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CODE BREAKING: GENETIC ENGINEERING AND ETHICS*

DAVID COOK

I. CONTEXT

When I went to University, a Salvation Army Captain gave me a promise box. I shared a house with a couple of medics, and in the mornings we'd read the Bible and pray together. Then we would pick a promise from the box of rolled up texts, using a pair of small tweezers – a promise to send us out into the world of academia. Every now and then we'd get a really lousy text. So we'd put it back and we'd pick another one, and another one, until we'd found a nice comfortable text! Sadly, the way we often use the Bible is like that: we take the text out of its context. Sadly, the way we approach many issues of the day is that we fail to put them in their proper context; the reality about genetics is that there is good news and there is bad news.

Whenever I go shopping I'm always amazed at the fresh fruit and vegetables: all those apples exactly the same size, exactly the same shape, exactly the same colour. When I look at the apple trees in my garden, all the apples are different shapes and different colours and different sizes. From the supermarket I enjoy the benefit of apples which have been designed by genetic engineering. Steak is now specially designed to be lean and minimum fat. Genetics enables us to do that. In terms of food, animals and plants, we enjoy the benefits of genetic engineering.

Now, of course, we're able to apply this to human beings. It's being applied in a major way throughout the world as a whole in attempts to map the human genome, to set down the basic structure of human beings. And as research is going on all over the world, particularly in the UK and in the USA, we're discovering more about the link between our genetic make-up and the diseases we contract. So, whether it's Huntington's Chorea or Muscular Dystrophy or Haemophilia or Sickle-Cell Anaemia or Down's Syndrome, whether it's forms of breast cancer, whether it's heart disease, whether it may be issues of

* The Laing Lecture 1996. Editor's note: special thanks to Diana Sheppard for long and careful work on the first draft of this paper.

criminality or intelligence or homosexuality: is there some kind of genetic base, genetic link?

Medicine exists in order to help us cope with and overcome the problems of disease. Our expectation is that modern medical technology will be able to do remarkable things. Yet even though we have the capacity to do things, we are still left with the question: ought we to use it? Is there a technological imperative which says just because we can, therefore, we ought? Technology has been limited, and there is a recognition that technology *needs* to be limited. But how should it be limited?

Initially we used to ask: would the doctor do this to himself or herself? If they would then we would allow the research to go on. Then we discovered that some doctors will do anything to themselves for the sake of their theory! So then we had a new principle: would they do this to a member of their family? (Then we discovered that some doctors will do anything to their family!) We need to limit technology. Warnock, of course, limited experimentations on human embryos up to fourteen days. Research has always been limited by the notion of informed consent.

There are limits about what we are able to do in terms of trans-species work. Trans-species fertilisation is permitted – you can take hamster eggs and male sperm and test the mobility of the sperm – though trans-species gestation is not permitted. We're not allowed to use a sheep's or a pig's womb to carry a human being.

It's interesting how the community of geneticists have drawn their own kind of limits. One of the limits is that they have properly said: let us continue to explore somatic cell therapy, which is designed to look at a particular body and to see whether or not the structure of that body, the genetic make-up in that body, can be adapted, changed or replaced for the benefit of that individual. But let's not cross the line and interfere with the germ-line, the germ-line which would begin to affect the next generation and the generation after that.

I think part of the concern in the genetics community has been an awareness that, as so often in medicine, there's been a concentration on the negative – we've been looking for disease, for illness, or breakdown. In that search for the negative, sometimes we may have overlooked the positive. If we were to get rid of a particular germ-line which seemed entirely negative – Sickle-Cell Anaemia, for example – the danger is we might get rid of the benefit, the benefit of a natural immunity from malaria which goes alongside Sickle-Cell Anaemia.

Thus, the context, medicine, is there to look at disease, and the genetic benefits are tremendous, but now we're beginning to apply it to human beings. How do we limit technology?

II. GENETIC TESTING AND SCREENING

First of all we have to understand what genetic understanding can bring to and for us. We begin by focusing on genetic testing and screening.

1. Testing

The Nuffield Council for Bioethics suggested that we ought not to test people for a genetic disease until and unless there is a cure for that disease. If that was the case, then much of the testing would actually grind to a halt. So instead, there's been the view that we ought not to test people until and unless they've received counselling. But that in itself creates a problem, because who does the counselling? The doctor? The geneticist? A trained counsellor? Or perhaps someone who is already affected by that particular genetic disorder? Indeed, the archbishops have been approached to supply people from the church who might become genetic counsellors, because the demands on the Health Service might be so great in years to come.

This kind of testing can only happen in the context of consent. When the doctor examines you, you might need to get undressed. Is that giving consent? If he asks to take your blood pressure, you hold out your arm. Is that giving fully informed consent? When the doctor is about to engage in some procedure, do we really understand all that is contained in that procedure? I have a friend who works in a diabetes clinic and theirs is a very complicated consent form. He says he gives the consent form to the patient and waits for that moment when the glazed look comes in their eyes, and then asks them to sign! Now, he knows only too well that that's a travesty, and it's thankfully a rare travesty of the notion of fully informed consent. But how much information is full information? The general rule for doctors is: if the risk is less than 5% then it's not really significant. (Although, of course, it's highly significant for the 5% who suffer from that particular problem.) So, what is fully informed valid consent, where one is genuinely able to say 'no', where there is an ability to reject a particular test or a particular screening?

The standards are very high within the area of genetics, and the desire is to inform patients and families as fully as possible, to make

sure that there is a valid and voluntary willingness, and that adequate counselling is given. But that can still create problems. We had an Asian couple who presented in the genetics clinic in Oxford. The wife was a carrier of Huntington's Chorea, which is a horrific disease. They had one child who was also a carrier of Huntington's Chorea, and the woman was pregnant again. She had come for the test to see whether the child *in utero* was or was not a carrier. When she and her husband came back for the result the genetic counsellor said: 'Good news, the baby is perfectly normal.' The woman then said, 'Well, is it a boy or a girl?' The counsellor said, 'Why do you want to know?' She replied, 'Well, if it's a girl we'll abort her because we don't want any more females in our community.' Is being female a genetic abnormality?

The difficulty, then, with genetic testing is that we are then able to identify what some people might call 'abnormalities'. But what is 'normality', what is a handicap, and what are the criteria we might use to decide? And once we begin to screen and test for handicap, what does that say about people with handicap in our society?

2. Screening

There are problems with screening, because of particular groups of people who might be at risk. For example, Jewish people are much more liable to Tay-Sachs disease, or some Mediterranean groups are subject to certain other thalassaemia kind of diseases. What sometimes happens is that the community takes it upon itself, with the aid of the religious authorities, to begin to get rid of that particular deformity. So in Cyprus, the Orthodox priest will require a couple to be tested before he will agree to perform a marriage ceremony, and if they are liable to produce a child who will be affected by thalassaemia, they will not be married.

In the Orthodox Jewish community in New York, every child at sixteen is given a genetic test and the result is put in a bank area. When a matchmaker is called to arrange a marriage, the very first thing she does is to phone the bank of information to discover whether or not the two individuals are genetically likely to produce a child suffering from Tay-Sachs disease, and if they are then the match is not made. The screening begins to discriminate against particular individuals. Of course, we've seen the ultimate kind of fear – the fear that screening and testing might lead to a programme of eugenics, a programme whereby we try to create a superior kind of group. It would be very handy if you owned a hop farm in Kent to have a child who had very long arms – think of the money you could save! Or if you had a deep-

sea diving school in Bermuda, to have a child who didn't require much oxygen to breathe underwater – again, it would be very cost-effective!

III. CONTROLLING INFORMATION

This kind of information raises questions about control. Who controls the information?

1. Confidentiality

We live in a world where confidentiality is very important. In the hospitals in Newcastle they examined how many people have access to your confidential file. You'll be delighted to know there are only 162 people who have access to your confidential file in hospital! Privacy is very important, and that's why we have laws about data protection. But once we begin to place people on a genetic register, how safely kept is that information?

2. Employment

How safely kept is information in terms of employment? It would be very useful for employers. Let's imagine that London Bible College, say, is looking for a new employee, and they say, 'Well, you are obviously the best man or woman for the job, but before we appoint you, please could we have a little look at your genetic make-up to make sure that by the time you're thirty you will not have developed Huntington's Chorea, by the time you're forty you will not have developed heart disease, by the time you're fifty you will not have developed cancer.' Employers could perhaps begin to discriminate by requiring people to have a genetic test before they were able to take on employment.

3. Insurance

What's true in the area of employment might also be true in terms of insurance or of mortgages, because insurance and mortgage companies are in the business of lowering risk and increasing profits. That's the nature of insurance, and if there is any evidence whatsoever that some groups of individuals may be at higher risk than one can understand why those companies might discriminate against them. Sadly, the example of HIV and AIDS does not fill us with very much confidence, that insurance companies will be able to regulate themselves in a way

which does not discriminate against people who may well require all kinds of insurance and mortgage safeguards.

On the other hand, of course, we have to recognise that family histories are already available, and when we fill in forms for insurance or mortgage often we give permission for our medical advisers to be consulted, and part of that consultation can involve asking questions of our family history; already much of that information might well be available.

4. Public policy

Controlling information is not just a matter of employment or insurance or mortgage, it's also a question of public policy – and the kind of control and safeguards necessary here. That's why there have been a series of committees, the Clothier Committee and then the House of Commons Select Committee, looking at this question: should we have an overall public policy, not only for genetics itself, but for the controlling of information about genetics? In part, this is a response to concern about public perception.

5. Public perception

Public perception is important. We're delighted about the amazing benefits of medical research, but we're not so happy with the downside, the dangers. There is the danger, perhaps, that within part of the genetics community there may be a drip-feed of information, that instead of burdening society with all that is currently known, perhaps it's better to allow the information to seep out more slowly in a way which is more acceptable. I've heard particular leading geneticists suggest that we must not frighten the public, but control the giving of information.

There is also the danger that some groups are actually propounding an understanding of genetics which in effect limits human beings. There was a campaign on the part of the British Association for the Advancement of Science; they went round various London railway stations advertising 'genes r us', as if we are nothing more than our genetic make-up.

There is also the question of public perception in terms of education. Perhaps, in schools, we need to be beginning to help our children understand the nature of cell biology, molecular biology, the way in which our genetic make-up affects all of us.

But the media doesn't always help. I think of the media scare over whether or not there was a homosexual gene. I recall taking part in a very interesting debate on Radio 4 where, for a change, I was the voice of sweet reason in the middle. On the one side I had Tony Higton and on the other side I had a representative of the Lesbian and Gay Christian Movement, and there was I, plumb in the centre. They were talking about whether there was or was not a gay gene, and those from the Lesbian and Gay Christian Movement were very concerned that if a test became available, and if parents realised that their child was indeed a carrier of the homosexual gene, then they would immediately abort. Richard Corker turned to me and said: 'Dr Cook, please use all your influence to stop this terrible threat of abortion.' I remember this same man pleading that the rights of women meant that women should always have the right to abort for any kind of reason at all; and so there was an interesting turn around when they themselves felt under threat. The media has much to answer for the way it picks up one aspect and then portrays it in a way which makes the part seem like the whole.

6. Family

Then there is the control of information in the area of the family. A recent Radio 4 programme had a piece on genetic testing and whether or not, if a family member were tested, other family members had the right and the freedom *not* to know. It's a difficult area: if one particular family member is tested then inevitably there is a question for other members of the family. The programme told of a couple of harrowing cases – one of breast cancer and the other of Huntington's Chorea – and of how individuals within the same family had made different decisions. On the one hand, people saying: yes I want to know, I want to prepare myself, I don't want to live with the Sword of Damocles hanging over me and wondering every time something happens – is this the onset of the disease? But, on the other hand, people saying: no, how could I live with that kind of death sentence? I'm better just to live a day at a time and to make the most of it – I couldn't cope with the knowledge.

Different people will react in different ways. The knowledge that one brother or sister has, or one parent or child has, will affect other members of the family. If there is a right to know our genetic make-up and our genetic predispositions, is there also a right *not* to know? It's made difficult because some families want to prepare for what might

be an inevitable situation while others are concerned to maximise choice within a family.

7. Ownership

Controlling information is not just an issue about the public or about the family, it's also an issue about science itself. It's interesting that in all academic institutions today, we're either PRATs or we're in a TRAP! If you're a PRAT, you're interested only in Publication, Research, a little bit of Administration, and Teaching if you really have to! If you're in a TRAP, you spend your life Teaching all the time, trying to do a little Research, trying to do some Administrative work, and every now and then trying to Publish.

That pressure is to be found in all academic institutions, and it's a pressure which scientists are feeling. If as a scientist you discover something in your lab, it doesn't belong to you anymore, it belongs to the University. It's intellectual property. Does the scientist own the information or, for example, does the donor – the person who donated that particular piece? This is important because of the danger and the possibility of commercial exploitation. There's a famous case in California, *Regent versus Moore*, where a particular individual, Mr Moore, had part of his anatomy removed, and the doctor was able to develop a very economically successful test from that piece of material. When Mr Moore discovered how much money the doctor had made he thought he would like a little piece of the action in return for the piece of himself! But the doctor argued that the piece of himself belonged to the doctor, because if it had been left to Mr Moore it would just have been thrown away, and it was the doctor's own knowledge and expertise which was able to use it. So who owns? Who exploits this genetic information? Are we in the business of science for science's sake or are we in the business of trying to bring benefit to others?

One of the things I find most impressive when I'm talking to groups of geneticists is the genuine desire to make a difference, often to very small groups of people who are suffering in horrific situations. I don't meet very many who are interested in pure science itself – but there are inevitable tensions and pressures. At Green College, we were approached by people from the Mars Foundation, who said they wanted to set up a fellowship in nutrition. They wanted to find out whether eating Mars bars was good for you or not – as if this was a real question! They were willing to put up substantial amounts of money. The little catch was that they wanted to control the results of the research, and they did not want it to be published if it was negative

towards that particular company. The academic institution said they could not control that information. But does the person who pays the piper get to call the tune? Do they get to control the information?

Of course, the matter has come to a head in terms of patenting. There are American companies who want to patent the new discoveries about the genetic code, our genetic make-up. Here is something which is natural, which is a scientific area of knowledge, which ought to be available to all of humankind. Should we allow it to become a commercial product, which is then bought and sold, which is controlled for the financial benefit of the few rather than for the good of the many?

IV. GENETIC TREATMENTS

What about genetic treatments themselves? These fall into three broad categories: (1) Gene therapy, (2) Gene replacement, and (3) Gene manipulation.

1. Gene therapy

What we're trying to do here is to take an individual body and to put something right. The difficulty is that many of the diseases which have a genetic component are not simply dependent on that genetic component. Both my parents had heart disease, and so it's likely that I'm carrying the gene for heart disease. But that doesn't mean that I will necessarily die of a heart attack, because that also depends on my environment, my lifestyle, my diet and my exercise. (On which basis, I'm guaranteed to have a heart problem!)

There's a multi-factorial understanding of many particular genetic problems. So when we're beginning to talk about therapy, we must remember the context, where not all genetic problems are simply one on one in relation to disease; there may be other factors to consider. Those other factors create problems not just for this one generation but for the next generation. There is a balance between the risks and the benefits. Do the means always justify the ends? What are the kinds of limits? Particularly, what are the limits if you screen and if you test and discover that there is a child, an embryo, which is already carrying some kind of genetic disorder which will certainly lead to a particular disease?

Now, I don't think there is any necessary link between genetic screening and testing and abortion, and even less of a necessary link between genetic screening and testing and sterilisation. But for many

people, particularly in the public perception, it seems that if you go for a test, then an abortion is the automatic result. There might be many reasons why a man or woman or couple want to have some kind of test apart from abortion, but it does raise the issue of what we are to do with that information. What are we to do with that information for the child *in utero*, and in relation to possible children who might be born?

This raises issues of control for the individual. Is there some way in which we ought to limit an individual's freedom to produce children because he or she carries a genetic disease which will inevitably be passed on and which will produce long-term disadvantage to society? So, for the sake of the many, do we limit the freedom of the individual? Within the family context how do we allow individuals to arrive at different conclusions? I think of one family where the grandmother had Huntington's Chorea, her daughter had Huntington's Chorea, and the daughter had two children, a boy and a girl. They were faced with the question – should they be tested? In the end, the granddaughter was tested and discovered that she was carrying the Huntington's Chorea gene, and has since had two children. The grandson was tested, found that he was carrying, and decided not to have children. People come to different conclusions and it's difficult for families and society to cope with that.

2. Gene replacement

Much work is being done in the area of gene replacement. Gene replacement produces artificial genetic make-up and delivers it into the system.

Recently, I took part in a conference of people working with Cystic Fibrosis. One of the difficulties they encountered was that they had designed a special spray to deliver artificially created genes into people who were suffering from Cystic Fibrosis, but because they'd been concerned about not crossing the germ-line, not affecting the next generation, this treatment was only available to young men. And so the question then was: is this just and fair? Should young women be debarred from having this treatment which might bring a reduction in the symptoms, and might produce some long-term benefit? They had to readjust the trial so that the women were put on the contraceptive pill so that they would not become pregnant, and that there would not be a problem with the germ-line, but so that they would have this possible benefit available to them. This is a problem of the benefit to the individual and the benefit to others.

3. Gene manipulation

The aim of much genetic work is to develop gene manipulation, where we're able to manipulate where there's a genetic fault. Then we can begin to limit disease. But is there a difference between limiting disease as opposed to enhancing particular kinds of qualities? Should we move into the area of 'designing' babies? Not just choosing the sex but actually designing the characteristics – blonde hair, blue eyes? Should we begin to manipulate genes so that we could develop particular organs? In much of our society, transplantation is held back because there is a shortage of organs. If we were *able* to produce and develop organs, why should we not do so? One of the problems in transplantation is the high rate of rejection. Why should we not produce lots and lots of material which will be non-rejected? If we can use genetic material and design particular organs then there would be a benefit for that particular individual. Perhaps we should be beginning to use animals and mixing human and animal genetic material so that we develop organs – livers and kidneys – which will be more easily transplanted than they might be simply from human to human. Perhaps we should, as many have now seen I'm sure, grow artificial ears on the backs of mice. We are able to do these things, but *ought* we to do them? And remember, all the time in terms of food, in terms of animals, in terms of vegetables, in terms of fruits, in terms of flowers, in terms of plants, we accept genetic manipulation, so why draw the line when it comes to humans?

V. ISSUES IN MEDICAL SCIENCE

I think it's important we try to step back from the particular areas to reflect on the broader issues at stake, and I want to do this in two ways. I want to reflect first of all on the issues in relation to medical science and then on the areas from a Christian perspective.

1. Resource allocation

It's interesting to note that people interested in policy-making see one of the main issues that genetics and code breaking are creating for medicine in the west is the issue of resource allocation. Very often, when I'm talking on medical ethics in general, I say this is the major question which faces us, as we see a health service under tremendous pressure, where the demands are too great and the resources are too small. How are we to cut the cake? How are we to allocate our

resources? How are we to decide whether or not to test or to treat? You see, if we know that 1 in 200 people will die from colonic cancer, if we know that we can test the population, if we know that we can actually do something about it, if we know that there is a real cost benefit, then surely we should do it. On the other hand, if heart disease is multi-factorial, what on earth is the point in testing many people in the population if in the end it's much more about environment, diet and exercise? Should we be testing people if indeed there is no cure? How are we to get the balance right between preventing disease, caring for people who suffer from a disease, and seeking to cure people from that disease? Are we to make judgments in relation to the severity of the condition – how severely does it affect people? Are we to talk about the rate of incidence – is 1 in 200 significant and 1 in half a million insignificant? And how are we to respond in relation to diseases which have many factors?

2. Values in science

There is another issue in medical science, and it's an issue which I find scientists more and more willing to talk about: the area of values in science. I do not believe that there is such a thing as value-free science. All science has certain values at its heart. But which values? What are the sources of those values? And most of all perhaps, what is our understanding of human being?

VI. CHRISTIAN ETHICS

In teaching Christian ethics, it's very important that we try to bring a Christian perspective on the world's problems – a perspective on life as it really is. I think one of the dangers in all Christianity, but perhaps particularly in evangelicalism, is that we like to simplify. We sometimes simplify so much that we *over-simplify* and we don't face up to the genuine complexity which confronts us in the world. It's not easy for geneticists; it's not easy for individuals who are carrying a particular genetic disorder; it's not easy for families in that setting; it's not easy for health service administrators to make hard decisions. But I think as Christians we have something to say. We have to say that when it comes to genetics we need to beware of *reductionism*, which reduces people to nothing more than machines, as if they were nothing more than their genetic make-up, as if they can say 'genes r us' and that's all there is to us. Whereas, Christians believe in whole people, people who are not just physical beings, people who are not just

emotional beings, people who have a spiritual dimension, people who are whole people living in whole communities in a web of interpersonal relationships. We need to deal with the whole person in the whole context. It would be desperately sad if, in discovering more and more about our genetic make-up, we removed that good move that is in so much of medicine today to see the whole person and to treat the whole person in relation to the whole community. It's a valuable insight, one which I believe comes from the Judaeo-Christian perspective.

We need also to beware, not just of a reductionism which reduces people simply to their genetic make-up, but of a *determinism* – a determinism which is a closed, physical, genetic determinism which suggests that there is no prospect of human freedom, where there is no ability for people to do anything other than to behave as their genes drive them. It was interesting to take part in the British Association for the Advancement of Science seminar in genetics, and it was fascinating to see the concern on the part of all those who took part in that particular gathering to emphasise the freedom of the individual, the need for choice, the need for individuals to be able to be different. That's why they were so concerned about ideas that genetic make-up produced certain kinds of criminality, or that genetic make-up produced a certain level of intelligence. Imagine if it was the case that our intelligence was solely related to our genetic structure, and we discovered a technique for enhancing intelligence. So 99% of parents use this to enhance everybody to a higher level and 1% of parents doesn't do that. Then the child who is born intellectually inferior sues that parent for failing to give him or her all the opportunities they could have had.

It is important to look at the integrity and the worth and the dignity of the individual. You must not forget in medicine, and good doctors never do, that the individual is crucial – the individual in his or her wholeness, in their integrity – and it is crucial to give them the kind of dignity that they require. That's why we're so uneasy about some of the moves which seem to call into question the worth and the value of people with disability. It makes them seem as if they are second-class citizens, and sadly that's often the reflection of society's attitude. But that's no reason to accept it, it's no reason to reinforce it, and it's no reason to consolidate it, particularly in certain forms of legislation. The individual is important because we believe that human beings were created. As created beings they are answerable, and we are answerable,

to God. That's what responsibility means – the ability to give an answer, to respond to God, to make choices for good as well as for evil.

It is a freedom which brings with it a responsibility for others, a responsibility for the protection of the vulnerable. We need in our society to recognise that one of the advantages of beginning to use and apply the techniques of genetics is that it identifies people who are vulnerable. Do we then get rid of such people or do we then give them greater protection? Are we able to identify people who require more from us as a society rather than less? Are we in the business of justice rather than of discrimination? Are we in the business of freedom rather than coercion? Are we somehow trying to balance the good for the individual over and against the good for the community? And, in particular, do we tell the truth? One of my concerns in dealing with medical science is the need for medical scientists and doctors in general to be honest with patients. So often there is an unwillingness to be honest, or an argument that it's in the best interests of the patient not to be honest. So the patient is often not consulted about what he or she judges to be in their own best interest. We need to be very clear that truth-telling in science, and truth-telling in the public realm, is fundamental to our well-being.

VII. SO WHAT?

What difference does all this make? Genetics affects all of us. We all have a responsibility for this knowledge and for what will happen with this knowledge. And I believe that as individuals, and particularly as Christians, we can make a difference. In fact, I'm amazed how easy it is to make difference. It's easy with respect to the world of the media: every letter you send to the BBC counts for a thousand viewers, a hundred letters will stand for a hundred thousand viewers. How else are they to judge what the public are saying except by the telephone calls and by the letters they receive? Let's not leave genetics simply to scientists or to ethicists. All of us are affected and all of us in society have certain values.

I recently sat in the National Curriculum discussion where Dr Nick Tate and Sir Ron Dearing talked about the 'collapse' (and these are not Christian people talking) of western civilisation, because there is no longer a core of societal values, and until and unless we return to those fundamental values in society as a whole, until we encourage our children not just in school but in families and in the whole of society, to return to those fundamental values, then our society is in danger of

collapsing. Here was an opportunity for Christians to reinforce the values that God has given us in his Word. But it's not only a cry from people who are designing national curricula, it's also a cry from professional bodies. It's been interesting to see professional bodies, Royal College after Royal College, saying that they are worried about the collapse of values in medicine, and expressing the need somehow to return to the core of medical values. As a society what values do we believe in fundamentally? In terms of the public, what kind of information, what kind of morality is there, and how does that morality then begin to express itself in terms of the law?

I believe that as Christians we have at least a two-fold duty. On the one side I believe that because government and those in authority are God-given, there is a responsibility on their part and on our part to restrain evil and to reinforce goodness. So wherever we can be in the business of restraining evil, wherever we can be in the business of reinforcing goodness, the Christian voice should be there supporting those who are doing that God-given task.

But that's only part of our responsibility. We are also called to be salt and light, to penetrate and inter-penetrate the world of work – not only the world of the academic cloister or the ivory tower, but the world which actually makes a difference to all men and women: in their homes, their families, their communities, the work-setting, the hospitals. We need to be salt and light in our society, and we need to spread the Good News; we need to live out the values of the kingdom.

I was once invited by the Open University to give a lecture on the proofs of God. In one hour, I managed to give 26 different proofs of God. To be honest, it was 25 different ones and the 26th was the cumulative case where you add them all together! I left two minutes for questions, and one guy got up at the back and said: 'Dr Cook, I have only one thing to say. There is only one thing that prevents me from becoming a Christian.' And I thought, 'Come on, you tell me what it is. I'll knock it down and you will be gloriously converted!' He said: 'Dr Cook, the only thing that stops me being a Christian is that I can't see any difference between the way Christians live and the way non-Christians live.' I have to tell you, I didn't have a clever or a witty answer to that because so often it's true. And until and unless we live differently, and show the difference that Christ makes – whether in genetics or the rest of life – nobody will take us seriously.