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THE EMERGENCE OF FUTURISM

IN ITALY: 1900-1916

THE INFLUENCE OF SCIENCE ON ART

A Thesis

Presented to the

Department of History

and the

Faculty of the Graduate College

University of Nebraska at Omaha

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Isabella B. Threlkeld

March

1971

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Accepted for the Faculty of the Graduate College of the University of Nebraska at Omaha, in partial fulfillment of the requirements for the degree of Master of Arts.

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CHAPTER I

INTRODUCTION

The brash poet, Filippo Tommaso Marinetti (1876-1944) first announced the Futurist movement in his Manifeste de futurisme in Le Figaro, published in Paris on February 20, 1909. It was a violent revolt against the imitative sentimentalism of the arts in Italy, a blast at the "cult of the past" and an opening wedge for a new aesthetic theory to evolve as an expression of the radical changes in science.¹

During the latter part of the nineteenth century new concepts of the physical world came from research, experimentation and analysis in the laboratories of Europe. New sources of energy included electricity which produced industrial changes in communication and transportation, and one result was an acceleration of the tempo of life. Among the men most responsive to these developments were the philosopher, Henri Bergson, professor at the Collège de France, and Marinetti, a student who admired Bergson's theories of intuition and vitalism. Mainly from the metaphysics of Nietzsche and Bergson, Marinetti and the Futurists--Umberto Boccioni, Carlo Carrà, Luigi Russolo, Gino Severini, Giacomo Balla and Antonio Sant'Elia--were to develop concepts of motion, force-lines, dynamism and physical transcendentalism to be expressed in art forms. Believing that creativity does not spring from the rational

¹Rosa Trillo Clough, Futurism (New York: Wisdom Library of the Philosophical Library, 1961), p. 11.

intellect, they stressed the irrational and extolled motion in many forms--from the artist at the "center of the world's ceaseless activity," to the man at the steering wheel, to the Earth "racing over the circuit of her orbit."² Speed was the only absolute universal; and exertion, agitation, violence, conflict and ultimately war were welcomed as expressions of universal dynamism.

During the six years that followed the first Futurist manifesto, the young men worked in feverish creativity in many media: poetry, prose, drama, music, typography, painting, sculpture, photography, architecture and film. Often they combined these means of expression in radical experiments, for the Futurists emphasized originality at all costs. They exploited speed and simultaneity and by 1912 had shocked, provoked and outraged most Italians and other Europeans as Marinetti circulated their work to cities throughout Europe.³ They implemented their program with serate, theatre performances of music, speeches, poetry, debates and dance. Ridicule was their weapon; humor was their thrust at the "passéist," the conservative Italian, comfortable with past art forms, apathetic to the new intellectual changes in scientific thought. The revolution in physics and mathematics motivated them to try to express through motion purely contemporaneous ideas, feelings and levels of consciousness in a space-time continuum. Their

²Marianne W. Martin, Futurist Art and Theory (Oxford: Clarendon Press, 1968), pp. 40-41.

³Werner Haftmann, Painting in the Twentieth Century, trans. by Ralph Manheim (2 vols.; New York: Frederick A. Praeger Publishers, 5th rev., 1968), I, 106-107.

goal was a fusion of art and science as part of life based on universal dynamism.⁴

By 1915 the Futurists had published twenty-six manifestos with increasing nationalistic fervor. In pro-war demonstrations in Rome, Benito Mussolini, editor of the Popolo d'Italia and a friend of Futurism, went to jail with Marinetti for burning a German flag in the street.⁵ Soon afterward, when Italy entered the war, the Futurists joined the military service, and Boccioni and Sant'Elia were killed. Marinetti, Russolo and Carrà were wounded, and the first phase of Futurism ended. Yet in 1916 their vitality continued long enough to produce four major additions to Futurism: Severini's theories on motion in art, Marinetti's manifesto on the new Religion of Speed, Balla's "plastic complexities" (sculpture that moved), and the Futurists' first full-length film, Perfido Incanto.⁶

The Futurist movement emerged from a matrix of Italian culture hostile to imaginative thought, irrational concepts, personal freedom and radical scientific change. Fear of the theories of Freud, Marx, Nietzsche and Sorel buttressed sternly conservative points of view. Imperialism and industrial progress had yielded profits too precious to the middle classes for them to be disturbed by the economic and social philosophers Weber, Pareto and Durkheim. Neo-idealism dominated

⁴Siegfried Giedion, Space, Time and Architecture (Cambridge: Harvard University Press, 4th ed., 1963), pp. 14-17, 440.

⁵James Joll, Three Intellectuals in Politics (New York: Pantheon Books, 1960), p. 162.

⁶Joshua C. Taylor, Futurism (New York: Museum of Modern Art, 1961), p. 123.

the thought in Italy through La Critica, the journal published by the philosopher-historian, Benedetto Croce, in Naples. Yet beneath the suppression enforced by conservative institutions, new studies in psychology, sociology, physics, and the arts were published and circulated in Italy.

Through the prose-poetry of the manifestos, the Futurists tried to shake Italy out of its intellectual apathy and into the mainstream of European thought toward synthesis in the arts. Marinetti and the "explosion of youth" expressed in periodicals formed a bridge of ideas between France and Italy, particularly in Florence where Il Leonardo, La Voce and Lacerba were published until suspended at the outbreak of World War I. French culture created a challenge for Futurism during what Stuart Hughes called the "intellectual revolution" when science had become the initial thrust for change in the French dissemination of the ideas of Bergson, Freud, Nietzsche, Einstein, Curie, Planck, Poincaré, Mach and Sorel.⁷ These men made it clear that concepts of matter and energy were transformed beyond recognition. Time and space were coordinated, and matter could be converted into energy according to Einstein's theory. Energy was a complex system of electric charges in motion, and many of these theories expressed in the arts are still evolving at the present time.⁸

Today there is a vast amount of literature on "classical" or the

⁷H. Stuart Hughes, Consciousness and Society (New York: Vintage Books, 1958), pp. 33, 105-109.

⁸Gerhard Masur, Prophets of Yesterday (New York: Harper and Row, 1961), pp. 203-206.

first phase of Futurism, from 1909 to World War I, written in the French or Italian languages. In 1958 Maria Drudi Gambillo and Teresa Fiori edited the first of two volumes of documentation of the Futurist movement; and in 1962, when the second volume was published, serious investigation was possible. Since 1960, three major publications and many articles on Futurism have been written in English, indicating a growing interest in the movement, particularly in the United States. The delay in investigation into Futurism was due in part to the problems of translation, the scattered documents throughout Italy, two world wars, the bombastic style of the manifestos with their nationalistic rancor, and the strong domination of the School of Paris in the arts of this period.

The political aspects of Futurism were also a source of resentment to those Italians whose memories of Marinetti's allegiance to Mussolini still foster hostility to Futurism. Hence, they did not encourage research by outsiders, and misconceptions in Futurist theory and the art resulted. It is now easier for a non-Italian to undertake an inquiry into the original sources of Futurism through the arts in museums and galleries, collected manuscripts and letters, and through private sources. The most rewarding is the collection of Donna Benedetta Marinetti, the widow of the poet; her collection of materials is to be turned over to the Italian government for a center for the study of Futurism. In addition to these documents, the publisher and editor, Mondadori of Verona, in 1968 compiled the writings of Marinetti for the public in Tutte le Opere di Marinetti.

Among recent studies of Futurism, there seems to be no

interpretation of the movement related to the basic changes of science of the period. Other than generalizations made on the "machine age," no historian has presented the Futurist movement as a science-motivated group embracing all the arts at the opening of the twentieth century. Scientific sources and their relation to the arts are not yet fully understood, but the "machine" interpretation seems superficial considering the deliberate program of experiment in the arts attempting to portray motion based on electrical energy, cosmic, terrestrial and cerebral in origin.

The theories of motion evolved by the Futurists toward universal dynamism cannot be based simply on their technological interest in the wheel, the automobile and the airplane. They had a serious desire to express scientific changes in thought, levels of consciousness and the underlying structure of matter in motion when they wrote in the Technical Manifesto of Painting in 1910: "We are the primitives of a new sensibility . . ." ⁹

There is no attempt here to evaluate their success on an aesthetic basis or to deal with their followers--artists, dealers, critics or writers in the movement. The spread of Futurist art and ideas in France, Germany, Russia, England and the United States must be omitted, as this inquiry is limited to the origins of the movement in Italy as it emerged from a milieu restrictive of original intellectual and artistic development. ¹⁰

⁹Maria Drudi Gambillo and Teresa Fiori, eds., Archivi del futurismo (2 vols.; Rome: De Luca, 1958 and 1962), I, 67. (Hereinafter referred to as Archivi I and II.) See also Taylor, p. 126.

¹⁰Martin, p. 182.

The leadership of Italian institutions was authoritarian and powerful, and these young men, excited by new scientific ideas, had to work collectively toward change against apathy and overt hostility; hence their methods were shock tactics and radical nationalism.

The emphasis of this investigation is on the plastic arts, as this was the emphasis of the Futurists themselves after their initial literary onslaught. Their strongest expression was in visual art and, although they created many forms of art, none of them as individuals developed more than one form of expression to the fullest.

The study ends in 1916 when the force of their originality was largely spent after the Manifesto of Cinematography, although Marinetti was to develop the secondo futurismo with other men after the war.

The influence of Futurism on our visual environment continues to this day in modern architecture, city planning, word-painting, action painting, collage-sculpture, assemblages, mobiles and the motion picture. The film expresses the essence of their concepts of motion, simultaneity and universal dynamism. The Futurists were prophetic in their theories of science and art which continue today in the art forms of the artist-engineer. But the movement can best be understood in relation to its total cultural setting as it emerged from the relationship of science and society when many significant art forms developed throughout Europe simultaneously with significant scientific changes in man's understanding of mind and matter. The Futurists called it "the new reality," and they added time as the fourth dimension to the arts.¹¹

¹¹Clough, p. 212.

CHAPTER II

FUTURIST LEADERSHIP AND IDEOLOGY

Filippo Tommaso Marinetti was born in Alexandria, Egypt, in 1876, the son of a wealthy Milanese lawyer. He was expelled from the Jesuit College of St. François Xavier in Alexandria for smuggling Emile Zola's novels into the school and for writing an anti-clerical pamphlet called Le Papyrus. At the age of seventeen he went to Paris to study at the Sorbonne and later took a Doctorate of Jurisprudence at the University of Genoa in 1899.¹ But he was never to practice law, as he preferred the creative activities of the poet, journalist, dramatist, propagandist and intellectual agitator as part of the avant-garde.

After 1905, Paris was still his spiritual home, although Milan became his physical home. Both influenced him as he traveled constantly in Europe, Asia and Africa. He had come to Paris at an impressionable age from the mysticism of the Near East where King Fuad had taught him about velocity, geometry and astronomy.² French culture was equally stimulating and exciting to him, particularly the ideas generated by the advances in science and the philosophical theories of man's changing his concepts of his physical environment. He eagerly assimilated ideas from the theater, museums, libraries and galleries, where revolutionary forces stirred in all fields. Even as a student, he wrote articles on drama for the journal Revue Blanche, a gathering place for writers such

¹Martin, p. 28.

²Mondadori, ed., Tutte le Opere di Marinetti (Verona: Mondadori, 1968), pp. 965, 980.

as Oscar Wilde and Bakunin, and for artists such as Bonnard and Toulouse-Lautrec.³ He read the intuitionist theories of Henri Bergson, the Dionysian theories of Friedrich Nietzsche, and the psychic theories of Sigmund Freud. His friends discussed the élan vital concept of Bergson, his theory of motion and "stream of becoming." In 1889 Bergson published Time and Free Will, and in 1896 his Matter and Memory, in which he describes the world as a dynamic continuity, an immense play of forces in which there is no division but a synthesis.⁴ In 1907 he published Creative Evolution, which emphasized change and states of consciousness and which presented his definition of man as creator: "To exist is to change, to change is to mature, to mature is to go on creating oneself endlessly."⁵ Marinetti, with an intense passion for science, was caught up in this ferment of ideas of change, movement and creativity which he expressed in poetry and plays.⁶

As an enthusiastic admirer of Rimbaud and Mallarmé, Marinetti wrote science-motivated free verse as he gravitated toward the writers of Mercur de France and La Plume, organs of the Symbolist writers. They, too, believed that through intuition and the elevation of man's irrationality they could create images in the arts to combine mind and matter in symbolism and purely associative sequences of words.⁷

³Haftmann, I, 44, 103.

⁴Clough, p. 213.

⁵Masur, p. 258.

⁶Clough, p. 11.

⁷Haftmann, I, 106.

With his friend, the poet Emile Verhaeren, Marinetti developed a faith in scientific progress and the glorification of the energy of man. In 1902, when Verhaeren published his scientific lyricism in Les Forces Tumulteuses, Marinetti published La Conquête des Étoiles at his own expense.⁸ He was only twenty-six years old. This poetry was dense with imagery, romantic and excessive yet brilliant with the concept of man as potential hero of the forces of nature. In 1903 he tried to shed his romanticism in D'Annunzio intime, a series of articles critical of the poet--the super-patriot of Italy and former inspiration to Marinetti. The following year he published Destruction, Le Démon de Vitesse and Poésie Liriques. In these the magic of speed and electricity were coupled with the tension of iron and steel.⁹ He felt that he could literally conquer space and time as he drove his automobile at great speed over the roads of France and Italy. His mastery of that machine was to have increasing significance for him when he wrote A l'Automobile in 1905, arrogantly glorifying force and speed.¹⁰ By coincidence that same year Albert Einstein published his first paper on the theory of relativity, stating that conventional ideas of motion, space and time were too simple and they merged into a fourth dimension: the space-time continuum. The concepts of matter and energy were being transformed. Science and society were changing.¹¹

⁸Martin, pp. 29-30.

⁹Ibid., pp. 30-31.

¹⁰Ibid., p. 34.

¹¹Masur, p. 207.

When the Revue Blanche suspended publication in 1905, Marinetti returned to Milan to found the poetry journal, Poesia. This was the only poetry publication in Italy, and as editor he became a zealot for vers libre and published French Symbolist poetry. He even translated Mallarmé's poetry into Italian and gathered around him a group of young Italian poets in an atmosphere of grandiloquent polemics and literary excitement. He exhorted them to express themselves with energy and defiance in radical forms in opposition to the classical unities.¹²

In Paris Marinetti, on a visit in 1905, published a play, Le Roi Bombance, a fierce satire on the corruption of society and the hypocrisy of religious and democratic practices. It was an allegory based on the French attention to gastronomy; the digestive system becomes alive with characters in conflict and the artist-poet-fool-leader resolves the conflicts. With irrational humor he expressed his hatred of the past and the decadence of the people in form much like the theater of the absurd today. Le Roi Bombance contained his ideas for Futurism, the role of the artist, and a reconciliation of art and life, and was produced in Paris in 1909.¹³

Marinetti had "fused himself with the scientific universe" when he embraced the feats of modern technology and rewrote A l'Automobile as Mon Pégasse in 1908. The new Pegasus became a cross between a car and an airplane.¹⁴ In taking full advantage of the telephone, telegraph,

¹²Haftmann, p. 106.

¹³Martin, p. 77.

¹⁴Horace B. Samuel, Modernities (Edinburgh: Ballantyne, Hanson and Co., 1913), p. 227. See also Martin, p. 34.

radio communication and printing devices now under the new sources of power, this prolific writer "modernized" himself into a new culture, a new way of life unlike that in which he was born. Moreover, his marriage to the painter, Benedetta, broadened his interest in art, and he began to see the possibility of giving ideological coherence to his controversial periodical, Poesia.

Marinetti coined the word "Futurism" in the autumn of 1908 to stir the minds of the young people. Before this choice, he had considered the terms "Dynamism" and "Electricism," for the incipient movement to reject the idealist notion of a static, changeless reality and to embrace intuitive concepts gained from modern science.¹⁵ Also, from 1902 to 1905, the poet Mario Morasso (1870-?) had published in Florence a journal called Marzocco, with articles on the aesthetics of speed, the heroes of the machine and the flight of the airplane. According to Marinetti, all artists were to abandon the contemplative life for one of activity, becoming part of the center, the sources of power. Giovanni Papini, art critic of Florence, said of Marinetti: "He was always rushing from one place to another writing, orating, organizing . . ."¹⁶ All sources agree on his boundless energy and his ambition. He wanted to leave no aspect untouched, to transform all the arts and to make Italy great. Croce called him the "high priest of mysteries . . . drunk with incestuous passion."¹⁷

¹⁵Taylor, p. 9.

¹⁶Joll, p. 138.

¹⁷Benedetto Croce, History of Italy 1875-1915, trans. by Cecilia M. Ady (Oxford: Clarendon Press, 1929), p. 242.

The year 1909 was the climax of his life. Revolutionary forces stirred in all fields as Italy felt the results of foreign publications and the young writers of journals in Florence, Milan, Rome and Naples. Anti-clerical elements, nationalism and socialism provoked new outpourings from the Florentine writers; and Ardegno Soffici of La Voce wrote back from Paris about the Impressionist paintings: "Italian painting is stupid Verism abetted by photography . . . stealthily copied from German or English magazines . . ." ¹⁸ Soffici sent articles, photographs and art exhibitions from Paris; a tidal wave of French aesthetics swept Italy. ¹⁹

Marinetti published his First Manifesto of Futurism, aimed at all of Europe. It was a violent burst of prose-poetry on the front page of the prestigious Le Figaro in Paris. Hundreds of copies were mailed out to people of importance in Italy. The movement was launched with the keen insight of the propagandist and the timing of an international journalist. ²⁰ Marinetti had found the literary form best suited to his talents, and he had offered a basic philosophy for the arts of the future. Aggressive, defiant and nationalistic, the manifesto sounds as outrageous today as it did in 1909, for it renounced the past and all tradition.

Marinetti also published the play, Poupees Electriques, in 1909, dedicated to Wilbur Wright of the United States, as well as Mafarka le

¹⁸Haftmann, I, 104.

¹⁹Ibid.

²⁰Taylor, p. 9; Martin, p. 35.

Futuriste, an epic of three hundred pages of the destructive and creative exploits of an intellectual yet militant African prince. The flashes of imagery are almost like religious exultation, and the language shocked André Gide, who called Marinetti a genius yet deplored his feverish and verbose style.²¹ His attempts to rid himself and Italy of the overtones of romanticism include the speech called Let's Kill the Moonlight, a diatribe against past sentimentalism in favor of the electric light in Venice.²² He was arrested by the police once in Trieste in 1908 for a speech against Austria and again in 1910 for obscenity in the Mafarka le Futuriste for the "undressing a fair priestess."²³ He welcomed the controversy, publicity and notoriety.

In the teeming industrial city of Milan during 1909, he gathered the men who were to form his revolutionary movement in the arts. The Futurists worked frantically for the next seven years to develop a program and to produce works of art "for the pride, energy and expansion of the nation."²⁴ They wrote many manifestos, held Futurist open evening meetings (serate) throughout Italy, and produced poetry, paintings, sculpture, typography, music, drama, architectural plans and film. Marinetti admonished: "Consider me not as a teacher, but

²¹Joll, p. 133.

²²Samuel, pp. 130-31; Joll, p. 144.

²³Joll, p. 142.

²⁴Ibid., p. 141.

as a strong exciter of European intellectuality."²⁵

Umberto Boccioni (1882-1916) was more than a mere follower of Marinetti; according to the art critic, Guido Ballo, he was like a son for the next few years.²⁶ He was creative in both art and literature, and independent in thought. When they met in Milan, both were stimulated by the vitality of the city and influenced by the scientific achievements in Europe. Boccioni had been born in Reggio Calabria and had studied engineering at the Technical Institute in Catania, Sicily, in 1897. He later studied in Rome at the Academy and with Giacomo Balla, the well-known painter influenced by Impressionism and Divisionism and later a part of the movement.²⁷ There he met Gino Severini, also a student of Balla, and in Paris in 1906 they saw the work of the Fauves as well as the Impressionists. The work of Cézanne was a revelation to them, and Severini recorded their excitement in his autobiography published in 1946.²⁸

When Boccioni returned from Paris, he studied the writings of Giovanni Previati, the Italian painter whose books humbled him because of their technical erudition. He wondered when, where and how he could study so much chemistry and physics.²⁹ In his diaries of 1907, he

²⁵Archivi, I, 239.

²⁶Guido Ballo, Modern Italian Painting from Futurism to the Present Day (New York: Praeger and Co., 1958), p. 56.

²⁷Taylor, p. 142.

²⁸Gino Severini, Tutta la Vita d'un Pittore (2 vols; Milan: Garganti, 1946), I, 33-38.

²⁹Martin, p. 57.

comments on his research toward a new form of art, for he believed in the need to synthesize modern knowledge to create art:

I believe that an immense mind that has courage and force to synthesize modern science . . . might create the true work [of art]. . . . Our feverish epoch makes that produced yesterday obsolete and useless.³⁰

His comments on his search for a form of expression show a most acute intuition according to Giulio Carlo Argan in his book on Boccioni. The painter reflected on the changes in modern Europe, and from the beginning his work was directed toward the discovery of a virile artistic order inspired by scientific conquests. He wanted to paint "the fruit of our industrial age."³¹ This grasp of scientific achievement and this desire for release from provincialism inclined him toward Marinetti. By the time they met, Boccioni was twenty-seven years old, had been in art for ten years, and had traveled in France and Russia.

Luigi Russolo (1885-1947) was born in Portogruaro near Venice. The son of an organist, he was well trained in music and self-taught in art. At The Brera Academy in Milan, he met Boccioni, Carrà and Marinetti and absorbed many art principles through discussion. His sensitive, mystical temperament and alert mind were valuable to the Poesia group, as he seemed to have the philosophical background to act as liaison among the literary, musical and fine arts branches of the movement. In 1909 he exhibited a group of etchings at the Famiglia

³⁰ Archivi, I, 227.

³¹ Giulio Carlo Argan, Boccioni (Rome: De Luca, 1953), p. 7.

Artistica in Milan, and among them was a head of Nietzsche showing the philosopher imprisoned in the hair of a female, perhaps representing madness.³² Always interested in sound, he gave up painting and invented the intonarumori, thereafter writing the manifesto on The Art of Noises which foreshadowed musique concrete and the work of Varèse, Pierre Schaeffer and John Cage today.³³

Carlo Carrà (1881-1966) was born in Quargnento near Alessandria and, by 1900, was working in London with a crew of Italian painter-decorators on the Victoria Station murals. In his autobiography, La Mia vita (1945), he recalled seeing the art of Manet, Delacroix, Courbet, Renoir, Monet and Gauguin in London and Paris. Eager to learn and to change social inequities, he was interested in art and science; he believed "young people could transform society."³⁴ He commented on the importance of newspapers in England "to elevate and educate the public," and also commented on his reading of the works of Saint-Simon, Bakunin, Nietzsche and Marx.³⁵ When he returned to Milan in 1904, he enrolled in the Brera Academy and earned a patente di disegno in 1909. There is little art extant from his period other than an awkward early portrait of his father (uncertainly dated about 1903) and the cover design for the 1909 Famiglia Artistica annual exhibition. Like Boccioni, he was influenced by Art Nouveau, the Grubicy circle,

³²Martin, pp. 70-71.

³³Clough, pp. 260-62.

³⁴Carlo Carrà, La Mia vita (2 vols.; Milan: Rizzoli, 1945), I, 15-18, 43-47.

³⁵Ibid., I, 48-56.

Segantini and Previati, and by the Impressionists.³⁶ He complained bitterly about the Academy's backwardness and the fact that the young people discussed Nietzsche and knew nothing of Renoir or Cézanne. There was, he thought, ". . . a paralysis of the young by this system . . ." ³⁷ He met Boccioni at an exhibition, and the two had long discussions forming the basis of a large part of Futurist theory.

Giacomo Balla (1871-1958) was born in Turin but lived most of his life in Rome. Older than the other Futurists, he was the son of a chemist interested in photography who died while Balla was still a child. Besides his study at the Academia Albertina, he worked for a lithographer in 1883 to aid the support of his family. Lithography stimulated his interest in art, and when the family moved to Rome in 1893, he set up a studio. In 1900 he spent seven months in Paris, which increased his enthusiasm for Impressionism.³⁸ He was a regular exhibitor in Rome when Boccioni and Severini became his students and later asked him to join the Futurist movement. His 1902 painting, Lavoro, shows the architectonic composition of his intuitive grasp of the shapes and planes. This night scene may have stemmed from his father's interest in night photography. The interest of cinematography rather than photography is evident in Giornata, painted in 1904. There are three divisions of the format depicting three times of day; light shifts and time shifts, a foreshadowing of Futurism. After his two

³⁶Martin, pp. 68-69.

³⁷Carra, I, 85.

³⁸Martin, pp. 73-75.

students convinced him to come to Milan, he put his past work up for auction with a sign with two black crosses: "for sale . . . the works of the late Balla."³⁹ Fortunately, his talent and his motivation were equal to the decision to join the Futurists.

Gino Severini (1883-1966) was born in Cortona, and he comments in his autobiography that he was "born twice; once physically in Cortona and then intellectually and spiritually in Paris."⁴⁰ Unlike the other Futurists, he remained in France, for in 1913 he married the daughter of Paul Fort, the Parisian poet. Yet he worked with the Italian group and kept them continually informed of art activities in the French capital.

After he had been expelled from the Cortona Scuola Technica at age sixteen because of a prank, he went to Rome in 1899 where he attended evening classes at the Villa Medici and worked at odd jobs during the day.⁴¹ In 1900 he met Boccioni, and they found that they had much to discuss: the theories of Marx, Nietzsche, Bakunin, and the "dominant ideas around 1900 that resulted from the progress of science."⁴² They decided both were atheists and revolutionaries and had a profound sympathy for the oppressed. When they studied together under Giacomo Balla, they "discovered" Impressionism and the art of

³⁹Ibid.

⁴⁰Severini, I, 1.

⁴¹Martin, pp. 76-77.

⁴²Severini, I, 1-3.

Pissarro, Signac, Bonnard, Matisse, Marquet and Rouault.⁴³ Their artistic environment included Italian artists, friends of Balla, such as Sironi, Vallone and Tito, who encouraged them when they exhibited their work or entered competitions. In 1906 Severini took the money from the sale of a painting and left for Paris.⁴⁴ Boccioni later visited him in the apartment Severini had found behind the Theatre de l'Oeuvre, where Marinetti's play Le Roi Bombance was later produced in 1909. The artist Severini joined the lively literary and artistic circle of the theatre, the Symbolist poets and Nabis painters.

The aerial feats of the Wrights, Bleriot and Chavez attracted Severini to the art of flying, and he spent a month in pilot's training before he realized "that painting, not flying, was his true calling."⁴⁵ When he returned to Paris, he showed his work in the Société Nationale des Beaux Arts (1908-1909) and the Salon des Indépendents. In his painting Printemps à Montmartre (1909), his Neo-Impressionist style showed the influence of Balla. But this endured only until he met the Cubists, Braque and Picasso, as well as the poets, Apollinaire and Salmon, and the artists most affected by science and industry, Leger, Metzinger, the Duchamp brothers and Gleizes. The combination of the driving force of Futurism with the subtle stimulation of the Paris

⁴³Ibid., I, 13-16.

⁴⁴Ibid., I, 21-22.

⁴⁵Martin, p. 77.

artists helped to bring his work to fruition.⁴⁶

Antonio Sant'Elia (1888-1916) was the last member of the primo futurismo who was considered one of the founders. He was not a signer of the early manifestos for this architect was considerably younger than the other Futurists. Born in Como in 1888, he lived only twenty-eight years; but he produced ideas and sketches during the years 1912 to 1914 of astonishing originality and strength. Sant'Elia was educated at the Brera Academy in Milan and took examinations at the University of Bologna in 1912, after which he set up an office in Milan. Many of his designs were displayed at the first exhibition of the Nuove Tendenze in 1914 at the Famiglia Artistica, and he wrote the catalog like a Futurist manifesto. And indeed it became, with few changes, the L'Architettura futurista manifesto of 11 July 1914 and printed in Iacerba on 1 August 1914.⁴⁷ The Futurists needed an architect, and Carlo Carrà introduced Sant'Elia to Marinetti in 1914 as a young architect who had at the time no construction of his designs and no substantial practice. But his damning of past styles and his desire to design the city of the future, based on the newest scientific knowledge, appealed to them all. His best known works were plans for the New city and the Power plant (see Pl. #7). These illustrated the use of building materials of concrete, glass and steel "selected to make the world of things a direct expression of

⁴⁶Ibid., p. 78.

⁴⁷Martin, p. 189; Taylor, p. 123.

the world of the spirit."⁴⁸ In his manifesto there was perhaps the hand of Marinetti in the theory of obsolescence: "Every generation should build its own city."⁴⁹ For the Futurists, the city and the power plant were symbols of electric energy--the generator of their dynamism.⁵⁰

In the first manifesto, signed by Marinetti alone in 1909, there are the main elements of an aggressive start of a movement which evolved a program and forms of expression partly based on science.

We shall sing of the love of danger, the habit of energy and boldness . . . the new beauty of speed and the racing car more beautiful than the Victory of Samothrace.⁵¹

The interest in motion is indicated when the poet talks of "the Earth, rushing over the circuit of her orbit . . . the poet must give himself with frenzy . . . there is no masterpiece without aggressiveness."⁵² Poetry was to be an "onslaught upon unknown forces, to command them to bow to man."⁵²

Time and Space died yesterday. Already we live in the absolute, since we have created speed, eternal and ever-present.⁵³

⁴⁸Archivi, II, 192-93.

⁴⁹Taylor, pp. 106-07; Martin, p. 190.

⁵⁰Martin, p. 191.

⁵¹Taylor, p. 124.

⁵²Ibid.

⁵³Ibid.

In eleven points Marinetti stated his case and hurled his challenge. He glorified war, showed contempt for women, wished to destroy museums and libraries, and embraced revolutions in modern capital cities, with their factories and smoke and bridges and locomotives, airplanes, flags and crowds. At the end he told why he launched this "manifesto of violence" in Italy:

. . . [to] deliver Italy from its cancer of professors, archeologists, cicerones and anti-quaries . . . as the oldest one of us is thirty; we have ten years at least to accomplish our task. When we are forty let others, younger and more valiant, throw us into the basket like useless manuscripts . . . We stand on the summit of the world and once more we cast our challenge to the stars.⁵⁴

He was a first-class showman and superbly gifted in the opinion of Moholy Nagy in 1947.⁵⁵

Marinetti called the Futurists to his Milan home, filled with Arabic lamps and Oriental rugs, to write the Manifesto of Futurist Painting in 1909. All night they argued, with Boccioni taking the leadership in theory to follow the philosophy proposed by Marinetti. In La Mia vita, Carrà described the aura of this dark mysterious house, like a mosque, where five northern Italians, born into poverty and with little education, discussed their society coming into the industrial revolution through radical changes in science.⁵⁶ Repressed by many aspects in their lives, they gave vent to their own revolution, a

⁵⁴Ibid., pp. 124-25.

⁵⁵Lazlo Moholy Nagy, Vision in Motion (Chicago: Paul Theobald, 1947), p. 303.

⁵⁶Carrà, I, 129-30.

revolution in the arts. Marinetti later had to finance most of the program from his own pocket and to fill in gaps in their education. But they attacked their problems with passion, and Boccioni read their first manifesto on the stage of the Chiarella Theater in Turin on the night of March 8, 1910. It was a bid for freedom, a cry of rebellion against mediocrity and the worship of the past.⁵⁷ And it was addressed to the young artists of Italy so that they would "reject the respected artists of Italy as banal, academic fossils . . . to follow the progress of science which had profound changes for humanity."⁵⁸ Most important was the "need to destroy all forms of imitation, to exalt originality and to glorify the present which was transformed by victorious science . . . in the conquest of the unknown, the miracles of contemporary life, in speed over land, sea and air."⁵⁹

Just two months later they published the Technical Manifesto of Futurist Painting (April 11, 1910), ". . . to expound with technical precision our programme for the renovation of painting."⁶⁰ The first requirement was the recognition of universal dynamism:

. . . dynamic sensation itself made eternal . . .
for all things move, all things run, all things
are rapidly changing . . . nothing is absolute in
painting; what was truth for the painters of yesterday is but a falsehood today.⁶¹

⁵⁷Taylor, p. 17; Martin, p. 44.

⁵⁸Martin, p. 45.

⁵⁹Archivi, I, 64-65.

⁶⁰Taylor, pp. 125-26.

⁶¹Ibid., p. 126.

They dealt with the new vision in terms of light and space; the figure and atmosphere are one--light infused and changed objects and figures. There was a penetration of forms, a reaction of one object in relation to another. X-rays and inner structure were important, and "universal vibrations" must be a part of art as the "vivifying current of science" as well as research. There was a new consciousness; the spectator must be at the center of the picture, and there must be innate complementarism based on Divisionism: ". . . and our art is intoxicated with spontaneity and power."⁶²

Under the words "we declare" and "we fight" the Futurists listed other ideas based on science as they demolished past criteria of painting. They glorified originality, sincerity and purity for a life of steel, pride, fever and speed. They declared that movement and light destroyed the materiality of objects. They looked to science both for example and inspiration as the new dynamic image of the world included the phenomena of after-image of seen movement. Dynamism was the key word, to be rendered in both psychic and physical phenomena.⁶³

This 1910 manifesto was signed by the five Futurists. They then had a program, but not one work of art! But the interchange of ideas was vigorous now that the Technical Manifesto had introduced the principle of dynamism, the chief theoretical statement of early Futurism. Both Marinetti's Technical Manifesto of Literature and Boccioni's Technical Manifesto of Futurist Sculpture in 1912 were extensions of

⁶²Ibid.

⁶³Martin, pp. 50-51.

this program outlined in 1910. The concept of motion developed more importance in each succeeding manifesto as in 1910 the concept of universal dynamism, especially speed, was not treated as an independent artistic value but enumerated with the others such as vitality, change and originality. Marinetti's manifesto of 1909 was inclusive of all creative activity, but the painters' manifesto was a specific commitment to the figurative arts.⁶⁴

This manifesto showed that the painters had broadened their horizons to combine Marinetti's complex modern view of the world with remnants of their previous positivism. The next three manifestos (1910-1911) extended Futurism to drama and music. Marinetti, the author of the manifesto on drama, reinforced his concepts of "speed on the earth, the sea, and in the sky, dominated by steam and electric power . . . and that sensation of power of the machine must be introduced into the theater."⁶⁵

In the music manifestos of 1911 Francesco Balilla Pratella exhorted the composer to write his own libretto in free verse:

. . . to experiment with tonal, modal and rhythmic changes and add (Italics mine) the power of the machine and the victorious reign of electricity to the central motifs of the musical poem.⁶⁶

There had been a shift from the evocative to the didactic tone of the manifestos; and there had been a shift in the arts as they thrust into

⁶⁴Ibid., p. 46.

⁶⁵Ibid., p. 47.

⁶⁶Martin, pp. 48-49. (The Italics placed by Miss Martin serve the thesis of this paper well.)

a society basically hostile to them. Established was the basic theoretical emphasis on science to be evolved in the next five years through the arts.

CHAPTER III

THE CULTURAL MATRIX: SOCIAL AND INTELLECTUAL CHANGE

During the year 1900 radical changes affected Italy and the lives of the young men who later formed the Futurist movement. King Umberto was assassinated by an anarchist, and King Victor Emmanuel III came to the throne. Shocked by this news, Carlo Carrà, working on murals in London, wrote a manifesto against violence for the Daily Mail. When the newspaper failed to publish his article, he distributed it on the streets by hand and soon left his anarchist activities to return to Italy.¹

Other young Italians to be linked with Futurism were working in Paris: the poets Ungaretti, Marinetti and Apollinaire; the artists Modigliani and Balla; and the Florentine writers Giovanni Papini and Ardegno Soffici who were interested in Impressionism.² Gabriele D'Annunzio published his poem Il Fuoco in Paris in 1900 and called on young Italians for violent action to redeem Trentino for Italy.³

Meanwhile Professor Henri Bergson was appointed to the chair of philosophy at the Collège de France where the mathematical physicist,

¹Carrà, I, 45-50.

²Denis Mack Smith, Italy, A Modern History (Ann Arbor: University of Michigan Press, 1959), p. 250. See also Haftmann, I, 103.

³Gordon Craig, Europe Since 1815 (New York: Holt, Rinehart and Winston, 1962), p. 344.

Henri Poincaré, was writing the Foundations of Science.⁴ Both men worked on theories of creativity, intuition and dynamism which later influenced the arts. The painter Cézanne was working on a series of Bathers, and Gauguin sent his painting, Who Are We? Where Do We Come From? Where Are We Going?, to Paris from Tahiti.⁵ Art Nouveau appeared and Symbolism was on the wane in both art and literature when a young painter, Pablo Picasso, arrived from Spain at the age of nineteen. He met Soffici as they both visited art exhibitions of Degas, Manet and Renoir in the Luxembourg and the Louvre museums.⁶ In 1900 the World's Fair in Paris offered art and science in new directions and new forms. Georges Méliès opened the first theater for film with The Doctor's Secret, showing trick effects with the motion picture.⁷ The Pasteur Institute demonstrated the first synthetic drugs for anesthesia and asepsis and opened the first departments for the study of genetics and bacteriology.⁸

In Rome in 1900 the first electric train and street lights on the Piazza Termini excited two eighteen-year-old art students, Boccioni

⁴H. Stuart Hughes, Consciousness and Society (New York: Vintage Books, 1961), pp. 109-114.

⁵Lionello Venturi, Impressionists and Symbolists (New York: Charles Scribner's Sons, 1950), pp. 137-38, 173.

⁶Jacques Barzun, The Energies of Art (New York: Harper and Brothers, 1959), p. 19. See also Alfred H. Barr, Jr., Picasso (New York: Museum of Modern Art, 1946), pp. 19, 253.

⁷K. G. Pontus Hulten, The Machine Age (New York: Museum of Modern Art, 1968), p. 43.

⁸A. Rupert Hall and Marie Boas Hall, A Brief History of Science (New York: Signet Science Library Books, 1964), pp. 247-49.

and Severini.⁹ Russolo, fifteen years old, was studying music in Venice; and Sant'Elia, only twelve years old, was a student in Como, an industrial-intellectual center in northern Italy.¹⁰ Meanwhile, at the University of Rome, Antonio Labriola, Georges Sorel and Benedetto Croce discussed Marxism for the last time before Croce returned to his native Naples to free himself of the theories of Karl Marx.¹¹ So, too, the Futurists were to try to shake off the influences of Romanticism and Victorianism with the acceptance of the ideas of Sigmund Freud in his Interpretation of Dreams and Max Planck's concepts in his Quantum Theory, both published in 1900. The Futurists also read about the "psychology of creativity" and the "will to power" concept of Friedrich Nietzsche who died in 1900 leaving a heritage of contempt for Christian decadence and the concept of the Superman with a new heroic morality.¹² Both Severini and Carrà wrote of Futurist discussions and arguments over the ideas of Nietzsche.

Twenty-nine years after political unification, Italy in 1900 was still deeply divided by local oligarchies, provincial dialects and differing customs as well as lack of education, communication and transportation. Inequality, hunger and repression illuminated the conflict between the Church and the State which indirectly promoted personal liberty.¹³ It was Giovanni Giolitti, later to serve five

⁹Severini, I, 16. See also Archivi, II, 177.

¹⁰Taylor, p. 146.

¹¹Hughes, pp. 202-203.

¹²William Barrett, Irrational Man (Garden City, New York: Doubleday Anchor Books, 1962), p. 197.

¹³Guido de Ruggiero, The History of European Liberalism (Boston: Beacon Press, 1966), p. 399.

terms as Premier, who wrote in 1900 that there was no tax on wealth:

. . . the country is sick politically and morally . . . the cause is that the classes in power spend enormous sums on themselves and their own interests and obtain the money almost entirely from the poor sections of society.¹⁴

Italy watched jealously as European imperialism, at its height in 1900, colonized the continents of Africa and parts of Asia and South America. Strikes and unemployment increased, and at the Socialist Congress of the Second International, reformers and revolutionists discussed the problems of Communism, strikes, jobs and emigration--Italy's chief concerns. Filippo Turati forecast in the January issue of Critica Sociale in 1900: ". . . revolution . . . coming by tiny fractions like snowflakes to make the eventual snow-storm."¹⁵

Just as there was revolution in social thought, so was there revolution in science. In the words of Severini, "The dominant ideas around 1900 were those resulting from the ultimate progress of science . . . "¹⁶ In physics Hermann Minkowski was working with the geometric theory of numbers to develop nomographs or diagrams illustrating four dimensions. One of his students was Albert Einstein, who was completing his schooling at the Federal Institute of Technology in Zurich in 1900.¹⁷

¹⁴Mack Smith, p. 214.

¹⁵Christopher Seton-Watson, Italy from Liberalism to Fascism (Fromme-London: Methuen and Co. Ltd., 1967), p. 264.

¹⁶Severini, I, 13.

¹⁷René Taton, ed., Science in the Twentieth Century, trans. by A. J. Pomerans (New York: Basic Books, Inc., 1966), pp. 3, 89.

Guglielmo Marconi, meanwhile, was working with radio waves to signal across the Atlantic Ocean, and Ernst Mach, the philosopher of science in Vienna, was studying centrifugal force. Ernest Rutherford was working with radioactivity and the structure of the atom in England, while Wilhelm Roentgen in France was investigating the X-ray for which he won the Nobel Prize in Physics.¹⁸

The study of science was spreading on the popular level and the abstruse level through universities, libraries and industry, as government and private subsidies encouraged research and development. France led the way in medicine, mathematics and physics, as well as the arts, and all of Europe felt the impetus of science as a cultural force.¹⁹

Even . . . Italy was an active center for scientific research. . . . functional analysis, algebraic geometry, theoretical mechanics, radioelectricity, geodesy, seismology, vulcanology, solar astronomy, neurophysiology and medical parasitology.²⁰

By 1900 art and science combined in many experiments in photography, and art began to turn " . . . away from reality, disregarding outer form for the traces of motion, becoming more analytical and more symbolic."²¹ Boccioni contended: " . . . forms may be endowed with life and motion . . . not drafted by calculating reason . . . but

¹⁸Columbia Encyclopedia (New York: Columbia University Press, 3rd ed., 1963), p. 1509.

¹⁹Norman Kaplan, Science and Society (Chicago: Rand McNally Co., 1965), pp. 42-47.

²⁰Taton, p. 573.

²¹H. G. Wells, Outline of History (Garden City, New York: Doubleday & Co., 1956 rev.), p. 818.

inspired by . . . intuition."²² More than the other Futurists, Boccioni was a serious student of science as well as art and criticism. His gift for words made him prolific; his books, many articles, sculptures, drawings, paintings and prints showed his imaginative dedication to what he called " . . . the new reality . . . transformed by victorious science . . . " for he felt that the concepts of matter and energy were transformed beyond recognition from 1900 to 1914.²³

Political changes in Italy after 1900 included attempts to pacify the Socialists and anarchists during the "age of Giolitti" (1903-1913), as problems of transformismo in Parliament blocked reforms in employment, housing, law, taxes, suffrage and sanitation. As a result, Giolitti governed by manipulation as Liberalism failed and young intellectuals without a voice in government joined extremist groups, strikes and other forms of protest against repression from the State and the Church.²⁴ The government was conservative; and the Church was reactionary under Pope Pius X, fearful of all forms of modernism. They were powerless in the face of a general strike in 1905 which paralyzed the nation. In 1903 Georges Sorel's anarchist doctrines had been published in Italian, and his Reflections on Violence influenced both Left and Right.²⁵

The Balkan Wars, Irredentism, the conquest of Libya and the Triple

²²Umberto Boccioni, Pittura scultura futuriste (Milan: Edizione Futuriste di Poesia, 1914), pp. 118-19.

²³Masur, pp. 205-206.

²⁴Mack Smith, pp. 211-14.

²⁵Hughes, pp. 38, 52. See also Craig, p. 342.

Alliance doubled the anxiety of people cognizant of the bribery, secrecy and fraud involved in international, national and local affairs. As the new industrial rich became despotic during Parliamentary dictatorship and inaction, Marinetti wrote in 1909 for Le Figaro: "If this injustice is based on reason, let us follow the absurd."²⁶ The Pro Patria party, formed a year later with the leadership of Corradini, editor of Il Regno and later Idee Nazionale, promoted the concept of the "elite" first formulated by Gaetano Mosca and Wilfredo Pareto.²⁷ By 1912 Socialists were voted into the government, but the party split into Communist and Fascist factions just at the time suffrage was finally extended to all men over thirty years of age.²⁸ The following year the Futurists turned to political activism in accordance with Marinetti's dictum: "Futurism is an artistic and ideological movement. . . . It intervenes in political struggles only in hours of grave danger for the nation."²⁹

In 1914 Italy was divided between neutrality and intervention at the outbreak of World War I, and in 1915 King Victor Emmanuel III signed the secret Pact of London to enter the war on the side of the Triple Entente after Parliament was dismissed.³⁰ The Futurists were the first

²⁶Archivi, I, 16.

²⁷S. B. Clough and A. Saladino, History of Modern Italy (New York: Columbia University Press, 1960), pp. 288-94.

²⁸Cecil Sprigge, The Development of Modern Italy (New Haven: Yale University Press, 1944), pp. 103-104.

²⁹Arnoldo Mondadori, ed., Tutte le opere de F. T. Marinetti (Verona: Mondadori, 1968), p. 490.

³⁰Silvio Paolucci, Storia: ottocento e novecento (Bologna: Zanichelli, 1966), p. 215.

volunteer cyclists into the mountains to fight Austrian troops, and Severini (who had stayed in Paris) contended that Futurism could be understood only as it reflected the historical conditions in Italy.³¹

Paradoxically, 1900 to 1915 was the "golden age" of economic expansion in Italy, particularly in the industrial north as seen in Boccioni's painting The City Rises in 1910. Tourism and foreign trade illuminated the "progress" of European industry and colonization through wealth, although Italy had to import coal, oil and steel. Poverty and hunger in the industrial slums and agricultural South accompanied widespread illiteracy. Giolitti contended that "all disturbances are due to bad economic conditions . . . in no other country of Europe were taxes on ordinary articles of food so high, or the gap between rich and poor so wide."³²

At the same time, Italian bank scandals, syndicates, cartels and trusts placed power in fewer hands. In 1911 five large steel companies combined and unemployment increased. As a result, emigration mounted every year, and in 1913 over one-half million people left Italy in search of work.³³ The population, in spite of constant emigration, increased 3.28 million from 1900 to 1911; and, with rising inflation, the wage levels were the lowest in Europe.³⁴ Giolitti

³¹Severini, I, 14.

³²Giovanni Giolitti, Memoirs of My Life, trans. by Edward Stover (London & Sidney: Chapman And Dodd Ltd., 1923), p. 194.

³³Paolucci, p. 204.

³⁴Croce, pp. 228-30.

charged: "No other people have for centuries suffered such grave evils with so much resignation."³⁵ These conditions invited the political thrust of the intellectual, the independent thinker and the artists, already alienated from society.

Society was studied "scientifically" by Pareto and Sorel (both trained as engineers),³⁶ as well as by Max Weber and Gaetano Mosca during the "intellectual revolution of 1914" when Italy made contributions to science, sociology, economics, psychology and philosophy. Young nationalistic intellectuals, concerned with social justice and creative achievement, were intensely interested in challenging positivism through the work of Nietzsche, Bergson and Freud.³⁷ They believed man's essence was of rational and irrational motivation. Not only did they refer to the irrational in their literature, but they used these concepts in their arts.

The "mystic" geometrician Bergson, counter to the materialism of the Marxists, offered metaphysical fusion of art and science in his quest for synthesis, and both Marinetti and Boccioni considered him the "deity of the generation." Bergson's Time and Free Will, Matter and Memory, Introduction to Metaphysics, and Creative Evolution were published in Italian between 1910 and 1914.³⁸ Boccioni named a

³⁵Clough and Saladino, p. 251.

³⁶Hughes, pp. 36, 90.

³⁷Ibid.

³⁸Aaron Scharf, "Futurism=States of Mind and States of Matter," Studio International, Vol. 173, No. 889, May, 1967, pp. 244-48.

painting Laughter in 1911, the title of one of Bergson's books of 1900; and Marinetti wrote his Manifesto of the New Morality-Religion of Speed in 1916 using concepts from Bergson's ideas later published in Two Sources of Morality and Religion (1932). The Bergsonian concepts of levels of consciousness, intuition and motion, both physical and psychological, were the groundwork for much of the theory the Futurists developed in the concept of dynamism and its counterpart, time. The flux of reality for Bergson had the element of time or what he called duration--time-as-experience. One could "transcend" the symbolic world of natural science through intuition and the elan vital, the vital impulse or life force, could take introspection into immortality.³⁹ Boccioni used the term physical transcendentalism to denote the occult aims of the states of mind in his paintings: ". . . the emotional architecture of the objects' plastic faces."⁴⁰

In March 1913 Boccioni approvingly quoted Bergson in his Pittura scultura futuriste: ". . . a division of material depends on absolute contours . . . movement from one pose to another is indivisible."⁴¹ Later from Bergson's Matter and Memory, Boccioni quoted: "The physical world is a dynamic continuity, an immense play of forces in which, in fact, there is no division."⁴² The artist interpreted this dynamic continuity in two sculptures: Development

³⁹Hughes, p. 118

⁴⁰Umberto Boccioni, Estetica e arte futuriste (Milan: Il Balcone, 1946), p. 181. [Hereinafter referred to as Estetica]

⁴¹Archivi, I, 144. See also Martin, p. 133.

⁴²Clough, pp. 212-13.

of a Bottle in Space, and Unique Forms of Continuity in Space. They were exhibited at the Galerie La Boétie in Paris in 1913. (See Pl. III.)

The dynamism of the human body and its relationship to space challenged Boccioni, and he became the theoretical bridge between the ideas of Bergson and the Futurists, although there seems to be no evidence that they ever met. Both evolved ideas of motion in space implying time based on the past fifty years of scientific achievement in the physical sciences. Bergson replaced the absolutes with his "stream of becoming" and "flux of reality" which acknowledged molecular action in thermodynamics and foreshadowed the motion of electrons in atomic physics. The philosopher combined theology and physics in his concepts of duration, space-time and synthesis; his work on consciousness overlapped the investigation of Freud and the "collective unconscious" of Carl Jung.⁴³ As early as 1889, in his Essai sur les données immédiates de la conscience, Bergson introduced dreams and the élan vital concept which was much like the vitalism of Nietzsche, the libido of Freud and the life force of Jung.⁴⁴ All these men recognized the levels of consciousness, the irrational, the "becoming" with some form of motion or dynamism. Often intuition seemed the origin of the creative impulse, and in Lacerba in 1913 Papini urged the Futurists to study their dreams to gain freedom and originality in

⁴³Harry Woolf, ed., Science as a Cultural Force (Baltimore: Johns Hopkins Press, 1964), p. 104.

⁴⁴Hughes, pp. 64, 116, 124-25.

their art.⁴⁵ Boccioni's paintings of states of mind in 1911 show the influence of Freud's theories as well as Bergson's concepts of dynamism and intuition. When in 1914 Bergson's writings were put on the Index to join those of Darwin, Comte, Spenser and Freud, Papini wrote again in Lacerba: "The Church castrates man . . . for it opposes novelty, experiment, originality, personal freedom, art and genius."⁴⁶

Meanwhile Croce--scholar, philosopher and editor of La Critica--developed his idealistic historicism with great authority and precision. Among his many books is the Brevario di estetica (1902), revised in 1912, which introduced an aesthetic theory based on intuition but contending that reason must predominate. Largely ignored by the Futurists, Croce, shocked at irrational art forms, informed Carlo Carrà that science was not valid in art.⁴⁷ He continued to maintain a benevolent dictatorship over Italian literature and philosophic life with leadership in opposition to most modern art forms. To Croce, as well as to the majority of Italians, Impressionism was a more "logical" art style.⁴⁸ He scorned the Futurists, and "for D'Annunzio . . . he had only words of reproof . . . they were spiritually of two different races."⁴⁹

⁴⁵Archivi, I, 32.

⁴⁶Ibid., I, 140. See also Hughes, p. 350.

⁴⁷Carrà, I, 63. No date is available here as the Futurists went to Naples for a serate and visited Croce sometime during their stay.

⁴⁸Hughes, pp. 201, 206-207.

⁴⁹Ibid., pp. 336-38. See also Martin, p. 40.

Bergson, Nietzsche and Poincaré were part of the "mainspring for intellectual energy" of the European generation of 1905 which embraced intuition and the irrational as an avenue for creativity.⁵⁰ But Italy was asleep according to Boccioni in a letter to Vico Baer in 1909. Force was needed to get her into the mainstream of European culture.⁵¹ The arts were imitative and sentimental, with little relation to the changes of the concept of man and his environment. Romanticism, developed with the risorgimento and fed by the cult of Goethe, appeared in many forms: the opera of Puccini and Verdi, landscape paintings of Signorini, Fattori and Lega, and the poetry of Pascoli and D'Annunzio. Through ridicule the Futurists constantly denied D'Annunzio's ideas, yet his flamboyant life-style (modo di vita) influenced them.

Stirring outside the bourgeois control of the arts through the academies were artists and writers who traveled throughout Europe, read international journals, and eventually created an "explosion of youth in a country dominated by old people, customs and institutions."⁵² This was Futurism. In Milan Boccioni studied the three texts of scientific principles of Divisionism by Gaetano Previati and worked with Medardo Rosso who made Impressionist sculpture in privation and neglect. The painter Giovanni Segantini wrote in 1894:

⁵⁰Jacques Barzun, The Energies of Art (New York: Harper and Brothers, 1956), pp. 326-28.

⁵¹Archivi, II, 41.

⁵²Giorgio Castelfranco and Jacopo Recupero, Il Futurismo (Rome: De Luca, 1959), p. 13.

. . . new ideas have emerged or are about to emerge . . . outmoded ideals are no longer justified. The thought of the artist must no longer turn to the past, but must forge forward towards the future he conceives.⁵³

Some artists such as Signorono or Cecioni pleased tourists with Corot-like landscape paintings in Florence, as did Costa in Rome. In Milan the Grubicy brothers practiced Divisionism inspired by Seurat and symbolism of Art Nouveau. But generally the plastic arts were weak, partly because " . . . every author or artist suspected of having originality or imagination was distrusted."⁵⁴

The Florentine movement, essentially a series of journals professing to integrate spirit with intelligence, began with Marzocco in the 1890's and gained force with Il Leonardo in 1903 and Il Regno and La Voce in 1908. These magazines aroused Italy to political and cultural problems, science and invention.⁵⁵ Papini and Soffici reviewed French art in La Voce and later in Lacerba (founded in 1913) from Impressionism to Cézanne and from the Fauves to Picasso and Cubism. Other journals aided the intellectual attack for social change: L'Unita, La Ronda, Avantguardia and Critica Sociale. In 1913 Marinetti and the Futurists gained a new voice when Papini wrote "Il Mio Futurismo" in Lacerba, combining Milanese ferocity with Florentine scholarship. This article established the artists as renowned agitators

⁵³Martin, pp. 11-12.

⁵⁴Count Carlo Sforza, Contemporary Italy, trans. by Drake and Denise de Kay (New York: E. P. Dutton Co., Inc., 1944), p. 139.

⁵⁵Peter A. Riccio, On the Threshold of Fascism (New York: Casa Italiana, Columbia University Press, 1929), pp. 11-12, passim.

for national and international audiences.⁵⁶

During the years 1903 to 1916 the journals presented articles on physics by Poincaré, science by Bergson, and syndicalist theories of Pareto and Mosca. The stress was on action, not just rhetoric; and the poetry of D'Annunzio, illustrated and continued in many issues, increased the nationalistic tone of the publications. Introiba, started in 1913 by Iacerba, included art and poetry with wild maxims, puns, satires and tirades, Futurist calligrammes and experiments with photography.⁵⁷ However, at the entry of Italy into the war, the publications were suspended.⁵⁸

Photography changed man's view of the world through motion studies of the human figure and animals by E. J. Marey and Eadweard Muybridge before 1900, foreshadowing the photographic experiments of Balla and the fotodynamismo of the Bragaglia brothers in 1912.⁵⁹ The motion picture camera, invented by Thomas Edison in 1889 and perfected by William Dickson, and the film by the Lumiere brothers in 1895 culminated in the "cinématographe," a combination camera, projector and printer first demonstrated in the foyer of the Paris Opera in 1896 by the Lumieres.⁶⁰ Marinetti enjoyed optics and the many new methods of observation--looking down into a microscope, up through a telescope,

⁵⁶Martin, pp. 19-27.

⁵⁷Archivi, I, 129. See also Martin, p. 131.

⁵⁸Riccio, pp. 111-12.

⁵⁹Hulten, pp. 36-39.

⁶⁰Ibid., p. 37.

through the eye of a camera, and later from a speeding automobile and down from an airplane in flight. He could combine these methods in film, and by September 1916 he wrote the Manifesto of Futurist Cinematography on what he considered a dynamic revolutionary art form.⁶¹

The important influence of French art on the Futurists started with their study of Impressionism and Divisionism and their use of color, light and paint application. The next phase of their study included the Symbolists and the Fauves. Cézanne's work and his dictum of reducing everything to forms of solid geometry appealed particularly to Boccioni.⁶² The true challenge for the Futurists was Cubism--that Cézanne-based style of Picasso and Braque which Soffici discussed in La Voce in August of 1911, the first article on Cubism in the Italian language.⁶³ In Futurist literature all references to Picasso were made with admiration; thus it is not unusual that the bronze female head by Boccioni in 1912, called Antigratzioso, is directly influenced by the Cubist head of a female in bronze by Picasso in 1909, Woman's Head. The Futurists had their daring concept of states of mind in 1911, but they turned to Cubism with eagerness and, using parts of this formal system, developed dynamism. They felt Cubism was lifeless, static, and illustrated only the concept of simultaneity in showing various views of the object at the same time.

⁶¹Archivi, I, 96.

⁶²Martin, p. 64.

⁶³Archivi, I, 96.

Space does not allow discussion of the Orphism-Futurism controversy over which group developed dynamism first. The many changes in Futurist art brought about by the Cubist simultaneity paralleled the theory of relativity. Boccioni used these ideas consciously in his sculpture of 1912-1913, for he wished to "surpass Cubism" by using their style in three dimensions, hoping to add the fourth, time.⁶⁴ Medardo Rosso had opened the way in 1909 with his insistence that movement in sculpture must not stop at the contours but should express cosmic rhythm, impelling itself into space " . . . the way an electric wave emitted . . . by a machine flies out to rejoin the eternal force of the universe . . . nothing is material in space."⁶⁵ Rosso's words were only a step away from the Futurists, yet his wax-covered sculpture was much like Impressionism.

As early as 1911 Marinetti tried to break away from Romanticism: "Today we hate our glorious forefathers . . . Poe, Baudelaire, Mallarmé and Verlaine."⁶⁶ Carrà noted in his autobiography the influences of Erik Satie, Varèse and Stravinsky in music, Diaghilev and Cocteau in dance and theater, Gustave Kahn in poetry, and Rousseau, Delaunay, Vollard, Brancusi and Ozenfant in art.⁶⁷ In their search for unity in the arts the Futurists, intent on the synthesis of Bergson, worked their way through major art movements to 1912 when Boccioni asserted:

⁶⁴Martin, pp. 124-26.

⁶⁵Ibid., pp. 56-57.

⁶⁶F. T. Marinetti, Futurisme (Paris: Sansot, 1911), pp. 82-83.

⁶⁷Carrà, I, 180-99. He comments also on the "great superiority" of Picasso and how much the young artists want to move the "old bourgeois culture."

"There is no such thing as painting, sculpture, music or poetry; there is only creation."⁶⁸ By 1913 their own "style of motion" had been correlated in theory, and individual achievements took precedence over their collective achievements.

The influence of Art Nouveau and German Expressionism was apparent in the 1911 states-of-mind paintings and culminated in 1912 with the influence of Kandinsky's painting and writing. His Concerning the Spiritual in Art, which introduced non-objective painting and analogies between painting and music, so impressed Marinetti that he wrote a manifesto to Kandinsky based on dynamism: "the abstract tension between spirit and matter."⁶⁹ Boccioni showed the influence of German Expressionism in his paintings of the dynamism of football players, horseback riders and cyclists. Not until 1914 did he paint Dimensioni astratte, an abstract composition in pure color and form. Dynamism had become the subject matter; no visual image was needed. Yet before this, in 1912, Balla had returned from Germany with a series of paintings called Compenetrazioni, pure designs of interlocking colors and shapes.⁷⁰

Cézanne's work also had a strong influence on the Futurists, greater than the color of Van Gogh and Gauguin and the Divisionism of Seurat. Carrà wrote "Da Cézanne a noi futuristi" in Lacerba in 1913,⁷¹

⁶⁸Martin, p. 126. See also Archivi, I, 79.

⁶⁹Archivi, I, 235.

⁷⁰Martin, pp. 174-76.

⁷¹Archivi, I, 145-47, 160-63.

and Boccioni returned to the style of Cézanne in Il Bevitore, 1914, and the Portrait of Fredrico Busoni just before the artist's death in 1916. Both paintings were lasting tributes to the architectonic structure of Cézanne.

The two main bridges between the Futurists and the arts of Paris were the poet-critic Guillaume Apollinaire, a long-time friend of Marinetti, and Severini, who lived in Paris near the painters Utrillo, Valadon, Dufy and Braque but who admired more the painters Seurat, Leger, Gleizes and Picasso.⁷² In August 1913 Apollinaire, referring to Orphism, wrote in Lacerba: "The last and most glorious phase of Cubism is the art of dynamism obtained by the use of complementary colors and simultaneous contrasts."⁷³ The French had appropriated dynamism and passed it off as new, although the Futurists had proclaimed it in their 1910 manifesto as "sensed molecular movements . . . that atomic movement which philosophy suspected and science later demonstrated."⁷⁴ (when matter was found to be a series of electrical charges, in motion). In 1912 Boccioni's definition was:

Dynamism is the simultaneous action of the particular and characteristic motion of the object (absolute motion) together with the transformations experienced by the object as a result of its displacements in a moving or motionless milieu (relative motion).⁷⁵

⁷²Martin, p. 77. See also Severini, I, 78.

⁷³Clough, p. 81.

⁷⁴Ibid., p. 82.

⁷⁵Boccioni, Pittura scultura futurista, p. 195.

Just as the definitions evolved, so did the dynamism in their arts.

Futurism was avowedly based on scientific ideas as early as 1907 when Boccioni had commented in his diaries before the movement started: "Art should become a function of life as science is part of life today. . . . I believe an immense mind might have the courage and force to synthesize modern knowledge and create the true work . . . of art."⁷⁶

Scientific research from 1900 to 1916 brought revolutionary changes in mathematics, physics, chemistry, cosmology and the study of human behavior. Motion was a unifying concept much as motion in many forms unified Futurism. It evolved from motion as activity or change in position, to kinetic energy in absolute motion and relative motion, to the concept of speed as Marinetti used it in his Manifesto on the New Morality-Religion of Speed in 1916. Speed was to him the only universal.⁷⁷ Only the year before, Einstein had established in the General Theory of Relativity in final form that the velocity of light is constant and the weight of bodies increases with velocity. Marinetti equated velocity with imagination and power with genius in his system of analogies: ". . . speed destroys the laws of gravity, time and space."⁷⁸ He saw this as a means to increase man's freedom in both art and science as he considered the Darwinian evolution, the Freudian revolution in psychology, and the Einsteinian revolution in

⁷⁶Archivi, I, 276-77.

⁷⁷Ibid., I, 52.

⁷⁸Ibid.

physics equating matter with energy and the relativity of motion in the space-time continuum.

Boccioni used Bergson's concept of motion in 1913 as a feature of both physical and psychological time: "Our idealism is constructed on laws from science illuminated by our intuition, sensitive to new conditions of life created by scientific discoveries . . . all is movement."⁷⁹ Motion became the generator of vision and insight as science became the intellectual force which continued to change the Futurists' concepts.

The Quantum theory of Max Planck changed the concept of physics when he postulated his theory of radiant energy emitted as waves of matter, not as constant stream but as discontinuous. This element of indeterminacy made it slow to be accepted by scientists, although the wave function was fully developed and determined for all places and time by initial and boundary conditions. Yet it was beyond visual perception which made it difficult for the classical physicist.⁸⁰ By 1904 the light quanta was used to develop the law of the photoelectric effect when Albert Einstein in 1905 published his Special Theory of Relativity. He worked out the relativity of simultaneous motion of moving bodies and the Brownian motion of molecules. Marinetti called this the "agitation of the atoms" in 1909 in Tutte Le Opere when he mentioned Brownian motion and microscopic studies in the "drama of the infinite" based on observation and intuition in

⁷⁹Ibid., I, 42, 144.

⁸⁰Robert G. Colodny, ed., Frontiers of Science and Philosophy (Pittsburgh: University of Pittsburgh Press, 1962), pp. 204-205. [Hereinafter referred to as Frontiers.]

this artist's search for fusion, for the synthesis of life.⁸¹

Hermann Minkowski in Zurich developed irrational fractions in his Theory of Numbers, based on the work of Castelnuove and Severi in geometric integrals. While working with Einstein, Minkowski made nomographs illustrating scientific laws--diagrams to illustrate multi-relationships simultaneously.⁸² By 1908 he developed the four-dimensional time concept based on Einstein's relativity of motion and the union of space and time. (See Pl. I.) As in science, time and space formed the space-time continuum, Cubism and Futurism developed the artistic equivalent in their search for a means of expressing simultaneity. There were indications of a new interrelatedness of science and art, a new dynamic existence freed from the static, fixed framework of the past.⁸³ The world could be conceived of in four dimensions.

By 1900 geneticists were revising the mechanics of the Darwinian concepts, and chemists were synthesizing drugs to ease pain in the study of organic chemistry.⁸⁴ Michael Faraday's imagery of "lines of force" in physics had followed investigation of magnetism and radiation.⁸⁵ Boccioni used these lines of force, or force lines, in his art as well as the states of mind influenced by drugs. Markow and Bach studied the

⁸¹Mondadori, p. 64.

⁸²George Gamow, Biography of Physics (New York, Evanston and London: Harper & Row, 1961), pp. 189-91.

⁸³Seigfried Giedion, Space, Time and Architecture (Cambridge: Harvard University Press, 4th ed., 1963), pp. 14-17.

⁸⁴Hall and Hall, pp. 239, 286-88.

⁸⁵Ibid., pp. 297-99.

electrical activity of the brain, and Clark Maxwell devised a mathematical theory of electromagnetism while Hertz investigated electromagnetism and wave transmission for radio. Medical men studied the mind, and Dr. Sigmund Freud attempted to cure mental illness through psychoanalysis, dealing with levels of consciousness and a theory of the subconscious and human desire. In his study of aphasia and hysteria, he first used hypnosis and later therapy to reach the emotional causes of neuroses and bring to attention the irrational, dreams, sexuality and the repressed, and intuition as a source of creativity. In 1906 Carl Jung joined him, and they founded a journal for the International Psychological Association just before 1913 when Freud's book, Totem and Taboo, was published as an investigation of the origins of morality and religion. Excerpts from both the journal and the book were published in Lacerba, and Boccioni makes reference to the irrational, Freud's concepts of the unconscious and parapsychology as parallel to the X-rays in the physical world--sources of insight and originality.⁸⁶

Human behavior was not as predictable as the universe where planets were found to have regular laws by Poincaré in his astrophysics and algebraic topology in celestial mechanics. In 1905 his Science and Hypothesis, and in 1908 his Mathematical Creation, dealt with levels of consciousness and intuition "of a mathematical order."⁸⁷ Rutherford compared the structure of the atom with that of the solar

⁸⁶ Archivi, I, 67.

⁸⁷ Brewster Ghiselin, The Creative Process (New York: Mentor Books, 1955), pp. 29-35.

system in 1911 and found that electrons whirl around the nucleus like planets around the sun. Einstein provided a new explanation of elliptical paths of planetary motion in his theory of relativity, and V. F. Hess investigated cosmic radiation in 1912. They could then prove the concept of spectral lines introduced by Poincaré and a new view of the universe with photography of nebulae showing continuous creation of matter.⁸⁸

By 1915, when the General Theory of Relativity was complete, Einstein's mass-energy equation looked simple: $E=mc^2$. The concept of universal dynamism and force lines of the Futurists, and simultaneity, had a scientific base. Boccioni, in his Estetica in 1912, had dealt with the "dynamic unity of the world through physical transcendentalism," gravitation, displacement, reciprocal attraction of forms, colors, masses and movement in the interpenetration of forces.⁸⁹ Einstein's view of the universe was comprehensive, unbounded and finite, based on the electrodynamics of moving bodies in which space was curved and relative motion denoted time as the fourth dimension and the velocity of light as the only constant in the space-time continuum. The simultaneity question, motion of the planets and gravity versus inertia, was part of the unified field theory of magnetism which could be applied to both the microcosm and the macrocosm.⁹⁰ Carrà commented on the "lie of the fixed laws of gravity of bodies" and explained the importance of relativity in his art:

⁸⁸Hall and Hall, pp. 266, 320-23.

⁸⁹Clough, pp. 210-13. See also Boccioni, Estetica, p. 73.

⁹⁰Archivi, I, 120-22. See also Hall and Hall, pp. 318-22.

questi i punti su cui insistere il nostro movimento nella nuova concezione dell'opera d'arte questi i concetti che noi cercammo di tradurre nell'espressioni sensibile di nostri quadri.⁹¹

Many scientists contributed to the continuing allegory of motion, particularly Sommerfeld and Moseley in studies of velocity.⁹² After de Broglie's work in radiation pulsations, or frequencies, Niels Bohr developed a huge synthesis of the ideas of Einstein and Planck after discovering in 1913 that the energy of electrons was quantized. He combined the quantum theory and the electromagnetic theory of wave propagation with the theory of radiant energy and experimental study of the structure of matter. But the problem of the particle or proton, electron or wave, forced him to develop the "complementary principle" which was beyond visual perception and perhaps visual conception, not mathematical or empirical but metaphysical. This problem was typical of the absurdities of the sciences when they are young, and Bohr wanted to put his scientific theories into an ontological system and make them plausible; but new phenomena did not fit into the quantum theory and hence into his "complementary principle."⁹³

Boccioni developed his "complementarism" concept in 1910 to combine the color analysis of Seurat, Signac and Cross with the Cubist analysis of form practiced by Picasso and Braque.⁹⁴ To create dynamic

⁹¹Carra, I, 138-39.

⁹²Banesch Hoffman, The Strange Story of the Quantum (New York: Dover Publications, Inc., 1st ed. 1947, rev. 1959), pp. 63, 67.

⁹³Hall and Hall, pp. 266-305.

⁹⁴Boccioni, Pittura scultura futuriste, p. 241.

contrasts of form and color in "pure painting," Boccioni proposed plastic complementarism based on the law of equivalence of contrasts of value and color using clashing colors to destroy form-equilibrium and engender sensations of motion.⁹⁵ By 1915 many of these theories in both art and science revealed that the absolutes had become a flux of variables; matter and energy, space and time were interrelated; and electromagnetics tended to unify the sciences. Some scientific knowledge could not be put into words or traditional symbols but in colors and shapes that appealed to many levels of consciousness and many levels of learning. The sense of energy was felt before the science of dynamics but was expressed in other ways.⁹⁶

In 1912 Boccioni prescribed three kinds of motion for the arts: the cosmic motion of the planets, mechanical motion of the environment, and the interior motion of the brain in states of consciousness. Underlying this was the concept of atomic energy.⁹⁷ In painting the Futurists were to search for structure beneath the surface of objects and look for their interaction. They claimed that movement was generated by the simultaneous "interpenetration of planes" of objects with their milieu, and they proposed to put the spectator at the center of the composition using force-lines (directional thrusts) to keep relative and absolute motion in directions set by the color-form unified by dynamic continuity.⁹⁸

⁹⁵Clough, pp. 99-100.

⁹⁶Woolf, p. 55.

⁹⁷Clough, pp. 86-91.

⁹⁸Ibid., pp. 91-103.

In 1915 Balla saw a fusion of art and science developing, and in 1916 Severini wrote: "We possess our direction through science and scientific philosophy."⁹⁹ Science had become a cultural force in the arts.

⁹⁹Archivi, I, 49, 63.

CHAPTER IV

THE INFLUENCE OF SCIENCE ON ART

1909-1911 Rebellion: Experiments in the Arts

Even before the 1909 Futurist Manifesto, science influenced Boccioni who wrote in his diary in 1907 of his desire to paint " . . . the fruits of our age . . . our feverish epoch makes that produced yesterday obsolete and useless."¹ Only a year later Poincaré produced his Mathematical Creation, an "intuition of a mathematical order" dealing with originality, energy, and the aesthetics of mathematics.² Hence it was not surprising that Marinetti, in the same year, wrote the preface to Revolverate by Gian Pietro Lucini describing man's intuition of energy and the molecular agitation of atoms in Brownian movement.³ Einstein had explained thermal motion of molecules in fluid, Brownian motion, in 1905 in a special paper dealing with motion proportionate to temperature.⁴ Marinetti openly stated in Revolverate that dynamism came from electric energy and irradiation from electrons, for he saw in this the "drama of the infinite" and wished to express the smallest molecular life as he worked toward fusion, an integral synthesis of life.⁵

¹Archivi, I, 225-27.

²Ghiselin, pp. 29-35.

³Mondadori, pp. 29, 64.

⁴Taton, p. 90

⁵Mondadori, p. 64.

The unifying concept of motion was basic to all the theories introduced by the Futurists in 1909 and 1910 in defiance of past art and basic to an experimental program of aesthetics for works of art. Motion was also an important problem in science of the period and the main problem for Einstein during his lifetime. The Futurists contended that motion and light destroyed the solidity of bodies, as they wrote the 1910 Technical Manifesto of Painting which stressed universal dynamism not as a fixed moment but as the dynamic sensation itself. All things moved; nothing was absolute in art. They declared that science had delivered painting from academic tradition. The "vivi-fying current" of victorious science had renovated their consciousness, and space and time no longer existed. Divisionism must be an innate complementarism, as necessary as free meter in poetry or polyphony in music. They realized that all forms interpenetrate each other, and universal vibrations unified all objects. Steel and speed could express their originality as their dynamism became both physical and psychic.⁶

In 1910 when Boccioni had an exhibition at the ca'Pesaro in Venice, Marinetti wrote the catalog describing the artist as an anarchist, a revolutionary whose life was changed by science, for he did research into light and dynamism using complementarism which distorted objects.⁷ Here the word complementarism meant more than just the complementary or opposite colors used together in Divisionism; it meant, perhaps, color, shape

⁶Archivi, I, 63-66.

⁷Ibid., I, 101.

and value in forms that would complement each other to make a whole, a unity.

The Futurists continued their tumultuous serate through many Italian cities urging freedom to translate scientific discoveries into music also, in a new counterpoint, harmony and tone scale documented in the Manifesto of Futurist Music written by Balilla Pratella in 1910. (See Pl. II.) Posters and programs announced the evening gatherings, one of which presented the Futurist opera, L'Aviatore Dro, and the opera, La Sina d'Vargöun, with free verse and enharmonic music by Pratella in 1909 in Bologna. Futurist ballets and folk music also opened the way for a new era in Italian music and dance. Pratella's Technical Manifesto of Futurist Music advocated a new scale with smaller than traditional subdivisions of tones even before the new scale presented by Schönberg and Stravinsky.⁸

In the Dramatist's Manifesto of October 1910, Marinetti intended to revitalize the theater also, with originality and new uses of electricity, steam and speed; and, by 1911, the didactic Manifesto of Futurist Musicians combined theater and music with free verse librettos, tonal and rhythmic changes for expression of the power of the machine and electricity.⁹

The Futurist principles, however, were not evident to any extent in the paintings assembled in the Esposizione d'Arte Libera exhibition in Milan in April 1911: Leaving the Theater by Carrà, The Elocution

⁸Clough, pp. 130-32.

⁹Martin, pp. 47-48. See also Archivi, I, 232.

Teacher by Boccioni, and the Triumph of Death by Russolo were on display. The motion expressed was moderate, and the states-of-mind paintings of Boccioni appeared largely influenced by German Expressionism. When Soffici, recently returned from Paris, reviewed the exhibition for La Voce, his criticism was scathing. He called it thirty or forty years behind European art, not modern at all.¹⁰ Severini, also disappointed in their work, urged the group to come to Paris to improve their formal precepts.¹¹

The Futurists in Paris were profoundly impressed by Cubism, and they gradually evolved their idiom. The eruptive power of the collective spirit (one of the symbolic themes culminated in Boccioni's The City Rises and Riot in the Gallery, and in Carra's Leaving the Theater and Funeral of the Anarchist Galli) showed the strident color, triangular shapes, and increase in force and violence of motion which led away from literal description. Both Music and Memories of a Night by Russolo illustrated Bergson's conception of psychic "duration" (time as memory, which linked the past with present and future), as well as psychological states.¹² In Russolo's paintings the simultaneous images, unrelated objects and figures appeared in dreamlike sequence, through the air. Also an example of simultaneity was Boccioni's Noises in the Street in which diagonal force-lines and intersecting planes of people interacting with buildings and streets illustrated Futurist interpenetration of planes.

¹⁰Martin, p. 81.

¹¹Severini, I, 125.

¹²Martin, p. 89.

In May of 1911 Boccioni spoke to the Circolo Artistico in Rome on his experiments with molecular density of materials, their substance, weight, expansiveness and reaction to light. He explained physical transcendentalism as the mysterious attractions and affinities which result in the reciprocal, formal influences on the planes of objects. Physical transcendentalism was expressed in non-objective painting of states of mind toward synthesis beyond unity of time and place. He called for movement of pure color and pure form as symbols of universal dynamism.¹³ "There will be a time in which painting will not be enough-- colors and movement will be depicted in colored gas."¹⁴ Painting then could be like music, in incessant motion, and the barrier between the art object and the spectator would be eliminated. Newspapers carried this story, and Boccioni later published most of the theory in his book Pittura scultura futurista in 1914.

In 1911 Marinetti published Le Futurisme in Paris with three manifestos advocating the artist to merge into the infinite of space and time. He called the arts the "dramas of humanized matter," using the forces of dilation and "torrents of massed molecules and eddies of electrons."¹⁵ He thought that a new man was emerging with capabilities multiplied by machines which were "nourished by electricity." This superman would some day have replaceable parts.¹⁶ He then described

¹³Archivi, I, 475-76. See also Clough, pp. 106-107.

¹⁴Boccioni, Estetica, pp. 182-83.

¹⁵Mondadori, p. 130.

¹⁶Martin, p. 130.

his system of analogies and dynamism of thought as a stream of images and sounds, a perpetual flux of spiritual states like the stream of consciousness of Freud and the psychic duration of Bergson.

For a revolution in typography he demanded mathematical signs, symbols, musical notes, twenty type faces used together, and colored inks for expressive force of words "like an explosion of molecules and atoms." He wanted to force a new vision, a new way of seeing the world as a glorification of scientific discovery and modern mechanics.¹⁷ From free words, he continued to words-in-liberty, to word autonomy, word-sounds and sound-noises, bringing together typography, poetry, music and the visual arts.

Perhaps the Futurists learned through Bergson's theories the principles developed by James Clerk Maxwell whose book Matter and Motion, 1876, dealt with light theory, expansion and contraction, radiation and dynamics. His studies of electricity and magnetic flux, optics and light, parallel the ideas of Marinetti. His theories of kinetic gases and color parallel the ideas of Boccioni, as do the "force-lines" of Maxwell's teacher, Michael Faraday.¹⁸ The space studies of Herman von Helmholtz led to the space-time continuum and geodesic lines, world lines, on a sphere. (See Pl. I.) Hermann Minkowski made a nonogram of the space-time continuum in 1908, preparing for what Hans Reichenbach called "spatial intuition."¹⁹ The

¹⁷Mondadori, pp. 66-67, 80.

¹⁸Colodny, Frontiers, pp. 180-81.

¹⁹Rudolf Carnap, Philosophical Foundations of Physics (New York, London: Basic Books, Inc., 1966), pp. 145, 166, 172.

electromagnetic waves described by Gustav Hertz and the electronic studies of J. J. Thomson paralleled the theories of Marinetti without direct evidence that he read them.²⁰

However, toward the end of 1911 the paintings of Russolo moved away from the anecdotal in Revolt, a forceful collision of speed and resistance, and in Speeding Train, a synthesis of light and force-lines. Boccioni completed his States of Mind: Those who Leave, Those who Stay, and the Farewells, three paintings like a triptych which characterized early Futurism. The subject matter and its expressionist force were tempered by the geometric force-lines of the composition. According to Carrà, Apollinaire was the only art critic who understood and encouraged the movement when he saw these paintings in 1912.²¹

1912 Art Exhibitions

The Futurists opened their art exhibition in Paris at the Bernheim-Jeune Gallery on February 5, 1912, with paintings by Russolo, Carrà, Boccioni and Severini. This exhibition traveled throughout European cities for the following year, accompanied by bombastic news coverage and propaganda handled by Marinetti.²² The catalog was shocking.

. . . our art is violently revolutionary . . . we have surpassed Impressionism . . . we exalt intuition, sensation . . . with dynamism, universal vibrations, lines of force, continuity, states-of-mind. We seek a style of movement . . . we are starting on a new epoch in the history of art based on interior mathematics and dynamic sensation with three new conceptions.

²⁰Hall and Hall, pp. 261-63.

²¹Carrà, I, 147.

²²Archivi, I, 481.

of volumes, force-lines and a synthesis of rhythms presenting a new reality.²³

The paintings were a contrast to Parisian art of the time, but their emphasis on subject matter and Impressionist color made Apollinaire write: "The Futurists have come to teach us . . . by their titles, and not by their works."²⁴ He referred to the Portrait of Marinetti by Carra, The Pan-Pan at the Monico by Severini, the Laugh by Boccioni and the Movement of a Woman by Russolo. The rudimentary forms of motion lacked the formal force and originality to come later, when the challenge of Cubism had been assimilated by the Futurists. At least Futurist painting took its place beside Futurist theory as an international force in art.

Marinetti extended Futurist theory and literature when he wrote radical ideas for poetry in the Technical Manifesto of Futurist Literature in 1912 in which he demanded a suppression of syntax and the use of free words or "words in liberty" without punctuation. He demanded the use of a "chain of analogies" which was to evoke a flow of successive images in dynamic sequences that ". . . man could be one with the universe . . ." and could awaken creative intuition like the telegraph or wireless (radio) to transmit imperceptible relationships and movements.²⁵ His poem, The Monoplane of the Pope, suggested aero-art, and his poem Zang-Tumb-tumb was made up of sounds, not words, based on warfare in Adrianople.²⁶ He contended that ". . . to conquer Paris

²³Ibid., I, 104-107.

²⁴Martin, p. 124.

²⁵Ibid., p. 129.

²⁶Mondadori, pp. 50-52. See also Archivi, I, 33, and Clough, p. 286.

you need wildness . . . " and Futurism was the "big noise" there.²⁷

The Futurists worked with fierce energy after their return to Italy, and Boccioni turned to sculpture after writing the Technical Manifesto of Futurist Sculpture in April 1912. It was based on motion of the object integrated with moving space and has been of significant influence on succeeding generations of sculptors to the present. To Boccioni, the artist must start with the nucleus of the object being created and link it mathematically with the apparent plastic infinite and the internal plastic infinite, between matter and spirit or between outer and inner structure. "A SCULPTURE OF ENVIRONMENT" was to replace the old pedestalled sculpture proclaiming the "ABSOLUTE AND COMPLETE ABOLITION OF THE FINITE LINE AND CLOSED SCULPTURE." "LET US BREAK OPEN THE FIGURE AND ENCLOSE THE ENVIRONMENT IN IT."²⁸ Sculpture had to be architectural with interpenetration of planes and the use of many materials to attain physical transcendentalism for a "STYLE OF MOVEMENT."²⁹ Introduced into sculpture could be electricity, lights, movable surfaces and mechanical devices to impart actual motion to planes and volumes. Materials could include wires, glass, metal, fabric, wood, plaster, cement, iron, leather or cardboard to carry out the interpenetration of planes. "There is no such thing as painting, sculpture or music . . . there is only creation."³⁰ Boccioni

²⁷Archivi, I, 237, 478.

²⁸Ibid., I, 67-72.

²⁹Ibid., I, 67-71. See also Taylor, p. 131.

³⁰Archivi, I, 67.

quoted Bergson again on the division of matter, for movement to him was indivisible.³¹ With the internal simplicity of synthesis, the work of art could only resemble itself. It was a new figure, a new entity, the milieu-object.

Objects moving in moving space were also the subject of the physicist, Einstein, whose theories in 1912 included the space-time continuum. So, too, the sculpture advocated by Boccioni illustrated in a sense the space-time continuum, although his Antigrizioso or Antigraceful in 1912 (a bronze head of a woman) reflected the influence of Cubism without the motion demanded in his manifesto. Not until 1913 in the series of dynamism of the human figure did Boccioni find a means of expressing his ideas fully in three dimensions. His studies of a man walking and his Development of a Bottle in Space went into Boccioni's Paris exhibition of sculpture at the Galérie la Boétie in July 1913. Many of the works, made in plaster, have been destroyed; but the most significant work, now cast in bronze, was the Unique Forms of Continuity in Space. (See Pl. III.) This figure of a man in motion with the space around him is completely integrated. Object and space become one. Motion in space denoted time, and the vitality of the sculpture represented Futurism well.

Two stylistic changes in 1912 appeared in the painting of Carrà and Balla. Centrifugal Force and Woman on the Balcony, Simultaneity by Carrà portrayed movement of planes in abstract shapes foreshadowing the Nude Descending a Staircase by Marcel Duchamp a year later. Even more extreme were Balla's Iridescent Interpenetrations, a series of geometric

³¹Ibid., I, 143.

optical designs of kinetic and auditory studies of light and motion,³²
 This research in non-objective art carried over into 1913 to become his
 most original work.

1913-1914 Maturity of the Concept of Motion:

Dynamism in the Arts

Balla's painting Moving Lines + Dynamic Sequences in 1913 was the
 culmination of a series of studies of flying swallows. (See Pl. V.)
 Like Russolo's Racing Auto (Auto-in-Corso) of 1913, the complex images
 of motion and simultaneous points of view created patterns of optical
 stimulation. (See Pl. IV.) Velocity was their chief concern, and
 Russolo expressed the force of the auto in repeated arrow shapes, a
 dynamic sequence of speed. Like diagrams, these paintings showed more
 understanding of the concept of motion, carefully based on experiments
 by individual artists working independently. Perhaps Anton Giulio
 Bragaglia hastened Balla's progress with photographic experiments he
 called Fotodinamismo futurista, studies of motion published in Rome in
 the summer of 1913.³³

Meanwhile Russolo, in his Manifesto on the Art of Noises (March 11,
 1913), proclaimed new sounds for future dynamic concerts as he created
 his intonarumori, the electrically powered noise organ which he played
 at concerts and serate. Six new "families of sounds," new rhythms and
 new machine instruments were included in the Futurist music for orches-
 tra. For Russolo regarded sound as acoustical, independent of past

³²Martin, p. 177.

³³Archivi, I, 499.

music, not limited to imitative reproduction, and he predicted thirty thousand original noises "interpenetrated" in the Futurist symphony.³⁴ This art of noises today is called Bruitism.

The Manifesto of Wireless Imagination and Free Words, May 1913, by Marinetti broke away completely from tradition in poetry and invaded the visual arts by freely deforming words by cutting and lengthening them for bold typographical effects on the printed page. His "shaped poetry" (poetry in the shape of objects) foreshadowed the Calligrammes of Apollinaire.³⁵ The "sound collage" of ciphers and sounds was a dynamic means for quick perception of several messages to be read simultaneously.³⁶ The same irrational emphasis appeared in his Manifesto of the Theater of Variety in which both actors and audience performed simultaneously like vaudeville. Marinetti's play, Electricity, the Futurist play for the University of Bologna, was reviewed by M. Sironi in Lacerba: ". . . it made the Romans vomit . . ." for it was based on the absurd as well as dynamism and simultaneity.³⁷

Carra wrote the Manifesto of Painting of Sounds, Noises and Odors in August 1913, demanding sensations beyond the visual: "total art" of whirling spheres, centrifugal force, and spinning ellipses with "reds that sccccrrreeeam" and colors that jump in shapes that thrust in spherical expansion of space with forms that intersect, interpenetrate

³⁴Clough, pp. 123-29.

³⁵Martin, p. 135.

³⁶Moholy-Nagy, pp. 301-306.

³⁷Archivi, I, 294.

in diagonals. It was like music. His Freeword Painting-Patriotic Festival (see Pl. VI) was a collage of whirling newspaper clippings, a combination of typography and painting with dynamic force in rotation of subtle order.³⁸

By the end of 1913 Boccioni had simplified his theories into form in motion, and motion in form. His "Analogies of Plastic Dynamism" article appeared in Poesia (1914) to express confidence in the affinity between the Bergsonian concept of motion and the static expression of the Cubists: ". . . we will demonstrate the great dynamic evolution. . . ." ³⁹ he predicted in discussing the relativity of time and place. For him, motion had become almost a religion when the concept of simultaneity was taken over by Orphism in Paris, and he attacked verbally in Lacerba with fully developed theories of Futurist dynamism and simultaneity.⁴⁰

To Marinetti in 1913, speed was the element which generated Futurist dynamism, and he thought that man was at last conquering his environment and could communicate with all people on earth. He urged the artists to explore outward through physics and inward through psychics.⁴¹ The Futurist equation now developed was: 3-D + material weight = expansion - resistance over absolute value = 4th dimension.⁴² His Manifesto of Synthesis of July 1913 included cinema as an example

³⁸Archivi, I, 262-63.

³⁹Ibid., I, 169.

⁴⁰Ibid., I, 148.

⁴¹Mondadori, p. 60.

⁴²Archivi, I, 302.

of dynamism with the art of noises and lights in dynamic transcendent-
talism.⁴³

Severini's unpublished "Plastic Analogies of Dynamism Manifesto" also aimed at synthesis by exaltation of form and color: ". . . to open up the universe, create a new dimension, a higher consciousness by destroying time and place by simultaneity."⁴⁴ For him, total reality lay outside time and space as the theory of relativity predicted the total destruction of "material = energy."⁴⁵ Like Ernst Mach, he believed all sensations could take plastic form with colors of maximum intensity and artificial light in spherical expansion illustrating force and velocity. Like Boccioni, he advocated unity ". . . through all possible materials integrated in action . . ." with sounds, odors, and "relativity of luminous phenomena."⁴⁶ The artist must try to express the total action of the universe.

I am forcing the end of painting and sculpture,
as these old forms limit our creative freedom.
Our creations should live in the open air.⁴⁷

Severini seemed to deny the early forms of Futurism.

However, his theories were in contrast to his art, chiefly paintings of analogies entitled Sea=Dancer+Flowers and Dancer=Sea+Sky, both with simple flat shapes of ambiguous subject matter in combinations. Not

⁴³Ibid., I, 27-29.

⁴⁴Severini, I, 79.

⁴⁵Archivi, I, 77-79.

⁴⁶Ibid., I, 78-79.

⁴⁷Severini, I, 80.

until 1914 did Severini abandon objective reality for subjective expression as in Spherical Expansion of Light (see Pl. VIII).

Dynamism in painting was the aim of Boccioni's series of paintings called Dynamism of a Footballer, Dynamism of a Cyclist, Elasticity, and Dynamism of a Human Body. They projected vibrant colored shapes in rotary motion bursting from the format, yet were still illustrative. He could not abandon subject matter, and he explained that the object was the nucleus (centripetal construction) from which the forces (force-lines-forms) which define it in the ambience (centrifugal construction) depart and thus determine its essential character.⁴⁸ His language was abstruse, but he was clearly the leading theorist of the Futurist plastic arts as indicated by his book, Pittura scultura futurista written in 1912 and 1913 but not published until 1914.

Our idealism constructed on laws of science,
illuminated by intuition . . . sensitive to
new conditions of life created by scientific
discoveries.⁴⁹

Contrary to popular opinion, Boccioni did not base his ideas merely on technology or the machine. He devoted several pages to pure science--the importance of magnetism, velocity, and the space-time relationship. He refuted division in the arts and called for "pure painting" and the use of the cinema as an art form. He believed that dynamism, dormant in the spectator, became actual when awakened by a work of art which expressed kinetic sensation. Velocity was the only absolute in the space-time continuum, and "total art" necessitated

⁴⁸Boccioni, Estetica, p. 66.

⁴⁹Archivi, I, 142.

a sense of speed for full realization of modern scientific life. Plastic dynamism was a function of dynamic complementarism, a synthesis of color and form; yet not until 1914 did Boccioni paint a non-objective painting.⁵⁰

By 1913 scientists were particularly preoccupied with the study of motion. They had investigated the motion of waves and particles of matter changed by the theory of Einstein. The principle of complementarity was proposed by Niels Bohr in 1913 to combine both the wave and particle theories of energy radiated by excited electrons moving from one orbit to another.⁵¹ Like Marinetti he used analogies--the analogy of love and justice, to link Planck's quantum theory with Rutherford's ideas of high speed electrons.⁵² Complementarity thus combined the quantum theory with relativity but was beyond visual conception. In the symmetry of space-time the electron became non-material and science became metaphysical.⁵³ The complementarity principle was based on premises which were neither mathematical nor empirical. Therefore, if this were workable, dogmatism in science was out, the irrational or absurd entered science, and Bohr's work allowed man to summarize and unify many experimental results.⁵⁴ It is still in dispute.

Boccioni redefined dynamic complementarism in 1914:

⁵⁰Boccioni, Pittura scultura futurista, chap. iv, passim.

⁵¹Colodny, Frontiers, p. 222.

⁵²Hall and Hall, p. 266.

⁵³Robert G. Colodny, ed., Mind and Cosmos (Pittsburgh: University of Pittsburgh Press, 1966), pp. 342-45, 351.

⁵⁴Colodny, Frontiers, p. 225.

Each form carries within itself the aspiration to complete itself with a complementary form . . . necessary to the integral expression of its temperament.⁵⁵

Plastic dynamism was a function of dynamic complementarism, a modernization of the term congenital complementarism in the painters' technical manifesto and later considered complementarism of form and color.⁵⁶

From this grew the notion of physical transcendentalism--the vibrations, emanations, density and motion of energy:

. . . the invisible aura of the object and its action, the analogous synthesis which lives on the borderline between the real object and its plastic ideal . . . That vision called physical transcendentalism is able to represent in plastic form, the sympathetic attractions and mysterious affinities which create the reciprocal influences of the planes of objects.⁵⁷

In March 1914 Marinetti wrote the Geometric and Mechanical Splendor and Numerical Sensibility Manifesto, adding concepts of hydraulic and cosmic forces to Futurist theory in both art and poetry.⁵⁸ Based on ideas of energy and molecular vibrations, this document set the scene for his sculptural assemblage in wood of a man running, his first sculpture. It is significant that the parts were movable. All the Futurist arts were now unified by motion.

In 1914 Antonio Sant'Elia, the architect, joined the Futurists to bring motion to the design of the city. His Manifesto of Futurist

⁵⁵Boccioni, Estetica, p. 145.

⁵⁶Martin, p. 133.

⁵⁷Boccioni, Pittura scultura futurista, pp. 42, 43.

⁵⁸Archivi, I, 47-48.

Architecture was published by Lacerba on August 1, 1914, two months after his exhibition of drawings at the Famiglia Artistica in Milan. His urban design and architectural renderings were designed mainly for mobility of vehicles and people. (See Pl. VII.) Motion was as important as form and space in the simple bold shapes of the "New City." His emphasis on transportation, communication, light-weight and elastic materials, and ferro-concrete created what he called a dynamic synthesis, an integration of art and science with motion as the dominant expression.⁵⁹ Bridges, viaducts, "moving staircases" (now escalators) were integrated with diagonal highways, subways, and ramps acknowledging the concept of motion in time.⁶⁰ Each generation was to build its own city.

Marinetti published the Manifesto on the Price of Artistic Genius in March 1914 after his group of Futurists was complete in representing the arts. Art was to him cerebral energy, creative force, which should be "scientifically" measured in a work of art to determine its value. The quantity of originality and intellectual energy in a poem, symphony or painting had to be computed and every artist should be able to invent a new art.⁶¹

New forms of art were forthcoming; Boccioni illustrated plastic dynamism in many drawings, paintings, sculpture and prints in 1913. But in 1914 he created a sculpture called Dynamic Construction of a

⁵⁹Gyorgy Kepes, The Nature and Art of Motion (New York: George Braziller, Inc., 1965), pp. 180-89.

⁶⁰Giedion, pp. 319-20, 439.

⁶¹Archivi, I, 41-45.

Gallop, Horse and House: a construction of wood, leather, cardboard and metal scraps interpenetrating in planes of diagonal thrust. Also, Balla, true to his interest in optics, painted Mercury Passing before the Sun, an expression of cosmic force and dynamic interaction of matter and energy. Carrà also used unusual materials in the newspaper collage, Freeword Painting-Patriotic Celebration with centrifugal motion (see Pl. VI).

Also for the study of motion in 1914 in Italy, the University of Padua republished Galileo's Dialogues Concerning Two New Sciences (1638). Dynamics was the main subject matter in ballistics, acoustics, and astronomy in the theory of motion and resistance.⁶² Einstein's theory of relativity was a brilliant culmination of Galileo's arguments on the rate of falling bodies and other mechanical experiments. The theory of gravitation was published by Einstein in 1914 on the relation between accelerated motion and the forces of gravity. He dealt with floating bodies in interstellar space and the curvature of space in accelerated systems, "geodesic lines" and centrifugal force in the space-time continuum.⁶³

Meanwhile the Futurists looked to Boccioni whose theory of creative forces in the total action of the universe added a new understanding of space and time. In his article on Plastic Dynamism in 1914 Boccioni foresaw the end of painting and sculpture as

⁶²Galileo Galilei, Dialogues Concerning Two Sciences (New York: McGraw-Hill Book Co., Inc., 1963), pp. vi, xx.

⁶³Gamow, p. 195.

electricity and energy would transform art. He predicted that modern cities powered by electric energy might also have machines for mathematics which would transform humanity.⁶⁴ Was this the computer?

As Einstein's work resulted in the geometrization of a large part of physics, so the Futurists' art became more abstract and more geometric. The electric and magnetic forces still lay outside the geometrical conquest in the so-called unified field theory.⁶⁵ Boccioni insisted that what truly made a falsehood of old painting was the separation of the study of matter and the study of energy.⁶⁶ He forged forward toward a new plastic unity, an indivisible unity with relativity of time and place with many simultaneous aspects of reality. Until 1905 simultaneity of two distant events had been an intuitive concept. Then Einstein introduced his definition of simultaneity and dealt with velocity, absolute and relative motion, dilation of time, the electromagnetic field and the mass-energy equation.⁶⁷ Boccioni used these terms in his redefinition of plastic dynamism in 1914 as simultaneous form that issues from the interaction of the object and its environment, to the destruction of the object through light and motion, as matter became energy.⁶⁸ The artist's new vision consisted of seeing, thinking, feeling in relationship, not as a series of isolated

⁶⁴Archivi, I, 95.

⁶⁵Gamow, p. 207.

⁶⁶Boccioni, Pittura scultura futurista, pp. 42, 469.

⁶⁷Taton, p. 91.

⁶⁸Boccioni, Pittura scultura futurista, p. 42.

phenomena but as a Gestalt, an integrated whole, a transcendence into the dimension of space-time.⁶⁹

According to Boccioni, physical transcendentalism in 1914 was the object of the artist's vision or contemplation--beyond all unity of time and place, beyond the distinction of things. To him, the creative motion of the universe revealed itself in pure color and pure form-- ". . . the lyrical appraisal of the motions of matter expressed through the correlated forms of consciousness."⁷⁰ Man's powers of transcendence were illustrated in plastic dynamism, as energy from electrons which possess both wave-like and particle-like properties cannot be diagrammed. The invisible force of the universe had transcended reality and was metaphysical.⁷¹ Max Born's studies in atomic dynamics at Göttingen included speculation in physics which he called "transcendental deduction."⁷²

1915-1916 Futurist View of the Universe:

The Film as an Art Form

By March 1915 the Futurists had a Manifesto of the Reconstruction of the Universe signed by Balla and Depero. In many studies of velocity and outer space, Balla had used Einstein's theories of the orbits of Mercury and now, in this manifesto, demanded a total fusion of the universe. Much like the relativistic theory of the universe, the manifesto demanded

⁶⁹Moholy-Nagy, p. 153.

⁷⁰Clough, pp. 88-89.

⁷¹Hall and Hall, p. 307.

⁷²Colodny, Frontiers, p. 242.

combined objects of many materials to form "plastic complexes" (constructions or assemblages) which could be put into motion. Art must be abstract, dynamic, transparent, luminous, transformable, dramatic, volatile, noisy, odoriferous and explosive. Materials could be varied: silk, metal, glass, cardboard and chemicals. The complexes must rotate or turn on a spindle, compose and decompose, in a fusion of art and science. Art, then, would become action, will, aggression and brutal reality.⁷³ Futurism developed a new art form, sculpture with actual motion, and Balla was the first to construct metal wire assemblages that moved and wood constructions which rotated.

In April 1915 the Manifesto of Futurist Scenography cited the possibilities of cinema as the "new realism," the synthesis of the arts. With dynamic effects of lighting, mirrors, glass and color in which the subject and the object could be interchanged, theater and art forms would converge.⁷⁴ Prampolini and Balla worked with Tristan Tzara on films to create the "abstract, synthetic, dynamic force of the universe."⁷⁵

Meanwhile Severini in Paris during the war combined freeword paintings of French mobilization, and Carrà published Guerrapittura, his book on war drawings and collage. Boccioni, at the front in Austria, found time to paint Cavalry Charge to show the dynamics of war. When on leave from the army, Boccioni continued to write, paint and lecture

⁷³Archivi, I, 48-51.

⁷⁴Ibid., II, 87-89.

⁷⁵Ibid., II, 51-57, 351, 361.

furiously: "The first Futurism accomplished its purpose of giving a new meaning and form to Italian art."⁷⁶

Also in 1915 the Synthetic Theater, Theater of Surprise and Tactile Theater broke the barriers between drama and life with a slanted stage and electric devices preparing the way to integrate film.⁷⁷ The space-time continuum was best expressed in film, and the possibilities for dynamism were documented in the 1916 Manifesto of Futurist Cinematography, signed by Marinetti and Balla and others and published in L'Italia Futurista. It predicted that the book which was passe would be replaced by the film, "the form of expression best adapted to the complex sensibility of a Futurist artist."⁷⁸ The film could present velocity and simultaneity combining poetry, music, drama, art and typography. Marinetti could use analogies, correlation of sounds with colors, and states of mind with freedom from logic. Ideas, happenings and many types of objects could be presented with contrasts of scale and proportion changing with varied feelings and emotions with odors and sounds, the intonarumori, architecture and drama. Marinetti said: "We could destroy and recreate the universe according to our marvelous fancy."⁷⁹

Severini published the Reconstruction of the Universe Manifesto

⁷⁶Martin, p. 204.

⁷⁷Wylie Sypher, Rococo to Cubism in Art and Literature (New York: Random House, Inc., 1960), p. 336.

⁷⁸Mondadori, pp. 118-23.

⁷⁹Ibid., p. 123.

in February 1916 in Paris as an explanation of relativity, the measurement of space and motion, and the fourth dimension. It was a compendium of the solid geometry of the world expressed in Futurist art. Much like the theories of Boccioni, this was a new idealism based on the life of matter as explanation of the gradual Futurist development of synthesis from object and environment to object and universe, their study parallel to scientific research. "We express a synthesis inspired by our intellectual and spiritual life through reality of vision. We possess our direction through science and scientific philosophy."⁸⁰ (See Pl. VIII.) Art had become a diagram, a design for luminous and colorful spherical expansion of shapes in space without recognizable subject matter, but with dynamic form.

In May 1916 Marinetti published the Manifesto of the New Religion-Morality of Speed as a full disclosure of the scientific development of speed on earth, in the air and on water. He equated velocity with creative genius and extolled speed for its destruction of the laws of gravity as well as time and space. His optimism for the future was based partly on the prediction that man's energy would be multiplied by speed dominating time and space. The new saints would be innumerable flying objects in the atmosphere, guided by light and electromagnetic force. Men would bow before a gyroscope going twenty-thousand RPM's a minute.⁸¹ By this time Einstein was working on his magnetic field theory, and the gravitational concepts of the universe had changed.

⁸⁰Archivi, I, 207.

⁸¹Ibid., I, 52-56. See also Mondadori, pp. 508, 111-115.

Severini reported:

Ours is a scientific philosophy . . . science in general has opened new horizons to the perception of modern artists . . . in cosmic, physical and chemical laws of the universe. Man himself has changed and the forces of nature have a different aspect.⁸²

When Boccioni and Sant'Elia were killed in the war, Balla continued with the Futurist search: "We will find abstract equivalents of . . . all the elements of the universe . . . combine them according to our inspiration to form plastic complexes that we can put in motion."⁸³ After seven years of research, from 1909 to 1916, the Futurists developed the film as a culmination of their program; and Bragaglia produced some short films and then Perfido Incanto, a full-length experimental film with Balla in 1916, using abstract scenery, fabrics, painted panels, wires and wooden bands.⁸⁴ As Marinetti put it in his equation: "painting = sculpture = dynamism = words-in-liberty = sound = architecture + synthetic theater = Futurist cinema."⁸⁵

⁸²Archivi, I, 202-203.

⁸³Ibid., I, 119.

⁸⁴Ibid., II, 499.

⁸⁵Ibid., I, 99.

CHAPTER V

CONCLUSION

The Futurist movement was a phenomenon of ideas in the arts which emerged from a nineteenth century schism of thought and feeling in Italy, a country dominated by people, customs and institutions which had become old and rigid in spirit and culture. To destroy apathy, past art and outmoded ideas, Marinetti used shock tactics and bizarre propaganda methods which even today obscure the serious aims of the Futurists and their contributions to art from 1909 to 1916.

Their objectives were to renew the arts, get European attention for Italy, exalt originality, and bring about social change to attain freedom for the arts through the integration of art and science. These aims developed with each ensuing manifesto developing their principle of motion in art with the concepts of dynamism and simultaneity. They wanted to express unity in the arts and the new concepts of man and his environment.

Influenced by the revolution in physical science with the Quantum theory and relativity, the Futurists were also influenced by the Freudian concepts of consciousness and the overlapping philosophy of Neitzsche and Bergson. In Futurist art, states of mind and states of matter were to be balanced as they expressed their theories in experimental combinations. Boccioni, as their aesthetic leader in the plastic arts, wrote his theories closely following the theory of relativity. Even the

terminology was similar.¹

Their unifying concept of motion developed from the Galilean interpretation through Newton's conception of the universe to thermodynamics, relativistic dynamics, and the spatialization of time. In 1909 Marinetti extolled his rudimentary concepts of motion in his first manifesto: rebellion, energy, speed, earth and universe, violence, search for the unknown, and the space-time continuum. Einstein had published his first papers in 1905, just four years before. His work also emphasized motion, the velocity of light, simultaneity, dilation of time, dynamics, and later the mass-energy equation (which led to materialization and dematerialization), accelerated systems, the gravitation of spherical bodies, and the solar system.² Einstein stressed the importance of creative imagination in visual thinking, problem solving without words or numbers, but with signs and images which could be combined. So the Futurists thought that art could make the world visible in images through which nature and its functions could be experienced.

As the arts tended to be pushed out of society around 1900 and utilitarianism tended to make the arts into luxuries, in 1909 the Futurists embraced the main source of change--pure science. They looked to science, not merely to the technological results of applied science, to develop their program for the future, their manifestos and works designed to express their ideas. The results of their experiments were sometimes significant works of art.

¹Supra, p. 64.

²Taton, pp. 90-99.

Boccioni developed the allegory of motion through a series of definitions of dynamism and simultaneity: a complex synthesis of physical, psychological and aesthetic factors to project a unified vision of man and the universe in the developing abstract idiom. The revolution in the scientific view of the world was, then, the impetus for revolution in the arts. Superficial realism was no longer important; reality lay in the basic molecular structure of objects, the atomic structure which was convertible into energy. This was the reality the Futurists wanted to express.

In 1913 Niels Bohr offered the "complementarity principle" to unify the dualism of the wave and particle emission of matter. The complementarism proposed by Boccioni was its counterpart.³ Both were based on the need for unity, two parts of a form or function making a whole, a synthesis. According to Kepes, the complementarity of motion and stability are fundamental to intellectual growth. One does not perceive one without the other, and the fundamental aspects of artistic vision include complementary unity, rhythm and sequence. Not only artists but scientists have come to recognize that they cannot create a valid model of nature that exists independently of the observer. Today complementarity is accepted as basic in the description of natural phenomena, and artists and scientists recognize the dynamic interpenetration of the inside and outside world.⁴

Based on the formal vocabulary of Cubism, Futurist painting and

³Supra, pp. 70-71.

⁴Kepes, pp. iii-v.

sculpture adopted complementarism to strengthen color, form and motion:

Plastic complementarism . . . based on the law of equivalence of contrasts, draws its force from the shock produced . . . by clashing colors . . . this results in the destruction of the form-equilibrium, which in turn engenders the sensation of motion; this motion tends to become spherical expansion in space.⁵

Futurism was one of many art movements of the period which were affected by the scientific and intellectual changes. Only five years after Wilhelm Worringer in Germany published his Abstraction and Empathy in 1907, abstraction in art had spread throughout Europe and into America.⁶ As the Futurists integrated space and objects within the format of a painting, Edgar Rubin in 1915 published his findings on figure-ground relationships.⁷ Art moved toward diagrams as artists tried to express motion in numbers, signs, colors and shapes as dynamism replaced subject matter. Energy replaced outward appearance analogous to physics and psychology. Dematerialization in art followed dematerialization in science.

Through their philosophy, their credo of dynamism, the Futurists developed a kind of scientific humanism. Their goal of synthesis of mind and matter was not wholly fulfilled, for expression of motion in their canvases often retained the look of photographic motion studies, but their experiments created a bridge between science and art with a renewal of aesthetics which is still evolving in the artist-engineer and

⁵Clough, p. 100.

⁶Haftmann, I, 129.

⁷Rudolph Arnheim, Toward a Psychology of Art (Berkeley and Los Angeles: University of California Press, 1967), p. 22.

the film maker today.

In 1915 Boccioni described dynamism as a combination of absolute and relative motion in cosmic, mechanical and interior movement. All motion was relative, and the ultimate speed was the velocity of light. Also like the theory of relativity was his concept of transcendentalism, parallel to the equivalence of matter and energy. Both transcended from the physical to the metaphysical. In psychology, transcendentalism postulated that art which could rise through its epoch and above, to be fulfilled as expression of the collective and the creative unconscious, that art might be timeless.⁸

When Croce scorned the Futurists as "artists of the convulsive school,"⁹ he was not aware that the new aesthetic striving to be born would destroy old canons of art which had become a fortress of security. Both Croce and society were to feel a loss of equilibrium, the disappearance of certainty as radical forms of art emerged from Futurism.

Absurdities were obvious in young sciences; the work of Freud, Einstein and Bohr all dealt with the irrational, the absurd.¹⁰ Marinetti's wild imagination exaggerated the irrational, not only to disturb the bourgeois, but to create new art forms generated from various levels of consciousness. It was apparent in both art and science that

⁸Erich Neumann, Art and the Creative Unconscious, trans. by Ralph Manheim (Princeton: Princeton University Press, 1969), p. 105.

⁹Croce, p. 241.

¹⁰Woolf, p. 104.

the complementarity principle, the stream of consciousness and the relativity theory were irrational. Science moved toward art, and art moved toward science, after the mass-energy equation made much of science metaphysical. Formless psychic and physical structures became visible in Futurist art. Art and science seemed to spring from the same root; the impulse to symbolic expression of ideas.¹¹

Futurist art was the expression of ideas much as human history is fundamentally a history of ideas. The importance of synthesis forced the Futurists to break down the traditional barriers between the arts and, whether original or not, new art forms emerged from Futurist experiments from 1909 to 1916: the intonarumori, a new tonal system, synthetic theater, photomontage, freeword poetry, noise poetry, freeword painting, assemblage, kinetic sculpture, optical art, odor assemblages, city planning and bold architecture of ferro-concrete, and glass. The Futurist experiments led to new forms of dance, typography, "total theater," photodynamism and the Futurist film.

Through the manifestos, Futurist ideas constituted an almost complete aesthetic theory which had a liberating influence, as important as their arts. Hence, Futurism directly influenced Dadaism in Zurich in 1916 through Tristan Tzara who carried Futurism to the Dada group.¹² Most appealing to them was the Futurist destruction of pictorial values and the development of the abstract idiom which the Futurists had needed

¹¹Suzanne Langer, Problems of Art (New York: Charles Scribner's Sons, 1957), p. 177.

¹²Haftmann, I, 182.

to express the spatialization of time.

Gerald Holton and other physicists recognize today that there are direct routes of valid transfer from science to art. There is the sharing of the allegory of motion that is now being reduced, abstracted and transformed, not just in science, but in our whole developing culture. The historian, the philosopher of science, and the humanist agree with the scientist in the endless search for an understanding of man and the universe.¹³

For further study of classical Futurism in depth, students should translate the writings of Boccioni and Marinetti. Also, for purposes of comparison, the work of Bergson should be analyzed for sources of Futurist concepts. More study of Tutte le opere di F. T. Marinetti, published in 1968, might reveal some direct evidence of the Futurist involvement in science instead of the Zeitgeist, that phenomenon of men who seem to be moved in the same direction simultaneously in philosophy, literature, painting, music, science and politics to indicate the spirit of the times as it emerged, as in the Futurist movement. A physicist could trace the concepts of relativity parallel with the concepts of Boccioni, and an art historian could trace the relationship between Cubism and Futurism.

Among the facets of Futurism still to be revealed is the 1916 fusion of many regenerative ideas and Marinetti's passion for speed, which became almost a religion.¹⁴ He saw what he termed "total art" like a Gestalt. Art became an attitude toward life. Futurism became

¹³Kepes, pp. 26-28.

¹⁴Supra, p. 78.

a way of life. It was at this time that Carrà and Severini left the movement to pursue other artistic aims.

Severini in 1916 discussed cerebral activity, the nervous system and the five senses (receptors) as analogous to the machine-like cybernetics. Among the predictions of the Futurists were: the film would replace the book, painting and sculpture would be replaced by the art of environment, flying objects would be guided by magnetism, architects would design escalators, men could have replaceable parts, and a machine would be developed for total computation. The film manifesto of 1916 brought classical Futurism to fruition: simultaneity and dynamism could best be expressed in the motion picture with its articulation of time in motion toward synthesis.

Futurism responded to the "crisis of civilization" in Italy and responded to the evolving pattern of interpenetration of simultaneous aspects of reality. Besides the scientific method of investigation and experimentation, there was an analogy between knowledge of man and society based on psychology and sociology, and the knowledge of the universe based on relativity and quantum mechanics. Like Marinetti and Bohr in their system of analogies, William J. J. Gordon teaches chemistry and physics today with a system of "synetics": personal analogy, direct analogy and symbolic analogy.¹⁵ Most scientists agree to the necessity and existence of a non-contingent dimension in scientific work,¹⁶

¹⁵Gyorgy Kepes, Education of Vision (New York: George Braziller, Inc., 1965), pp. 96-97.

¹⁶Woolf, p. 93.

Many Futurist principles are still evolving, and speed continues to be basic to the twentieth century condition. The Futurists found seven methods of control of the motion in the film and, hence, might control time. Both dynamism and simultaneity opened the way for what Arnold Hauser called the "film age," and Futurism reflected science as a cultural force.

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Museums and Galleries

Accademia, Venice.

Small collection but interesting early Futurism.

Carnegie Institute, Pittsburgh.

Casa di Risparmio, Venice.

Boccioni and Carra' prints and paintings are emphasized.

Civica Galleria d'Arte Moderna, Milan.

This is a large collection of varied Futurist works.

Civica Raccolta delle Stampe e dei Disegni A. Bertarelli, Milan.

Futurist paintings and drawings here represent 1912-1915.

Detroit Institute of Arts, Detroit.

Good small collection of Futurist sculpture and paintings.

Fogg Art Museum, Harvard University, Cambridge.

Futurist drawings are excellent here.

Galleria d'Arte Moderna, Florence.

Futurist founders and many followers make up this collection.

Galleria Nazionale d'Arte Moderna, Rome.

Late Futurism (1915-1916) paintings and sculpture make up this collection.

Musée des Beaux Arts, Grenoble.

Among the few early Futurist works, Russolo and Balla are represented.

Musei Civici, Como.

This has the finest Sant'Elia drawings available.

Musée National d'Arte Moderne, Paris.

The large paintings of Severini are the finest in Europe.

Museum of Modern Art, New York.

This excellent collection of early Futurist paintings and sculpture includes two Boccioni bronzes and Balla paintings.

Pinocoteca di Brera, Milan.

There are a few recent gifts here; chiefly drawings.

Sheldon Art Gallery, Lincoln, Nebraska.

Some Boccioni etchings are recent accessions.

Sidney Janis Gallery, New York.

One major work of art of each of the five Futurist painters make up this collection at the present.

Stedelijk Museum, Amsterdam.

Three major Boccioni paintings are the main attraction.

Tate Gallery, London.

The Eric Estorick Collection, a recent gift, is excellent.

Private Collections

Donna Benedetta Marinetti, Rome.

This collection includes paintings, sculpture, constructions, drawings and documents of the classical Futurists. It will be turned over to the Italian government in the near future.

Peggy Guggenheim, Venice.

This collection includes the late sculpture and constructions made by Boccioni shortly before his death in 1916.

Mr. and Mrs. Barnett Malbin, Birmingham, Michigan.

This collection was formerly that of Mr. and Mrs. Harry Lewis Winston before Mr. Winston's death. Mrs. Winston is now Mrs. Malbin and continues to collect and display the finest collection of Futurist art outside of Milan.

Futurist art is held in many other private collections which this author was not privileged to visit, both in Europe and the United States. The finest collections are in the Milan area, from which the Futurists first emerged, and the collections are too numerous to record here.

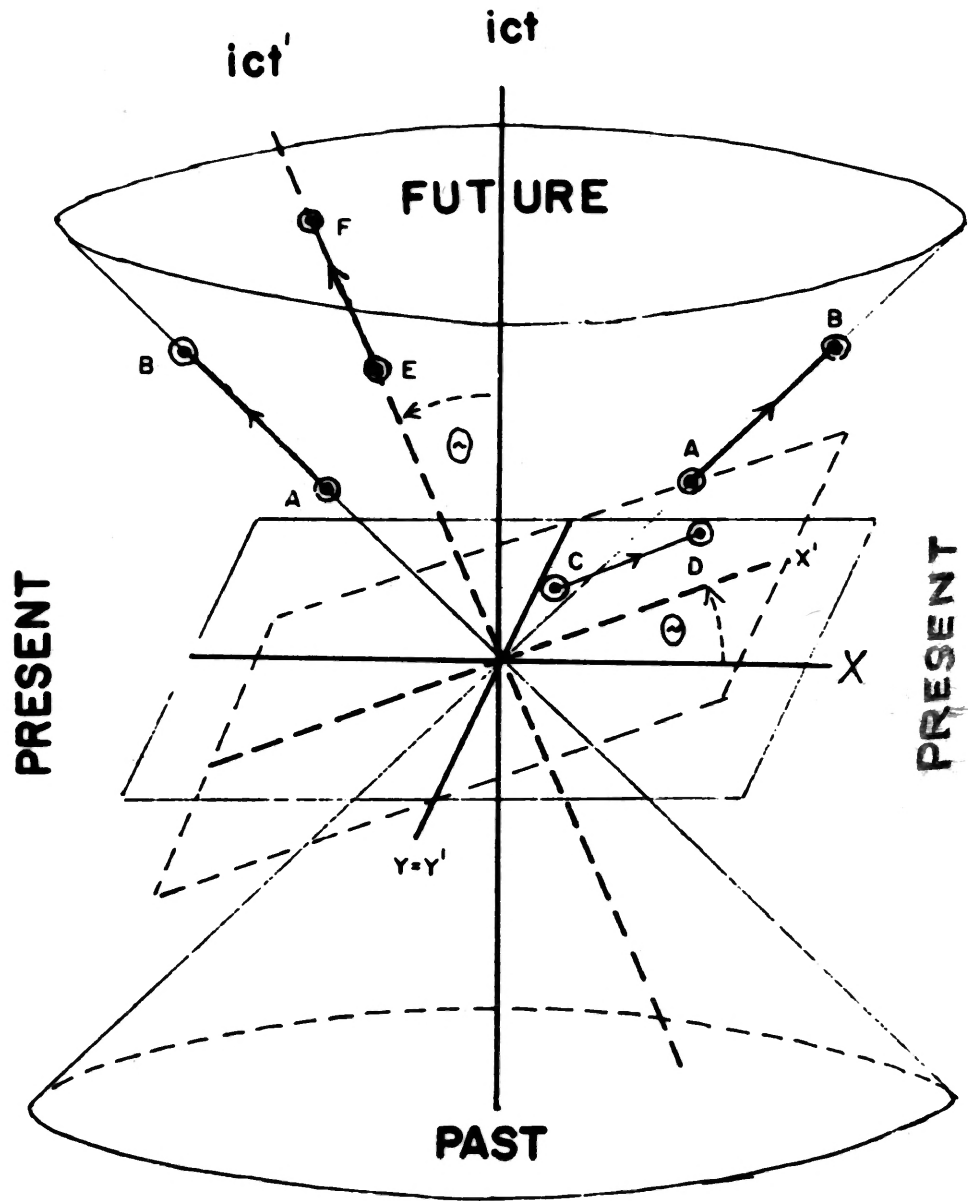


FIG. VI-11.

I HERMANN MINKOWSKI. SPACE-TIME CONTINUUM (1908)
GEORGE GAMOW, BIOGRAPHY OF PHYSICS, HARPER
TORCHBOOKS, NEW YORK, 1961. p. 191.

"LA TEATRALE"

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TEATRO COSTANZI

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Grande Stagione Lirica Carnevale-Quaresima 1912-913

Domenica 9 Marzo 1913

alle ore 21 prec.

== GRANDE SERATA ==

FUTURISTA

PROGRAMMA

1. **INNO ALLA VITA**

Sinfonia futurista del maestro **Ballila Pratella**

esecuta dall'Orchestra del Teatro Costanzi. Autore

2. **La Poesia nuova** di *Paolo Buzzi*.

La Fontana malata di *Aldo Palazzeschi*.

L'orologio ed il suicida di *A. Palazzeschi*.

Sciopero generale di *Luciano Folgore*.

Sidi Messri di *F. T. Marinetti*.

Plate III



III UMBERTO BOCCIONI. UNIQUE FORMS OF CONTINUITY IN

Museum of
Modern Art

SPACE (1913) bronze. 43x21x12 inches approximately.

New York

Plate IV



IV LUIGI RUSSOLO. RACING AUTO. (1913) oil on canvas. 41x17 inches approximately

Musee National
d'Art Moderne

Paris

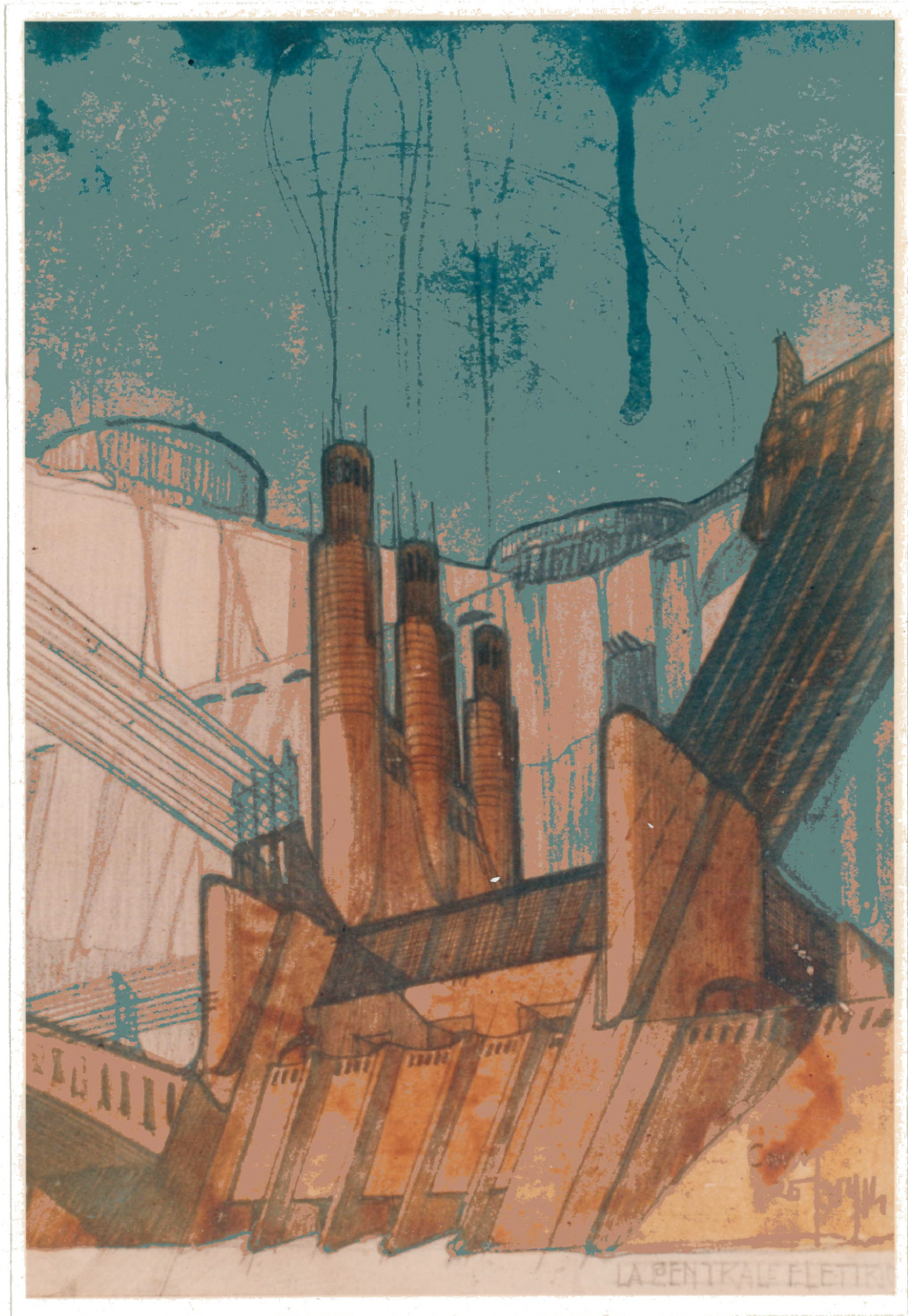


V GIACOMO BALLA. MOVING LINES AND DYNAMIC SEQUENCES. (1913) oil canvas

Museum of
Modern Art

38x47 inches approximately.

New York



VII. ANTONIO SANT'ELIA. THE POWER PLANT (CENTRAL ELECTRIC)

(1914) pencil, ink, watercolor. 11x7 inches approximately.

Avv. Paride
Accetti Milan

Plate VIII



VIII. GINO SEVERINI. SPHERICAL EXPANSION OF LIGHT. (1914)

oil on canvas. 24x19 inches approximately.

Dr. Riccardo
Junker

Milan