

JÜRGEN MOLTSMANN

From Physics to Theology – A Personal Story¹

I was never a learned scientist. I was not even a student of physics. But science is for me a ‘paradise lost’. Chemistry, physics and mathematics formed the dreamland of my youth. I was part of a young scientific community in school. We tried chemical experiments in hidden cellars; in friendly rivalry we told one another our newest findings in atomic physics. We were a group of schoolboys training our minds in science not only to impress our teachers. It was a wonderful time of awakening of the spirit of discovery of the truth and beauty of nature.

The end came early. In 1943, just as I was reading a new book by the French scientist Louis de Broglie, *Matiere et Lumiere*, published in German with a long foreword by Werner Heisenberg, I was called up and conscripted into the German army. I was sixteen years old. In Hamburg the school classes were distributed to the anti-aircraft batteries of the city. We were made into ‘Luftwaffenhelfer’ (Air Force auxiliaries). I was sent to a battery in Schwanenwiek, that stood on stilts on Hamburg’s large lake, the Outer Alster. It was probably on stilts to allow a wide firing range in all directions, but it also made the battery very visible from above. We already felt like ‘soldiers’; teachers however came during the day and taught us over-tired ‘warriors’ who had been on the alert during the night. It was here that Dr Magin, a teacher of mathematics, found me. I shall never forget him, he was only interested in interested students and didn’t care about the rest of the class. My friend Gerhard Schopper and I became his devoted disciples.

In July 1943 the Royal Air Force began the bombing of Hamburg. For a whole week several hundred bomber squadrons were over the city. The eastern part of the city was completely destroyed as more than 30,000 people died. During the final night of the raid our battery was bombed and destroyed. One bomb hit the platform where we were standing. A mass of splinters destroyed the firing device and Gerhard Schopper, who was standing next to me, was torn apart. He hadn’t got down quickly enough. I stood up blinded and deaf, but only slightly wounded. That night, for the first time in my life, I cried out to God: ‘My God, where are you? Where is God?’ Then I was tormented by the question: ‘Why was I not dead too, like the friend at my side? Why must I live?’ I came from a secular family and

¹ This is the edited text of a Faraday Lecture given at Emmanuel College, Cambridge on 14 February 2012.

was not religious, but in that night of terror and death my ‘wrestling with God’ began.

‘Operation Gomorrah’, that was the name the biblically versed Air Force commanders gave their first planned destruction of a big German city. When we heard this we were horrified, until we realised that during the Nazi regime more than 20,000 people were put to death in the Neuengamme concentration camp near Hamburg, and that Hamburg Jews were murdered in White Russia: Hamburg was no innocent city. As a survivor of ‘Gomorrah’ I am a survivor of these Hamburg catastrophes too and feel ‘guilty’ and duty bound to the dead because of my survival.

In my younger years I had wanted to become a scientist; after five years of war and captivity I came back a theologian. Questions about God had become more important to me, although the questions about scientific truth have always remained with me. I shall first tell you about my journey to theology, because I am indebted to Britain for this. In the second part I shall deal with the slogan ‘knowledge is power’ and the idea that science is nothing more than a way of seizing power over some parts of nature, and confront this idea with the other ideas: truth is beauty and knowledge is wisdom and wisdom is the ethics of science. In conclusion I shall deal with the question: How far does the responsibility of the scientific community go in questions of war and peace of our nations and in the life-and-death questions of humankind?

1. The long road to theology

My personal journey to theology was undertaken in prisoner-of-war camps in the UK. In 1944 I was drafted into the German infantry. We were briefly and poorly trained before being sent to the Netherlands in September 1944. British airborne troops had landed in Eindhoven and Arnhem and we were sent to stop them, though we were more the hunted ones than the hunters. Then in February 1945 a British-Canadian operation through the Reichswald began. My unit was scattered, I lost my way at night and found myself alone in the woods, until I met a group of British soldiers. I called ‘I surrender’, and they didn’t shoot me. The next morning a compassionate lieutenant gave a plate of baked beans to the hungry prisoner. I have loved baked beans ever since – for me, they taste of life!

My first POW camp at Zedelgem near Ostende in Belgium was quite miserable: 200 men in an old ammunition shed with the threat of Nazi terror attacks at night until the end of war. Afterwards we just felt numb with despair as we learned that most German towns had been destroyed, that twelve million displaced people had been expelled from Silesia and East Prussia ... but no personal news came through. We had escaped death, but we had lost all hope. The thought of there being no way out was like an iron band constricting the heart. And each one of us tried to conceal

his stricken heart behind an armour of untouchability.

The worst however took place in one's soul: Every night the nightmares of war, terror and death returned. The faces of the dead appeared and looked at me with sightless eyes. Every night it was like wrestling with the dark side of God. In those nights one was 'alone' like Jacob at the Jab-bok river fighting powers that seemed dark and dangerous. It was only afterwards, and later, that it became clear to me with whom I had been wrestling. It was three years at least before I found some healing for these dangerous memories.

We had escaped the mass death of the world war. But for every one who survived hundreds had died. One had to bear the weight of grief. My spiritual nourishment had been the poems of Goethe and Schiller. I knew many of them by heart. They had awakened and formed my boyhood emotions, but now, shut in with 200 others, I found they had nothing more to say to me. My dream of science faded.

What was the point of it all? I lost interest in life. All my senses were dulled: I had eyes, but saw nothing, ears and heard nothing. I felt nothing any more. Then something unforgettable happened to me. In May 1945 as we were pushing a truck out of the camp I found myself suddenly standing in front a cherry tree in full bloom. Life in all its fullness was before me. Deprived as I had been of any interest in life, I almost fainted with the overwhelming joy of it. I saw colours again and sensed life in myself once more. The Spirit of Life had touched me.

In August 1945 my name was called and we were taken to a ship in Ostende, sailing not for Hamburg but to London. The next morning we passed under Tower Bridge. By train we reached Scotland and ended up in Kilmarnock, Ayrshire. We had been transferred to an old, well-equipped POW camp, where only twenty of us shared a Nissen hut. After a variety of jobs I advanced to become interpreter for a working group on the streets of New Cumnock. The Scottish overseers and their families were the first to come into friendly contact with us. They met us, their former enemies, with a hospitality that profoundly shamed us. We heard no reproaches, we were not blamed, we experienced a simple solidarity and a warm common humanity. For me this was quite overwhelming. They made it possible for us to live with the guilty past of our people without repressing it and without growing callous. True, we had numbers on our backs and prisoners' patches on our trousers, but we felt accepted. That humanity in far-off Scotland made human beings of us once more. We were able to laugh again.

In September 1945 we were confronted in the camp with pictures of Bergen-Belsen and Buchenwald – concentration camps. They were pinned up in a hut, with only laconic commentaries attached. Some of us thought it was just English propaganda. Others set the piles of dead bodies against

the destruction of German cities. But slowly and inexorably the truth seeped into our consciousness, and we saw ourselves through the eyes of those Nazi victims. Was my generation the last to be driven to death so that the concentration camp murderers could go on killing people? For me every patriotic feeling for 'Germany the Holy Fatherland' collapsed and died. Depression at the extent of wartime destruction and captivity with no end in sight was compounded by a feeling of profound shame at having to shoulder a share of the disgrace of one's own people.

One day a well-meaning British army chaplain came to our camp and after a brief address distributed some Bibles. I read in the book in the evenings without much interest, until I came upon the psalms of lament in the Old Testament. In particular Psalm 39 caught my attention:

... I remained utterly silent,
not even saying anything good.
But my anguish increased;
my heart grew hot within me.
While I meditated, the fire burned ...
You have made my days a mere handbreadth;
the span of my years is as nothing before you ...
'Hear my prayer, LORD,
listen to my cry for help;
do not be deaf to my weeping.
I dwell with you as a foreigner,
a stranger, as all my ancestors were.'

That was an echo from my own soul, and it called my soul to God. I didn't experience any sudden illumination, but I came back to these words every evening.

Then I read Mark's Gospel as a whole and came to the story of the passion. When I heard Jesus's death-cry: 'My God, why have you forsaken me?' I felt growing in me the conviction: there is someone who understands you, who is with you in your crying to God, and who felt the same forsakenness that you are living through now. I began to understand the forsaken Christ, because I knew he understood me. He was the divine brother in need, the companion on the way who goes with you through this 'valley of the shadow of death', the fellow sufferer who carries you in your pain. I summoned up the courage to live again and was slowly but surely seized by a great hope for God's 'wide space where there is no cramping any more'. This perception of Jesus did not come suddenly overnight, but it became more and more important for me. I read the story of the passion of Christ again and again and discovered my little life story in his great story.

In the summer of 1946 I realised that my captivity was going to last longer than I had thought. I had been captured late in the war and would be released later than other prisoners. I heard about an education camp

in England where so-called ‘baby-prisoners’ could repeat their final school-leaving examinations that were required to enter university. This possibility really did exist in the British ‘camp culture’. I applied, passed an English language test and, guarded by a soldier with a rifle, was put on a train and travelled through sunny and so peaceful England to Norton Camp in Cuckney, near Mansfield in Nottinghamshire.

Romantically situated in parkland belonging to the Duke of Portland it was a camp intended to train teachers and pastors for post-war Germany. Set up by the British YMCA, financed by the American businessman John Barwick and guarded by the British army, Norton Camp was England’s generous gift to German prisoners of war.

Life for us at this camp was a kind of enclosed monastic existence from which time and the outside world were excluded. The day began at 6:30 a.m. with a bugle reveille and ended at 10:30 p.m. when the lights were put out. Suddenly we had plenty of time and, intellectually completely famished as we were, had set before us a rich library, put together by the YMCA and the prisoners-aid of the WCC in Geneva.

I read everything I could lay my hands on – poems, novels, mathematics and philosophy and any amount of theology, and that literally from morning to night. My first theological book was Reinhold Niebuhr’s *The Nature and Destiny of Man*, which impressed me deeply, although I hardly understood one sentence of it. Many international visitors came, among them John Mott, Visser ’t Hooft and Martin Niemöller. We had some imprisoned professors of theology who taught imprisoned students theology for free. I have never since lived so intense an intellectual life as I did in Norton Camp. We received what we did not deserve, and lived in a spiritual abundance we had not expected.

A special event which completely turned my life upside down was the first international SCM conference after the war, held at Swanwick, Derbyshire, in Summer 1947. A group of POWs were invited to attend, I being one of them. We arrived with fear and trembling. What were we to say about wartime horrors and mass murder in the concentration camps? But we were welcomed as brothers in Christ and could eat and drink, pray and sing with young Christians from all over the world. To be accepted like that was a wonderful experience.

But then a Dutch student group came and wanted to speak to us officially. They told us that Jesus Christ was the bridge on which they came to meet us and that without Christ they would not have been able to speak to Germans. They told us about the Gestapo terror in their country, about the murder of their Jewish friends, and about the destruction of their homes during the German occupation. We too could step on this bridge which Christ had built from them to us, even if we did so only hesitantly at first, could confess the guilt of our people and ask for forgiveness. At the end we

all embraced. I could breathe freely again. And – most important – I knew what I was going to do: Theology.

In April 1948 I went home on one of the last transportations of POWs. I was discharged after five years in barracks, trenches and camps. But I had experienced something that was to determine my whole life. For that reason this time for me was so important that I would not have missed a day of it. What at the beginning had looked like a grim fate became an undeserved blessing. It had begun in the darkness of war and then when I went to Norton Camp the sun had risen. We came with severely wounded souls, and when we went away ‘my soul was healed’.

When after fifty years we survivors returned to England in 1995, we visited the site of Norton Camp again. The Nissen huts had disappeared, but the great old oak trees remained. We remembered the people, who that time after the war had met us with forgiveness and reconciliation. And we thanked God with hymns.

The camp’s old commanding officer, Major Boughton, said the same thing but more dryly: ‘I have never before heard of prisoners returning to prison of their own free will and praising God for what they had experienced there.’ But that was exactly what we did with great joy.²

This is for me not only my ‘personal story’, but also the ground and motive for my theological thinking. Relevant theology is always set in life-and-death experiences, otherwise it becomes speculative. I experienced hope that enabled me to live – to survive and not give up – in those camps; hope is the last to die, as the proverb says, if at all. These experiences are woven into my *Theology of Hope* (1964). And as I have already told, the godforsakenness Jesus felt between Gethsemane and Golgatha was a consolation to me in my own feeling of forsakenness. This is the foundation of my second book *The Crucified God* (1972), and the reason this book was written in the blood of my heart, so to speak.

2. Questions of science

I shall turn now to the human, or to be more exact, the personal dimensions of science, because what led me from physics to theology were the human questions of suffering and death, of guilt and forgiveness – in short, the God question.

The question about God and the question of ‘what holds nature together in its innermost being’, as Goethe put it, are not wholly divergent. They are not even controversial. I believe they belong together and whoever separates them is damaging both. According to Plato, wonder is the beginning

2 See Moltmann, J. *A Broad Place: An Autobiography*, London: SCM Press (2007).

of all knowledge and truth is beautiful. According to the Jewish-Christian tradition, the fear of God is the beginning of all wisdom. If wonder over the phenomena of nature converges with reverence before the great mystery of the whole world, the outcome is a humble search for truth and unending joy at its discovery.

Knowledge is power

The motto 'Wissen ist Macht' was written in the popular scientific journals of my youth to say that science is the method of seizing power over nature. Through science and technology man will become 'lord and owner of nature', as René Descartes promised in his book *Discourse on Method*. This promise in fact was fulfilled in the 'scientific-technological civilisation' in the nineteenth century. Was this atheistic? No, it was religious, motivated by the Judeo-Christian creation story and explained by modern theology.

Francis Bacon, the author of the phrase 'knowledge is power', saw in the gaining of power over nature the redemption of humankind from the Fall and liberation from the subsequent dependency on nature. The goal of the scientific elucidation of nature was 'the restitution and reinvesting (in great part) of man to the sovereignty and power which he had in his first state of creation'. Man was created in the image of God and called to rule over the earth: 'Subdue the earth' and 'have dominion over the animals'. So, the more man's rule over nature grows, the more he becomes again in the image of God. God is the almighty ruler of the world, his human image must become the mighty ruler of the earth. So knowledge is power and power is divine.

Gaining power was, and is, a modern motive for the exploration of nature, but it is a very dangerous one. The twentieth century saw the politicisation of science as fascist and communist ideologies took possession of the sciences. The twentieth century also saw the militarisation of science during two world wars and the cold war that followed. The twenty-first century has brought us the economisation of science. Knowledge is not only power, but profit as well. These interests are alienating pure science from nature. Do we want to know nature for its own sake, seeking truth and correspondence with nature and finding what we have in common with nature? If so, the sciences are better preserved in fellowship with theology, than in the service of politics, economics and the military.

Has man in the name of God to 'subdue the earth' in order to become aware of his own nature as in the 'image of God'? One may continue reading the Bible. According to Genesis 1 human beings have to 'subdue the earth'; according to Genesis 2 human beings are taken 'from the earth', and dying they will 'return to the dust'. They are not divine lords of the earth, but children of the earth. The earth is not their subject, but their mother. Who can subdue his mother, rob or sell his mother?

In the great dramatic picture of creation in Job 38 – 40, a human being is very small and insignificant before God's wild and immense creation. 'Where were you when I laid the earth's foundation? Can you bind the chains of the Pleiades? Can you loosen Orion's belt?' And Job answers: 'I am unworthy – how can I reply?' This is the answer of human wisdom. True knowledge presupposes cosmic humility, as Richard Bauckham maintains, not the 'arrogance of power'. True science is bound to truth and is not for sale.

Truth is beautiful

I believe an aesthetic dimension is essential for pure science. Where there is truth beauty is also present because beauty is the 'splendour of truth'. Since ancient times truth and beauty have been seen together: 'pulchritudo est splendor veritatis'. 'Truth is the truth of being. Where the truth appears the appearance is beautiful', said Martin Heidegger. In the history of science beauty has been taken as a sign that truth is near. Truth has also been recognised in the correspondence between mind and matter, the subject and the object, the *adeaquatio rei et intellectus*. Is this only an old romantic glorification of science, or is beauty still a concomitant of every truth-seeking science?

Boethius in his *Consolation of Philosophy* was formative for the truth-concept of classical physics. The beauty of the world is manifest in its mathematical order, because all things find their harmony in numbers. Therefore this world harmony is also recognised in music. Music is the art of bringing different parts to unity through consonance. Biblical wisdom confirmed this world-view: 'You ordered everything according to measure, number and weight' (Wisdom 11: 20).

In classical and modern physics the beauty of truth was discovered in the symmetry and order of geometrical figures. Euclidean geometry was for Johann Kepler 'the archetype of beauty'. He developed a theory of the *harmonia mundi* out of the discovered symmetry of the constellations of the stars in the firmament.

Another sign of truth is simplicity: *simplex sigillum veri*. The simple is clear and distinct. Next to simplicity unity is a sign of truth. This principle was important for Isaac Newton because the reconciliation of different aspects and the unification of various theories were considered signs of stability. And stability and consistency were considered signs of the faithfulness of the creator of the universe and of the unity of God's creation.

Many modern physicists are on their way to finding the unified world formula. This may be through the unification of different theories, for example the general theory of relativity and quantum physics. One may also try to unify different theories by discovering common symmetries of resonance to each other. Beauty is also at stake in the modern physics of

complex systems and in sciences that use morphology. That is the beauty of forms and figures. ‘Fractal geometry is revealing a world full of beauty’, confessed its founder Benoit Mandelbrot. And when we understand the cosmos as an unfinished open-ended process and see the emergence of the new in time, we can discover a ‘dynamic concept of beauty’. The ‘splendour of truth’ is shining not only in timeless symmetry, but also in symmetry-breaking transformation. The becoming and the passing away of temporal forms are beautiful signs of life.

The German scientist Friedrich Cramer, well-known for his *Time Tree* and his *Symphony of Life: attempting a general theory of resonance* stated: ‘What we call beauty belongs neither to pure order nor to pure chaos. Beauty is revealed where chaos is flowing into order or order into chaos’.

What I want to say with these few remarks on the connection between science and aesthetics is this: beauty is still a sign of truth. And this is important for any ‘truth-seeking community’, as John Polkinghorne called the scientific community. Beauty is not a matter of personal taste and ‘you can’t dispute about taste’. Beauty is part and parcel of the self-revelation of truth that happens in every discovery. This beauty may be useless, but it is most intrinsically meaningful, which is more than one can say of all technical, political or economic utilisation of scientific discoveries. Scientists may be proud of their joy at the beauty of their discoveries.³ As Confucius once said:

Better than knowing the truth is loving the truth.
Better than loving the truth is rejoicing in truth.

Knowledge is Wisdom

Nature is not a ‘mechanism’ (Robert Boyle), nor a ‘world machinery’, nor a cosmos of timeless laws. The nature of the earth is full of wisdom. We humans are part of the earth, and the earth is not a meaningless accumulation of matter and energy, but an ecological system with a long evolution more like an ‘organism’ than a mechanism, more a living object than a dead one. The earth’s organism is a subject in its own right. The earth ‘produces living creatures’ (Gen. 1: 24). The earth is the only creation God has designed to create living beings. And human beings are taken from the earth.

At a certain point in its evolution the earth began to feel, to think, to become conscious of itself and to sense reverence, as Leonardo Boff has said:

³ Cramer, F. & Kaempfer, W. *Die Natur der Schonheit. Zur Dynamik der schonen Formen*, Frankfurt: Insel Verlag (1992); Schmidt, J.C. ‘Physikalische Zugänge zur SchDnheit, *Evangelium und Wissenschaft* (2010) 31, 2-17; ‘Art. Das Schone’, in: *Historisches Worterbuch der Philosophie*, VIII, 1343-1385, Basel 1992.

and at this point humankind appeared on the scene. We therefore don't stand over against the earth to subdue it, we are, in whatever we recognise or do, part of the earth's community. This cosmic community is wider than the limited parts of nature that we can see and control. Science becomes wisdom wherever we integrate ourselves into the earth's community and into the greater cosmic community.

Wisdom is the ethics of science

Wisdom doesn't come from what we experience but from the way we deal with our experiences. It is not perception by itself that makes us wise; it is the perceiving of perception. It is when we apply our consciences to science and to what we know that the ethics of knowledge emerges. We look back over our shoulder at ourselves, so to speak, and ask 'What are you doing? Is it good or evil? Does it serve life or death?' For scientists in the twentieth century the question was 'Do we serve peace or war?'

We can see the dilemmas involved if we look at two outstanding personalities, Albert Einstein and Fritz Haber.

- 1 Einstein's discovery of the general theory of relativity in 1907 was 'the happiest thought in my life'. Its proof in 1915 through the predicted movement of Mercury convinced him 'that nature had spoken to him'. The outbreak of the Second World War in 1939 raised the fateful question: 'Develop the atomic bomb in Hitler's Germany or in the Western Democracies?' Einstein made his decision and wrote his famous letter to President Roosevelt. The Manhattan project began and led to the destruction of Hiroshima in August 1945. And with this the Second World War ended, and the nuclear end-time of humankind began. Einstein became a pacifist in consequence: 'Abolish war!'
- 2 Fritz Haber was a famous German chemist and Nobel prize winner. His discovery of how to isolate hydrogen from the atmosphere made it possible to produce artificial fertilisers in peacetime, and ammunition in wartime. During the First World War it was Haber's chemical discoveries, that made the German poison-gas war possible. For this Haber was ostracised by the international scientific community after the war. The commandment of scientific ethics was clear for him: 'In peace – for humanity; in war – for the Fatherland!' His love for the Fatherland had however its limits. When the Nazis took over his fatherland in 1933 he refused to collaborate any further.

How far does the responsibility of scientists for their scientific research go? Does it include responsibility for their results, or even for what others make of their results?

In 1957 leading German nuclear physicists recognised this responsibility. In an official declaration they refused to cooperate in the nuclear

rearming of Germany, much to the annoyed frustration of leading politicians. Of course this responsibility is not restricted to the scientists and technicians concerned. It is the responsibility of all the citizens of that society. Scientists share this political responsibility in a special way. And if the whole human race is threatened by a nuclear or an ecological or an economic disaster, the responsibility rests with all human beings. It may be a good idea to discuss the introduction of the Hippocratic oath for all members of the scientific community again to make clear that we serve life, not death.⁴

Today the formula for power is principally in the hands of the scientists. But a second formula is that for the exercise of ethical power over the physical, and this formula is today still underdeveloped. The last centuries have brought such an enormous increase in scientific knowledge and technological power that what we need in the immediate future is a yet greater increase of wisdom and of wise dealings with what we know and can do. Wisdom is the love of life and the courage to be. Truth is what we seek in science and spirituality. The Beauty of God may redeem the world.

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⁴ See Moltmann, J. *Science and Wisdom*, London: SCM Press (2003).

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