

Stud. Hastings Cent 1973 1:53-62

INEVITABLE, AWESOME, & IMPOSSIBLE RESPONSIBILITY

Making and escaping moral decisions

ERIC J. CASSELL

TO CONCEIVE of a physician practicing his profession without constant ethical decision-making is to conceive of a physician operating in a cultural vacuum and caring for a collection of static facts wrapped in human form.

Medicine is inherently moral. That is to say, that the practice of medicine is a "doing" function. The practice of medicine—caring for the sick—takes what are presumed to be facts about bodies and disease, and on their basis does something to a person. In the practice of medicine, we might say, the doctor keeps before him a body "ought" and a body "is." Presumably, in health, the "ought" and "is" are the same while in sickness they are different. It might be argued that speaking of "ought" and "is" in the context of the facts about the body and disease is a misuse of the term morality, a confusion of facts and values. The doctor is dealing with facts (at least as he sees it). The body "ought" is not an ethic, it too is a fact. One might say, to point up

that confusion, that a plumber works the same way in repairing a leak or installing a sink, that the plumber has an "ought" and an "is" for pipes, and that therefore his behavior in relation to the pipes can be examined in moral terms. While plumbers certainly can be immoral, commonly we would say that they can only be immoral in relation to people, not pipes. To the pipes, which are inanimate, unfeeling, replaceable and fixable six different ways, the plumber cannot be immoral. He can just do a good or a bad job. There is nothing inherent in a pipe to make a plumber feel guilty if he errs. He can generate feelings depending on how he fixes the pipes, but the feelings are in him (or others), about himself. In fact, if something does go wrong and he carries on about the pipe, we say, "Why are you so upset, it's only a pipe." Thus the analogy of the plumber would show us that the body "ought" and "is" are in the realm of fact, not value—if we could compare bodies to pipes. We cannot, and we are offended when we see doctors treating bodies like pipes, rather than persons. It is, actually, quite possible to conceive of a body like a piece of cast iron pipe, even necessary to do so for understanding the body, but as we shall

see such a conception is only partially useful to medical care. It is caring that we are speaking about when we discuss the right of doctors to make ethical decisions for their patients.

For a physician to do a good job he must treat the patient as a person. This is a truism. The meaning of patient as person, however, requires some examination. But unfortunately, no reflection, however deep, will suffice to resolve satisfactorily the nature of the relationship of person to body. We know this question has been the subject of examination over the centuries.

Yet the relationship of person to body is the true question before us. It is at the center of the distinctions between pain and suffering so common to Catholic ethics, and the essence of criticism of radical vitalism (keeping the patient alive at all costs). It is, perhaps, the heart of medical ethics. Avoiding the ultimate resolution of the relationship of person to body, one might say, simply, that *a person is a body with values added*.

Perhaps medicine is called an art, not a science, because a necessarily inherent part of it is decision-making linked to human values. Ethical and technical decision-making are both a part of doctoring; both are rooted in human experience. Alfred Cohn, a renowned medical researcher, examined the difference between art and science. Surprised to have found so many similarities, he concluded by writing "Art is not science, nor is thought emotion, but they share in that which is lent to them by their common origin in the experience of man."¹

Doctor as Arbiter

Previously we noted that the doctor treating the sick is confronted with a body "ought" and a body "is"; and he applies

his skills and values in an attempt to make the two conform. In actuality, however, it is clear that he is confronted with the "ought" and "is" of a *person*. The "ought" of a person can be seen in ethical terms because it is a mixture of fact and value. What "ought" a man be or what "ought" a man do are determined by both the body and the values of the man.

We have discussed elsewhere the dramatic conflict of self and body in the dying person,² but the conflict is often present in the most simple illness. A twenty-eight year old actor has just gotten his first important movie role when he develops a non-specific illness resembling a bad cold. He continues working, and develops severe chest pain which on examination is seen to be a kind of "viral" pleurisy. With rest, the illness usually quickly clears; if he continues working the problem will continue and may severely worsen, even possibly (but rarely) become life-threatening. What is the doctor's job? In *body terms*, the answer is clear. He informs the actor of all the possible consequences and insists that he go to bed to insure that the illness is cured (and coincidentally, that the actor lose his job). In *person terms*, however, he helps assess the relative risks, agrees to continue to act as arbiter between the actor's desires and the needs of his body—and in so doing takes on responsibility for risks incurred. Or more simply: a child has a cold—should it go to school? Every parent knows that the question is often hard to resolve in terms of symptoms alone. In *body terms* the answer often is clear, in *person terms* complex.

It is true that there are situations where *body terms* alone are the determinant: hemorrhage, heart attack, shock, etc. But most often the patient's values enter

¹Alfred E. Cohn, *Medicine, Science and Art* (Chicago: University of Chicago Press, 1931), p. 73.

²Eric J. Cassell, "Being and Becoming Dead," *Social Research* 39 (Autumn, 1972), pp. 528-542.

in the decisions, whether so stated or not. The physician's phone rings all day with questions varying from "Can I have a drink when I'm taking the pills?" to "I have a pain in my chest, you know what a hypochondriac I am, but still. . . ." Certainly most of the moral decision-making is at a low level—not concerned with allowing to die or to live—but real and value-oriented just the same.

The doctor is the arbiter between the person and his body. Actually, as has been made clear by the sociologists of medicine, the situation is more complicated. The physician is not only the arbiter between person and body, he is also a representative of society and its values.

In the complex equation created in illness by the needs of person, body and society, the physician plays a vital role. As the only one who knows the body (and it does not matter if his body knowledge is correct, only that it is culturally consonant), he is the one who can legitimate body demands. The sociologists often act as if the only important aspect of the triad is the person-society matrix; as if disease did not really exist. Indeed, seeing illness in wholly cultural terms is another way of attempting to deny fate. There is a fate and fate can find expression in disease.

Are the moral decisions a physician makes about the sick an unjustified extension of his technical expertise? Or, are they not inherent in professional responsibility? Is it the level of ethical decision that is at issue, or just the fact of it? If it is the level of ethical decision, rather than its presence or absence, the question before us changes. A seventy-seven year old woman is admitted to the hospital with pneumonia. In the course of investigation some test results raise the possibility of widespread cancer. No other signs of cancer are found. The same test results may also be found in unimportant conditions, or may even be error. *Is the*

physician obligated to tell the patient all of the possibilities? In the face of the uncertainty, it would seem unnecessary for the doctor to tell the patient, even self-indulgent to do so. Later, perhaps, when the diagnosis is made with certainty, the question of telling-or-not-telling is entirely different. It is not my intention to enter into a discussion of "telling-the-patient," but to point out that starting with the most routine moral actions on the part of the physician, we are gradually led to the deepest ethical issues. It is these profound questions, and our unease about how physicians handle them, that

M_{edical}

care is a *process*. . . . In the process of care, especially in cases that lead to difficult moral decisions, a number of minor ethical matters have been handled along the way . . . in which both patient and physician interact in making decisions. In that process both patient and physician have informed each other of how each feels, and the interaction helps form the basis for the next decision.

leads us to doubt the physician's ethical prerogatives.

But medical care is exactly this sort of a *process*. It cannot be seen or even discussed as a point in time, as one static decision made on a static set of facts. In the *process of care*, especially in cases that lead to difficult moral decisions, a number of minor ethical matters have been handled along the way—matters that involve both fact and value, in which both patient and doctor interact in making decisions. In that process both patient and physician have informed each other of how each feels, and the interaction helps form the basis for the next decision. We are all aware of the problems involved in patient-doctor interaction. We shall not discuss them in this presentation; what is important, here, is to realize that, in the handling of a case, *the physician has made ethical decisions respecting his patient, in full view of that patient, and usually with the patient's consent.*

Thrusting Decision-Making on the Physician

The answer to the question "Where does the physician get the right to make ethical decisions?" is simple. *From the patient.* From some patients more than others, but to some degree, from all.

The society—the collective patient, if you will—gives over to physicians the right to moral decision-making. Evidence on this point varies from the fact that society "has perhaps wisely abandoned the statutory regulation of medical morals, satisfying itself with prescribing standards of technical training"³ to all the fiction and non-fiction literature that idealizes or castigates physicians on moral grounds. Such a body of literature seems always to have been present.

³Thomas Percival, *Medical Ethics*, ed. and introd. by Chauncey Leake (Baltimore: Williams and Williams, 1927 [originally published Manchester: 1803]), p. 8.

The question before us no longer is, is moral decision-making in medicine a "generalization of expertise"—we have seen that it is considered a part of the art of medicine. The question no longer is where do physicians get the right to moral decision-making—we have seen that society and individual patients thrust on them that right.

The question is, now, *how do doctors protect themselves from the responsibility that goes with the right to make such decisions?* Socially, the assignment of responsibility is extremely useful. We are aware that the sick are weak. In their weakness, which may be shared by their loved ones, judgment is impaired by emotion. While we may be aware that the judgment of the sick may be impaired, we tend to look at impairment in a quantitative sense. The sick person is distracted by his illness, pain or disability and is unable to bring his "full capacity" to bear on a decision. In fact we are discussing a qualitative impairment, which may well be shared by a distracted family: a shift from primarily cognitive to primarily emotive thought and decision-making. Since it is difficult to know, even in ourselves, when judgment is cognitive or emotive, how useful to turn to a group within society and give over to them the responsibility for *maintaining* cognitive processes. If it is difficult to conceive of shifts in sphere from cognitive to emotive decision-making, or the effects of such a shift, then call to your mind the effect of yelling "Fire" in a crowded theatre. Everyone *knows* cognitively, that he should not panic; should not rush to the exits. Yet we all know what actually happens as emotive thought takes over the decision-making process. "As often as fever disturbs his brain does not a man for a time perceive, fancy, think, judge, desire, and reject differently than when his body is sound?" In the empathy-objectivity battle within the physician, we all expect him, *demand* of him

that his judgments remain based in cognitive process. Similarly with moral decisions we expect cognitive thinking of the physician.

The responsibility is awesome—and impossible. It is impossible for the physician to conceive that something he does, even some little thing, will destroy a life, alter a family, ruin happiness, or produce anything except salutary change. It is a conception from which physicians, or any men, must protect themselves. Who could function under such a burden if it were in full view? Conversely, what person can give himself over to the care of another, knowing as we all do, the frailties of men?

Technical Decisions Only

It remains now to go back in history to trace how men—both doctor and patient—have protected themselves from the knowledge that doctors make value decisions about their patients. In so doing I think we will see how the protection has become the vice.

The best protection of all is the simple denial of the fact: *The physician does not make ethical decisions, he only makes technical decisions.*

Physicians are pragmatists. They have little use for philosophy or philosophizing. A divinity student who had entered a medical school was asked to participate in a seminar about teaching values to medical students. What special perspective did his background give him? "In college I used to beat the system. Medical school is different," he said. "You think about all there is to learn and how if you make a mistake it could cost somebody his life. You can't very well say you weren't paying attention that day in school so you don't know what to do. I'm a pragmatist, now!"

Recently, in discussing the death from heart attack of a famous and beloved athlete, I said I was happy his death had taken that form. At the time of his death,

he was living with the threat of blindness, or the loss of his legs, or both, within relatively few months; and these alternatives seemed particularly awful for this active and powerful man. Another doctor present—a medical researcher—said "How can you say that, you're playing

It becomes clearer and clearer that "playing God" really means making a non-technical decision—a moral decision.

God!" Yet no decision had been made that caused that death in preference to the other outcomes.

"Playing God." That odd phrase that crops up from medical student days to, I suspect, old age. I have always wondered what it meant, since, in the situations in which it is so often used, it has been hard to see how one decision is *more* playing God than another. It becomes clearer and clearer what the phrase really means. "*Playing God*" means *making a non-technical decision—a moral decision*. To use a classic example: a patient with terminal cancer is clearly dying. The disease is widespread, overwhelming, and the patient is within days of death. Blood tests show an increasing, and now severe, anemia. The intern suggests blood transfusions and the resident refuses. The intern and the medical students say that the resident is "playing God." If the transfusions are given the patient may live a short while longer. Is denying the transfusion any more "playing God" than giving the transfusion? The giving of life is seemingly as much "playing God" as

denying life. It is clear, however, that giving the blood is a technical decision based upon tests or other technical assessments of the case. Withholding the blood has no technical basis and is, therefore, a moral decision. The resident defends himself by pointing out that blood is in short supply and better used in a case with more hopeful outcome. The assignment of priority is, again, a "technical," not a moral, decision and is approved grudgingly by the students and interns since they are learning to assign priorities in their work, a learning experience essential to medical existence.

It would appear, then, that physicians do not, manifestly, make moral decisions, they *only* make technical decisions. But we know this to be untrue. Let us listen to Dr. Samuel Dickson for two contrary statements about pain and death:

It then became my duty also to protract life, and . . . avert death; but how could I in any given case . . . be assured that life was a good to be desired—death an evil to be shunned? . . . I was not, however, invested with any right to distinguish between special examples, being bound to proceed upon a universal principle, and protect and prolong a life, hateful, it might be, to the possessor, and burdensome and injurious to all connected with him.⁴

Contrast that with the following:

But I would present the question . . . whether there does not, now and then, though very rarely, occur an exceptional case, in which they [physicians] might, upon full and frank consultation, be justified before God and Man in relieving, by the efficient use of anesthetics, at whatever the risk, the incurable anguish of a fellow creature laboring under a disease of organic destructiveness or inevitably mortal. . . .⁵

Note the difference in the tone of the

writing. The first statement is boldly prohibitive, while the second is almost a confession of human weakness. Dr. Dickson confesses that his empathy overrides his objective goal—the support of life at all cost.

We find ourselves not only at the fact-value interface, but at fact-value conflict. Recently we were surprised to find that interns from widely disparate cultures (Switzerland, Taiwan, India, France, and Yugoslavia) expressed the same opinions in regard to the case of a dying patient. All opted for a life-at-all costs decision in the particular case. Their varied cultural backgrounds did not seem to enter the decision-making process. The decision, though clearly having moral implications, was technical. Physicians are pragmatists. They-do-not-make-moral-decisions, they-make-technical-decisions. To understand these contradictions—that moral decisions are seen as really technical decisions, despite obvious moral implications, it is necessary to briefly examine the mind-body controversy.

Moral Men but Not Moral Decisions

It has been said that Descartes' explanation of the mind-body duality was a necessary precondition for the development of modern science. It was also effectively a moral-technical duality: physicians were given the (technical) body, in company with other scientists; while philosophers and theologians got the (moral) mind. We shall not enter the controversy, except as it illuminates our problem. But it is clear that the controversy has not cooled. At issue is *the degree to which the mind-self-soul is part of the human machine*, and therefore understandable in the terms that define that machine. That part not understandable in scientific (machine) terms is involved with values and morals.

Physicians, clearly, are involved in the care of the machine. They make technical decisions based upon their understanding

⁴Samuel H. Dickson, *Life, Sleep, Pain, Etc.* (Philadelphia: Blanchard and Lea, 1852), p. 94.

⁵*Ibid.*, p. 292.

of the body and its malfunctions. Pragmatically, they remain out of the area of morality and philosophy, except as regards their behavior as good men. As good men, certain behaviors are expected of them and discussed in moral terms. This morality regards their interaction with patients and other physicians, but does not define what their behavior should be concerning moral decisions in terms of their patients' lives—does not define for them, except in the most general terms (i.e., saving life) how they are to make ethical decisions that concern the patient. The famous Code of Ethics of Sir Thomas Percival, written in 1773, is explicit in many areas of physicians' behavior, but not in regard to moral decision-making about patients. (It does, however, surround the ideal physician with such a strict code of behavior that the morality of the life of a physician is strongly emphasized. As with other oaths and codes, it is consistently demanded of the physician that he lead an exemplary moral existence. Presumably it is expected that if those precepts be followed an ethical man will result. (An ethical man, it must be presumed, will make "proper" judgments.) One section of Percival's *Medical Ethics* deals with the matter of telling the truth to patients and families. It is clear that Percival and his contemporaries were as conflicted by the matter as we are today. Outright lying is little countenanced but aggressive truth-telling is also denigrated. The general attitude conveyed is exemplified by the following: "He is at liberty to say little, but let that little be true. St. Paul's direction, not to do evil, that good may come, is clear, positive and universal."⁶

While Percival's attitude seems the most common, i.e. physicians do not make moral judgments, other opinions exist. At least one writer on medical ethics felt that physicians had a more direct role to play. Dr. Richard Cooke,

⁶Percival, *Medical Ethics*, p. 188.

in an 1834 letter to Dr. Valentine Mott (a famous physician in New York City) was not persuaded that the clergy had more to offer than physicians.

The moral relations of an individual are in direct ratio to his responsibility, and next to the duties of the sacred office . . . is the responsibility of him who holds the links of animated nature and wards away untimely mortality from men. The preservation of health is implied in the creator's laws—if the physician's agency be not invested with the dignity of expressed appointment—his responsibilities to the laws of nature must authorize him to exert more or less directly an important influence upon the moral condition and happiness of mankind. . . .⁷

Hesitating at the Mind-Body Boundary

The distinction between technical matters, involving the body, and moral matters, involving the mind (the brain is part of the body), is seen in diverse sources. To be appreciated, the manner by which the mind-body distinction was handled by physicians should be seen. The following excerpts are from a book on fever written in 1798 by Fordyce:

Again certain alterations of the material part of the brain undoubtedly derange the mind . . . an inflammation of the brain in many cases produces delirium; not in all. This might lead to a belief, that the mind resides in the brain.⁸

Fordyce then produces some evidence that the mind may not reside in the brain. Then he says "all these considerations have induced a doubt in the author, whether delirium may not arise in fever as an affection of the mind only, independent of any affection in the material part of the body." After describing fully

⁷Richard F. Cooke, *Medical Ethics* (New York: 1833).

⁸George Fordyce, *A Third Dissertation on Fever*, Part I (London: 1798), p. 101 ff., for this and subsequent quotations.

what he believes to be the clinical details of the two types of delirium, Fordyce adds,

Whether the author be right or no, in supposing that there are these two species of delirium depending upon fever itself, delirium, whether it be of one species, or if both species exist, affects not only the mind, but the functions of the body also.

If Fordyce had not been able to demonstrate that delirium affecting the mind also

disorders of that organ are capable of disturbing those operations.⁹

After some further paragraphs justifying the separation of mind and body, he says "Madness is indeed an awful malady, and might at first sight convey an impression, that mind itself was liable to the changes and decay of our material structure. . . ." And finally, "If these premises be correct, to restore the organ through which the mind chiefly operates, to a sound condition will be the best way to remove madness."

As we read the two previous authors we perceive their uneasiness with the effect on their work of the mind-body problem. They are not quite ready to stop at the interface or they are not sure where the interface lies. At first, they seem unsure of the boundaries of body, but they are also searching for formulations which would be more acceptable to their conservative colleagues than would outright statements of a desire to work directly with mind or even manifestly attempt to influence the mind through the body.

Jerome Gaub displayed less hesitation at the borderline. L. J. Rather has translated and provided an introduction and commentaries to two mid-18th Century essays of Gaub, professor of medicine and chemistry at the University of Leiden. The whole is a fascinating insight into the mind-body problem in medicine. The freshness of Gaub's essays make clear how much history has been forgotten in the brash rush of this technical era, and further suggests that the present technical era of medicine is merely another step in the history of medicine, rather than the culmination of that history.

Although the investigation and regulation of the faculties of the human mind appear to be the proper and sole concern of the philosophers, you see that they are in some part nevertheless so

We perceive

the uneasiness of these authors with the effect on their work of the mind-body problem. They are not quite ready to stop at the interface or they are not sure where the interface lies.

affected the body, intervention by a physician would not have been justified!

A similar attitude is demonstrated by Armstrong in a book on fever.

It will have been perceived, that I consider insanity as the effect of some disorder in the circulation, whether produced by agencies of a corporeal or mental nature. It might be shown by familiar facts, that the brain is the principal organ through which the operations of the mind are performed; and it does not, as many have supposed, necessarily involve the doctrine of materialism to affirm, that certain

⁹John Armstrong, *Practical Illustrations of Typhus Fever* (1st American ed., Philadelphia: James Webster, 1821), pp. 403 and ff., for this and subsequent quotations.

little foreign to the medical forum that while someone may deny that they are proper to the physician, he cannot deny that physicians have the obligation to philosophize.¹⁰

At some length, Gaub explores the various metaphors used to exemplify the relation of mind and body. He moves from the concept of body as prison-house of the mind to Leibnitz' parallel harmony, with stops at various other views. But finally he finds none satisfactory.

... I shall dismiss all else and deal rather with that which a plain and exact survey of the human economy teaches of this mutual fellowship. ... I confess openly and state plainly that I know and understand nothing of all these things; and moreover, I have no hope that man will ever be able to understand them.¹¹

In a section entitled by the translator "The physician's duty is to care for the whole man; mind and body are abstractions," Gaub goes at length into the practical nature of understanding the interaction of mind and body.

Hence the reason why a sound body becomes ill, or an ailing body recovers, very often lies in the mind. Contrariwise, the body can frequently both beget mental illnesses and heal its offspring.¹²

Thus we have seen over centuries the physician, unable to abide comfortably with the mind-body distinction and yet recognizing and respecting it in the very act of rationalizing his trespass into forbidden territory—unless like Gaub he cuts the Gordian Knot by adopting the attitude of the pragmatist, taking into his realm that which seems useful, abandoning morality and moral disputation as his overt concern.

¹⁰Jerome Gaub, *De Regimine Mentis*, trans. and introd. by L. J. Rather in *Mind and Body in Eighteenth Century Medicine* (London: Wellcome Historical Medical Library, 1965), p. 40.

¹¹*Ibid.*, p. 48.

¹²*Ibid.*, p. 71.

Today we are justified in having greater concern over the physician's moral judgments. This is particularly true when we see that he still protects himself from a realization of the moral aspects of his work by insisting that he just makes "technical decisions"; yet the scope of his technical decisions seems more threatening than ever. On the other hand we should be somewhat comforted to realize that the dispute over who can lay claim to the various realms within man has been going on for quite some time—at least since Hippocrates.¹³ When philosopher-priest-healer stopped being one and the same person, the inheritors of each piece of the mantle started arguing. It seems that they have been arguing ever since.

In Summary

To sum up: the answer to the question, "where does the physician get the right to ethical decision-making?" has turned into a complex of answers to a complex of questions.

From its very origins, the art of medicine has combined both care for the body and values about life and health. Such concern for morality is not a generaliza-

¹³In the first essay of his works Hippocrates separates medicine from magic and religion. Further, he tries to free it from philosophical speculation on the nature of things, pointing out that philosophy is not so necessary to medicine as medicine is to philosophy. "Certain sophists and physicians say that it is not possible for anyone to know what man is (and how he was made and how constructed), and that whoever would cure men properly must learn this first. But this saying rather appertains to philosophy, as Empedocles and certain others have described what man in his origin is, and how he was first made and constructed. But I think that whatever such has been written by sophist or physician concerning nature has less connection with the art of medicine than with the art of painting." *Works of Hippocrates I*, trans. by Francis Adam (New York: Wm. Wood, 1886), p. 143.

tion of expertise but an accepted part of the physician's role, and is so recognized by the society, though largely in a covert manner. The doctor derives his right to ethical decision-making from the society and from the individual patient. But he and his patient protect themselves from the awesome implications of that responsibility by hiding behind the belief that doctors only make technical decisions. In the dispute over the borderline between mind and body, the physician,

whose claim is body, has enlarged his horizons, as larger pieces of the whole man have seemed to be understandable in scientific terms. However even this brief glimpse of the mind-body battle gives some understanding of why the "historical unconscious" of the scientist makes him so fear the term value. We come to understand that we are parties to a dispute that seems at least as old as Western history and whose final resolution seems at least as far away.

CONTRIBUTORS

PAUL SIEGHART is a retired Barrister and Convenor of the Working Party that produced the article in this issue.

ROY BRANSON is Associate Professor of Christian Ethics at Andrews University, Berrien Springs, Michigan.

ROBERT M. VEATCH is Associate for Medical Ethics at the Institute of Society, Ethics and the Life Sciences, Hastings-on-Hudson, New York.

MIRIAM SIEGLER is a Research Associate in Experimental Sociology at the Bureau of Research in Neurology and Psychiatry in Princeton, New Jersey. With Humphry Osmond, she is writing a book, *Models of Madness, Models of Medicine* to be published by Macmillan and which will contain the material in this article.

HUMPHRY OSMOND is Director of the Bureau of Research in Neurology and Psychiatry in Princeton, New Jersey.

ERIC J. CASSELL, M.D. is Clinical Professor in Public Health at Cornell University Medical College, New York.

MARC LAPPÉ, an experimental pathologist, is Associate for the Biological Sciences at the Institute of Society, Ethics and the Life Sciences, Hastings-on-Hudson, New York.

JUNE GOODFIELD teaches the history of science and medicine at the Universities of Sussex and Michigan. Among her books are *The Fabric of the Heavens*, *The Architecture of Matter*, and *The Discovery of Time* (with Stephen Toulmin), and most recently *Courier to Peking*.

1. The first part of the paper is devoted to a general discussion of the problem of the origin of life. It is shown that the problem is one of the most important and interesting in the history of science. The author discusses the various theories of the origin of life, and shows that the most probable one is the theory of spontaneous generation. This theory states that life originated from non-living matter, and that it has since developed into the various forms of life that we see today. The author also discusses the evidence for this theory, and shows that it is supported by a large number of facts. Finally, the author concludes that the theory of spontaneous generation is the most reasonable one, and that it is the only one that is supported by the facts.

2. The second part of the paper is devoted to a detailed discussion of the theory of spontaneous generation. The author shows that this theory is based on the fact that life is everywhere, and that it is impossible to find a place where life does not exist. This fact, the author argues, is the best evidence for the theory of spontaneous generation. He also shows that the theory is supported by the fact that life is found in the most hostile environments, and that it is able to survive in the most extreme conditions. Finally, the author shows that the theory is supported by the fact that life is found in the most remote parts of the universe, and that it is able to survive in the most inhospitable environments. The author concludes that the theory of spontaneous generation is the only one that is supported by the facts, and that it is the most reasonable one.

