

Rick Szostak

Econ- Art

Divorcing Art from
Science in Modern
Economics



ECON-ART

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in Modern Economics

Rick Szostak

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Preface

This book operates on two levels. Its most ‘traditional’ contribution to the literature on the evolution and practice of economics is to study the cultural influences on the field over the last century. Historians of economic thought have long recognized the importance of such analysis, but have performed exceedingly little of it. It is much easier to trace the internal history of the field – how successive theories have borrowed from predecessors – than to look for external influences.

Art historians have boldly gone where historians of economics have been wary of treading. There is now an extensive literature tracing the cultural influences on the evolution of modern art. This book asks a simple question: can the same cultural influences which have been identified by art historians be seen at work in economics?

While artists seem more prone than economists to public self-examination, their utterances often provide elliptical and even contradictory explanations of their work. Art historians have thus had to focus primarily on the works themselves in tracing cultural influences. We must do the same with respect to economics. For each cultural influence identified by art historians, we will ask whether this seems to be reflected in economic theory. We will find it all too easy to recognize examples of each influence at work. I have thus endeavoured to draw upon virtually every field of economics in this book.

The second contribution of this book is both more novel and more controversial than the first. The comparison of art and economics raises an obvious second question: if economics has responded to the same influences as art, should we question its scientific credentials? To answer such a question we need to enquire into the nature of ‘art’ and ‘science’ and the possible relationships between them. We must also delve into the philosophy of science literature. We will find that the mere existence of cultural influences on theory hardly discredits economics as a

science. Philosophers, though, have suggested other criteria by which we might judge how scientific economic practice is.

We can push our analysis a step further by looking not just at the works economists produce but how they produce them. This will mainly involve a focus on method, but we will also look at (rare) descriptions proffered by economists of how they approach their work. Our question will be whether economists approach their task more like artists than scientists.

We will find that economists do behave much like artists, though scientific principles are not absent. We will identify two types of endeavour, econ-art and econ-science, and conclude that the conduct of the latter would be much aided if the guiding principles of econ-art were less prominent. A first step toward this goal must be the recognition of the existence of econ-art.

The concept of econ-art will invite hostility from some practitioners in a discipline not noted for introspection.¹ The author has thus had recourse to the all-too-uncommon rhetorical approach of gentle satire. The author confesses both to believing in the existence of econ-art and to gently exaggerating some of his arguments about it. It is his hope thus to entice some who would never otherwise touch a methodological treatise into reading this one, and to allow them to absorb criticism of disciplinary practice without offence. Lest this rhetorical device cause confusion about what the author believes, the author is deadly serious in his proposals for reform of econ-science (see Chapters 7 and 8).

This book is loosely structured. Each essay explores a different aspect of the subject of economics as art. The reader should not expect each to lead logically to the next. Still, there is a cohesiveness to each chapter. And the analysis builds toward the conclusions in the last chapters. The first chapter focuses on defining art versus science. As with 'freedom' or 'anarchy', precise definitions are impossible. We cannot hope to separate perfectly art from science in practice. Still, we can (and should) strive to distinguish them as much as possible, and can know that we should strive for more of one and less of the other. I emphasize this point here, for the reader must recognize at the outset that it is not necessary for there to be a night/day or black/white distinction between art and science for the analysis herein to be valuable.

It should be clear from the above that when we speak of 'art' we are not referring to the use of that word in the phrase 'arts faculty', wherein 'art' is extended to include the social sciences. Nor are we speaking of art in the sense which Colander (1992,

following J.N. Keynes) does, where 'art' refers to the process of applying theoretical results to public policy. Kindleberger (1990) uses 'art' to refer to the acts of inspiration or intuition required of the scientist. We will discuss in Chapter 1 the possibility that the pursuit of art may aid the pursuit of science. We would hardly wish to define 'art' so as to guarantee a particular result. In this book, we apply the same meaning to the word 'art' as do art historians. We are aware of no previous attempts to compare art so defined with economics.²

The second chapter focuses on Surrealism. Even those who dislike the depiction of economics as art should see the value in tracing the cultural influences on art (as seen by art historians) over this century and seeing if those influences appear to have affected economic theory as well. As in art history, our analysis of economics will focus on the works of economists, but also to a lesser extent on their views as to why they created what they did. Among the influences on Surrealism which can be found in economics are the pursuit of a second reality superior to the real world of experience, the belief that the practice of art could actually change the world so that it would resemble art, the belief in a primitive man motivated by basic desires (shorn of the philosophical niceties bestowed on humankind by much nineteenth-century thought), a desire for order, a desire for precision in a world of overwhelming complexity, a reaction to extreme nationalism and suspicion of authority.

Chapter 3 provides a similar analysis of the forces which art historians believe to have encouraged the rise of Cubism and abstract art. Among topics discussed are self-referential art, linearity, fragmentation of time, technology, trivialization of change and appeals to the classics.

While Chapters 2 and 3 look at economic theory, Chapter 4 focuses on economic methodology. We argue that mathematization, while sometimes pursued for scientific reasons, can often better be understood as displaying the artist's need to incorporate their technique in their view of self. Mathematization can also serve the same subconscious-raising role achieved by automatic writing in the Surrealist novel. Examples of the artistic use of maths are provided by General Equilibrium theory and econometrics.

To clarify again: in Chapters 2 through 4 we will borrow from the art history literature the latest thinking as to what have been the major socio-cultural forces shaping the evolution of twentieth-century art. In each case, we will provide important examples

from the history of economics in which it *appears* that the same forces were at work. In some instances, we support our line of argument with the words of econ-artists themselves commenting on why they created what they did. Most often, though, there is no smoking gun: since economic theory evolves in the brains of its practitioners one cannot ‘prove’ why certain developments occurred (innovators themselves need not know their subconscious motivations). This is likely one reason why historians of economic thought pay so little heed to cultural arguments (see section 1.8). As we will see in later chapters, though, economists – as all scientists – never prove anything. We merely make arguments and provide supporting evidence as best we can, and try to sway the opinion of the profession. If the analysis herein appears less ‘conclusive’ than other works in the field, this is a matter of appearance. That links are so readily established between art history and the history of economic thought is itself evidence that they both reflect the same cultural or aesthetic influences. The evidence for each link must be weighed with this wider similarity in mind.

A number of art historians have written of the ideological content of art. Chapter 5 looks at the ideological content of economics in terms of this literature. Ideology must operate at the subconscious level, and thus it is foolhardy to accuse individual economists of conscious bias. It becomes that much more important, though, to uncover the cultural preconceptions which may colour academic research.

Chapter 6 marks a transition from the first part of the book which shows the cultural and artistic influences at work in economics to the latter chapters which focus on methodological implications. In this chapter, I look at how econ-art and econ-science can each be identified and separated. I also note that while art is a laudable goal, the proper pursuit of econ-science is of great importance to society.

The remaining two chapters deal with the implications of this study for econ-science methodology. We discuss the effects of the fact that economists are generally ignorant of both the cultural influences and artistic standards which guide their work. The conclusions of recent works in both the philosophy of science and the rhetoric of economics are examined from this novel perspective (and vice versa).

It is essential that artistic and scientific motives be separated in economics. There is no natural equilibrating mechanism at work which guarantees that scientific standards will always be valued.

Recognizing that its present emphasis on only one type of empirical testing is not methodologically justified is a first step which can be taken. Openness to, and the search for, a variety of forms of evidence (which we already do unofficially: how many theories are believed solely because of econometric results?) will help ensure that Truth is not sacrificed to Beauty.

I argue at length that the need for methodological diversity and the need for an evolutionary approach (with an emphasis on technology and institutions, and openness to ideas from other disciplines) are not unconnected. Economists explore questions amenable to the use of existing tools, not necessarily the questions of greatest importance. Hopefully this manuscript will help to change this state of affairs in some small way.

1 Art and Science

1.1 Unveiling Econ-Art

The task of criticism is to improve opinion into knowledge.

Samuel Johnson

Society has been done a great disservice by existing studies of the evolution of economics which treat it as if it were (entirely) a scientific discipline. Our purpose here is to right this wrong, and highlight the evolution of economics as an art form. It is, to be sure, a complex art form, but any student of art will tell you that a true appreciation of painting or music or literature only comes after lengthy study of underlying principles. So it is with econ-art.¹ Some pieces have an easily comprehended aesthetic effect, while others will to the novice appear to have no artistic merit whatsoever. This is perhaps why society, and even the practitioners of the art themselves, have been largely unaware of the existence of econ-art. This situation should be remedied at once, for just as music is able to evoke elements of the human spirit which the sculptor cannot touch, econ-art explores territories into which none of the traditional art forms can venture. And econ-art is only beginning to show its great potential. Music, painting and literature can all uplift the soul of humanity and transport it far away from the grime and toil of everyday existence. But such journeys are only temporary. The soul inevitably snaps back to earth. Econ-art is capable of so much more than mere momentary refreshment. The true aficionado can be carried permanently away from the cares of this earth, to run carefree through a world far more well-behaved than our own. The beatific smiles of the foremost practitioners can be observed at conferences. Despite – or perhaps because of – their lack of recognition as an artistic elite, they seem untroubled by the legendary traumas of the artist. It is the most peaceful of arts, the most contemplative, the most

sublime (moreover, it does not require lengthy residence in a garret, at least if one ignores graduate school). Having long pursued recognition as queen of the social sciences, it may soon recognize a higher role as the queen of the arts.

One advantage econ-art possesses is its use of multiple media. Rooted in a literary tradition, its use of diagrams (which, while only rarely featured in formal works, play a crucial role in undergraduate education and thus the shaping of the economist's world-view) renders it also a visual art. More novel is the use of mathematic formulation to achieve purity of both insight and expression; this, we shall see, has emerged as the key element in modern econ-art.²

'There is not a generally recognized definition of art' (Kung 1981, p. 10). We might all think we know what art is, but cannot agree on a verbal formulation of the concept. This could provide a huge stumbling block to an attempt such as this to establish the existence of a heretofore unrecognized art form. Walk through any modern gallery, and you can hear people looking at works of art and sniffing, 'That's not art.' Anger may rise in your throat – say, if your brother had splattered the paint across the offending canvas – but there is no easy answer: one simply can't say 'It is art, and I can prove it.' There will be many who object to the very existence of econ-art. Indeed even the artists themselves in their ignorance may object to such a classification, having so much of their self-image dependent on the accolade of 'scientist' (though we will try to show in what follows that art is a loftier aim than science). I have long thought that the most useful – if tautological – definition of art is that which someone perceives as being art. As long as there is a group of people who perceive random paint splotches on canvas to be art, as long as it moves their souls, then art it is, even if the rest of society looks askance at such work (we could, as economists, impose a somewhat tougher definition: 'as long as some people are willing to pay for random paint splotches', but the result is the same). The conundrum of whether econ-art exists is thus solved; the very perception (by me alone, in the first instance) of artistic value in the work of economists makes it art, and no amount of denigration by others can make it otherwise.³

The ongoing debate about pornography highlights the difficulty with this sort of definition. It has proven exceedingly difficult (impossible?) to define pornography precisely. When public figures attempt to use the 'I know it when I see it' standard, they are scorned by their opponents. Even if the public were to accept the logic of our definition of art, then, this would

not lead them in any practical sense to an appreciation of this new art form. At some level of consciousness, they would still rebel against the concept of economics as art.

Greater evidence is clearly desirable if econ-art is to gain the full light of society's understanding and criticism. The obvious path to follow is to draw comparisons with the traditional arts (if it looks like a duck, and quacks like a duck, you can't be entirely sure that it isn't a carefully crafted imitation, but chances are it's a duck). We are aided here by advances in the discipline of art history. While the field of art history once focused almost exclusively on the personality of the artist, there is now a large body of work which describes the evolution of art forms as resulting from changes in society at large.⁴ We will draw heavily on this body in the next chapters.

We form a simple hypothesis: if econ-art is art, its evolution will have been shaped by the same forces which have shaped the evolution of painting, sculpture, film, literature and music. Clear parallels should exist.

Ideally, we would be able to draw on the work of historians of economic thought; we could then juxtapose their words with those of art historians to show that the same forces have been perceived to have been at work in both areas. With a couple of notable exceptions, though, such works have eschewed the placement of the evolution of economic ideas in any sort of socio-cultural context. Fortunately, the parallels are generally quite obvious. Indeed, we cannot list them all; many more connections will leap to the minds of readers familiar with economic theory and practice.

Even those who reject the sobriquet of econ-art may still recognize the value in first reprising the cultural influences which art historians have identified as having conditioned the evolution of modern art, and then discerning the effects these forces have had upon the evolution of economics. This alone fills a notable gap in the literature. That is, even if one remains wedded to the belief that economics is primarily a science, one should recognize the cultural influences on the evolution of that science. Only if one has the truest faith – and doubts that anything but the highest of scientific principles has ever motivated economists – could one casually dismiss this line of analysis.

1.2 The Question of Purpose

But surely art must be purposeful; the artist self-aware of their role as artist? If thousands of economists believe themselves to be pursuing solely the goals of science, then surely this must be so?

We need not pause here to note that many have in fact recognized non-scientific motives – we will have cause to discuss this later – for even if the whole discipline revelled in the mistaken self-perception of scientist, it would not mean that they could not be artists. We do, after all, admire the beauty of, and display in museums, many artefacts of the past which were designed primarily for their utility.⁵ Pottery and textiles are the clearest examples. While the art of the potter (or weaver) is tied up with the question of use, it can still be hailed as ‘art freed from any imitative intuition’ (Read 1968, pp. 41–2). Few of these distant artisans would even have been conscious of the aesthetic sensibilities which their craft serves. Likewise, the modern draftsman would spurn the artist title, but Klingender has argued that technical drawings went through the same sequence of styles in the fifteenth through nineteenth centuries as the other graphic arts (1947, p. 63). The modern economist, then, would be in good company if they were to unknowingly produce works of art.⁶

Indeed, Meakin (1976, pp. 135–41) has forcefully argued that the dichotomy the modern mind draws between works of utility and art is mistaken (and elitist). While some have viewed art as the expression of humanity’s playful nature, it is more apposite to see it as both reflecting and providing an input into work. Thus, Morris, inspired by Ruskin, could conclude that ‘A true artist is only a beautiful development of tailor or carpenter.’ He defines real art as the expression of joy in labour. Meakin continues, ‘Far from being separate domains, art and labour belong together, and only an unnatural state of affairs has thrust them asunder.’⁷ In the words of Gill, ‘the artist is not a special kind of man, but every man is a special kind of artist’ (in Meakin, p. 141). These writers see it as only natural that people would express their artistic sensitivity while working, that this should in fact be a major focus of their work and a major determinant therefore of the form their achievements take.

Historians of technology have come to recognize the interplay between the practical and the aesthetic in architectural structures as diverse as Gothic cathedrals and modern suspension bridges. Rather than engineering and art being separable, they were often combined in the same person (da Vinci, for example). Recognition of technical possibilities created the Gothic architectural vocabulary; its refinement influenced the direction of technical experiment. Appreciation of the aesthetic appeal of suspension bridges drove engineers to improve their technical capabilities. Historians who attempt to trace either technical or

artistic evolution in isolation miss half the story (Billington and Mark 1991).

Economists have the good fortune to have the latitude – not available to most of modern humanity – to integrate art and work. It is perhaps ironic that a discipline which has for the most part ignored the characteristic alienation of the modern worker should yet strive for such an integration in its own activities. Art satisfies our aesthetic impulses, ‘impulses that exist at the deepest levels of personality’; our modern world gives most people insufficient opportunity to exercise their aesthetic capabilities to the fullest (Feldman 1992). Economists are only human and should be expected to extract the pleasure from their work that the mere pursuit of truth could not provide. One can still regret the lack of recognition of this fact.

We should be clear that econ-art is no accident, unlike a brilliant sunset that pleases our aesthetic sense without having been deliberately created (at least by humans). Our subconscious minds are the source of our artistry. And econ-art is far from the first art form to be produced subconsciously. But if Meakin is right, we would be happier if we were conscious of our art. We would likely be better artists too.

Read (1968, p. 25) believes that Art expresses the intuitive rather than the intellectual – its message is implicit rather than explicit – and thus it is hardly necessary that the artist be conscious of his art. While the intellect can never dominate, Read (p. 135) feels that modern art is characterized by the reintegration of the intellect, though Feldman (1992, p. 38) argues that it is in modern art especially that ‘The artist becomes a kind of intuitive investigator of forms that are somehow appealing, or unexpected, or both.’ If we accept a role for the intellect, the lack of self-awareness of the econ-artist must bequeath a certain roughness to the work. Chinese scholar-painters have for centuries shown the role the intellect can play in art; econ-artists cannot follow this path to its fullest potential if they do not recognize their artistic motives (just as architects who deny the artistic side of their endeavours are unlikely to produce great works). We can hope our present study goes some way towards rectifying this situation.

It might be thought odd that the economists’ pursuit of art could for so long be misinterpreted as the pursuit of science. As we shall see, recent developments in the philosophy of science tell us that we cannot know with certainty whether we are right or wrong.⁸ This does not mean that inquiry is useless. It does mean

that knowledge advances through the collective evaluation of new information. Therein lies the danger. With no criteria by which we can prove a theory true or false, it is quite possible that subjective decision making may serve goals unrecognized. Thus art may be rewarded, even though both rewarder and rewarded never use the word.

The work of Meakin above implies that the goals of art and science need not be incompatible.⁹ This point, at least, has recently been recognized by economists Dasgupta and Stoneman: 'Knowledge, all too frequently, is both a consumption and a capital good. A mathematical theorem is often valued for its beauty, as well as for its potential for the generation of other theorems' (1987, p. 2).¹⁰ Art, after all, is a different medium for understanding the world we live in; it could well be imagined that a symbiotic relationship could emerge between the pursuit of artistic and scientific understanding. However, a problem still arises when the artistic motive is not recognized, for while the two goals may not be incompatible they are hardly similar (see below). Both art and science must suffer in such a state of conscious denial, though we can well imagine that the intellectual and explicit goals of science will fare worse than the intuitive implicit goals of art.

1.3 The Purpose of Art

If art involved the realistic portrayal of the world around us, there would be no reason why the cause of econ-science could not be served by the pursuit of art. Like pottery or architecture or draftsmanship, we could create an economics which served both aesthetic and utilitarian desires. To be sure, the pursuit of the former might tip the focus of economic inquiry away from matters of greatest real-world importance, but this could only slow rather than derail the pursuit of Truth.¹¹

Art, though, is anything but realism. Even those works of art which seem at first glance to be realistic portrayals of the world around us in fact capture our hearts through subtle misrepresentation:

Distortion of some kind is present in a very general and perhaps paradoxical way in all art. Even classical Greek sculpture was distorted in the interests of the ideal. The line of brow and nose was never in reality so straight, the face so oval, the breasts so round (Read 1968, p. 29)

To comprehend art at all we must recognize that people derive pleasure (or insight or inspiration; some recognized works of art hardly provide pleasure) from certain sensory stimuli. Even without knowing exactly what these preferences are, we can see that the purpose of art is to transform the world about us into a form which appeals to our soul in some fashion. It is not that Greek sculptors were incapable of providing exact representations of their models – truth does not necessarily mean perfect replication – but that they intuitively pursued distortion.¹² Such works should be seen not as definitions but as ‘infinitions’, meant to bring out the viewer’s own enlightenment. Art exemplifies and expresses, rather than describing and depicting (Goodman 1978).

We must be careful to distinguish this purposeful ‘misrepresentation’ from the model building which is an essential practice in any science. Models of necessity are not exact replicas of the reality they describe. Thus, for the scientist, distortion is a necessary evil as they focus in on some aspects of reality. The scientist does not value distortion for its own sake. Indeed the scientist carefully tests models against the real world to ensure that the distortions are not so great as to invalidate (all of) the results produced by the model (only a very misguided science would casually forget the simplifying assumptions it had originally made). The scientist’s models are intended to *reveal* reality, the artist’s works to take us away from our humdrum reality.

The artist often adds additional elements to their image: splashes of colour that were not there; the Cubist representation of figures from many angles at once; the novelist’s juxtaposition of unrelated events. Read’s description of a Chinese horse carving is helpful here:

The carver might without much trouble have made his horse more realistic; but he was not interested in the anatomy of the horse, for the horse had suggested to him a certain pattern of curved masses, and the twist of the neck, the curls of the mane, the curves of the haunches and legs had to be distorted in the interests of this pattern. The result was not very much like a horse – in fact this horse is often mistaken for a lion – but it is a very impressive work of art. (1968, p. 32)

The very subtlety of much artistic distortion makes it possible that econ-art could be unappreciated for so long, and poses the greatest danger to econ-science. If the work of our Chinese carver were taken as a depiction of reality, the scientists which followed him must have struggled to fit their observations of horses into the

image of a lion. The work of the econ-artist, which *must* involve the transformation of the world we actually live in into one of superior aesthetic form, *must* inevitably distort the pursuit of econ-science. This is undoubtedly a lesser sin than the perversion through ignorance of the art form itself, but provides a further motivation for the present inquiry. If providing econ-art with the respect it deserves has the effect of improving the practice of econ-science as well, we should not be displeased. We would not, though, wish to cause those who have heretofore displayed such artistry in their work to turn their genius to the performance of mere science.

1.4 Art versus Science

I am continuously amazed by the naivete of [young scholars]; they think of the economics profession as a pure academic pursuit in which the search for truth will be rewarded, quality work will overwhelm non-quality work, and people will be judged on the merits of their teaching and research. To this I say hogwash.

(Colander 1996, p. 43)

Perhaps, though, econ-art and econ-science merely cohabit in economics departments, without either perverting the other? Such cannot be the case. Just as the image of science hovers over all economists, the urge to create art must infect them all. Not all are blessed with equal amounts of either scientific acumen or artistic sensitivity, to be sure, and thus left to their own devices would pursue the two divergent goals to different degrees. But economics – like any other discipline – is a community, with its own standards of what is good and what is bad. These standards affect the individual practitioner in two ways. First, they provide her with important personal incentives; hiring, tenure and promotion all depend on publication, and the latter depends on satisfying community standards.¹³ The psychic benefits of scholarship also depend in large degree on meeting these standards. As Paul Samuelson has said, ‘In the long run the economics scholar works for the only coin worth having – our own applause’ (in Breit and Ransom 1982, p. 107). Earl (1983) discusses at length the personal incentives of academics to embrace the existing value system: ‘The pressures of the modern academic lifestyle make it particularly hard for a scientist to take a detached view of why she is doing what she is doing’ (1983, p. 121). He notes in particular how writing unorthodox papers must heighten the fear of rejec-

tion. Only the most heroic of scholars can be expected to battle against standards they consider to be misguided. The second effect is more subtle. Lacking objective criteria, the community decides which ideas are correct, and the emerging scholar cannot help but be conditioned by the community values which she inherits. In the words of the literary critic Stanley Fish, intellectual communities 'will necessarily agree because they will see (and by seeing make) everything in relation to that community's assumed purposes and goals' (in Backhouse 1992, p. 21). Of course, other social science disciplines embrace more than one 'community' in this sense; economics is unusual (perhaps precisely because artistic motives have overshadowed scientific ones) in the predominance of one theoretical and methodological perspective. Colander (1996, p. 49) advises scholars to do mainstream research at least until they get tenure: 'The system either trivialises or transforms non-mainstream economists who do not understand and accept the system, or if it can't do either it eliminates them from the profession.' This, of course, makes Fish's argument more powerful with respect to economics. Our subconscious minds, after all, are more selfish than our conscious minds. Unless we consciously force ourselves to question the status quo, our subconscious mind will naturally choose to avoid rejection and encourage us to 'play the game' to the best of our abilities. Even the heroic, willing to battle for either artistic or scientific integrity, may be unaware that the battle needs to be fought.

We will return in later chapters to the question of what, if any, scientific standards guide the discipline. For now our focus must be on econ-art. While much of the work to follow will highlight the role of artistic ideals in the evolution of economic thought, it is useful at this point to make some general observations about this pervasive influence.

McCloskey and others have in recent years stressed the role of rhetoric in economic discourse. Economists do not simply put forth new ideas unadorned to prosper or die in the cold light of truth, but use a variety of argumentative devices to present their case. Recognition of this fact must at least raise the possibility that science need not be the only arbiter of quality: 'Shakespeare used 200 rhetorical devices; economists do with less, using mainly metaphors but also analogy and appeal to authority, to a person, a mathematical procedure, or whatever else might please a reader by its order or beauty' (Spiegel 1991, p. vii).

The use of the word 'beauty' by Spiegel can hardly be viewed as a slip of the pen. Nor for that matter should the frequent use

of the word ‘elegant’ to praise this model or that. Economics, to be sure, is hardly the only discipline in which words like ‘beauty’ and ‘elegant’ are used. Von Baeyer (1993) has studied the use of the word ‘beauty’ in science, and stresses two points. First, beauty lies not in the equations themselves, but in the promise they hold of enhancing our understanding of the world. Second, while beauty can gain scholarly attention, testing against real-world phenomena serves as the sole arbiter of validity. In economics, it is well known that econometric techniques are generally incapable of showing that one model describes reality better than another (see section 4.11). How then do we choose one over another? The appeal to beauty and elegance must be a powerful influence when scientific criteria are difficult to establish. Beauty ceases to mean ‘this theory enhances our understanding’, but rather becomes a comment on the equations in isolation from the world they supposedly represent. The futile attachment of econ-science to a methodology which purports to be capable of precision and conclusive proof, when such are not possible, merely opens the door to the ascendancy of artistic values.

Of course, scientific merit alone is rarely if ever the sole reason for the ascendancy of a new view of reality in any field. Romain Rolland has stated this best:

Ideas have never conquered the world as ideas but by the force they represent. They do not grip men by their intellectual contents but by the radiant vitality which is given off by them at certain periods in history ... The loftiest and most sublime idea remains ineffective until the day when it becomes contagious, not by its own merits, but by the merits of the groups of men in whom it becomes incarnate by the transfusion of their blood. (in Fleming 1970, p. 439)

Our willingness to accept ‘facts’ as having scientific value depends ultimately on a sense of intellectual beauty or ‘an emotional response which can never be dispassionately defined’ (Polanyi 1958, p. 135). Ideas must always win through appeal to more than our intellect, because humans are not computers but beings, constrained to respond to feeling and intuition as well as logical thought. This may be regrettable at times – when, for example, emotion conquers logic and nationalist fervour leads to death and destruction – but few if any of us would want a world of cold logic (even Mr Spock of the original *Star Trek* was at his most interesting when his human side overcame his logical Vulcan side). We are not mere machines for eating and reproducing, but beings

capable of love and compassion, enthusiasm and pain. It is these non-cerebral elements to which art speaks, and we would be foolhardy to wish to excise this influence from our lives.

We would also be foolhardy to neglect this inevitable influence, and believe we are pursuing Truth alone, especially in matters of practical importance such as economics purports to be. If we thought poets were plumbers, what sort of world would we have fashioned?

In other words, the advance of knowledge must involve the restructuring of the patterns of perception (gestalts) through which people 'manage' their experiences – put them in their memory, relate them to other experiences and ideas, and retrieve them. This change in gestalts is at the heart of the study of aesthetics. Our ability to change the world-view of any of our audience (a transformation which may have a major impact on their future actions and beliefs, and may be quite disagreeable) will depend, therefore, on their artistic sensibility. The hidden artistic component of economics may play a much larger role in changing how people think than the supposedly scientific exterior. Keynes, it might be noted, consciously appealed to the aesthetic sensibility of his audience. Great economists, it could be argued, achieve (much of) their status not by adding another brick or two to that rickety structure called economics, but by creating penetrating images in the minds of their peers which govern how these others view the world. If we don't recognize that we are enchanted by such artistic creation, we can scarcely expect to more than stumble toward Truth.

An example might be helpful here. International trade theory has long been based on the concept of comparative advantage: nations should export goods for which the internal relative price is lower than that abroad; cross-country differentials in relative prices are attributed in general to differences in endowments, in particular to differences in the availability of capital and labour. The truth of the concept is not in question; as with much of economic theory the question is rather of relevance. Yet the theory has been developed in increasingly elaborate fashion. It was shown, for example, that under conditions of free trade, both wages and interest rates would be equalized across countries. Numerous extensions were then required to deal with the divergence between theory and the clear fact that trade did little in the real world to equalize cross-country wage differentials. McCloskey (1996, p. 87) describes the process as theorists alternately proved that wages would or would not converge, and bemoans the

absence of examination of the real world in the process. There was a similar reaction to the discovery by Leontief that the United States actually exported labour-intensive goods against the predictions of the theory, or the observation that most trade in the world occurs between countries of similar endowments (the developed countries), rather than between countries of radically different endowments. Since economists spend much more time developing theory than looking at issues or data, they were able to continue to take trade theory on faith despite such pieces of conflicting evidence (Leamer 1983). Again, the problem is not that the theory was wrong, or that these extensions were totally without insight, but that they failed to face up to the fact that the theory seemed to be capturing only a very small part of reality.

Hufbauer (in Vernon 1970) spoke of the obvious alternative: that international trade was largely determined by international differences in technology. While this sometimes could be reduced to relative price differences, it more often meant that one country produced goods which, at least in quality terms, other countries could not produce at all. Though he and others had been pushing this alternative conception for some time, Hufbauer observed that 'It can as yet offer little to compare with Samuelson's magnificent (if misleading) factor price equalisation theorem' (1970, p. 192). Three decades later, those who favour the technological explanation still must view themselves as revolutionaries and still feel their case is lost until they can formulate an equally elegant model. Relevance could hardly lose out more clearly to beauty.

It might be thought that this lack of willingness to eschew a model simply because an alternative explanation provides a better description of reality represents false scientific values rather than artistic values. It must be an incredible perversion of scientific method, however, to disregard the clear implication that reality does not accord at all well with theory. Who, though, that has ever taught international trade – drawn the Edgeworth box diagram, derived offer curves, illustrated the effects of tariffs with production possibility frontiers and indifference curves – who can have done that, that would not shed a tear if this elegant mass of theory had to be pushed to the background for the mere crime of only being a residual claimant on truth?¹⁴ Countries producing different products are hard to capture on pretty diagrams.

We should not lose heart, though. If econ-science only has place for such diagrams in the footnotes, they will always have a prominent place in the annals of econ-art, for they are exquisite. The world need not work that way for us to treasure them.

1.5 Science versus Art

We have run the risk in the preceding of defining art so broadly that everything becomes art. The distinction between art and science must vanish if art is all-inclusive. We might hope that science lends itself to a more precise definition, and thus we could build up this distinction from the other end. Unfortunately, if we turn to the philosophy of science literature for a handy definition, we are immediately plunged into a morass. There is, however, a way out.

As Redman (1991) notes throughout, the demarcation problem – establishing the boundary between science and non-science – has plagued the philosophy of science from the outset. Generations of discourse have yielded the conclusion that there is no simple definition of science. All those proffered over time have broken down under attack. Most centrally, Karl Popper and others had argued early in this century that science could be distinguished from other activities by the concept of falsification. Earlier philosophers had defined science in terms of empirical confirmation; Popper recognized that no number of confirmations could show a theory to be true, but argued that one falsification could show it to be false. It was soon shown, however, that scientific theories cannot be objectively falsified. Any test is of necessity a test of both theory and ancillary assumptions, and thus failure can be blamed on the latter rather than the former. Moreover our observations of the world are not independent but themselves theory-laden (see Section 7.4; Lambert and Brittan 1992; Klee 1997).

This opens the door for Feyerabend (1978), who argues that in fact there is no distinction between art and science. We can be relieved that the economics profession, with its self-image dependent on an inflated view of the scientific ideal and its own claims (even if scarcely recognized by natural scientists) to be a member of some exclusive scientific club, has been spared exposure to such heretical beliefs. Economic methodologists (Mirowski 1989; Redman 1991; Colander and Brenner 1992) often accuse economists of being more ignorant of philosophy of science than other scientists, though they may give more credit to other disciplines than these deserve.

Few philosophers have been prepared to follow Feyerabend's extreme views (I apologize if I have inadvertently frightened the uninitiated). We cannot, after all, provide a simple definition of such concepts as 'freedom' or 'democracy' which would allow us to establish without doubt situations when these exist or not. This

does not make these words meaningless. The same is true of science. We can hope, albeit imperfectly, to be able to distinguish between science and non-science.

Chalmers, while going some way with Feyerabend, retains the belief that we can evaluate the activity of any knowledge-generating community:

Each area of knowledge can be analysed for what it is. That is, we can investigate what its aims are, which may be different from what its aims are commonly thought to be or are presented as, and we can investigate the means used to accomplish those ends and the degree of success achieved. It does not follow from this that no area of knowledge can be criticized. We can attempt to criticize any area of knowledge by criticizing its aims, by criticizing the appropriateness of the methods used for attaining those aims, by confronting it with an alternative and superior means of attaining the aims, and so on. (1982, p. 166)

While Chalmers eschews the use of the word ‘science’ in this passage, we could hazard a couple of tentative descriptions of science. First, science, as an intellectual enterprise, must do what it says it does. To the extent, then, that we find in what follows that economists have been pursuing other goals than that of explaining the world around them, they fail as scientists on that score. Second, if other means of investigation would advance knowledge appreciably faster, then the discipline is not behaving in a truly scientific fashion. That is, we can evaluate a discipline both in terms of its goals and the process by which it attempts to achieve those goals. Mayer (1993) and others have bemoaned the sluggish pace of the advance of economic understanding. This, of course, provides only circumstantial evidence. Our later discussion of methodology will provide the smoking gun.

Thomas Kuhn has dealt with the question of how to distinguish art from science. In his book *The Structure of Scientific Revolutions* he had noted some similarities between art and science. Others had responded that science and art were indistinguishable. He is forced to agree that ‘The more carefully we try to distinguish artist from scientist, the more difficult our task becomes’ (1977, p. 341). Many, who would have thought themselves quite capable of distinguishing one from the other, would find themselves after reading the philosophical literature much less sure. If they feel they have left the light and entered darkness, they may yet be rewarded with light at the end of the tunnel.