemporaries, the real world was that disclosed to man alone through the senses: a world of color, sound and warmth; of beauty, goodness and truth, or sometimes perhaps of ugliness, evil and error. A world without man, who, after all, is God's highest creature, is for the Scholastics a world lacking in meaning. Under the analysis of sixteenth century scientists such as Copernicus and Galileo, and lesser known figures like Salviani, Konrad von Gesner and Ulissi Aldronandi, the objective world was itself the locus of experimentation and observation. And it was investigated in the manner of ancient Greek materialist philosophy, on its own terms. For the scientists and philosophers of the Renaissance the material universe could only be understood in the light of its own laws of development. Nature had little concern with problems of the beautiful, the good, the true, or their opposites. (As Machiavelli demonstrated, neither did the politico-economic life of men.) The perplexities of a theory of knowledge which takes into account science, the difficulties encountered in the apprehension of matter in motion by human consciousness, appeared for the first time. This in turn generated fresh problems for philosophers like Bruno, as to the actual role of man in a world where he is but a tiny speck amidst the vast cosmos.

Bruno was not so naive that he did not fully understand that his ontological-cosmological views on the infinite universe completely shattered the Aristotelian-Ptolemaic conception of the universe. The implications for humanity are made quite explicit. If the earth does not hold any special rank in the cosmos it becomes impossible for anyone to claim that men are the product of "divine inspiration". Humanity deposed from its Aristotelian-Ptolemaic throne must not, however, feel in any way despondent. One must not think that anything of great value has been sacri-

ficed. On the contrary, the very shedding by man of ignorance concerning the natural universe has given him an immense and incomparable freedom. It is a freedom born of the knowledge with which to control his actions and passions so that they conform to the "actions and passions" of nature. Bruno is not seeking to "overthrow" the position of mankind. Rather, by stripping people of false idols Bruno is attempting to re-establish in a scientific way the foundations of man's greatness.<sup>30</sup> In this respect, Bruno anticipates the same kind of attempt made by Francis Bacon. As John H. Randall points out, Bruno shrank from the view that the universe is but a "meaningless world of rolling suns . . . No, God cannot be found anywhere in the boundless universe just because He must be everywhere; as it is the same life that in me beckons with my finger, beats with my heart, thinks with my brain, so God must be the single life and soul of this infinite universe; 'Nature is God in things'. The power, the life that animates the whole must be that which lives in each of the parts . . . Losing God from the world, he found Him again in the rhythmic life of the universe, in the falling waters and the ripening grain and in the circling of sun on sun."<sup>31</sup>

In a universe which is infinite and eternal, "the flaming bodies of space are the messengers of God, declaring his excellent glory and majesty. Thus our vision is enlarged to behold the infinite effect of the infinite cause, and we are taught to seek the divinity not far off but closer to us than we are to ourselves."<sup>32</sup> Bruno perceived that if the Copernican revolution had diminished the cosmological importance of man, it had exalted him epistemologically, that is, as a Being capable of grasping so large a view. The Aristotelian conception of the universe was based, like the layman's, on sensible appearance. However, it is the function of the intellect to pass beyond mere sense-appearances to the "higher truth" embodied by conceptual knowledge.<sup>33</sup> To accomplish this, says Bruno, we must observe nature anew. The first step in this re-evaluation is to discard the Aristotelian categories of Essence, Attribute and the like. It is not important or valuable to set up ideals that do not correspond with the facts of nature. "True philosophy" must rationally examine natural things and

processes, honestly inquiring into the conditions under which things change shape and the direction natural processes take.

Man's greatness is founded on contemplation. Bruno holds that it is in the contemplation of the infinite universe that men reach the highest peaks of scientific, aesthetic, religious and moral satisfaction. Because every event moves of necessity toward the goal which is intended for it by nature, Bruno's *telos* amounts to nothing more than the belief (inherited from Medieval philosophy) that the more perfect the nature, the more perfect is the tendency to fulfillment. Human tendency and aspiration cannot find fulfillment in finite goods and in finite truths, for this only makes it clearer that there are more goods to be desired and more truths to be known. Because man has the desire to become all things, he is necessarily directed to the contemplation of the infinite universe, which, at one and the same moment, is man's cause, source and goal. The existence of this infinite quest for knowledge implies, in Bruno's theory of reality, an infinite realm to be known.<sup>84</sup> The contemplative spirit is the means through which humanity gains insight into the nature of the "true infinite Being".<sup>85</sup> To escape from relativity in knowledge Bruno is forced to "escape" from all motion. Like all rationalists, Bruno seeks certainty not through social practice but through mental gymnastics. For this purpose it is necessary to transcend the finite and changing impressions conveyed by senses and flee to a realm of conceptualization that can provide man with certain knowledge of the infinite universe.

Bruno repeatedly says that it is the presence of the infinite in man himself that brings out his driving compulsion to "become one" with the infinite realm.<sup>86</sup> Bringing the will and affections under the power of the universe enables man to reach "the perfect object of love." The relative comprehension of objective truth finds its fulfillment, its perfection, only to the degree that it becomes a more perfect comprehension of the infinite universe. It is for this reason that human perfection consists in a form of knowledge by which the knower becomes identified with an infinite realm that waits to be known. As Bruno puts the matter: "To see the infinite is to be seen by the infinite."<sup>87</sup> The relation

of man to the universe is not a relation based on false grandeur, in which the truth of the universe is prostituted for the sake of an artificial security that places mankind at the center of the universe. The true grandeur of men lies in their seizing the supreme truth of infinity by means of reason and in practicing sovereign good by means of the will.<sup>38</sup> The high calling of thinking Beings may be in the contemplation of infinity but not as a mystic or skeptic would. Rather, as the scientist contemplates the universe about him. In this "act of contemplation" the "scientific" becomes one with the "moral." Man both gains his greatest knowledge and achieves his greatest good.

The "love of true wisdom" leads one to believe that the universe endures, ever one and itself, its parts in flux throughout infinity. Bruno comes close to the Stoical view of contemplating nature when he says:

From which contemplation if we apply the mind, we shall neither be dismayed by incidents of pain and dread nor exult in pleasure and hope; we shall pursue the path of right conduct, shall be large-minded observers of puerile thoughts and shall behold greater matters than small gods whom the vulgar adore; we shall secure clear-sighted contemplation of the course of nature, which is written in ourselves, and observe, with even tenor, those divine laws which are given in our hearts.<sup>39</sup>

The same nature, according to Bruno, is to be found in the skies as on our earth. We may discard from ourselves "the vain desire and stupid anxiety and hankering after distant goods; for they are already at hand and with us."<sup>40</sup> Bruno sees in his system of the infinite the way to the opening of the senses and the way in which humanity can enlarge the scope of reason. It is the consideration of the universe in all of its depth and breadth that sets the human spirit free.<sup>41</sup>

Not satisfied with "abstract thought" by itself, Bruno desires active contemplation of an active universe. What he fails to understand is that our sensuous nature is *practical*, human sensu-

ous activity. Practice, by its creation of the unity and mutual conditioning of the sensed and the rational aspects of knowledge, is, at once, a verification of the correctness of both of them, and a measure of the truth of knowledge as a whole. In this same verification there is realized in its turn the mutual transition of the sensed and the logical, and we notice that the verification of any theory—the transformation of it into life—is at the same time a creation of a new objectivity that is now accessible to direct perception. All “contemplative” philosophy fails to realize that practice is the crown and completion of the ideal and, as such, unites in itself both the moment of universality, attainable at once by reason and the great diversity of sensed material. The transformation of scientific theory into life, and the possibility, on its basis, of uniting and dissociating the different forms of movement of the material world that are found outside the human head, and of manipulating them according to previously formed aims—these disclose the close connection of theory with objectivity.

The noticeable lack of emphasis on social and scientific practice makes a good deal of Bruno’s analysis of the relation of man to the universe seem “outmoded.” But if we take cognizance of the epoch in which he wrote, we must conclude that even an emphasis on “secular contemplation” was cause enough for concern among the enemies of natural philosophy. And if Bruno’s efforts to set the human spirit free by means of reason alone appear limited (as in fact they are), then let the reader note the extent to which Bruno was willing to engage in social practice for the sake of thinking freely about the infinite universe. Clearly, the actual career of Bruno proves that all social life is essentially practical. All mysteries which urge theory into idealism find their rational solution in human practice and in the comprehension of such practice. To our other paradoxes, we may add the fact that Bruno spent a lifetime, ended somewhat abruptly, engaging in bitter social and philosophical conflict, and yet advocated a theory of contemplation which was more in keeping with the medieval philosophy he was combatting.

The cause of this unresolved conflict between the active and the contemplative in Bruno is to be located in the economic

fabric of sixteenth century Italy. The Italian Renaissance, built in the first burst of liberation of the bourgeoisie, was on too narrow an economic base in a world still largely feudal. Its own inner contradictions were too much for it. Thus thinkers like Bruno, who mirrored the highest ideals of the Renaissance could not carry these ideals out in actual practice. He helped inject a leaven into the rest of European culture and ideology, but he could save neither himself nor the class he represented.

## *Chapter Four*

### *Dialectics and Reality*

**THE MOST UNFORTUNATE** state of affairs in Hegelian studies is that bourgeois interpreters have placed the greatest stress on the system at the expense of the method. So too, in examinations of the philosophy of Bruno, the main emphasis has been placed on his system of infinity. American and British commentators have been especially wary of dealing with Bruno's dialectical method. There have been noteworthy exceptions to this, but even the "exceptions" do not give an adequate or accurate account of the method of analysis and theory of change employed by Bruno. Those who have ventured to treat his method, on the whole distort the dialectic to a point where the genuine significance of dialectics becomes unrecognizable.

It is the thesis of this study that the dialectical method expounded by Bruno is a decisive factor in the formulation and resolution of his ontology. Both the greatness and the weakness of Bruno's philosophy of the infinite are intimately linked up with dialectics. There is not a single aspect of his philosophy that does not introduce dialectics in at least one of two contexts: as an aspect of motion within the infinite universe, or as a principle of logical analysis. Randall has pointed out the importance of methodology to sixteenth century philosophers. "For those who forsook the authority of the ancients, the chief problem seemed to be an authoritative and infallible method . . . The search for a method that would give certain knowledge was the paramount scientific problem of the sixteenth century. Ironically enough, the very discovery of Copernicus that the earth moved increased the distrust of the senses and experience, and sent men to mathematics as the only unshakeable knowledge. If men's eyes lied here, where could they be trusted? This helps to explain why the mathematical method had already worked itself out to completeness in Newton when experimental science had hardly been

born. In the sixteenth century Ramus spent years elaborating a new method, and Bruno was able to support himself by lecturing to large crowds in every town on his wanderings on a new method of finding truth.”<sup>1</sup>

As shown earlier, the status dialectics occupied in terms of the ancient philosophic problem of “appearance” and “reality” was questionable. Bruno could not fully emancipate himself from the classical notion of dialectics as an inherent mental construct that does not necessarily reflect the dialectical character of the material world. His *scientific* speculations, however, often provoked him into positing dialectical motion as part of the objective natural universe. Here we see Bruno the “lover of paradox” himself involved in the greatest paradox of all, namely, whether the dialectic was objectively in nature or subjectively in mind. The preliminary investigation further revealed that be it objective, subjective or both, the internal opposition in things was totally synthesized when the universe was looked upon as a whole. This is the famous *dialektischer Dreitakt* by which logical thinking marches to the One or the Absolute. The whole process is in the end served up before the system.

Framing a methodology which ignores its ontological commitments, or which refuses to believe that it even has such commitments, is for Bruno a most objectionable position.<sup>2</sup> His criticism of the formal method devised by Plato and Aristotle assumed an intimate connection between logic and ontology. This is so basic a criticism, that like Hegel (or for that matter Aristotle himself), Bruno finds it unnecessary to ever separate the two. He sees in his dialectical method a far more realistic and comprehensive way of appraising objective reality than the method of formal logic could attain. The ultimate synthesis of all natural processes within a single receptacle called infinity allows Bruno no opportunity to affect a clearcut *bifurcation* of reality into two realms. It does, nevertheless, afford him the opportunity of making *distinctions* concerning the one, all-embracing universe. As interesting as this differentia between “distinction” and “bifurcation” is, it cannot be denied that Bruno’s avowed monism often acts as a cover for the different “realms” in the universe, “realms” that

have no connection to each other or to objective reality. Bruno employs the dialectical method in two distinct senses: as a heuristic principle for distinguishing truth from falsity, that is, as a method of analysis. And in a second sense, as a method for describing the most general laws of the motion that takes place within the infinite universe.

Motion, declares Bruno, is not absolute but is a movement of the accidents of being. Motion is an aspect of alteration and development which takes place between the "modes of being". If change is a change of "mode" and not of "substance", then there can be no real qualitative change in the fundamental composition of the infinite universe. Bruno is thus led to adopt two different "principles of motion" which in nature can be reduced to a common origin, infinity or universal substance. The two principles are: finite motion which moves in time with respect to the finite subject, and infinite motion which moves instantaneously with respect to itself. Therefore, those bodies that are moved by virtue of infinity are in reality not moved at all, because instantaneous movement and no movement at all are identical.<sup>3</sup>

The principle of opposition, the cardinal category of dialectics, according to Bruno, does not operate in all realms of natural existence. This is his decisive break with Heraclitus who held that the unity of opposite tensions is the *universal* characteristic in things and events. The infinite universe contains, in Bruno's view of things, contrasting but mutually inclusive types of motion. The motion of matter which is determined by and inherent in the finite bodies; and the motion which is derived from the "infinite first Cause", a motion that is instantaneous and circular.

Thus it is that we can say that God moves all: thus should we understand that He gives the power of self-motion to all which moves.<sup>4</sup>

In *Concerning The Cause, Principle and One*, Bruno explains that the two "antagonistic" attributes, finite cause and infinite first principle, are fused in the divine universe.<sup>5</sup>

In conclusion, he who wishes to know the greatest secrets of

nature should regard and contemplate the maxima and minima of opposed bodies. For profound magistry is to be able to reach the contrary, after having found the point of union.<sup>6</sup>

The One Infinite is perfect; simply and of itself nothing can be greater or better than it. This is the one whole everywhere, God, Universal Nature. Naught but the infinite can be a perfect image and reflection thereof, for the finite is imperfect; every sensible world is imperfect, wherefore evil and good, matter and form, light and darkness, sadness and joy unite, and all things everywhere are in change and motion. But all things come in infinity to the order of Unity, Truth, and Goodness; whereby it is named universality . . . Wherefore as rational and irrational in the animal are indifferent, being a single truth, so in the infinite, in the maxima, hot and cold are assuredly one throughout the universe; and we have often shown them coincident in the minimum as in the maximum.<sup>7</sup>

The dialectic then, is relative to the world of sensations. All of the dialectical forces are perfectly synthesized in the objective, rational universe. In distinguishing the various aspects of Nature by introducing the epistemological categories of reason and sense-perception, Bruno affects not a bifurcation of nature, but a bifurcation of dialectical motion. By means of a metaphysical monism and an epistemological rationalism Bruno tightly seals off the dialectical method. The former relegates motion only to finite parts of infinity while the latter relegates the dialectic to the spurious, uncertain world of sensations. This two-pronged limitation in Bruno's use of dialectics is of prime importance for understanding the lengths Bruno had to go for the purpose of preserving his harmonious and motionless system of the universe.

The multiplicity of movers and of things moved, like the multiplicity of particular things, are united in a simple substance. No finite thing exists which is not in some way related to its opposite, infinity. But this is not the only dialectical relationship between things, for a thing's internal opposition is its limit and

terminal point. Thus every finite thing, by virtue of its "limitation," contains its own negation.

The limit of one contrariety is the principle of the other, and the limit (end-point) of one is the beginning of the other.<sup>8</sup> . . . inside each term or phase, there is a principle of limitation; for where there is motion and alteration, there must also exist simultaneously the limit of one and the inherent opposition of the other.<sup>9</sup>

Dialectical opposition not only gives meaning to a thing but more crucial is also the basis of limitation in a thing. The limited is always described by Bruno to mean the dialectical, and the unlimited is necessarily that which "transcends" dialectics. Any finite thing has an organic relation to its opposite, issuing from the fact that it already exists in its opposite determination as its beginning. What Bruno somewhat confusedly is saying, is that where the limit of one polar opposite (thesis) fuses with the beginning of its contrary which limits it (antithesis), the two opposite forces come into a condition of unity (synthesis). Such mutual interpenetration of opposites is, for Bruno, the "secret" of finite or determinate existence.

It is great wisdom to know the absolute viewpoint after having found the point of union. The contradiction is greatest at the extremes, the greater contrariety is the one nearest the end-point, the least, or none, is in the center where the opposite forces meet and comprise a unity, at this point the opposites are in a relation of indifference.<sup>10</sup>

In Bruno's conception of opposition one finds both "metaphysical opposition" and "dialectical opposition". The former view takes a "thing" and unites it with another, external "thing". The second takes the "thing" as nothing apart from the opposite forces it contains. In the first, the propelling force must of necessity be some "prime mover." In the second, change is accounted for on the basis of the inner tension between the opposite relations.

Sidney Greenberg succinctly relates the basis of determinateness and finitude in Bruno's dialectical method. "It involves two aspects within itself; it contains being in itself, as the first contrary, but as involved with its opposite, the second contrary. Since it contains this notion of a limiting contrary, the first contrary can never be determined or finite or limited without its other correlative aspect, the second contrary. Hence, its existence as determined, finite and limited by its contrary, cannot 'be' unless it is so determined. Through this limitation, this determined something becomes a finite thing, since it is obvious that where the opposite 'began', it, the contrary, is not, but has its determined end. Only by its finitude, then, as determined, as limited, as contrary plus its opposite, is the first contrary or opposite a determinate 'this', and thus a particular finite. This then is the very notion of finitude: that the opposite, the limit, the end, which by its nature of limitation 'determines' the first contrary is not, since it is the principle of the other, and since it is the principle of the other, is contrary and opposite at the point of union. The determined or limited, then, in one sense coincides with its opposite, and in a sense does not. Only thus can a 'this' be determined as a particular—that is, when it is limited by its contrary; and only 'as opposite' is it therefore something determined,<sup>11</sup> limited, and finite."<sup>12</sup>

Since the category of limitation immediately calls into being a unity of opposite forces and aspects, the infinite universe must, in like manner, call into being a category of non-limitation, or that which cancels and transcends all opposition. Hence, infinity or the unlimited, by criteria established by Bruno, transcends finitude and limitation itself. The infinite is without contradiction. It is the supreme category. For it is the only aspect of reality that is an identity with itself.<sup>13</sup>

Of these things one flows forth from another and another from still another, different things from different things, they are innumerable multiplied in number as if they numbered among the multitude of the heavens. The whole is not determinate: when in truth they flow back each one is drawn to

its own unity, from which unity there is One source (fons est).<sup>14</sup>

In the conception of dialectics drawn up by Bruno, the opposition in things does not disappear but is incorporated and swallowed up by the infinite universe. “. . . in the universal intellect there is one idea of all things, it becomes a question of being illuminated, made alive and united.”<sup>15</sup> Infinity therefore becomes an identity with all that it comprehends, which is the entire universe.

While the one becomes the highest, a stage in which the act of generation is indifferent, which can be absolutely all and is all that can be; it is fully one, great, infinite. It has the power to comprehend all things . . .<sup>16</sup>

The infinite is simply that which is its own opposition, its own determination, its own end; and that which by its internal structure is a negation of the contradictions in the realm of the finite and limited. Universal substance transcends all finite limitations, for it is the “it” that contains the power to determine and limit itself. This substance which is nothing but infinity taken as a whole, must be self-determining and self-sufficient. At one and the same time, infinity contains within itself all limitation and contradiction. The opposing tensions inherent in all finite things are but participating contractions of this infinite essence.<sup>17</sup> It is Bruno’s contention that to understand the point of synthesis of the opposites we must first understand that a thing is a “both-and” and a “neither-nor”. Finite particularized things both exist and at the same instant contain their own negation. This is to know that the limit and transcendence of opposites is but the principle (the essence) of still another relation of interacting opposites. This ultimately becomes the self-limiting and self-determining goal of nature, which is at once an end without end—it is universal substance.

The essential point which Bruno lost sight of, is that infinity is itself a contradiction. Thus the basis of infinity requires not

“pure harmony” or fixity, but never-ending contradiction. As Frederick Engels points out in *Anti-Dühring*:

Infinity is a contradiction, and is full of contradictions. From the outset it is a contradiction that an infinity is composed of nothing but finites, and yet this is the case. The finiteness of the material world leads no less to contradictions than its infiniteness, and every attempt to get over these contradictions leads . . . to new and worse contradictions. It is just *because* infinity is a contradiction that it is an infinite process, unrolling endlessly in time and space. The removal of the contradiction would be the end of infinity.<sup>18</sup>

Engels is really pointing out that the rigid carrying out of the requirements of any metaphysical system leads not only to the end of dialectics, but even to the end of infinity.

There are three major factors determining the relation between Bruno’s ontology and dialectics. First, the unity of opposites has operational validity only in finite realms. The universe taken as a totality, is viewed as transcendent of particular determinations and contradictions. Thus the infinite universe is not “other” or “opposite”, although and because it includes both of these categories. Second, the universe is itself “particular” when predicated of finite things. And this “particular” exists only in connection with the “universal.” The infinite universe contains within its domain all contradiction, since contrariety is the manner in which the unfolding and development of what already is in the universe takes place. Third, the universe, though it contains and even generates contradictions, must itself transcend such conflict in order to maintain its supreme status as infinite. The harmony of the interacting finite parts is for Bruno a “harmony of opposition” but the harmony of the infinite whole is a “harmony of unity”.

The essence of Bruno’s dialectical method has been summed up with clarity and great force by Samuel Coleridge.

**Every power in nature and in spirit must evolve an opposite,**

as the sole means and condition of its manifestations: *and all opposition is a tendency to reunion*. This is the universal law of polarity or essential dualism, first promulgated by Heraclitus, two thousand years afterwards republished and made the foundation both of Logic, Physics, and of Metaphysics by Giordano Bruno. The principle may thus be expressed. The identity of thesis and antithesis is the substance of all being; their opposition the condition of all existence, or being manifested; and every thing or phenomenon is the exponent of a synthesis as long as the opposite energies are retained in that synthesis.<sup>19</sup>

Here we have the substance of Bruno's dialectics: the conflict of different forces and tendencies reacting on a given finite body or inside a given natural phenomenon; interdependence, and the closest, indissoluble connection between all sides of every phenomenon. This connection provides the one world-process of motion proceeding according to objective law. This is the meaning of Bruno's "essential dualism"; however, the motion generated by the "essential dualism" is "resolved" in the everlasting perfection of an "essential monism".

The remaining question which confronts us is whether the dialectical method is connected to a materialist ontology or to an idealist theory of reality. The answer must be that the impact of both theories of reality are present in Bruno's method. He has a materialist dialectic to the extent that dialectics is introduced to explain the precise character of flux and development in the material universe. When dialectics is employed as both a tool of logical analysis and a description of the general laws of cosmological movement, Bruno's dialectical method can be considered scientific and materialistic. Since this materialist strain which posits dialectics as laws that accurately describe the motion of matter only in the limited realm of finitude, Bruno is led to adopt an idealist metaphysics to describe "instantaneous motion"; the non-motion of the infinite universe taken as such. Bruno's "resolution" of dialectical opposition takes the form of an unchanging, all-embracing system of infinity. The outcome

was a theory of objective idealism closely allied to neo-platonism and neo-pythagoreanism. Bruno unwittingly accepts the idea that the universe is a "receptacle" in which all material processes can be dumped. It is not without meaning that at the point Bruno discards dialectics as laws describing the motion of material reality and retains it only as a method of logical analysis, at that point Bruno also discards his materialist strain.

This rejection of materialism, or rather the causes for such a rejection, requires further elaboration. And it is important in such an elaboration to see what difficulties Bruno gets into even with the philosophical tools on hand. Cosmological thought in physical science from the earliest time to the recent past abstracted and hypostatized form and matter. Thus, they were separated from each other and from reality. As a result of this certain questions arose. From time to time there were answers, none of which proved very satisfactory. The question was: how and why matter (the content) takes on forms? It is obvious that such a viewpoint cannot believe in the inseparable unity of matter and form. Form abstractly considered is a frame which matter as bare and uniform extension takes on. Such is the answer given by Plato and Bruno; the former making form central while the latter making matter central. But the theory of immanence of forms in content (matter) gets into difficulties, for the arbitrary divorce of form from matter is not avoided. The question arises why does matter or substance assume any given forms? The reply, as historically given by Aristotle, Bruno and Whitehead is that there is for matter a lure of the forms. The content is thereby endowed with an activity and a Protean quality, and what is most incorrigible, this indeterminate matter should dominate abstract forms.

It appears, thus, that once form is abstracted from matter and made an independent entity it is impossible to formulate a true conception of it. Matter, too, when abstracted from process, i.e., dialectics, loses its essential nature and becomes a puzzle to the intellect. Matter, considered abstractly, is that which has no form, and so becomes indeterminate and indescribable. But the question now arises how can it assume forms? If it is originally

without differentiations where will differentiation start? There cannot be any specific location in it, spatial or temporal. Besides, if it assumes forms, it is broken up into infinite shapes and so is reduced to bare multiplicity. On the other hand, if it remains one without taking on forms it would be intangible, a mere fictitious substratum of phenomena without any relation to, and so without explaining, the latter. Thus form and matter, when intellectually abstracted from each other, raise more problems than they can solve. For Bruno it necessitated a "substance" that "unites" matter and form. Matter was not enough for his conception consequently, materialism as a world view also proved insufficient.

Bruno's dialectical philosophy although set in an idealist framework, retains its vitality by placing stress on the many-sidedness of reality and knowledge. The infinite number of gradings in the various approaches and approximations to "intelligible reality" was the cornerstone of a philosophical system that develops "wholeness" from the unity of the relative aspects. As V. I. Lenin remarked: Idealist dialectics has "an immeasurably rich content as compared with 'metaphysical' materialism, whose fundamental *trouble* lies in its inability to apply dialectics to the *Bildertheorie* (image theory), to the process and development of knowledge. Philosophical idealism is nonsense *only* from the standpoint of a crude, simple and metaphysical materialism. On the contrary, from the standpoint of *dialectical* materialism, philosophical idealism is a *one-sided*, exaggerated, boundless theory. A development of one of the little characteristics, of the aspects, or limits of knowledge into a deified absolute, into something that is *severed* from matter, from nature".<sup>20</sup>

Bruno's monistic system of the universe is, in spite of its "many-sidedness", an attempt to rationalize dialectics out of existence. Were Bruno not to do this, he would have been faced with the task of squaring his idealist strain with the experiential fact that the core and not the perimeter of objective reality is in a constant process of becoming. The hypostatization of the universe as basically eternal and unchanging (Bruno acknowledging the element of becoming only to the somewhat spurious world of sensations), is his desperate resolution of a changeless system of

the universe and a dynamic theory of change. Bruno, developing his philosophy at the very beginning of the scientific age, the age of mechanism in both the physical and social sciences, was never able to formulate a consistently scientific and materialistic dialectic. Coupled with the fact that Bruno never overcame the scholastic tradition which nurtured him, a tradition which frowned upon experimentation and investigation of the concrete conditions of existence, it is not difficult to understand why Bruno sought refuge in systematic, idealist philosophy. For all of Bruno's anticipatory ideas, it remains a fact that he acutely reflected the limitations in scientific knowledge, limitations which seriously hampered any full development of dialectical philosophy. The paradox of system and method, the intellectual abstraction of form and content, were characteristic features not merely of Bruno's philosophy, but of the philosophic thinking in the sixteenth century.

## PART II

### THE PARADOX OF SYSTEM AND METHOD

#### *Chapter Five*

#### *Substance and the Problem of Permanence and Change*

In Bruno's philosophy, there is a clear attempt to fuse the idealist notion of substance as "universal form" or "spirit" with a nominalistic<sup>1</sup> view of substance as something particular, extended and material. His attempted synthesis, although containing many salient features, was for the most part a failure. In spite of the fact that Bruno thoroughly investigates the various interpretations of the category of substance, the actual existence of a fixed substance is itself never questioned. This proved to be Bruno's undoing, as it was the undoing of all other philosophers of the sixteenth century who sought the unchanging without banishing the changing. The stage of social production and the level of scientific achievement was such that the category of fixed substance no matter how "overhauled" it was, could not be completely discarded.

Broadly, the search for an immutable substance takes two distinct directions which corresponded to the necessities of either an "absolute idealist" (Platonic), or "naturalist" (Aristotelian) framework. In its Aristotelian variant, substance is the particularized "it" which must always be something that becomes "this" from "that", something which survives through the "process".<sup>2</sup> This is the substratum, substance or subject. Thus Aristotle says that "one can gather from the various cases of becoming in the way we are describing, that, as we say, there must always be an underlying something; namely, that which becomes".<sup>3</sup> Both "something which comes into existence" and "something which becomes that" from this, are "coming to be from a substratum".<sup>4</sup> What then is the substance for Aristotle? The reply given is that "the substratum is different from the contraries, for it is itself not a contrary."<sup>5</sup> Essentially, the substratum is that in the particular object which endures through change, the self-identical subject,

that which undergoes no change and which is itself not contradictory.<sup>6</sup>

Still a second variant of the concept of substance that had a great influence on Bruno's thinking is the Platonic notion of substance as "Universal Form" or "Idea". This view links perfection to universality. It is not the concrete material objects themselves which contain as its "essence" an immutable substance, as is the case with Aristotle. Instead, it is the ideal representation of the phenomenal things in flux. Plato's substantive reality does not "underlie" material Being, for it is not by its nature material but ideal. The particular qualities of Being (those qualities that ideally represent the object), arranged in harmony with the "Form" in a certain manner, as distinct from all other possible arrangements, comprises the substance of a thing.

In Platonic theory, as expounded in the *Timaeus*, "the mother and receptacle of all created and visible and in any way sensible things, is not to be termed earth, or air, or fire, or water, or any of their compounds or any of the elements from which these are derived, but is invisible and formless being which receives all things and in some mysterious way partakes of the intelligible and is most incomprehensible".<sup>7</sup> This matter is identified by Plato with space which provides a kind of home and location for the shadows of universals which we call things. Space itself has no properties, and is hardly real. Plato fashions the physical world out of mathematical forms applied to this material.

It would not be wrong to say that for Plato an immutable substance stands *over* and is *apart from* material reality, while for Aristotle, substance is not only *in* matter but is its *essence*. But the two ancient philosophers are in full agreement when it comes to representing substance as "logically harmonious", that is, as excluding contradiction. For both, substance and Being are united. The dialectics of substantial process is overruled by a fixed universal.

Bruno is critical of both the Platonic and Aristotelian uses of the term substance, not because either are incorrect, but rather, when taken each by themselves, they prove inadequate. Aristotle sees the unchanging and the stable persisting in a particularized

“it”, while Plato seeks the same objective in a universalized “it”. What Bruno desires is a “synthesis” of both without destroying the foundations of either. He can be critical of both variants only because each is held to lack what the other possesses. One view can account for the “essence” only in particular finite things, whereas the other can account for the unchanging only by declaring finitude to be unreal and by maintaining the sole reality to be the incorporeal. Bruno’s “synthesis” of the two ancient concepts of substance takes the form of retaining the Platonic “receptacle” and pouring the more localized and particularized Aristotelian notions of matter and form into this “universal it”. Substance cannot be known apart from the categories of matter and form.<sup>8</sup> Matter and form are the two dialectical attributes which give to substance its content. Neither matter nor form, when taken separately, deserves the rank of the “it” which includes the “all”. Bruno’s “substance” does not underlie each separate phase or aspect of reality, nor is it the “idea” of any given object. It is that which underlies and is inherent in all the individual aspects of being only when being is seen in its complex unity, that is, when it is seen in its totality, in its wholeness. It will be quickly seen that this forced merger of Plato and Aristotle turns a “dialectical” theory of substance into its opposite, eclectics.

Bruno carefully outlines his view that in nature, form and matter are united. Only for the purposes of logical and scientific examination can they ever be separated, and even this verbal separation must take into account their essential unity. Form and matter are the two inter-penetrating forces which gives to substance its being.

Matter does not desire the form for its conservation; because the thing corruptible does not conserve the thing eternal: from which it follows that it is rather the form that desires matter in order to perpetuate itself; for separating itself from matter, it is it that loses being and not the matter, which has all that which it possessed before the form was brought to it and is able still to have other forms . . . when one determines the cause of corruption, one does not say that the form fled

the matter or abandoned it, but rather that matter rejected that form in order to take up another. I consider further that we have no more reason to suppose that matter desires forms than to suppose on the contrary that it takes them reluctantly; I speak of the forms which arise and pass away, because the source of the forms, which is in matter, is not able to desire, for one does not desire what one already possesses. In the same way as one speaks of desiring when one receives or produces, one is able to speak of hating when one rejects or suppresses. Likewise matter hates more violently than it desires, since it rejects eternally the singular form which it keeps only for a brief moment.<sup>9</sup>

But just as it is a necessity for us to posit a constant and eternal material principle, so also should we posit, in like manner, a formal principle.<sup>10</sup>

There can be little doubt that Bruno, unlike both Plato and Aristotle, believed matter and not form to be the more central attribute of universal substance. For particular forms "have no being without matter, in which they are generated and corrupted, and out of whose bosom they spring and into whose bosom they are taken back".<sup>11</sup>

Particular finite material objects and their forms, however central to a theory of substance they may be, cannot themselves be substantive. Neither of the two contain the universal "it" that persists through change, for the simple reason that particular things undergo a process of change. And by definition, Bruno rules out the possibility of a changing substance. That which unifies and yet transcends matter and its changing forms Bruno defines as "universal substance". This turns out to be nothing but the infinite universe taken as a whole. Substance is the universalized "it" which gives to matter and form their homogeneity and wholeness. Matter and form are "of substance and about substance" but are not "themselves the universal substance".<sup>12</sup> Sketching Bruno's views briefly: Substance exists not only in actual material being but also in the possibility of being. All which is possible and all which is actual must be related to a

higher, more inclusive principle that is the combination of the two, namely, universal substance. Every thing or process that has objective existence is "actuality" but power or "potentiality" has "caused it to be". Matter, therefore, cannot be the existing ground of all things, for like form, it is subject to endless generation and degeneration. Taken together, matter and form are actuality and potentiality in undistinguished unity. And this unity or identity is the substance, which, because of its nature as infinite, is able to transcend the transient nature of either matter or form which have finite determinations and limitations.

In the idealist aspect of Bruno's theory of substance, attention is called to the limited or conditioned character of existent things; they are not independent or self-existent but incomplete and dependent on one another. On the other hand, the completely self-existent is deemed to be the only fully real, the only genuine substance. Ordinary existents are fragments of it, pointing to it as a completion. God is then identified with the unified totality of the universe. The chief question then became for Bruno the character to be assigned to this Absolute, e.g., whether it should be interpreted as rational or as will. Bruno, of course, saw in this Absolute substance the rational unity and synthesis of existential reality.

Aristotle termed matter potentiality, called into being by a "longing after form". Bruno takes a somewhat different position, holding matter to be both the actual and the potential. It is both "what is" and "what is becoming". In like manner, form in its nature as "Cause" and "Principle" is not a context independent of matter. It finds its "fulfillment" only through its inter-penetration with matter.<sup>13</sup> The dialectical distinctions made by Bruno, between actuality and potentiality, between matter as potency and matter as act, and between form as cause (external structure) and form as principle (internal structure), are oppositions that are resolved in one and the same eternal, immutable substance.<sup>14</sup> This substance is infinite by virtue of its boundless and inclusive nature. The forms of material reality may be constantly changing. New combinations and levels of the organization of matter may constantly come into existence, but the absolute substance, the

universal receptacle, which embraces the two modes (matter and form), is eternal, infinite and immortal. In this principle of cosmological monism Bruno sought to escape the dilemma of both the Aristotelian substance that “persisted through all change” and the Platonic-Plotinian view of substance which reduced it purely to an ideational principle devoid of material content. Bruno’s substance becomes identified with an eternal, changeless “Reality” only by a recognition that opposite forces and attributes inhere in the infinite plenum. Form and matter, when taken as a unity, provides the content of Bruno’s ideas on substance.

Modern science and contemporary materialist dialectics reject the notion of immutable substance in its entirety. Of course, Bruno is not being held responsible for failing to grasp the findings of a philosophy and science that had not yet come into being. What is being pointed up is the difference between consistently materialist philosophy and Bruno’s thought on the all important question of the meaning of substance.

In modern materialist philosophy, the category of substance is coincidental with moving and eternally evolving matter. Substance is not some “underlying it” or “Form of forms”, but is the very process of change itself. More than this, dialectical materialism asserts that substance is the unity of form and matter. A matter which is particular, concrete and qualitative and a form which represents the internal organization of matter.

Interestingly enough, Bruno anticipates in a one-sided way, it is true, just such a contemporary view of substance when he writes that “substance never diminishes but changes, and this through infinite space . . .”<sup>15</sup> This sentence has great interest, not only because of its possible demolition of an unscientific substance theory, but of greater importance, it gives a nascent presentation of the indestructability theory of matter. To say that “substance never diminishes but changes” is certainly not very far from stating that “matter can never be destroyed, it can only be transformed”.

Unfortunately, it is the former meaning of the term substance that dominates Bruno’s thought. If this were not the case, if he were to make explicit the meaning of a “changing substance” the

inevitable result would have been to discard the category of *fixed* substance as metaphysically supreme. And to do away with the doctrine of a motionless reality of substance would have necessitated a drastic revision in Bruno's conception of infinity. His dilemma can best be put in terms of the traditional metaphysical notion of "Being". In the realm of finitude, the becoming is part and parcel of Being. However, in the domain of the infinite, Being transcends the changing, the becoming. Bruno thus becomes entangled in the web of his own metaphysical synthesis of "process and reality".

Bruno emphasizes the fact that the "operational" method developed by Aristotle commits the fallacy of reducing the things in objective reality to the status of "simple givens". This has the profound effect, says Bruno, of destroying the basis of a theory of the infinite. The only method which provides an adequate theory of the universe, is necessarily one that avoids this type of reductionism. One has to take into consideration the complex and dialectical structure of the content of reality.

Those who proceed to discover the secrets of nature by starting from experimental reason of the simples are in a less enviable position than he who starts from theoretical reason—than he who starts from humors; and this is no more than heing; and among these, no less he who starts from complexions who descends from sense elements, or from one matter, which is the highest and most distinct principle of all. Indeed, sometimes he who takes the longer way does not make the more successful trip, especially when his end is not so much theory and contemplation as operation.<sup>16</sup>

Instead of an analysis of "simples", Bruno proposes that we deal with substantive reality as a dialectical unity of the form and material internal to it. The content of universal substance is form and matter. This is the "essential dualism" necessary for achieving the still more "essential" monist view of the universe. Substance is a unity, an identity, not as a "simple" underlying or

over-riding "it", but issuing from the specific opposition it generates, the opposition of matter to the forms it acquires.<sup>17</sup>

Form and matter determine each other because the form, having in itself the facility to constitute particulars of innumerable species, comes to contract itself to constitute one individual; and, on the other hand, the potentiality of indeterminate matter, which can receive any form whatsoever comes to be determined into a species; the one is the cause and definition of the other.<sup>18</sup>

There are two derivative categories in the natural universe: one of which is form, the other of which is matter.<sup>19</sup> This is a necessary pre-condition for the existence of an infinite plenum. Bruno makes clear that there must exist a most substantial act in which the active process of becoming is joined to a passive potency of a subject which "is". The active principle of motion must then be "the power to make", while the passive principle must be "that which already is". Bruno's principle of passivity is that which concretely exists, but due to its finite nature, what "exists" contains its own negation and suffers a degeneration which eventually transforms it into non-being. Matter contains the eternal "power to be made". What is passive is not dead but awaits only its unity with the active principle of motion to become transformed into something other than what it is.<sup>20</sup> Form, which orders and brings into being the variety of things, needs for its operations the prior existence of that from which, and in which, it can generate change. In other words, forms cannot exist independent of material reality.<sup>21</sup> There can be no separation or isolation of matter from form. They are the opposite attributes of which the unifying principle, substance, is comprised. Matter becomes with form the essential principle of all things. Since the two attributes exhibit no semblance of "apartness" it is meaningless to postulate a material principle divorced from a formal principle.<sup>22</sup>

Substance, "the highest and most divine principle of unity", in one sense is for Bruno nothing but the opposing attributes in-

ternal to it. But in another, more important sense, substance is more than its modes or attributes. By the very nature of its all-inclusiveness it contains a "wholeness" which neither form nor matter can boast of possessing. Substance is the only "it" because it is the only "quality", the only "universal".<sup>23</sup>

At this point we must interrupt our examination of the dialectic of matter, form and substance, to clarify a central problem in the dialectical method itself. Bruno has often been called the "philosopher of identity." This is indeed so, but only in a very specific sense of the term "identity." In Bruno's method, the relationship of two finite tendencies is one of opposition. The result being that the dialectical methodology must reconstruct the principle of identity. The latter can no longer be tautological and non-contradictory for finite things. On the contrary, identity has to be conceived as self-motion generating essential and specific opposition. It is not identity as such that is negated by Bruno, but identity as tautological. Bruno's dialectics is the affirmation of internal opposition as the relationship which reaffirms identity on a different, more inclusive, plane. The principle of identity is, in the hands of dialectical philosophy, established by *mutual inclusion* of contraries, not their *mutual exclusion*. Identity is thus not an Aristotelian "simple" but a unity comprised of opposites, and therefore a complex identity. Bruno's unusual use of the categories of potentiality and actuality makes it inconceivable to postulate the principle of identity as a simple tautological "is."<sup>24</sup> The limited, incomplete, and frequently erroneous way Bruno applied the concept of dialectical identity<sup>25</sup> should not blind anyone to his obvious attempt to turn Aristotle's (and it might be added Plato's) formal method "up side down" into a dialectical method of analyzing things and thoughts.

It is in light of Bruno's dialectic that his ideas concerning matter, form and substance assume their fullest significance. Since "forms have no being without matter" and matter can have no "being without the forms inherent in it," neither, when taken singly as isolates, contain all that is or can be. But both are organically a part of the substantive, synthesizing principle, which does contain all that is and can be.<sup>26</sup> For Nicholas of Cusa

“Christ unites all, and is in all,” in like manner, Bruno’s “substance unites all and is in all.”

In the eternal principle, in the internal structure of the universe, matter has all that it can have, since its “absolute potency” is identical with the “absolute act.” Seen in this light, Bruno has no trouble divorcing matter “when taken as absolute” from motion. For when taken as infinite, matter must share in common the basic feature of infinity, its fixity. It is all that it can be, at once, always and together. In the finite sphere, the changing sphere, what is “becoming” is limited and determined by what already “is.” This in turn is determined by its “potential otherness;” accordingly, matter does not have all it can have. Bruno’s category of form suffers a like fate: Form is devoid of motion when taken as absolute. It too, is all that it can be, at once, always and together. However, in its finite manifestations, form cannot possibly be all, at once, always and together.<sup>27</sup> For it is subject to the very same determinations and limitations that matter in its finite manifestations is subject to. Matter as Principle, then, is not isolated from form in any way.

Matter is at the highest grade of purity, simplicity, indivisibility, and unity because it is absolutely all; for if it had certain dimensions, a certain being, a certain figure, a certain property, and a certain difference, it would not be absolute, and would not be all.<sup>28</sup>

The particular forms which matter takes on is not received from forms external to itself. Matter is eternally all forms, for it is united with the “universal form.” In precisely the same way, “universal form” is eternally all matter, because it is one with matter.<sup>29</sup>

The particular transformations which matter and form undergo, are resolved in the one, immutable substance.<sup>30</sup> The closed system of the universe once more becomes the impediment of dialectical processes in the very essence of reality. In the approach taken by Bruno, flux and development never really take place in substantive reality. It only occurs *within* the frame-

work of a universal substance which itself remains unchanging. Were Bruno to expound a theory of "changing substance" the entire category would itself have to be thoroughly revamped. This dissection of substance Bruno was neither able nor willing to perform. Processes have their anchor in universal substrate, which, according to Bruno, though containing the "absolute flux" is itself "absolutely permanent." What is changing is the multitude of things and the particular forms these things assume. But it is change that cannot lead to qualitative difference, only to a Democritian sort of quantitative rearrangement of the finite particles. The "real," the universal substrate, knows not even this type of change. Its motion being "instantaneous" gives it the quality of existing as an identity with itself. Aristotle held every finite substrate to be an identity with itself. Bruno saw in this "law of identity" the basis for making his metaphysical conception of infinity supreme. The contradictions that characterize all finite changing things is subsumed under an "it" which is an identity, not of opposite tensions, but of harmony with itself. Substance, as the universal receptacle, must include all contradiction without itself being part of the dialectical process of change. This has been a pitfall of idealistic dialectics from Bruno to Hegel. It demands in spite of the "changing" the "changeless." It seeks out a supreme category that is "undialectical" rather than accept a materialist ontology. In this way dialectics is turned into bad metaphysics. Both Bruno and Hegel ultimately rest their case on the same idealist proposition: that "it is not the finite which is the real, but the infinite; and this Reality is further determined as Essence, Motion, Idea, and so forth."<sup>31</sup> Both developed the logical implications of "systematic philosophy" by the simple expedient of declaring the unchanging infinite to be the Real, and the finite changing things to be the superficial, the spurious, or just plain unreal.<sup>32</sup>

## Chapter Six

### *Mechanism, Pluralism and the Monad*

To know that there exists a substance which comprises the immutable "it" of infinity is one thing, but the deeper problem confronting Bruno is the precise *quality* of that substance. The problem is perhaps the most complex yet dealt with, for it involves us in a discussion of the basic principles underlying Bruno's theory of reality and theory of change. Investigation into what Bruno's commentators have had to say on the question of the monadic structure of the universe provides very little knowledge and very much confusion. It would appear that most misconceptions over the theory of the monad held by Bruno stem from an over eager attempt to avow or disavow its affinity to the atomism of Democritus or to the monadology of Leibniz. Hence it is most fruitful to answer the problems raised by Bruno regarding the monad by means of a comparative analysis with the Democritian and Leibnizian views on the fundamental unit of reality.<sup>1</sup>

All of Democritus' metaphysical notions are subsumed under the concept of the monad (the atom). "Nothing exists but atoms and empty space: all else is only opinion."<sup>2</sup> He begins with the premise that the content of perception consists in reducing all phenomenal occurrences to the mechanics of atoms. Change can only be quantitative because "all change is only the combination and separation of atoms."<sup>3</sup> Now while Bruno held Democritus' reductionist materialism in the highest esteem, saying of his philosophy that "it contemplated nature with open eyes"<sup>4</sup> and proving his esteem by basing many of his cosmological ideas of the infinite on the philosophy of Democritus, Bruno makes an explicit rejection of atomistic or mechanical materialism.<sup>5</sup>

Democritus and also the Epicureans, say that that which is not corporeal is nothing; and consequently, they hold matter

alone to be the substance of things; and the same time hold matter to be the divine nature . . .

And for a long time, I myself have been an adherent to this conception, only because it has a foundation more correspondent to nature than the views of Aristotle; but after having more maturely considered, and after having regarded more things, we find that it is necessary to recognize in nature two kinds of substance: one of which is form, the other of which is matter; because it is necessary that there be a most substantial act, in which is the active potency of everything; and also a potency of all; in the former is the power to make, in the latter the power to be made.<sup>6</sup>

For Democritus, the atoms are internally homogenous. They are substances which underlie and support all things.

The atoms are infinite in number, and of endless variety of form. In their eternal fall through infinite space, the greater, which fall more quickly, strike against the lesser, and lateral movements and vortices that thus arise are the commencement of the formation of worlds.<sup>7</sup>

Bruno also conceived of the atom, or as we shall henceforth call it in reference to Bruno, the nomad, as the underlying substratum of all things. But whereas the former sees in his atom only that which is corporeal, Bruno imparts to his monad a dynamic spiritual as well as physical existence internal to its nature.

The minimum is the substance of all things and thou wilt await it at length as the largest of all things. This is the Monad, this is the atom, the whole spirit that is poured hence on all sides, without form, disposing all things by its tokens, the total essence and substance, this it is if at length thou examinest the matter.<sup>8</sup>

The monad, in the hands of Bruno, becomes the basic unit of objective reality not only because it is the smallest thing in ex-

istence, but because at one and the same moment it is the largest and the smallest.

Since indeed the minimum thus renews all things, so that nothing is spread beneath it nor is there anything else. Were there no monad, there would be nothing of number for the monad constitutes the species, building up every kind. For it is the prime basis in all things, that as it were whence God and the parent nature and art do elaborate on high, that which reigns over every kind and resides in every kind . . .

Number is the accident of the monad, but the monad is the essence of number; thus the atom enters into composition and the atom is the essence of the composite . . . For the substance for the building of all bodies is the minimum body or the atom, and for the building a line or a surface, the minimum is the point.<sup>9</sup>

Like Democritus' atom, the monad of Bruno is objective reality reduced to its primary condition. The difference between the two constructions in large measure underscores the difference between mechanism and dialectics. The primary condition of the monad is, for Bruno, not merely the smallest (minimum), it is also the greatest (maximum); it is not just the least complex, but the most complex. Indeed, reality is simply the monad amplified to infinity. The diverse multiplicity of things are attributed to the particular groupings of these eternally moving monads. The motion of monads is diverse but not chaotic, for they always tend to return to their "own body and place." Flux, activity and development is a quality inherent, to a greater or lesser degree, in every part of the infinite universe.

From the minimum everything grows and every magnitude is reduced to the minimum; and the minimum builds up to the many and to the innumerable and infinite.<sup>10</sup>

Democritus and Bruno utilized the monad as the point of de-

parture in "rational investigation." It became, for both, the cornerstone for raising physical and mathematical knowledge to the level of an ontology. Bruno, for example, raised the monad to a status supreme in every conceivable way. The monad became identified with a method that posits change and development through a struggle of opposites. And the supreme identification of the monad was with an eternal and changeless system of the universe; the "monad of monads" corresponding to the infinite whole.

The monad devised by Bruno is one with Greek atomism when he speaks of the monad as the "essence or substance of reality." Here, however, the similarity ends, for the monad is not, as in atomism, something already "composed" but is the very process of "composing."<sup>11</sup> This changing composition of monads is not a change in "essence" but a change in "appearance." As can easily be seen by now, Bruno's "monadic theory of the universe" is perfectly consonant with the rest of his natural philosophy. And lest we forget this fact, Bruno reiterates his belief that the changing composition of the monads takes place within the broader locus of an already "composed" universe. Democritus held the *infinite number* of atoms to be composed and without internal movement; Bruno, on the other hand, held the parts, the infinite number of atoms to be in a constant state of internal flux. It was the *infinite whole* that was composed and without motion. The ancient mechanists were unable to develop such a highly refined doctrine of the atom, a doctrine which had changing monads as the content of an unchanging and infinite structure.

Democritus taught that "nothing happens by chance, but everything through a cause and of necessity."<sup>12</sup> This appears to rule out not only the occurrence of purely chance events, but purposeful and teleological events from the movement of atoms as well. Once more Bruno accepts this Democritian edict only as a basis for developing his own concepts. He not only takes over the doctrine of mechanical necessity but makes a tremendous improvement by declaring this necessity to be internal to the nature of the individual monad. The Greek atomists be-

lieved that "the necessary motion of the atom had a derivation external to it." Bruno said that the necessary motion of the monad is derived from a source internal to its own nature, and that external motion is but an outgrowth of the more "profound" internal motion.

Bruno's monads are subsumed under a supreme monad. Thus his monads, are not, as are Democritus', pluralistically conceived. This is not to say that Bruno rejected the existence of the plurality of monads. He merely pointed out that such a view was an incomplete description. Pure and simple pluralism failed to account for the organic unity of the universe. Mechanism fails to account for the "whole" of reality for it sees the parts as perfectly complete and "whole" in themselves. Therefore, Bruno was driven to develop a "monist conception of the universe." Substance, or the "monad of monads" is one and simple. The plurality, an endless multiplication of monads, is meaningful only when placed in the larger matrix of the supreme monad. Since the monads have motion internal to themselves, dialectically producing the "higher orders" out of the "lower orders," Bruno feels perfectly secure in claiming that there exists a supreme monad which synthesizes all the lower (finite) orders of the monads and which itself undergoes no change.

The "order of monads" is not dealt with by Democritus or any of his mechanistic disciples. Atoms are differentiated only according to size and shape.<sup>13</sup> "The variety of all things is a consequence of the variety of their atoms in number, size, figure and arrangement; there is no qualitative difference of atoms."<sup>14</sup> In the atoms there exist no internal states; they act on one another only by collisions resulting from their mechanical movement. The difference between things is explained by differences in spatial attributes, the number and mutual arrangement of the aggregates of atoms which compose them. Emergence is the uniting of atoms; disappearance their falling apart. Bruno differentiates monads and their motion in an entirely different manner. He introduced an order of monads not merely distinguished by size, shape and weight, but whether they issued from the realm of God, Nature or Man. The impact of ethics and

theology were important reasons in prompting Bruno to reinterpret the materialism of Greek science without completely abandoning the doctrine of the atom.<sup>15</sup> Bruno restricts the motion of the monads to the realm of finitude. It is a motion of parts within the framework of a universal substance that itself is devoid of any motion. Once again Bruno's distinction between "motion in" and "motion of" saves him the embarrassment of watching his supreme monad wither away in the eternal flux of particularized monads. The universe as it appears in sensations is in constant motion. But since this motion is but an illusory outgrowth of an essentially motionless universe, the conception of the hierarchy of monads, like Plato's hierarchy of forms, arises from Bruno's efforts to find the "real substance." This substance, unaffected by motion of finite bodies, though including this type of motion, in the final analysis is the equivalent of Bruno's "monad of monads." Universal substance is endowed with the same qualities and properties as is the supreme monad. From different vantage points the two categories (universal substance and the monad of monads which are really identical), set out to achieve the same goal, the liquidation of qualitative change.

Everything particular is in continuous alteration and change; that is, a change in the disposition of its atoms, and a change in place; the primal subject (Universal Substance) moves infinitely, that is, it does not move at all; the 'parts' enter into and go out from this to that other place, part, and whole.<sup>16</sup> Suppose the body to exist in dispersion; it may be maintained nonetheless that the total of all these scattered particles . . . is infinite; but body we saw to be that which has extension every way; how then can there be several dissimilar elements, each infinite? Each would have to be infinitely extended in every way.<sup>17</sup>

The pluralistic mechanism of Democritus is retained by Bruno, who sees meaning in the plurality of atoms, but only in so far as they are related internally to each other and to the supreme

monad. The atomic “billiard ball” universe envisioned by Democritus was, ontologically speaking, wide open; while the monadic universe of Bruno is organically sealed tight. Democritus failed to account for the unity of atoms. As a result they fail to show order and relationship. It is just this sort of mechanical contingency that Bruno sought to avoid through his introduction of the order of monads, namely, by demonstrating the unity and organic connection between the basic units of external reality. The key difference between the two can be summed up in one word, “connection”. Democritus, because he lacked the ability to show a connection between atoms, destroyed the *raison d'être* of atoms themselves. Bruno's monad is not a sterile isolate, plucked out of context and “examined” for its “properties”. Through its use he shows the interconnection between the smallest and the largest, the least significant and the most significant, the finite and the infinite, and of greatest importance, the monad demonstrated to Bruno's satisfaction the connection between God and Nature and Man.<sup>18</sup>

Some historians of philosophy claim that Leibniz received his conception of the monad directly from Bruno. A close reading of the text of both philosophers, while revealing many similarities, serves to disprove rather than prove the contention. Leibniz termed his monad a “force-substance”. In this he more closely parallels the meaning given to the monad by Bruno than did Democritus. Bruno too, endowed the monad with a dynamic power internal to its structure. Leibniz would unquestionably have agreed with Bruno that the monad was the dynamic substrate of all reality. But at this point a fundamental difference rears its head. Whereas in Bruno's philosophy the monad was to be understood only in relation and connection with other monads, Leibniz postulated a monad which, with reference to the rest, was perfectly independent and isolated (“windowless”). They neither could experience nor could they exercise any influence on one another. Leibniz's monads “have no windows” and this “windowlessness” is to a certain extent the expression of their metaphysical “impenetrability”. Leibniz writes that:

There is also no way of explaining how a monad can be altered or changed in its inner being by any other creature, for nothing can be transposed within it, nor can there be conceived in it any internal movement which can be excited, directed, augmented or diminished, as can be done in compounds where there is change among the parts. The monads have no windows through which anything can enter or depart. The accidents cannot detach themselves nor go forth from the substances, as did formerly the sensible species of the Schoolmen. Thus neither substance nor accident can enter a monad from without.<sup>19</sup>

We may recall that the monads only had meaning for Bruno in so far as they interpenetrated with one another. They were dialectically interconnected, i.e., united through their opposition. The monads comprise a unity of opposites which ultimately become a unity containing all opposite moving forces, but which itself is without contradiction. This was Bruno's supreme monad.

There are many dissimilar finite bodies within a single infinity . . . Many continuous parts form a unity; . . . as with liquid mud. There throughout and in every part, water is continuous with water, earthy matter with earthy matter; wherefore, since the concourse of the atoms of earth, and the atoms of water, is beyond our sensible apprehension, these minima are then regarded as neither discrete nor continuous; but as forming a single continuum; which is neither water nor earth. . . ; the infinite universe may be regarded as a single continuum in which discreteness is no more introduced by the interpolation of ether between the large celestial bodies than it can be within the mud, by the interposition of air among the dry and watery particles; the difference being solely in the fineness and subtlety of the parts of the mud exceeding our sensible apprehension, as against the greatness, size and sensible qualities of the members of the universe. And thus contrary and diverse mobile parts converge to constitute a single, motionless continuum.<sup>20</sup>

In contrast to this “philosophy of inter-relatedness” Leibniz puts forth a monad which is a self-sufficient internal principle. His monads being in a state of complete isolation from external influences and closed to processes of a larger and more complex context. This leads Leibniz to a thoroughly idealist metaphysic. He writes: “that the natural changes of the monads proceed from an *internal principle*, since an external cause could not influence their interior.”<sup>21</sup> Substance, therefore, becomes a force of imminent activity. The monad in Leibniz’s philosophic scheme is *psychical* and not *physical* in its nature. It has already been shown that Bruno carefully avoided the pitfalls of an atomistic materialism. There is little doubt that he just as ardently wished to avoid a subjective and pluralistic idealism. Bruno never allowed a bifurcation of his monadic system to develop. (Whatever else he was, he was most certainly not a metaphysical dualist). There wasn’t a “psychical monad” distinct from a “material monad”, but only *one* type which had the quality of being both material and vitalistic. More in line with Spinoza’s “Substance” than with Leibniz’s “Monad”, the distinctions concerning the monad in Bruno’s ontology are distinctions in attributes, not in substance.<sup>22</sup>

Leibniz and Bruno fully agree that the monad is a “mirror on the world.” For both philosophers, the monad contains the whole universe as a contracted representation within itself. The monad was the principle of both the minimum and the maximum. The *apparent* similarity between the two versions extends still further: each monad is thought of as containing individual characteristics that are distinct from the individuality of all other monads. Thus, there are no two monads in the universe which are identical. Leibniz expressed this as the “*principium identitatus indiscernibilium*”:

It is necessary, indeed, that each monad be different from every other. For there are never in nature two beings which are exactly alike and in which it is not possible to find an internal difference, or one founded upon an intrinsic quality.<sup>23</sup>

In a similar vein, Bruno insists that monads are incapable of pro-

ducing two figures or two lines precisely alike.<sup>24</sup> Leibniz adds that it is not possible to find two drops of water or milk that are exactly the same when seen through a microscope. Both philosophers therefore were faced with the problem of either finding some sort of relationship between things or else bog down in the most extreme form of pluralism. It is the solution of this relational problem which provides the cardinal differences between the views of Bruno and Leibniz concerning the monad. At the outset, the clear cut advantage is with Bruno rather than with Leibniz. The former differentiated monads quantitatively, while the latter thinker differentiated them qualitatively, thereby preventing the monads from being internally as well as externally connected.

Leibniz saw in the monad a difference in their mode of representing content, holding that the difference between monads consists in the qualitatively different degrees of clearness and distinctness with which they represent the universe. Hence the monad is regarded as active in so far as it represents reality with clearness and distinctness, as passive when it represents obscurely and confusedly.

The creature is said to *act* externally in so far as it has perfection, and to *suffer* from another in so far as it is imperfect. Thus *action* is attributed to the monad in so far as it has confused perceptions.<sup>25</sup>

Not so heavily burdened with idealist and supernaturalist commitments, and philosophizing before the Cartesian era of sharp "mind-body" separation, Bruno doesn't conceive the monad to be "active" or "passive" in quite the same way. Bruno saw *all* monads as being active *within* the framework of a supreme monad which is inactive, simple and immutable. The monad is, for Bruno, indestructable and with the exception of the "monad of monads", endlessly in motion derived from its own internal dynamic. From the viewpoint of modern science, Bruno's approach although encumbered with many serious weaknesses, is far more accurate an account of fundamental material processes than is the viewpoint developed by Leibniz.

Superficially examined, the "orders of the monad" devised by Leibniz and Bruno are similar. A closer survey, however, convinces one of their qualitatively divergent character. In Leibniz's ontology the monads form an uninterrupted graded series; a great system of development which rises from the "simple" material monads to the complex "souls and minds". Leibniz, the philosopher of "quality", because he artificially tore apart the quantitative elements which comprised quality, finds himself at the end no better off than the "philosopher of quantity", Democritus. The search for a category which can unite the disjointed monads leads Leibniz to say that "a soul can read in itself only that which is distinctly represented in it. It cannot develop its laws all at once, for they reach into the infinite."<sup>26</sup>

Thus although each created monad represents the entire universe, it represents more distinctly the body which is particularly appropriated to it, and of which it forms the entelechy, and as this body expresses the whole universe through the connection of all matter in a plenum, the soul also represents the whole universe in representing this body, which belongs to it in a particular way.<sup>27</sup>

The lowest monads, which represent only obscurely and confusedly, i.e., unconsciously, are therefore only passive; they form matter. The highest monad, which represents the universe with perfect clearness and distinctness, and just for this reason there can be but one such monad, is accordingly "pure activity devoid of materiality". Leibniz calls this pure activity the "central monad", "God" or the "monad of monads". In as much as each monad lives out its own nature, they all harmonize completely with each other at every moment by virtue of their content; from this arises the appearance of the action of one substance upon the others. This scheme of "pre-established harmony" provides Leibniz with the necessary "unity" which makes all monads hang together throughout the spiritual universe. Leibniz had to call into being a *deus ex machina* to resolve the difficulties of positing, on the one hand, an organic whole in which the monads were fused into unity, and on the other, an absolute separation of monads.

Thus each organic body of a living being is a kind of divine machine or natural automaton, which infinitely surpasses all artificial automata. Because a machine which is made by man's art is not a machine in each one of its parts; . . . But nature's machines, that is, living bodies, are machines even in their smallest parts *ad infinitum*. Herein lies the difference between nature and art, that is, between the divine art and human art.<sup>28</sup>

There could be only an external relationship between Leibniz's two ultimate metaphysical presuppositions. He was led to adopt a third entity, "pre-established harmony" or "God", to resolve the conflict between these two metaphysical opposites.

If the discussion on Leibniz's monad has been somewhat extended, it has been necessary in order to make clear the alternative path developed by Bruno. Bruno's approach, though plagued by his supreme paradox of fixed structure and dialectical method, does have the merit of pointing a way out of the dilemma of extreme pluralism without necessarily introducing a *deus ex machina*. For Bruno, "there is one Womb, conceiving all things".<sup>29</sup> All monads are part of, and operate within a monistic system of the universe. The distinctions in Bruno's "order of monads" remain just that, distinctions. Hence, if it is in the nature of universal substance to be a unity of the many contrary tensions to begin with, there is no need for "pre-established harmony." Such harmony arises out of the nature of the universe itself. Bruno does not rule out difference in things. In fact, it is the very opposition between monads which generates and differentiates all things ; while it is the supreme monad which brings into unity and harmony all contraries.<sup>30</sup> Whereas Leibniz related his monads to one another only externally, Bruno's monads are organically and internally related. The opposition of macrocosm (nature), which is the second order of the monad, and the microcosm (man and the rest of the animal world), which is the third order of the monad, are internally synthesized by their inclusion in the "highest principle of Being", universal substance. This is the first order of the monad, the supreme monad. The harmony of monads

is internal to the universe itself. Thus, Bruno unlike Leibniz, does not need a supernatural entity or an "entelechy" to resolve all distinction and contradiction.

Both Leibniz and Bruno desired a completely harmonious universe. Such a rational arrangement flowed naturally from Bruno's monistic theory of the infinite. For Leibniz it was a forced marriage of pluralities external and alien to each other, brought into harmony by a *deus ex machina*. The principles of Leibniz's *Monadology* were geared to the needs of the theology of his day. The opposite is true in Bruno's case. The impact of science on his monadic system of infinity is clearly revealed in a general summation of the procedures and purposes of his great and final Latin writings.

In the first volume, sense-perception is most important; in the second, words; in the third, the thing itself. The first concerns what is within us; the second, things heard; the third, that which is discovered. In the first, the method is mathematical; in the second, divine; but in the third it is natural.<sup>31</sup> The first deals with simple objects, the second with abstract, the third with composite.

In the second work . . . viewed according to the monad all things are in harmony; viewed by number they mostly differ one from the other; but viewed according to form they are in complete opposition. For the monad is the individual substance of a thing, but form is indeed the orderly flowing forth from the original site of the unfolded origins. The monad is that which is absolutely true; number is goodness in its own nature; for it is beauty in a certain relation.

In the third work . . . it is shown that the principle elements in the universe are water, light and air; the principle substances are the sun, our earth, and the Heaven (under one Being, lord of all things, unconditioned by any form) . . . the hindrance to natural knowledge and the main foundation of ignorance is the failure to perceive in things the harmony between substances, motions and qualities.<sup>32</sup>

Bruno develops a harmonious composition of monads in spite

of their quantitative uniqueness, because they are related to each other organically, internally and qualitatively. Bruno's monad is not the material "simple" of Democritus, nor is it the spiritual "simple" of Leibniz. The unity of the monads is a complex unity, a dialectical unity. The supreme monad is built on the foundation of the manifold internal opposition of monads. Bruno arrived at a "monad of monads" which transcended all strife, divergencies and motion. Such an outlook is consonant with his entire effort to do away with the problems raised by Copernican science. Most general of which is the problem of an eternally changing universe. Bruno's changeless pattern of the infinite taken as infinite enables him to preserve, intact and without contradiction, universal substance or the supreme monad.

## Chapter Seven

### *The Category of Process*

The category of process comprises the nexus of the antagonism between Bruno's closed system of infinity and his affirmation of dialectical movement. The internal self-generation of things is, in the grand plan laid out by Bruno, the crucial function of material objects. Causality for example, is not taken in the mechanistic sense of bodies in motion as a consequence of external pushing and pulling. Bruno does not exclude the existence of such mechanical movement, rather, he insists upon its subordinate character; dependent upon the dynamics internal to the bodies themselves. Motion is not eternal and immutable in the same way the universe is. The processes which take place in the universe are *immutable processes of the parts*, but *not of the infinite universe taken as a totality*. This fact is extremely significant if we take Bruno's efforts to establish a perfect system of the universe seriously. The extreme limits process can be granted in a closed metaphysical system were reached by Bruno when he declares that the finite parts of the universe are a synthesis of freely developing internal forces impelling to eternal flux within a framework of a "fluxless" universe.<sup>1</sup>

"That which intrinsically contributes to the constitution of a thing, and remains in the effect", Bruno terms the "Principle".<sup>2</sup> And "that which contributes to the production of things from without, and which has its being outside of the composition", he calls the "Cause".<sup>3</sup> The distinction between "Principle" or internal causation, and "Cause" which is external causation, is made for two closely related reasons. First, for the purpose of explicitly differentiating dialectical from mechanical processes. Second, in order to prove that the infinite universe has motion internal to itself through the movement of its parts; processes which are never exhausted in particular finite things. Therefore motion which is *extrinsic operates* only in particularized and localized

finite things. Motion taken as *intrinsic* is simultaneously operative in everything. Hence, "Principle" and "Cause" comprise in Bruno's metaphysics, the two categories of causation and flux in the infinite universe.<sup>4</sup>

The animation and self-movement of phenomena constitutes the "hidden" law of nature. It is ultimately that which accounts for the development in determinate, particular things. Motion *in* the infinite plenum and motion *of* the infinite plenum are not to be confused. Bruno recognizes *only the former* when he writes that:

As to such argument showing that motion is determined and finite, none have denied or doubted this. But it is false to describe it as simply determined upward or determined downward, and this we have proved on several occasions. For everything moves indifferently hither or thither, wherever may be his place of conservation, and we maintain that, even if we accept the principles of Aristotle and other principles which are like his—nevertheless if there were another within our earth, the parts of our earth would remain within that body only if held by constraint, for they would naturally rise.<sup>5</sup>

We may then believe that all motion is finite . . .<sup>6</sup> and also that there is an infinity of worlds; since even as each of the infinitely numerous worlds is itself finite and is in finite space, so there appertain prescribed terms to the motion of each and of their parts.<sup>7</sup>

The conception developed by Bruno on the nature of process more closely approximates the views of Heraclitus than they do those of Democritus. It is internal rather than external opposition in things that is the essence of process. That type of motion which is external and mechanical fails completely to account for the development of the infinite number of things in the universe. It is with an eye to the defects of ancient materialism that Bruno is led to interpret all change as due, in the final analysis, to "hidden" motion. In *De immenso*, he points out that extensive mo-

tion arises from the influences exerted by the inherent motion of things. Things act on, and affect the motion of each other externally only as a consequence of their internal, dialectical motion. Standing above and uniting both internal and external motion of the finite things, Bruno has his ever-present changeless infinity. This universal substance determines the motion of particular things in every way.

Particular things, whether corporeal or incorporeal are never completed; and among eternally pursuing individual forms, seeking eternally nevertheless those to pursue, never rest content . . . Thus it is the Infinity of All ever bringing forth anew, and even as infinite space is around us, so is infinite potentiality, capacity, reception, malleability and matter.<sup>8</sup>

All determinate aspects of motion, aspects involved in spatio-temporal relations, Bruno understands as expressions of inherent law. Motion is not a movement of atoms colliding with each other haphazardly and lawlessly. No given object is "at rest" and then put in motion by that which somehow already is in motion. Rather than outward constraint, the existence of change must be accounted for on the basis of internal contradiction. This is the most general principle of motion Bruno ever expounds. As has been indicated many times before, Bruno restricts the category of process to finite events. It is opposition which generates change but it is the union of opposites that overcomes change. Were Bruno to adopt the view that motion, rather than universal substance is eternal and immutable, he would have had to scrap the metaphysical use of any substantival category. This Bruno clearly fails to do.

If then spirit, soul, life, is in all things, and to a varying extent fills all matter, it must assuredly be the true act and the true form of all things . . . Thus only the external forms of things change and dissolve again, for they are not things in themselves but appertain to things, not substance but accident, and circumstance of substance.<sup>9</sup>

In his attempt to salvage his closed, unchanging system of infinity, Bruno is forced not merely to declare that processes are limited to the parts and not the whole of reality, but also that such events are in the realm of "appearance" and not "reality". The identifiable substance of Aristotle becomes the foundation of Bruno's attempt to read out of "real existence" all processes. Here Aristotle has his revenge on the Nolan. Bruno is compelled to reiterate Aristotle's claim for a motionless "prime origin".

The Prime Origin is not that which is in motion, but itself is still and immobile, it gives the power to generate their own motion to innumerable worlds, to great and small animals throughout the vast space of the universe, each with a pattern of mobility, of motion and of other accidents, conditioned by his own nature.<sup>10</sup>

Processes then, whether internal or external, intensive or extensive, dialectical or mechanical, are not part of substantive reality. Emergence and decay are but expressions and representations (in appearance) of substance. Dialectics comes to mean only a method of drawing logical inferences within the immutable universe. In a fairly long, yet revealing comment, Bruno has Philotheo state the two main reasons why the universe must be infinite and immutable and motion not so.

. . . it is never possible to make concerning these parts an inference such as: the universe is infinite, these are infinite worlds; therefore a single part of the world is endowed with infinite motion, and must be infinitely attracted by an infinitely distant earth, and moreover hath infinite weight. This impossibility ariseth from two reasons. On the one hand, such a transition is impossible; for, since the universe consists of opposed bodies and principles, such a single particle could not traverse far through the ethereal region without being overcome by its opposite; so that this part of the earth would no longer move, because the substance thereof would no longer be earth, having through the victory of the contrary

thereof, changed his complexion and aspect. In the second place, we observe in general that far from there being ever an impulse of weight or lightness from an infinite distance as is alleged, such attraction of the parts cannot take place save within the region of their own containing space; for if they were beyond it, they would no longer move there; for the fluid humors . . . if placed outside their own proper containing region, even though near to it, would lose their natural force and impulse.<sup>11</sup>

The varying aspects of matter in motion are, therefore, not predicable of infinity but are just oppositions generated by the "world-soul", "God" or "Universal Substance" (as the all-inclusive "it" is called at varying times). Placed in a receptacle, all opposition is taken up and transformed into the one true unity, which at the same time is the sole reality. "Behold then the proof that when two contraries are opposed to one another, there ensueth always finite action and finite alteration."<sup>12</sup> How then does "infinite action" and "infinite alteration" ensue if not through the existence of some harmonious synthesizing agent! The final lesson Bruno would have us learn is that motion is not attributable to "Being" but only to the various finite manifestations and modes of "Being".

The central ontological category of qualitative and quantitative change is rarely (if ever) dealt with on its own terms by Bruno. Nevertheless the problem persists, forcing itself to the foreground by way of his conception of "potency and act". If all finite things and processes are indifferently one thing, then it is obvious that there can be but a single real quality.

In number then, and in multitude, there is infinite possibility of motion and infinite motion. But in unity and singularity is infinite motionless motive force, an infinite motionless universe. And the infinite number and magnitude coincide with the infinite unity and simplicity in a single utterly simple and indivisible principle, which is Truth and Being.<sup>13</sup>

All that occurs within this single quality or infinite substance, can only have quantitative determinations. Hence, there is a difference between the infinite universe taken as a whole and the things moving about in the universe. Bruno makes this distinction in many ways and many times. It has been used in this study as the basis for analyzing the connection between his theory and method. We can express this distinction in more generic terms as the difference between the one single quality and the many finite quantities. The infinite universe comprises all Being, and in addition, all modes of Being. Particular things, although infinite in number and containing all Being in a contracted way, do not contain all the modes and representations of Being. Thus, the infinite number of things can have only quantitative dimensions, and only infinite taken as infinite (boundless and limitless) contains all aspects of reality in an unchanging way. The conclusion must therefore be that infinity is the only quality.<sup>14</sup> The infinite universe as the highest category must be a totality, a quality. Each quantitative determination includes Being only partially, for the quantitative is caught up in flux, in the becoming. In the unique quality of Being (infinity) nothing exists that is outside of its scope. This is not the case in particular quantitative things subject to generation and destruction. The very limitations of these finite objects must imply the existence of "something more than itself." The infinite is thus considered a quality of Being.

Therefore, it is to be understood that all is in all, but not totally, and in all modes in each one; understand, therefore, that everything is one, but not in the same mode.<sup>15</sup>

The interconnection between that which "is" and that which is becoming, is but a quantitative relation. It is obvious to Bruno that if "all is in all" instantaneously, no genuinely new qualities can emerge. Potency and Act taken together constitute an "Absolute Principle of Being". Since what exists as an "is" already contains the "becoming", it is clear that change cannot be qualitative, for "Universal Substance" cannot become other than what it al-

ready is or implies. If substance is immutable then the only quality must also be immutable. The distinction drawn by Bruno between matter as act and potency, and form as act and potency is merely a quantitative distinction. Such distinctions cannot possibly involve qualitative alterations either in matter or the forms it adopts. Both are quantitative polar aspects of the one substance or quality. The affirmation of quality as substance can only lead to a corresponding denial that any essential (qualitative) developments occur in the objective universe. Irrespective of the perspective, the conclusion Bruno comes to is the same: the infinite substance is the sole existing quality, a quality which is eternal and changeless. All distinctions, alterations and processes that take place are quantitative in nature and do not affect the fundamental "essence". The "process" is impotent in the face of the "real". Bruno is unyielding in his identification of quality and essence.

What actually is, and what potentially is coming to be, Bruno sees as an identity of opposites; with the accent on the *identity* aspect. Hence, change is necessarily relegated to the realm of appearance and fixity becomes a property of objective reality.

... because the absolute possibility, through which the things are in act can be, does not exist before that actually, not after it; moreover, the capacity to be exists together with the being in act, and does not precede it; because if that which could make itself, it would be before it was made.<sup>16</sup>

That which undergoes change, development and disintegration is quantitative. Bruno holds that since there is but a single recognized quality, it is impossible to speak of qualitative changes in the one substantive unity.

Everything we see of difference of bodies . . . is nothing other than a diversity of appearance, a transitory, mobile, corruptable appearance of an immobile, stable, and eternal thing; in which all forms, all figures, and numbers are indistinct and as it were conglomerate, not otherwise than in the seed, in

which the arm is not distinct from the hand, the breast from the head, the nerve from the bone.<sup>17</sup>

Quantity is not substance, but about substance. Because substance is quality it is essentially one and indivisible. It is a composite of all quantitative determination. The dichotomy Bruno introduces between quantity and quality flows inevitably from his presupposition of the identity of that which is and that which is becoming. Processes are quantitative, they enter into qualitative relations in so far as they are part of the substantive quality. Hence in the identity with the "Absolute Principle", actuality and potentiality lose even their function as categories of flux and development.<sup>18</sup>

Only in finite and determinate things are potentiality and actuality dialectically identical, not tautologically identical. According to Bruno, what "is" has finite limitations and, by the same token, "that which is becoming" is also finite and limited. Although quantitative changes do take place in the finite realm no qualitative meaning can be attached to the finite realm itself.

Every potency and act, which in the Principle is enfolded, unified and one, is in other things unfolded, dispersed, and manifold . . .<sup>19</sup>

In like manner, says Bruno, because particulars never have more than quantitative and particular being, the particular refers "itself to every form and act, it does so through certain disposition, and through a certain order of succession of one being after another".<sup>20</sup>

The infinite universe, which is the image of the First Principle, is all that it can be. It is the sole quality. Here essence and quality merge. For no single finite part "is all there can be". Thus, every finite object, irrespective of the degree of their development must be purely quantitative. The universe, extensively viewed, is all there can be, in a developed, contradictory and distinct way. While the First Principle (the infinite universe viewed intensively), is all that there can be, "unifiedly and indifferently; it is all in all, and the same in all, simply and without distinction and

difference".<sup>21</sup> Bruno, by maintaining that "what is" and "what is becoming" are in actuality a unity, concludes that the universe is the "infinite image" of the "Infinite First Principle". Furthermore, the distinction between potency and act are quantitative.<sup>22</sup> The difference between matter as potentiality and matter as actual substance is, along with the distinction of Universal Form and Universal Intellect, quantitative. Relations are taken up and united in the sole eternal and unchanging quality, substance.<sup>23</sup>

Atomistic materialism, as expounded by Democritus, is the spring-board for Bruno's ideas on quantity and quality. Quantitative change is adjunction and separation of atoms. Qualitative and substantival change in the material world are illusory. But whereas for Democritus the atoms and the void constitute the whole of reality, Bruno's universe is far wider in scope and imagination. "Universal Substance" is Bruno's way of making up for the "shortcomings" in atomist philosophy. Such a "universal" has the advantage of bringing unity out of the extremely diverse movement of atoms. At this point in his analysis *the qualitative and the substantival merge, not however as process, but as stuff.*

There is an aspect of Aristotelian metaphysics that Bruno would have done well to give his closest attention. This aspect is Aristotle's treatment of the quantitative and qualitative. Aristotle at least sets the question of quantity and quality in a proper i.e., objective and natural, framework.

In Aristotelian theory the notion of change is a very generalized one: there is a change whenever an underlying substance first lacks a property and then possesses it. The types of change he recognizes are four in number, distinguished by the domains in which they occur. Quantitative change is illustrated by growth and decay, whether biological or artificial. Alteration is qualitative change, such as a substance changing color. Motion is change of position and is most pervasive, being involved in all the others. Coming into being and passing away are changes of substance. Unlike the others they are instantaneous, since at any moment a bit of existence either is or is not of a definite sort. Other types of change may lead up to substantival change, but it does not itself cover an interval.

For Aristotle, all types of change are equally "real." He makes no attempt to reduce them to one another. In his physical theory qualitative change emerges as important. For the changes in the composition of things are ultimately traced to qualitative replacements. This rests on a definition of the four sublunar elements in qualitative terms, earth being the cool-dry stuff, water the cool-moist, air the hot-moist, and fire the hot-dry. Yet there is no attempt to assign any primacy to qualitative change. Similarly, while physics is described as the study of the properties that are not isolable from matter, namely movement and its kinds, there is no attempt to assign it any primacy among the sciences. Thus, although Aristotle, through his formal logic, attempts to read out of existence objective change, the "this-sidedness" of his theory does attempt to work out a plausible concept of the quantitative and qualitative.<sup>24</sup>

As with so many other critics of Aristotle, the "baby is thrown out with the bathwater" by Bruno. This usually leads not to a "refutation" of Aristotle, but to the weakening of the critics' own structure. This cannot be made into a blanket generalization, but few would argue that had Bruno seen through the distorted vision of Aristotle presented by the Schoolmen into the materialist side of the great philosopher of antiquity, Bruno would have strengthened immeasurably his effort to formulate a new, revolutionary world view. Instead, by artificially combining the atoms of Democritus with the universal forms of Plato, Bruno fell prey to his own variant of objective idealism. He devised a theory of change that amounted to an empty categorical formula: the quantitative is the Becoming whereas the qualitative is the Being.

Bruno failed to note that quality is that definiteness of a given thing which is inseparably connected with its existence. Every thing or process in nature possesses given characteristics through which its quality is defined. Bruno's inability to see the concrete nature of quality, makes it impossible for him to distinguish a certain thing or process from all others. Scientific knowledge must in the first place establish the qualities of the phenomenon being analyzed, that is, define the specific properties which differentiate it from all other things. This Bruno did not do, and as a

consequence, his system of infinity reduced every material object and process to a quantitative alteration in appearance.

Bruno first failed to perceive that if the qualities of the particular thing are not determined, it is impossible to clarify the laws of development. Failure to grasp this fact led Bruno to deny the development of the universe *qua* universe altogether.

It is a fact of dialectical reality that to every thing there belongs internally a special type of movement. And the movement of a thing, its self-movement, defines its internal nature, is its uniqueness, its quality. The world consists of processes, not of quantitatively but of qualitatively unique movements of matter. The quality of a thing, be it the atom or the entire universe, is given by the particular kind of movement that is fundamental to it. Such a theory of quantity and quality leaves no room for the isolated, unchangeable and self-related conception of the infinite as the type developed by Bruno. Quality is the inalienable and specific mark of a thing or a process. It is inalienable because without it the thing ceases to exist as that given thing. It is specific and concrete because it distinguishes that thing from all other things. In spite of the forcefulness of Bruno's words, we must draw the conclusion that there is no eternal quality; qualitatively unique things are only transitory forms of unitary, evolving matter.

The resolution of the contradictions between quality and its particular level in the developmental process is at the same time an intensification of that contradiction, which reveals the final limit of the quality and leads to a new "leap". The very emphasis by Bruno on the "identity" part of "opposition" led him to seek out the ossified rather than the changing. Bruno held firm to a dualistic and metaphysical notion of the relation of quantity (the infinite number of finite things), to quality (the One Universal Substance); they both operated in different realms with relative independence from each other. This separation of the quantitative and qualitative is the inevitable outcome of any systematic rationalism. Dialectics, on the other hand, examines quality first of all in its emergence and then in the process of its evolutionary

development, as a transition of quality into quantity. It can then be shown that this quantitative alteration is at the same time the preparation for the transition to a new quality. From this follows the correlative transition of quantity into quality. And this circle expresses the continuous course of development. Development can never end, nor can it be relegated to a separate and distinct "realm". In the birth of a quality there is already included the seed of its decay, the decay of the one is the inevitable beginning of the new and so on, endlessly.

In any concrete existence, the quality which differentiates it from other things is in a process of change, contrary to Bruno's conception of development as a movement fulfilling itself within the limits of a fixed substantive quality. Having come to the conclusion that quality and quantity are connected only superficially, and that in essence they are independent of each other, Bruno excluded the possibility of the emergence of new qualities and the destruction of the old through quantitative changes. He spoke of the substantive quality as being "immobile, unalterable and incorruptable". Even the quantitative parts of this single self-inclusive quality showed no real development, for they too, are "all perfect and complete".<sup>25</sup> Were Bruno to carry out the "logical" implications of the dialectical method rather than his metaphysical structure, he would have seen that dialectics, recognizing the interdependence of quality to quantity, seeks to discover in the case of every concrete quality the quantitative limits within which alone it exists and beyond which it is transformed into a new quality. Bruno committed the classical idealist error in assuming that a quality, because it is unique, stands over and above its parts, when in fact it is nothing more than its opposite parts or forces. Bruno is right in assuming the "abstract" character of substance or quality, but he did not understand that the abstract is at the same time the most concrete. It is the concrete composition of a quality that gives to it content. A quality does not "contain" the contents in the same way as a drinking glass contains some liquid, because a quality is no more than its concrete and specific contents. When compared with the previous

approach taken by Bruno on the subject of quality and quantity, the differences between materialist dialectics and idealist dialectics becomes manifest.

Summarizing, we may say that Bruno develops a hierarchy of categories. In this, his system bears great resemblance to other "systematic philosophies". It is a known fact that in the attempt to show the completeness of their system, Kant and Hegel developed a "Table of Categories". While Bruno had not explicitly outlined such a "Table", a perceptive reader of his works would have little difficulty in recognizing this as implicit in Bruno's philosophical edifice.

Chief among the categories are those of process and the category of the unchanging (Being), the latter regulating the function and matrix of the former. Such a "categorical imperative" could serve as a prop for theology. This is so because any effort to answer the question of how we account for the origin of things, must resort in the end to some "Prime Mover". The logic of this categorical analysis made it inevitable that Bruno seek refuge from change in just such a "First Cause".

## *Chapter Eight*

### *The Reign of Reason*

The path of a new scientific rationalist tradition in philosophy was blazed by Bruno; but not by him alone. Such outstanding sixteenth century rationalists as Girolamo Fracastoro,<sup>1</sup> Girolamo Cardano (Jerome Cardan)<sup>2</sup> and Peter Ramus<sup>3</sup> who, if they did not actually lay the foundation of modern science and the new rationalist literature of the ensuing century, should be given credit for having prepared the way for a more advanced civilization by putting an end to the sterile disputations of the scholastics and by awakening the human mind to the vast possibilities opened by capitalist society. Ideas of progress and perfectibility will always appeal to democratic souls, because they are, in a sense, fundamental to the material and intellectual growth of mankind. In proclaiming reason the criteria of truth, Bruno, along with his rationalist predecessors, became a part of the rising bourgeois social current that sought philosophical emancipation from divine revelation and earthly reaction.

A dominant theme throughout the history of philosophy has been the idea that the universe and everything in it is completely rational. The "stuff" of the world, whether it be primarily material or spiritual, is held to exhibit orderliness. It must, therefore, be readily available to conceptual knowledge. The ontological rationalism (as distinct from epistemological rationalism)<sup>4</sup> of the pre-socratics was primarily materialistic and geared to the scientific needs of the time. Medieval rationalism, reflecting the pervasive role of the church, was steeped in objective idealism, and its orientation was ethical and religious. Renaissance philosophy sought to combine the two variants of rationalism. And to this fact much of the eclecticism in Bruno's thinking can be traced. His was an eclecticism that stemmed from an over-eager attempt to unite all philosophic camps under a single domain.

The system of infinity Bruno worked out plainly reveals this

aim of not only re-introducing the scientific rationalism of Greek materialism on a new level, but also to make it ring with the emotion, poetry and imagery characteristic of medieval religious rationalism from Augustine to Cusanus. "The final arbiter is reason" Bruno emphatically declares. But reason does not mean only the symbols of mathematics and physics. It also includes the gamut of human emotions, the imagination and inspiration derived from contemplating the manifold aspects of the universe.<sup>5</sup> The high-point of rationalism in Renaissance philosophy was reached by Bruno. To the extent that nature has meaning it is rational.<sup>6</sup> In the "perfectly orderly universe" which Bruno envisioned, the infinite number of parts may be in constant flux, but it was a flux that obeyed natural law, dialectical law. The unity of universal substance (the infinite universe) was rational by virtue of its own perfect harmony and immutability.

Bruno combined two types of rational monism, a monism of stuff and a monism of change.<sup>7</sup> There is much in Bruno's "perfectly orderly universe" that suggests Leibniz's "best of all possible worlds". The similarity is not without importance, for it points up a conclusion "system-builders" are forced to come to irrespective of basic differences within systems. Bruno attempted to account for the fundamental structure of the universe and its various manifold parts by assuming the universe, to begin with, was harmonious and perfect not as a "process" but as a "stuff". In this way Bruno isolated motion from matter. Whether Bruno's "stuff" was primarily material and Leibniz's "stuff" primarily ideal in this context matters little, for both firmly committed themselves to a harmonious immobile theory of reality. Bruno says:

Thus all things are so constituted that they can in no way be better constituted and arranged, for every single thing is endowed according to its capacity and to the nature suitable for its own species, according to its proper powers, activity, understanding, form, duration, since, by the very nature of matter, limited sometimes by species, sometimes by number, nothing can be advantageously added to or subtracted from

it by any one. It is in this sense that Moses said all things are utterly good. To be sure, they may not seem so, if we consider the will and desire of the individual things, but they are so if we regard the order of the universe as a whole.<sup>8</sup>

Out of Bruno's conflict with the mechanistic confinement of all connection to external relations, he contrariwise emphasized that relations between things flow out of their internal nature. And at the same time, whatever Bruno and the rest of the upholders of logical harmony may have said, it should not be forgotten that the mutual relativity of qualities is infinitely various, deeply contradictory and by no means absolute in the sense of being fixed. The unitary development of the universe is accomplished through particular things. Their relative independence and stability in development, their contradictions and conflict, which belong to them internally and are manifested in their external relations—all these destroy Bruno's legend of an absolutely rational harmony of nature. Bruno forgot that with the whole unity of development there always remains "a chaotic aggregation of the objects of nature in some or other determined field or even over the whole world".<sup>9</sup>

There are no absolutely external things. This Bruno understood well. But also there is no absolute concordance of things. In vital development the relatively external and the relatively internal are interwoven, condition each other, and create a vital connection of everything in the unitary flow of the development of matter. The different relations of a thing to others must be united in our knowledge and action, not arbitrarily, not on the basis of "universal harmony", but on the basis of the *development* and *self-movement* of a thing, whether that thing be a single atom or the entire universe.

Universal law becomes meaningful for Bruno, only at that point where one transcends his subjective limitations and embarks upon the task of comprehending the universe objectively, that is, by employing the powers of human reason. Bruno rejects the notion that the senses can, when unaccompanied by human reason, furnish us with an intimate knowledge of the laws of nature. This

observational approach, he indicates, is a decisive weakness in Aristotle's philosophy. Bruno might have said that: common sense may lead one to the well of the rational universe, but it is incapable of allowing one to truly drink up its laws. Bruno's final epistemological dictum is that the universe of law and order must be comprehended, if it is to be comprehended at all, by a rational method.<sup>10</sup>

Bruno's classic form of rationalism proceeds from an assurance that the order and connection of ideas are the same as the order and connections of things, but does not establish this coincidence in fact. Moreover, Bruno's attempts to establish it invariably led him to the idea of a pre-determined harmony between mind and body. The "Universal Intellect" directs nature to the production of orderly and rational things and further directs the human intellect to form rational ideas congruous with the objective universe.

The universal intellect is the intimate, most real, peculiar and powerful part of the soul of the world. This is a single whole which fills the whole, it illumines the universe and directs nature to the production of suitable species: this is concerned with the production of natural things, as our intellect with the congruous production of rational kinds. This is called by the Pythagoreans the motive force and mover of the universe, as said the poet: "Mind moveth the whole form and mixes itself throughout the body".<sup>11</sup>

This consciousness or "universal intellect" was conceived by him in a doubly abstract form, separate both from the individual material carrier of consciousness and also from social man. But in spite of this, Bruno's doctrine of the unity of "body" and "mind" (what Spinoza later termed "extension" and "thought"), in the one substance approached incomparably nearer than the later rationalists the materialistic solution of the "mind-body" question. For it pointed a way in which one could distinguish human consciousness from objective reality without dividing the two into separate isolated realms as the Cartesians were to do.

The many-sided development of Bruno's epistemological rationalism led him to posit a "universal intellect" that is primary and a nature which partakes of this objective spirit. In a sense, then, Bruno accepts an objective idealism (or as it is sometimes called "metaphysical realism") that is not out of spirit with the results of medieval "realism". However, it is difficult to claim Bruno for the camp of objective idealism. Through his directive that "God" or "Destiny" is a significant category only within the context of the natural universe, he is able to confine his "spiritual world" to the world of nature and man. The dualism of matter and spirit is united by Bruno in the unity of the infinite universe.

What would happen if there were this or that additional world? Whether they be even or uneven in number, why should they be in this rather than in that category? And indeed why is all this matter divided into many worlds instead of being agglomerated in a single globe? Since unity is better than multiplicity, *cet eris paribus*, why is the substance divided among four or six or let us say ten earths, rather than forming a single great and perfect globe? Indeed, just as there rises from the possible and the impossible a finite sooner than an infinite number; so, as between the convenient and the inconvenient, unity is more rational and atural tha multiplicity or plurality.<sup>12</sup>

Bruno's monistic conception of the universe, although a valiant effort to "resolve" a materialist theory of nature with an idealist metaphysic, results not so much in resolution of the problems generated by the two antagonistic philosophies, as much as in an avoidance of them. The grandly envisioned pronouncements on the "oneness" of the universe clearly ignores necessary distinctions that have to be made between things, processes, concepts and categories. This makes much of Bruno's analysis chaotic, disorderly, and at times incomprehensible. A characteristic statement well illustrates the eclectic obfuscation of what might well be considered a fundamental concept in Bruno's ontology.

For nature is not merely present, but is implanted within things, distinct from none; naught is distinct from her except the false, and that which existed never and nowhere, nullity. And while the outer face of things changes greatly, there flourishes the origin of being more intimately within all things than within they themselves. The fount of all kinds, Mind, God, Being, One, Truth, Destiny, Reason and Order.<sup>13</sup>

The main question Bruno's rational system faced in every sphere of thought it turned to, is one of reconciling a closed and fixed system with a method, the dialectical method, which postulates eternal movement as its central maxim. Whether this "paradox" be clothed in the oldest philosophic verbiage or in the latest theory of physics and mathematics, the paradox remains essentially the same. All inconsistencies in Bruno's ontology ultimately rest upon this irreconcilable dichotomy between system and method. The venture into philosophic system-building, coerced Bruno into assuming the universe to be rational in all phases. Take this unwarranted assumption away from Bruno and you take away the entire foundation of Bruno's theory of changing things in a changeless universe.

The theory of knowledge developed by Bruno is a perfectly consonant outgrowth of his theory of reality. Reason dominates every aspect and every level of objective reality. And although any particular phase has finite, determinate limitations, they all find their rationality in their inter-connection and interpenetration with universal substance. Man as part of this rational universe must, according to Bruno, act in rational way. To know a rational world demands a rational method. The difference between the rationality of things and the rationality of men is that only men can consciously direct their energies, desires and emotions. Material things can only obey the laws of nature. They must merely operate in accordance with universal reason. Thus, science, morality and religion must be phenomena distinctly characteristic of conscious and thinking beings. In this way Bruno's epistemological rationalism maintained its organic connection to the broader rationalistic theory of reality. The implications for

epistemology of Bruno's rationalist viewpoint is that he was able to solve the problem of *human* consciousness in a materialist fashion. But by imparting to "universal substance" a "consciousness" over and above human consciousness, Bruno concluded his studies in epistemology by adopting the idealist notion of a trans-human "Geist" or "Mind".

The result of holding a theory of the universe which had a wider and more pervasive meaning than a theory of knowledge, was a de-emphasis on ethico-religious considerations. This Bruno did by seeking the ethical justification of his rationalism through scientific investigation of the physical universe. An approach which is the very antithesis of what Platonic scholastics such as Cusanus strived to accomplish. Science was always subordinated to the needs and desires of theology. For example, Cusanus, although one of the most enlightened of the scholastics, sought the scientific justification of his rationalism through Christian morality. It is because of the prime emphasis Bruno placed on developing a scientific conception of reality, that he must be viewed as a leading progenitor of modern materialism. This is so without ignoring the fact that there clearly exists within his rationalist philosophy the germs of an eclectic development. One aspect of which is an aphoristically formulated doctrine which pulsates with inconsistencies derived from ancient mechanism and medieval neoplatonist idealism.

If inconsistencies in Bruno's rationalism can be traced to the philosophical paradox of closed system and open method, this in turn must be related to the broader ideological contradictions of an established system of theology struggling to retain its dominance over a rising scientific world view. This struggle Bruno tried to "synthesize" by fruitlessly attempting to salvage a closed system of the universe through its inclusion of dialectical processes. No matter how "revolutionary sounding" his theory of an infinite universe may appear (and in fact it was an extension of astronomical theory), objectively, it represents Bruno's cardinal concession to the static ontologies supported by medieval philosophy. He failed to understand that it was the *universe in motion* which was itself the totality of the rational universe. Such a view

does not need an immutable scaffold to give it meaning; in point of fact it must reject such a changeless structure. The genius of Bruno emerges, however, when one probes the interior of the scaffold, investigating what lies inside. It is the *content* of the system that must be kept in the foreground if Bruno's positive achievements are to be recognized and appreciated.

Bruno summed up the goal of the human enterprise in most passionate and emphatic terms. Such terms clearly demonstrate that he held his system of the universe to be valuable and significant because it led to an extension of scientific knowledge.

Continue to make known what heaven really is, and the truth about all of the planets and stars; how the infinite worlds differ; how an infinite space is not impossible, but necessary; how such infinite effects suit the infinite cause; what the real substance, matter, action, and efficacy of the whole is, and how far from similar principles, and like elements every sensible and composite thing is formed. Make this knowledge of the infinite universe known to everyone. Tear away the concave and convex surfaces, which restrict both within and without so many heavens and elements. Make ridiculous the different fixed orbs and stars. Break and hurl to the ground, with the sound and fury of lively arguments, the adamant wall of the prime mover, and the last convex cherished by the blind masses. Crush the very life out of this whole view. Destroy the ignoble faith in the quintessence. Prove that the composition of all the other planets and worlds we can see is the same as that of this our planet and world. Let every one of the large and spacious worlds graze time and again in its turn and order with other infinite smaller ones. Tear down the extrinsic movers together with the margins of their spheres. Open the door through which we may see the indifference of this planet to the others. Show the consistency of there being other worlds in the ether as well as our world. Make it clear that the motive power of every world comes from its internal soul, so that with the light of such contemplation we may proceed with firmer steps to the knowledge of nature.<sup>14</sup>

In the synthesis of the old to create the new, lies the genius of Bruno. His philosophic edifice, despite its erroneous foundation, is not merely erected on top of other systems, but rests on a transcendence of all previous systems. It is this characteristic which gives to it vitality and importance. The rationalistic system, enriched and enforced by dialectics, is separated from past systematic philosophy in that it is firmly anchored to the *rising* social, scientific and ideological currents of Bruno's epoch. He boldly defied supernaturalism, dogmatic faith, superstition and scholastic authority. The kingdom of *reason not revelation* is the final arbiter of all men survey, and all that men survey is rational.

In every historical era, a philosopher with an encyclopaedic sweep emerges; a thinker who synthesizes and transforms all past contributions to thought in terms of the situation of his own times. This is the greatest accomplishment of Giordano Bruno's philosophy.



## NOTES *and* INDEX



## NOTES

### PROLOGUE

1. *Concerning The Cause, Principle, and One*, Dial. 1, pp. 154-55 (Greenberg Translation, New York 1950).
2. *ibid.*, pp. 79-80.
3. *ibid.*, p. 102.
4. Baumgardt, Carola, *Johannes Kepler: life and letters*, New York 1951, p. 77.
5. Documents of the Venice Trial. VIII, as cited by D. Singer, in *Bruno: His life and thought*, New York 1950, p. 12.
6. Bruno, as cited by Singer, *ibid.*, p. 14.
7. *Concerning The Cause, Principle, and One*, pp. 95-96 (Greenberg translation).
8. Singer, D. W., *loc. cit.*, p. 16.
9. *Concerning The Cause, Principle, and One*, p. 102 (Greenberg translation).
10. *La cena de le ceneri*, Dial I, (Gentile, Op. ital. I, pp. 15-17).
11. *ibid.*, pp. 101-2.
12. *Concerning The Cause, Principle, and One*, p. 92 (Greenberg translation).
13. *ibid.*, p. 102.
14. Documents of the Venice Trial. I-IV, cited by Singer, *loc. cit.*, p. 161.
15. *ibid.*, p. 161.
16. Documents of the Venice Trial. VI, *ibid.*, p. 162.
17. As cited by Ilin, M. and Segal E., in *The Giant Widens His World: The Middle Ages and the Renaissance*. pp. 215-216, New York 1949.
18. Documents of the Rome Trial, XXX. This statement was recorded for eternity by a braggart youth, Gaspar Schopp of Breslau, a recent convert to Catholicism, to whom Pope Clement had shown great favor.
19. Bruno, as quoted by Singer, *loc. cit.*, p. 201.
20. Pope Leo XIII, as recorded by Professor R. Adamson, in his *Development of Medieval Philosophy*, 1903, Vol. II, p. 23.
21. Berti, D., *Preface to the Vita di Giordano Bruno*, Turin 1889.
22. *Le cena de le ceneri*, Dial I, (Gentile, Op. ital., I, p. 17).

### INTRODUCTION

1. The authors that are included in this introductory discussion are: Boulting, W., *Giordano Bruno: his life, thought, and martyrdom*, London 1916.

Brinton, D. G., *Giordano Bruno: philosopher and martyr*, Philadelphia 1890.

Fontaine, W. T., *Fortune, Matter and Providence*, Louisiana 1939.

Frith, I., *Life of Giordano Bruno the Nolan*, London 1887.

Greenberg, S., *The Infinite in Giordano Bruno*, New York 1950.

Singer, D. W., *Bruno: His Life and Thought*, New York 1950.

2. Horowitz, I. L., *Cultural Reaction In Plato's Thought*, "Journal of Social Studies," Vol. VII, No. 2, Spring 1951, p. 28.

3. In the second section of the essay, I divide Bruno's system and method. It should be made clear at the outset, that this division is made for the sake of analysis only. Bruno himself, of course, made no such distinction between his system of the infinite and his dialectical method.

### 1. THE REVOLUTION IN COSMOLOGY

1. Engels, F., *Dialectics of Nature*, New York 1940, p. 184.

2. Wolf, Abraham, *History of Science, Technology, and Philosophy in the Sixteenth and Seventeenth Centuries*, London 1935, pp. 1-25 et. passim.

3. *La cena de le ceneri*, Dial. I, pp. 5-6, (Gentile, Op. ital., I, p. 22).

4. Bruno obviously was not aware of the attacks to come on Aristotle's conception of organic life, since he was in the midst of the Copernican overthrow of Aristotelianism in the inorganic sphere which took place two hundred years before the "Darwinian revolution." But both revolutions in scientific theory had the similar consequences of shaking the ruling classes of society to their very marrow. This reflected itself in the fierce ideological conflict between theology and science, a conflict that resulted in the complete vindication of science; but not before men like Bruno were willing to sacrifice their very lives in its defense.

5. Singer, D. W., loc. cit., pp. 46-47.

6. Aristotle, *De coelo*, pp. 113-114, 286b, 21.

7. Aristotle, *ibid.*, II, 3, 286a.

8. Aristotle, *ibid.*, IV, 3-4, 310-312a.

9. Aristotle, *Physics*, VIII, 6, 258a-259b.

10. Aristotle, *De coelo*, II, 8, 289b.

11. Aristotle, *Metaphysics*, XII, 8, 1074a, 13. Aristotle distinguishes between the elements as perceptible bodies which are always encountered by us in alteration with one another, and the original sources of these elements which are equal in number and identical in kind with those in the sphere of the eternal and primary things.

12. Ptolemy's work is better known by the title of its Arabic version, *Almagest*.

13. For a survey of the stages in the development of the Ptolemaic system see: "Humanism and the History of Astronomy," by Grant Mc-

Colley. *In Studies and Essays in the History of Science and Learning offered in Homage to George Sarton on the Occasion of His Sixtieth Birthday*, New York 1946, ed. M. F. Ashely Montagu.

14. Engels, F., loc. cit., p. 185.

15. Copernicus, N., *De Revolutionibus Orbium Celestium*, Lib. I, Cap. X.; English trans. W. C. D. and M. D. Whetham, *Readings in the Literature of Science*, Cambridge 1924, p. 13

16. Angus Armitage, *The World of Copernicus*, New York 1951, provides a full and vastly rewarding account of the Copernican revolution in cosmology, and the historical development of astronomy from the pre-socratics to Gallileo. See also, E. A. Burtt, *Metaphysical Foundations of Modern Science*, Cambridge 1939, which is the best treatment of the philosophic implications of the new science. D. Singer, *Bruno: His Life and Thought*, New York 1950, has a readable and rich discussion of the concepts introduced by Aristotle and Ptolemy and Copernicus, including the bearing these views had on Bruno. A recent competent work on the growth of the sciences during this period is *The Origins of Modern Science*, by H. Butterfield, New York 1951.

17. In the third dialogue of *On The Infinite Universe and Worlds*, Bruno considers ten points (which Bruno correctly breaks down into four), that forms the basis of his views on the infinite. First, from an analysis of motion Bruno finds that motion, natural and unnatural, is to be considered each within its own sphere. Every planet has motion internal to itself. "Just as this earth has her own heaven . . . through which she moves and has a course, so the same may be said of each of the innumerable other worlds. Every star has motion even as does our own. . . ." Second, distance between bodies is not a sufficient ground upon which to postulate difference in the natures of these bodies. The vital principle of a particular body is one with the vital principle of the Infinite Substance, for the latter is totally in everything that exists. Third, each one of the infinite worlds is finite as presented to us. But though motion is determinate within particular worlds, it cannot be inferred from this that motion is itself determinate and limited in the infinite universe. Fourth, absolute infinities and all distinctions between elements, while necessary on arithmetical, geometrical and logical grounds, do not exist in matter itself, as such they do not exist in the nature of things.

An interesting illustration of the dialectical method applied to cosmology emerges in this dialogue when Bruno discusses the origin of illumination. "Light proceeds always from the opposed star . . . we should see no illumination save over a small region where the light of the sun and light of the moon were opposed to us (the earth)."

18. Armitage, Angus, loc. cit., pp. 131, 144.

19. Singer, D. W., loc. cit., pp. 49-50.

20. *Spaccio de la bestia trionfante*, Op. ital., II, (Gentile, Op. ital., II, p. 14).
21. *ibid.*, p. 18.
22. Windelband, W., *A History of Philosophy*, New York 1901. This scholar believes that "anthromorphism is the cardinal characteristic of Renaissance philosophy." That this is only partially so (more true of the early Renaissance thinkers than of the later Renaissance philosophers), is attested to by Bruno's "universe-centered" metaphysics.
23. *La cena de la cenere*, Dial. I, p. 128, Op. ital., I.
24. *De l'infinito universo et mundi*, p. 278, (Gentile, Op. ital., I).
25. Lovejoy, A. O., *The Dialectic of Bruno and Spinoza*, University of California Publications, Philosophy, Vol. I, 1904, p. 160.
26. Heraclitus, Fragment 129, (Diels text).

## 2. THE HERITAGE OF GREEK AND MEDIEVAL PHILOSOPHY

1. Wolf, Abraham, loc. cit., pp. 1-10; has an excellent summary of Renaissance struggles against medieval philosophy, theology, and what passed for science.
2. Windelband, W., *A History of Philosophy*, New York 1901, pp. 354-55.
3. Bruno received his information concerning Greek mechanism mainly from the philosophic poem written by Lucretius, *De Rerum Natura*.
4. Bruno, in his Italian works and in the last cycle of Latin works, developed a position which was more openly critical of Plato's metaphysical idealism and epistemological realism than were his earlier, less mature works. What was particularly obnoxious to Bruno was the Platonic attempts to impart a valuative status to matter and form. All attempts to make Bruno merely a Neo-Platonist ignores the scientific (and hence materialist) approach permeating his more technical writings.
5. For an interesting account of Bruno's attack on Aristotelian categories see: Wernecke, H., *Giordano Bruno's Polemik gegen die Aristotelische Kosmologie*, Dresden 1870.
6. An extremely penetrating and many-sided account of Francis Bacon's opposition to Aristotle's method and system (but primarily method), is contained in, Anderson, F., *The Philosophy of Francis Bacon*, Chicago 1950.
7. *De l'infinito universo et mundi*, (Gentile, Op. ital., I, p. 314).
8. *De la causa*, (Greenberg translation), p. 155.
9. *ibid.*, pp. 129-30.
10. Introductory Epistle to *De l'infinito universo et mundi*, (Singer translation), p. 245.
11. *De la causa*, (Greenberg translation), p. 128.

12. Engels, Frederick, *Ludwig Feuerbach*, trans. C. P. Dutt, New York 1941, p. 21.

13. At times, Bruno rejects the idea that matter is at all a primary substance in favor of a view that places form and matter on an identical footing. This latter view is truly more consonant with his entire conception of substance as the *only* primary "stuff" of reality. At best, matter can be "primary" only in terms of the forms internal to it. But it can only be secondary in terms of Bruno's universal category of substance.

14. *De la causa*, Dial. IV, (Gentile, Op. ital., I, p. 156; pp. 237-246).

15. It has been necessary to digress a bit from the main line of discussion due to the great confusion extant over the ontological status of Bruno's philosophy. He has been claimed by every philosophical camp. The idealists of all varieties deny that Bruno has a profoundly important materialist strain by the simple expedient of equating materialism with a reductionist (mechanist) type of materialism. This is a vulgarization of the highest order. The "fallacy of materialism" is more truthfully the "ignorance of idealism."

16. *De l'infinito universo et mundi*, (Singer translation), pp. 283-284.

17. *De immenso*, Lib. V., Cap. 9, (Op. lat., II, p. 146).

18. *De la causa*, (Greenberg trans), pp. 165-66.

19. *ibid.*, p. 164.

20. This refers either to Cusanus or Pseudo-Dionysius.

21. *On The Infinite Universe and Worlds*, (Singer translation), pp. 323-24.)

22. This view is attributed by Aristotle to Heraclitus in the *Nicomachean Ethics*, VIII, 2, 1155b (McKeon translation).

23. *De la causa*, as cited by McIntyre, loc. cit., p. 178.

24. *De gl'heroici furori*, Part I, Dial. III, (Gentile, Op. ital., II, p. 367).

25. *Summa Terminorum Metaphysicorum*, section entitled "De Deo seu mente," Op. lat., I, Part IV, pp. 75-76.

26. Lovejoy, A. O., loc. cit., pp. 160-66. Lovejoy's view (which is based on scant information) is upheld in its essentials by Bartolomess, G., in his *Jordano Bruno*, Paris 1847. There is no doubt that Bartolomess was greatly responsible for the upsurge of interest in Bruno. However, he was in no small measure responsible for the rampant confusion concerning Bruno's metaphysical commitments. Bartolomess, at one and the same time, sees Bruno as a Platonist and as a materialist. No wonder Bruno has been labelled "eclectic."

27. Cusanus, *Liber excitationum*, Lib. V., (Opera, p. 482).

28. Cusanus, *ibid.*, Lib., IV, (Opera, pp. 460, 585-86, 591, 672).

29. Cusanus, *De Mathematica Perfectione*, (Opera, p. 1120).

30. Cusanus, *De conjecturis*, Lib., Cap. 13, (Opera, p. 88, seqq).

31. Cusanus, *De venatione sapientie*, Cap. 36, (Opera, p. 327).

32. Cusanus, *De docta ignorantia*, this is the clearest exposition of Cusanus' use of the dialectical method.

33. Cusanus, *The Vision of God*, translated by E. A. Salter, Dent, 1928, as cited by Misch, George, *The Dawn of Philosophy*, Mass. 1951, pp. 284-85.

34. Cusanus, *De pace fidei*, (Opera, p. 862).

35. Cusanus, *De docta ignorantia*, Lib. III, Cap. 12, (Opera p. 60).

36. *De l'infinito universo et mundi*, Dialogue V., (Gentile, Op. ital., I, p. 409).

37. *De la causa*, Dial. III, (Gentile, Op. ital., I, p. 219).

### 3. NATURE, MAN AND THE INFINITE UNIVERSE

1. Bruno's "infinity of worlds" in the context of an "infinite universe" is a concept with which contemporary astronomical theory is still grappling. Although the present tendency is to regard the universe as in some way enclosed, there is far from unanimity on this approach. It is agreed by most interpreters of Bruno that the "infinity of worlds" is the equivalent of what is now termed an infinite number of solar systems. (For this reason I have used the two interchangeably.)

2. For an interesting treatment of the relation of man to his universe in Bruno's philosophy see: Cassirer, E., *Individuum und Kosmos*, in *der Philosophie der Renaissance*, Berlin 1927.

3. That the problem of the infinite is fundamental for Bruno is evident from the fact that its resolution is the concern of five of his major works. Two of these, *Concerning The Cause, Principle, and One*, and *On The Infinite Universe and Worlds*, are the subject matter of this topic. (The former volume mentioned has a broader metaphysical framework than the latter.) A third work, *De immenso*, is the Latin equivalent of *On The Infinite Universe and Worlds*; a fourth *La cena de le ceneri*, deals with the Copernican theory from the viewpoint of its relationship to the formation of a scientific ontology; and the fifth, *The Heroic Enthusiasts*, has as its major concern the ethical and religious implications inherent in the new cosmological outlook.

4. *On The Infinite Universe and Worlds*, Intro. Epistle, (Singer translation), pp. 230-31. Although D. W. Singer's translation has been used as the basis of *De l'infinito*, on reverting back to the original Italian text, I have found a few minor errors in the translation and have taken the liberty of making the necessary corrections. A general criticism of the Singer translation is its exaggerated tendency towards keeping the translation "literal." Such an approach has the shortcoming of missing the subtleties in the original work. It has the further limitation of making poor twentieth century English.

5. *ibid.* p. 232.

6. *ibid.* p. 233.

7. *ibid.* p. 231.
8. *ibid.* p. 233.
9. *ibid.* p. 233.
10. *ibid.* p. 235.
11. *ibid.* p. 235.
12. *ibid.* p. 235.
13. *ibid.* pp. 235-36.
14. *ibid.* p. 238.
15. *ibid.* p. 239.
16. *ibid.* p. 238.
17. *De l'infinito universo et mundi*, (Gentile, Op. ital., I, p. 316).
18. *ibid.*, p. 317.
19. *ibid.*, p. 317.
20. *ibid.*, p. 319.
21. Engels, F., *Anti-Duhring*, New York 1939, p. 62.
22. *On The Infinite Universe and Worlds*, (Singer translation), p. 295.
23. Aristotle, *De coelo*, i, 7, 274b, 30-34.
24. *On The Infinite Universe and Worlds*, p. 294.
25. Far in advance of Jules Verne, Bruno taught that other planetary spheres are inhabited by creatures similar to those that inhabit our own planet.
26. *De l'infinito universo et mundi*, Dial. II, (Gentile, Op. ital., I, p. 316).
27. *De immenso*, Lib. I, Cap. 12, (Op. lat., I, i, p. 244). cf. *Cena de le ceneri*, especially Dialogue V.
28. *De l'infinito universo et mundi*, Dial. V., p. 154 (Gentile, Op. ital., I, p. 404).
29. Vinci, Leonardo da, *The Notebooks of Leonardo da Vinci*, New York 1938, Vol. I, p. 67, edited and translated by Eduard MacCurdy.
30. Bruno's doctrine of achieving freedom through an understanding of the necessary laws of the universe foreshadows the conception of freedom held by Spinoza, Hegel and Marx.
31. Randall, J. H., *Making of the Modern Mind*, New York 1940, p. 243.
32. *La cena de le ceneri*, Dial. I, (Gentile, Op. ital. II, pp. 27-28).
33. *ibid.*, p. 30.
34. *De immenso et innumerabilibus*, Op. lat., I, Part 1, p. 205.
35. *ibid.*, p. 203.
36. *De l'infinito universo et mundi*, Op. ital., I, (Gentile, Op. ital., I, p. 341).
37. *De gl' heroici furori*, Op. ital., II, pp. 349, 357.
38. *De immenso et innumerabilibus*, Op. lat., I, Part 2, p. 247.
39. *De l'infinito universo et mundi*, Proem. Epistle cited by Boulting (loc. cit.), p. 137.

40. *ibid.*, p. 137.  
 41. *ibid.*, p. 138.

#### 4. DIALECTICS AND REALITY

1. Randall, J. H., *loc. cit.*, pp. 219-20.
2. The view that logic and ontology have an identical content held implicitly by Bruno, was made explicit by Hegel when the latter philosopher says that: ". . . logic therefore coincides with metaphysics, the science of things set and held in thoughts—thoughts accredited able to express the essential reality of things." (*Encyclopedia*, C, I, p. 45; D, I, p. 45).
3. *De l'infinito universo et mundi*, Op. ital., I, pp. 298-99 (Gentile).
4. *De la causa, principio et uno*, Op. ital., I, pp. 175-76 (Gentile).
5. *ibid.*, pp. 176-77.
6. *ibid.*, pp. 263-64.
7. *De immenso*, Lib. II, Cap. 12, (Op. lat., I, p. 307).
8. *Summa terminorum metaphysicorum*, (Op. lat., I, Part 4, p. 83).
9. *De gl' heroici furori*, (Gentile, Op. ital. II, pp. 324-25.)
10. *De la causa, principio et uno*, (Gentile, Op. ital., I, p. 255).
11. Bruno's view is essentially the same as Cusanus' in the latter's *Vision of God*, (Salter translation, p. 60-62).
12. Greenberg, Sidney, *loc. cit.*, pp. 72-73.
13. *De umbris idearum*, (Op. lat., II, Part 1., p. 45).
14. *ibid.*, Conceptio X, (Op. lat., II, Part 1., p. 45).
15. *ibid.*, Conceptio VII, (Op. lat., II, Part 1., p. 43).
16. *De la causa, principio et uno*, Op. ital., I, p. 247, (Gentile).
17. *ibid.*, p. 253.
18. Engels, F., *Anti-Duhring*, New York 1939, p. 62.
19. Coleridge, S. T., *The Friend*, I, p. 149, Essay XIII; I, pp. 193-97, Essay XVI (3rd edition; edited by Coleridge, London 1918).
20. Lenin, V. I., *On Dialectics*, contained in the *Marx-Engels, Marxism* volume. (A collection of articles) New York 1934, pp. 209-10.

#### 5. SUBSTANCE AND THE PROBLEM OF PERMANENCE AND CHANGE

1. Nominalism is a tendency in medieval philosophy which maintained that the only real existences are the separate concrete things with their unique individual properties, that general concepts do not exist independently and are only names, words, or abstractions of human reason. The positive side of nominalism consists in the fact that it recognized the primacy of the object and the secondary character of the concept. This type of thought clearly moved in a materialist direction. Thus Marx and Engels considered nominalism "the first expression of materialism" in the Middle Ages. However, nominalism did not understand the objective sig-

nificance of concepts and their dialectical connections with the system of things. cf., Selsam, Howard, *Handbook Of Philosophy*, (Adopted from the *Short Philosophic Dictionary*, by M. Rosenthal and P. Yudin), New York 1949, pp. 90-1.

2. Aristotle, *Physics, The Basic Works of Aristotle*, edited by Richard McKeon, New York 1941, pp. 229-30, 189b-190a.

3. Aristotle, *ibid.*, p. 230, 190a.

4. Aristotle, *ibid.*, p. 231, 190b.

5. Aristotle, *ibid.*, p. 232, 191, 191a; pp. 304-305, 226a.

6. For a penetrating interpretation of the category of substance as it was used by Aristotle, see: Harry K. Wells, *Process and Unreality*, New York 1950, pp. 94-97.

7. Plato, *Timaeus* 51 (Jowett translation).

8. Some of the difficulty in understanding Bruno's category of substance stems from a failure to realize that his "it" is *universalized*, whereas Aristotle's "it" was that which underlies the *particular things* themselves. Bruno utilized the category of substance to account for the dialectical processes undergone by the form and content of reality without destroy his immutable universe.

9. *De la causa, principio et uno*, (Gentile, *Op. ital. I*, p. 188).

10. *ibid.*, p. 230.

11. *ibid.*, p. 234.

12. *ibid.*, p. 184.

13. *ibid.*, p. 186; pp. 183-84, et passim.

14. *ibid.*, p. 247; pp. 251-56.

15. *ibid.*, p. 189.

16. *ibid.*, p. 218.

17. *ibid.*, pp. 186-87.

18. *ibid.*, pp. 187-88.

19. *ibid.*, p. 197.

20. *ibid.*, pp. 197-98.

21. *ibid.*, p. 198.

22. *ibid.*, p. 199.

23. *ibid.*, pp. 205-6.

24. See: Harry K. Wells, *loc. cit.*, pp. 103-4. This section contains a similar analysis of the principle of "identity" as it operates in Hegel. An interesting article which touches upon this topic is Richard McKeon's *Philosophy and Method*, in the *Journal of Philosophy*, Vol. XLVIII, No. 22, October 1951, pp. 674-75.

25. Bruno's idea that the system of the universe "is all that it can be" is in obvious conflict with the dialectical materialist proposition which states that the universe is always becoming something "other than" what already "is." Bruno's unsatisfactory resolution of the paradox of closed

system and open method takes the form of admitting motion within but not of the universe taken as infinite.

26. *De la causa, principio et uno*, (Gentile, Op. ital., I, p. 206.)
27. *ibid.*, p. 228.
28. *ibid.*, p. 229.
29. *ibid.*, p. 234.
30. *ibid.*, p. 245-47.
31. Hegel, G. W. F., *Science of Logic* (English translation by W. H. Johnston and L. G. Struthers), New York 1929, Vol. I., p. 162.
32. *De la causa, principio et uno*, (Gentile, Op. ital., I, p. 245.)

#### 6. MECHANISM, PLURALISM AND THE MONAD

1. An extremely penetrating and provocative account of the doctrine of the monad, and its relation to Bruno's system and method is, Xenia Atanassievitch's *La Doctrine Metaphysique et Geometrique de Bruno*, Belgrade 1923, (written in French and printed in France).

2. Democritus, Diog. ix, 34ff. as cited by Milton C. Nahm, *Selections from Early Greek Philosophy*, New York, 1944. No. 44, p. 165. (I have rendered the fragments of Democritus' philosophy into systematic sentences, while at the same time attempting to be truthful to the great atomist's words and intent.)

3. Democritus, *Arist. Physics*, 9, 265b 24. as cited by Nahm, op. cit., No. 58, p. 175.

4. *On The Infinite Universe and Worlds*, (Singer translation), p. 374.

5. Despite the fact that Howard Selsam, a leading American Marxist, has proved extremely capable when dealing with questions in the history of philosophy, he has shown much confusion regarding the nature of Bruno's metaphysical commitments. In a selection of readings of the great philosophers of the past, Selsam conveyed a false impression concerning Bruno's relation to atomism. It would seem, by the extracts Selsam takes from *De la causa*, that Bruno was a follower of Democritus in every sense. The error is compounded by placing the selections in a section entitled "Early Modern Materialism." The error may have been slight were it not for the fact that Selsam extracts the very passage in *De la causa* in which Bruno explains his relationship to, and rejection of Democritus' mechanism. Selsam's approach cannot lead to anything but the gravest type of misunderstanding. See: Selsam Howard, *Readings in What is Philosophy*, New York 1949, p. 15.

6. *Concerning The Cause, Principle and One*, (Greenberg translation), p. 128.

7. Democritus, Simplic. *de caelo* p. 293, 33 Heib. as cited by Nahm, loc. cit., No. 37, p. 169.

8. *De minimo*, Lib. III, Cap. 2, (Op. lat., I, iii, p. 138).

9. *ibid.*, p. 140.

10. *De immenso*, Lib. III, Cap. 2; Lib. IV, Cap. I, (Op. lat., I, iii, pp. 237, 269.)
11. *De minimo*, Lib. I., Cap. 3, (Op. lat., I, i, pp. 74-5).
12. Democritus, Diog. ix, 34ff., No. 45, p. 165; Aetius, I 26, 2, No. 66, pp. 177-78. As cited by Nahm, loc. cit.
13. The atomists did not differentiate the atoms according to weight. The reason being that the problem of weight was known to Greek science only obscurely, if at all. Aet. I 3, 18. (D. 285). "For Democritus ascribed to qualities (to the atoms), size and shape. But Epicurus added to these a third, weight; for, he says, the atoms require the impact of weight to move. 12, 6. (D. 311). Democritus says the primary bodies (these, as we have seen, are the solids) do not have weight, but are moved in the infinite by striking each other. And there can be an atom the size of a whole world. Cic. de fat. 20, 46. (Epicurus) said the atom has a declination. First, why? Because they have a certain force of motion which Democritus calls impact, but which you, Epicurus, refer to gravity and weight." Cited by Nahm, loc. cit., p. 172. A good analysis of this topic can be found in Benjamin Farrington's *Greek Science*, Harmondsworth-Middlesex, 1944, 1949.
14. Democritus, *Simpl. Phys.* 28, 15, No. 38, p. 170; Cic. de fato. 17 17, 39. As cited by Nahm, loc. cit.
15. *De monade numero et figuro*, (Op. lat., Vol. I, Part II, pp. 346-49.) This work illustrates the extent Bruno reinterprets Greek atomism in the light of Renaissance ethico-religious concepts.
16. *De l'infinito universo et mondi*, (Gentile, Op. ital., I, p. 316).
17. *ibid.*, p. 317.
18. Atanassievitch, X., loc. cit., pp. 18-19, 58-59.
19. Leibniz, G. W., *Monadology*, in *The Philosophical Works of Leibniz*, 1908, New Haven, Vol. D, pp. 308-23. Monad. No. 7.
20. *De l'infinito universo et mundi*, (Gentile, Op. ital., I, p. 373.)
21. Leibniz, G. W., loc. cit., Monad. No. 11.
22. *De minimo*, Lib. I, Cap. 2; Lib. I, Cap. 3; Lib. I, Cap. 4, as cited by Frith, I., loc. cit., pp. 215-23.
23. Leibniz, G. W., loc. cit., Monad. No. 9.
24. *De minimo*, Lib. I, Cap. 3, cited by Frith, p. 213.
25. Leibniz, G. W., loc. cit., Monad. No. 49.
26. Leibniz, G. W., loc. cit., Monad. No. 61.
27. Leibniz, G. W., loc. cit., Monad. No. 62.
28. Leibniz, G. W., loc. cit., Monad. No. 64.
29. *De monade numero et figuro*. (Op. lat., Vol. I, Part II, p. 348).
30. *ibid.*, p. 348.
31. By the "natural method" we justifiably assume that Bruno is referring to the dialectical method.

32. *Dedicatory Letter and Key*, (general remarks made by Bruno concerning his last three Latin works.) Cited by Singer (loc. cit.) pp. 155-56.

#### 7. THE CATEGORY OF PROCESS

1. *De la causa, principio et uno*, (Gentile, Op. ital., I, p. 172).
2. *ibid.*, p. 175.
3. *ibid.*, p. 172, 175.
4. *ibid.*, p. 175.
5. *On The Infinite Universe and Worlds*, (Singer translation), Dial. IV, pp. 343-44.
6. The one "exception" Bruno takes to the statement that "all motion is finite" is his belief in the "absolutely simple motion of the whole." Upon analysis, this turns out to be non-motion. So we may safely say that Bruno never seriously questioned his precept that motion is limited to the "apparent" and to the "finite."
7. *De la causa, principio et uno*, (Gentile, Op. ital., I, p. 176).
8. *De immenso*, Lib. I, Cap. I, (Op. lat., I, i, p. 204).
9. *De la causa, principio et uno*, (Gentile, Op. ital., I, pp. 189-90).
10. *De l'infinito universo et mundi*, (Gentile, Op. ital., I, pp. 304-5).
11. *On The Infinite Universe and Worlds*, (Singer translation), p. 345.
12. *ibid.*, p. 297.
13. *ibid.*, p. 364.
14. *De la causa, principio et uno*, (Gentile, Op. ital., I, p. 242).
15. *De l'infinito universo et mundi*, (Gentile, Op. ital., I, p. 291.)
16. *De la causa*, (Gentile, Op. ital., I, p. 212).
17. *ibid.*, p. 245.
18. *ibid.*, p. 212.
19. *ibid.*, p. 212.
20. *ibid.*, p. 212.
21. *ibid.*, p. 213.
22. *ibid.*, p. 216.
23. *De l'infinito universo et mundi*, (Gentile, Op. ital., I, 400).
24. Abraham Edel, in his *Theory and Practice of Philosophy*, New York 1946, pp. 321-22, gives an excellent account of the "this-sidedness" of Aristotle's theory of quantity and quality.
25. *De la causa*, (Gentile, Op. ital., I, p. 326).

#### 8. THE REIGN OF REASON

1. The Italian rationalist physician and poet, Girolamo Fracastoro was one of the most learned men of his day. Although a poet, he was less of a mystic and more of a scientist than his famous contemporary Paracelsus. He was exceptionally skillful in the arts and sciences. His book, *De Sympathia et Antipathia Rerum* (1546) has been referred to as "an important work in which universal attraction and repulsion, as well as elec-

tric and magnetic motions have been attributed to an imponderable principle." His experiments and his reasoning led him to the conclusion that the reciprocal attraction and repulsion of lodestone, amber and diamond, depend upon whether the "principles entering into their composition are analogous or contrary." In other words, he believed in the "sympathies" and "antipathies" between fragments of what we habitually refer to as lifeless matter. Although this thesis has been refuted, Fracastoro should be given credit for having expressed his own opinions in an age when it was inexpedient and even dangerous to do so.

2. Jerome Cardan was a physician, mathematician and philosopher of Milan (1501-1576). He thought of nature as consisting of space, matter and intelligence, the latter being one with the "soul of the world." He did not theorize about God, and might even have denied his existence of this had it not involved almost certain conflict within the Inquisition. Apart from his contributions to mathematics, and his fame as a physician, Cardan's book, *De Subtilitate* (Paris, 1551) proves him to have been a fine rationalist philosopher. This intriguing book clearly exemplified the revival of physical science with the receding sway of medieval magic. Cardan criticizes those who expect to gain knowledge of nature without experimenting. He contradicts the foolish statement that diamonds counteract the attractive power of lodestone, but himself clings to the belief that a diamond on the left arm affords reliable protection against bad dreams. This thinker illustrates a vital fact of sixteenth century thought, the struggle between science and mysticism and the attempts to reconcile the two.

3. Peter Ramus is important as one of the earliest adherents to the doctrine of "Reason above Authority." His incisive attack against Aristotelianism and the resultant conflicts between him and the ecclesiastical power are well treated by Alfred Still in his *Borderlands of Science*, New York, 1950. Also see: Marie, *Histoire des Sciences*, Paris, 1883, Vol. II, p. 293.

4. The distinction between "ontological rationalism" and "epistemological rationalism" is made because of the various meanings the term rationalism has acquired. A rational ontology refers to the assumed orderliness and regularity of the stuff and process of the universe. A rationalist epistemology is used to indicate a method of acquiring genuine knowledge. In this latter sense, rational is commonly equated to "conceptual," "logical" or "abstract" thinking. Thus a "rationalist" is one who denies the efficacy of the senses in gaining knowledge of the world, and who believes that such "truth" can be derived solely from the employment of the "powers of reason." In the first sense, "rational" means orderly, lawful and regularity in the operations of nature. In the second sense, "rational" signifies a way of gaining absolutely infallible knowledge concerning the universe.

5. No matter how divergent epistemological schools were in Renaissance philosophy, there was an almost universal acceptance of the view that the universe was rational, even if men were not.

6. *Dedicatory Letter and Key*, cited by Singer, (loc. cit.), p. 156.

7. The term "monism of stuff" signifies the principle that the universe is composed of a single material; in effect it is the assertion that the physico-cosmological system has universal application. The term "monism of change" is the belief that every change however imperceptible effects a corresponding change in everything else. The monism of both varieties was asserted by Bruno. On his analysis there was little to be gained in differentiating the two since what takes place in the "stuff" is "change," and both were related to the larger whole, universal substance. Bruno's monism attempted to account, in this way, for the "oneness" of "process and reality."

8. *Summa Terminorum Metaphysicorum*, (Op. lat., Vol. I, part 4, pp. 77-78.)

9. Engels, Frederick, as cited in a *Textbook of Marxist Philosophy*, London 1938, p. 261, edited by John Lewis.

10. *On The Infinite Universe and Worlds*, (Singer translation), pp. 250-52.

11. *De la causa, principio et uno*, (Gentile, Op. ital. I, p. 224).

12. *On The Infinite Universe and Worlds*, (Singer translation), p. 358.

13. *De immenso*, Lib. VIII, Cap. 10, (Op. lat., I, ii, p. 314).

14. *De l'infinito universo et mundi*, (Gentile, Op. ital., I, pp. 417-418).

## INDEX OF NAMES

- Aldrovandi, Ulissi (1522-1605)**, Italian naturalist, who was the founder and director of the botanical gardens at Bologna. He wrote a famous natural history which was notable for its illustrative material.—63
- Alphonso of Castille (1221-1284)**, sponsored and assembled a group of astronomers and mathematicians at Toledo. Their observations, a minor revision of the work of Ptolemy, led to the publication of the "Alphonsine Tables."—23
- Anaxagoras (fl. 5th Century, B.C.)**, ancient Greek materialist, who declared that the sun was not a god, but a piece of fiery stone. The moon, too, was not a goddess but was made of material things. For these assertions he was tried for blasphemy, convicted, and thrown into prison.—36
- Aquinas, Thomas (Thomism) — (1227-1274)**, established a philosophic synthesis of Catholic philosophy. Delimited the realm of philosophy to everything that is open to argument, and maintained that the subject matter of theology is the content of faith.—4, 6, 12, 32-33, 62-63
- Aristotle (384-322 B.C.)**, Greek philosopher, the founder of formal logic, a scholar of encyclopedic genius, whom many have since characterized as the greatest thinker of antiquity.—6, 18, 21-22, 25, 32-33, 35-37, 45, 47, 50, 55-56, 59-60, 62-64, 70, 78, 81-89, 91, 93, 107, 109, 114-115, 122
- Augustine (354-430)**, early Christian idealist philosopher and follower of Plato. He developed the notion that we must first believe in order that we may know. Augustine was the first philosopher to develop a theory of history and historical process.—120
- Avicenna (Ibn Sina) — (980-1037)**, Arab physician, mathematician and philosopher. Translated and interpreted the writings of Aristotle. He was greatly occupied with a central problem in medieval philosophy—the problem of universals.—36
- Bacon, Francis (1561-1626)**, the progenitor of English materialism and modern scientific philosophy. A severe critic of Platonism and Aristotelianism, he held that no ossified school of thought has the right to interfere with the development of science and natural philosophy.—36, 64
- Berti, Domenico (1835-1901)**, wrote biography of Bruno. He was the first to identify the persecution of Bruno with Giovanni Mocenigo, the correspondent of the literary courtier, G. Battista Leoni.—16
- Brahe, Tycho (1546-1601)**, Danish astronomer. In 1588 he published his own system of cosmology, in which the earth is considered the center of the universe. However, he broke with Ptolemy in asserting that the

- sun is the center of the orbits of the five planets.—22
- Bruno, Giordano (1546-1600)—3-160 *et passim*
- Cardano, Girolamo (1501-1576), Italian physician, mathematician and philosopher. He thought of nature as consisting of space, matter and intelligence, the latter being identical with the "world-soul."—119
- Coleridge, Samuel T. (1772-1834), British writer and philosopher who attacked contemporary British empiricism and skepticism in the name of the objective idealism of Kant, Fichte and Schelling.—76-77
- Copernicus, Nicholas (1473-1543), creator of the modern heliocentric cosmology. The system he expounded in *On Celestial Revolutions* marks the emancipation of natural science from theology.—17, 21-25, 63-64, 69, 105
- Culpepper, Martin (fl. approx. 1565-1595), rector of New College at Oxford, who was one of the first intellectuals to express interest in Bruno and his philosophical system.—10, 11
- Democritus (460-370 B.C.), greatest materialist philosopher of ancient Greece. The founder of the atomic theory; he was an advocate of philosophic pluralism and determinism as well as being a mechanical materialist.—35-37, 39-42, 91-98, 102, 105, 107, 114-115
- Descartes, Rene (Cartesianism)—(1596-1650), outstanding French philosopher and scientist. He was a dualist—holding that two basic substances exist: material substance, possessing the attribute of extension, and mental substance, possessing the attribute of thought.—101, 122
- Engels, Frederick (1820-1895), co-founder with Marx of the basic principles of scientific socialism. Responsible for working out many of the philosophical features of dialectical materialism. Engels' work exposed the shortcomings in both mechanical materialism and classical idealism without discarding the positive achievements of either.—38, 58, 76
- Epicurus (342-270 B.C.), materialist philosopher and follower of Democritus. His work was a powerful source of enlightenment in the Greek world. He differed from his teacher in two important respects: in his attempt to avoid a determinist conception of the universe, and in his emphasis on the empirical basis of human knowledge.—35-37, 40-41, 92
- Erasmus, Desiderius (1466-1536), the great northern figure of the Renaissance. Endowed with a keen wit and devastating intellect, he lashed out at the ignorance, greed and corruption of the priesthood and monasteries. In the process of opposing the abuses of organized church groups, he promulgated a doctrine which emphasized human worth and dignity.—6
- Faye, Antoine de la (fl. approx. 1570-1600), professor of philo-

- sophy at Geneva University. A learned translator of the Bible. He was attacked by Bruno in an article exposing his teachings as shallow.—8
- Ficino, Marsilio (1433-1499), medieval Platonist, who found in the thought of Plato a prop for Christianity. He believed that the truth of revelation can be deduced from rational argumentation.—30
- Fracastoro, Girolamo (1483-1553), Italian rationalist physician and poet, who was one of the most learned men of his day. A thinker of scientific and dialectical inclination.—19
- Galileo, Galilei (1564-1642), Italian physicist and astronomer. One of the founders of classical mechanics; he formulated the law of inertia and the law of composition of forces. He is likewise one of the founders of dynamics, the discoverer of the law of falling bodies, and the law of the oscillation of the pendulum.—16, 26, 63
- Gesner, Konrad von (1516-1565), German-Swiss botanist and zoologist. His famous book *Historia Animalium* (1550-87) is regarded as the foundation of zoology as a science.—63
- Goethe, Johann Wolfgang von (1759-1832), great national and philosophic genius of German literature; wrote the symbolic drama *Faust*, along with many other works of drama, science and philosophy.—33
- Greville, Sir Fulke (1554-1628), English nobleman and philosopher who was a devoted friend and patron of Bruno.—11
- Hegel, Georg Wilhelm Friedrich (1770-1831), German dialectical idealist. His dialectical method asserts that the development of knowledge is an endless process, but the idealist system led Hegel to consider his philosophy as the culmination of all intellectual evolution, the final and complete truth.—28, 30, 58, 61, 69-70, 91, 118
- Heraclitus of Ephesus (544-484 B.C.), ancient Greek dialectician. Outlined in a nascent form the basic tenets of dialectics: The world is an eternal process of growth and decay, the universe is composed of opposite tensions among which a struggle is constantly taking place, and all parts of reality are connected in a universal process.—17, 30, 35, 41, 43-44, 46, 71, 77, 107, 118
- Kant, Immanuel (1724-1804), founder of classical German idealism. The principle feature of Kant's philosophy is the attempted reconciliation of materialism and idealism, of science and religion. The Kantian categories were noted for their purely formal character. They represented his efforts to establish a complete system which would include morality as well as metaphysics, esthetics as well as epistemology.—118
- Kepler, Johannes (1571-1630), confirmed the heliocentric hypothesis of Copernicus and Galileo, and shattered once and for

- all the Ptolemaic spheres by his discovery that the planets follow a precise path as they revolve about the sun, a path which is not circular but elliptical.—6, 22, 26
- Leibniz, Gottfried Wilhelm (1646-1716), German philosopher and mathematician. He was a forerunner of classical German idealism. Attempted a reconciliation of science and religion. Leibniz was co-inventor with Newton of the infinitesimal calculus.—12, 92, 98-105, 120
- Lenin, Vladimir Ilyich (1870-1924), practical and theoretical leader of the Bolshevik revolution of 1917. He was responsible for far-reaching advances in Marxist economic and philosophical theory.—29, 79
- Leo XIII, Pope (1810-1903), his real name was Gioacchino Pecci. He became the spiritual leader of Catholicism in 1873, and remained in that position until his death.—15
- Leucippus (fl. 5th Century B.C.), co-founder with Democritus of atomism. He attempted to reconcile the reality of multiplicity, variety and change with the exigencies of Eleatic formal logic.—37
- Lovejoy, Arthur Onken (1873- ), dean of American realism. He was one of the first American philosophers to recognize the importance of method in Bruno's philosophy.—30
- Lucretius, Carus (99-55 B.C.), Roman poet and materialist philosopher. In his work, *On The Nature of Things*, he expounded in poetical form the philosophy of atomistic materialism. He asserted that the basis of all reality is eternally existing matter moving in space and made up of tiny indivisible particles—atoms.—35, 42, 51, 58
- Machiavelli, Niccolo (1467-1527), Italian realist political philosopher, who was one of the earliest thinkers to glean the central features of social domination and oppression. This Machiavelli did by introducing the idea that economic and political power rests upon material strength and coercion.—32, 63
- Marx, Karl (1818-1883), formulator of the basic features of the revolutionary world view embodied in dialectical and historical materialism. He applied this theory to the concrete economic relations of capitalist society.—29, 40, 58
- Matthew, Tobie (or Tobias) — (1546-1628), Protestant Dean of Christ Church at Oxford, England. He displayed courtesy toward Bruno and sympathy for his ideas during Bruno's stay at Oxford.—10, 11
- Mauvissiere, Marquis de Michel de Castlenau (fl. approx. 1555-1600), patron and sacrificing friend of Bruno, he supported Bruno's views and aided him in every way possible to popularize his philosophy. Mauvissiere acted as the French ambassador to Queen Elizabeth of England.—4, 12

- Medici, (fl. 14th-18th cents.), Italian family that dominated Italian economic life for four centuries. For a period, this family held a virtual economic dictatorship over the whole of Europe. Their rule emanated from Florence, which was the economic center of Italy in the sixteenth century.—14
- Newton, Sir Isaac (1642-1727), great English physicist, astronomer and mathematician, the formulator, following Galileo, of classical mechanics. Newton discovered the law of universal gravitation and worked out the theory of the movement of the heavenly bodies.—12, 69
- Nicholas of Cusa, (Cusanus) — (1401-1464), German idealist dialectician, who sought in his cosmological theory of infinity a reinforcement of his theological concept of God as the supreme synthesizer of all finite contradiction.—17, 30, 35, 42, 46, 48-51, 57-58, 89, 120, 125
- Paracelsus, Philippus Aureolus (Theophrastus Bombastus von Hohenheim) — 1493-1541), a Swiss by birth, an omnivorous student, an indefatigable traveler, and a doctor by profession, he spent most of his life a wanderer, hounded from one place to another by the suspicions he aroused. Paracelsus is noted for his radical ideas on medical practice, chemistry and metaphysics.—30
- Parmenides, (fl. 5th cent. B.C.), the original formulator of the "law" of tautological identity, which states that a thing must either be or not be. There is no middle course. Furthermore, what *is*, cannot change. Hence change, for Parmenides, cannot *Be*. It has to be the non-existent.—35, 43-44, 46
- Petrarch (Francesco Petraracha)—(1304-1374), considered the harbinger of the literary Renaissance. In his original work, he emphasized the theme of Italian national homogeneity, by declaring the sovereignty of the Roman people over the Empire.—12
- Plato (427-347 B.C.), ancient Greek philosopher. Creator of the system of objective idealism. Spokesman for the slave-holding, landed gentry.—17, 19, 21, 25, 35, 41-44, 61, 70, 78, 81-84, 86, 89, 97, 115, 125
- Plotinus (204-270), greatest of the religious mystics. He believed that God was directly felt, and that the mind is prepared for this final ecstasy of immediate union by close and reasoned thinking. Plotinus asserted that the gods dwell not in the temples but in the heart.—17, 30, 35, 46, 47, 86
- Proclus (412-485), one of the last Greek philosophers of any consequence; a dialectician and Platonizing idealist. Proclus accounted for the Ineffable Nature of the One in the dialectical trinity of "Idea-Number-Unity."—46
- Pseudo-Dionysius (fl. ca. 500), he is reputed to be the author of an important work reconciling neo-Platonism and Christianity. Un-

- fortunately, nothing is now known of him or his works.—17, 30, 35, 46
- Ptolemy, Claudius** (fl. 127-151), Greco-Egyptian mathematician and astronomer who provided a rationale for Aristotle's cosmology by introducing a complex mathematical system to overcome the inadequacies of an anthropomorphic cosmology.—23, 62-63
- Pythagoras** (fl. 540-510), Greek philosopher and mathematician. His order combined a religious mysticism with a scientific quest to understand the world. Noted for his "number theory" which is an extension of his interest in mathematics to further ideas of the magical efficacy of certain numbers.—36, 78, 122
- Ramus, Peter** (Pierre de la Ramee) (1515-1572), one of the earliest adherents of the doctrine which places reason above revelation. Ramus, a Frenchman, was important both as a mathematician and as a philosopher.—30, 70, 119
- Randall, John Herman** (1899- ), noted American pragmatist. He has made important contributions to the history of ideas.—64, 69
- Salviani** (1514-1572), Italian biologist, who helped reopen the study of botany and zoology through reviving the writings of the ancient thinkers.—63
- Schelling, Friedrich Wilhelm** (1775-1854), a representative of German classical idealism. Leaning originally towards the philosophy of Fichte, Schelling later created his own philosophical system of objective idealism.—28
- Sidney, Sir Philip** (1554-1586), defender and patron of Bruno's views. Sidney and Bruno became devoted friends during the latter's stay in England. Bruno dedicated many works to Sidney which revealed the class character of his philosophy.—11
- Spinoza, Baruch** (1632-1677), philosopher of materialist tendencies. His panpsychic outlook prohibited a conception of God as the creator of the universe. Spinoza maintained that nature was itself God, since nature was both self-existent and all inclusive.—29, 39, 100, 122
- Stevinus, Simon** (or Stevin) — (1548-1620), Dutch mathematician, famous for his discoveries in statics and hydrostatics, he distinguished between stable and unstable equilibria.—63
- Whitehead, Alfred North** (1861-1947), British objective idealist, who developed an organismic conception of the universe. Noted for his work in symbolic logic and cosmology.—55, 78
- Vinci, Leonardo da** (1452-1519), a painter, sculptor, engineer, architect, physicist, biologist and philosopher. He was supreme in all fields; perhaps no man in the history of the world shows such a record. His performance, extraordinary as it was, must be reckoned as small compared with the ground he opened up, the grasp of fundamental principles in science, art and philosophy.—62



THE UNIVERSITY LIBRARY  
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

This book is due on the last **DATE** stamped below.

To renew by phone, call **429-2756**

Books not returned or renewed within 14 days  
after due date are subject to billing.

NOV 21 78

NOV 22 1978 REC'D

DEC 11 '83 M

DEC 20 1983 REC'D

MAR 14 '85 M

MAR 5 1985 REC'D

APR 20 '88 A.  
MAR 21 1987 REC'D

APR 20 '88

FEB 11 1989 REC'D

APR 15 1990 REC'D

JAN 14 1990 REC'D

MAY 29 '90

MAY 30 1990 REC'D

Series 2373

APR 15 1991  
AUG 21 1998 REC'D

APR 15 2001

OCT 29 2001 REC'D

DEC 2 8 1990

B783.Z7H6



3 2106 0002 9915



