



AVARSITY

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Volume 11

Living Water

**An interdisciplinary
exploration of water
as a theological theme**

Edited by

Manitza Kotzé & Kobus van der Walt

Reformed Theology in Africa Series
Volume 11

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EDITORS

Manitza Kotzé

IJ (Kobus) van der Walt



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The publisher (AOSIS) endorses the South African 'National Scholarly Book Publishers Forum Best Practice for Peer-Review of Scholarly Books'. The book proposal form was evaluated by our Theological and Religious Studies editorial board. The manuscript underwent an evaluation to compare the level of originality with other published works and was subjected to rigorous two-step peer-review before publication by two technical expert reviewers who did not include the volume editor and were independent of the volume editor, with the identities of the reviewers not revealed to the editor(s) or author(s). The reviewers were independent of the publisher, editor(s) and author(s). The publisher shared feedback on the similarity report and the reviewers' inputs with the manuscript's editor(s) or author(s) to improve the manuscript. Where the reviewers recommended revision and improvements, the editor(s) or author(s) responded adequately to such recommendations. The reviewers commented positively on the scholarly merits of the manuscript and recommended that the book be published.

Research justification

While numerous publications have recently appeared on the subject of water, reflections from theology and Christian ethics are often lacking. As such, this scholarly publication wants to add ethical value to the local and global conversations on the theme from a theological perspective. The book reflects on water as a theological theme from perspectives that originated in the disciplines of Christian ethics, systematic theology, biblical studies, natural science and law. It presents novel and innovative inquiries, primarily from a qualitative methodological viewpoint. The book unveils new themes for deliberation and provides new interpretations and insights into existing research. The authors represent a variety of academic, disciplinary and confessional backgrounds and, as such, a range of epistemological points of departure, increasing the richness and value of the contribution. The target audience of this book includes scholars, peers, researchers and professionals with an interest in migration, in particular as reflected upon from the fields of theology and Christian ethics. The chapters are based on original research. No part of the book was plagiarised from other publications.

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List of abbreviations and acronyms

BA	Bachelor of Arts degree; bachelor's degree
DNA	deoxyribonucleic acid
EXCO	executive committee
FAO	Food and Agriculture Organisation
GPS	global positioning system
Hons	honours degree
IARF	International Association of Religious Freedom
IUPAC	International Union of Pure and Applied Chemistry
MA	Master of Arts; master's degree
NWA	<i>National Water Act 36 of 1998</i>
NWP	<i>National Water Policy for South Africa of 1997</i>
NWU	North-West University
NRF	National Research Foundation
PELJ	<i>Potchefstroom Electronic Law Journal</i>
PhD	Doctor of Philosophy degree; doctoral degree
PU for CHE	Potchefstroom University for Christian Higher Education
RNA	ribonucleic acid
SI	International System of Units
UDBHR	Universal Declaration on Bioethics and Human Rights
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization

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Living Water: An interdisciplinary exploration of water as a theological theme

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■ Introduction

Water is a vital element of all life and health. Within the natural sciences, the importance of water is not only emphasised in hydrology and its various branches but it is also emphasised as an essential aspect of all created life. Without water, there can be no life, and water fulfils numerous essential functions in nature. In the field of biology, water is known to purify, nurture and heal, while the very same substance can literally, within a few seconds, change the shape of landscapes through awesome destructive power. It also serves as a habitat for a bewildering variety of dynamic, interwoven webs of life. Water can be a source of great relaxation for people enjoying

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a peaceful setting alongside a river or the ocean, but it can also be a life-threatening symptom of dehumanising ideologies where some people do not have access to this very basic need. People can enjoy drinking from a pure, ice-cold mountain stream, but that very same water can become poisonous when mistreated by humankind.

Water is also the topic of several ethical inquiries, including questions about water pollution, water management and sanitation, the ecological scope of the water crisis, the spreading of waterborne ailments, the relationship of water to geopolitical power and conflict, the desalination of salt water and fracking, among others.

Undoubtedly, water will become an ever more crucial locus of academic reflection, as noted in Christiana Peppard's (2014) concerns over how 'wars of the future will be fought over water, not oil'. Increasing water shortages worldwide and global warming of water, in particular the salt water of the oceans, beg further reflection from natural and agricultural sciences, as well as theology. As a basic human right, water is also, as Nadia Marais (2018, p. 124) remarks, 'closely connected to peace and justice issues'.

Within the field of theology, water has been reflected on in a number of ways, such as Colin Russel's 'hydrotheology' (2007), Steve de Gruchy's (2010) 'aquacentric theology' (2010) or Margaret Ferris's (2014) 'blue theology'. De Gruchy (2010, p. 198) also pointed to the noteworthy association of water not only with life, but abundant life, noting that 'without water there is no life'. De Gruchy also stressed a variety of themes, such as water as the foundation of life, water as God's gift and water as a divine symbol. This finds expression in his 'Jordan river motif', in which De Gruchy (2010, p. 200) spoke of 'an aquacentric moment in salvation history' where 'the crossing of the waters that flow from life (Sea of Galilee) to death (the Dead Sea)' functions as an ethical turning point. He placed this within a particular context: 'human choice, human responsibility, human praxis focused on the question of sustainability, of one's descendants living long in the land' (De Gruchy 2010, p. 62).

Writing on water, imagination and ethics as optics, Marais (2018) notes:

Like the river's flowing, the ethical stream shapes the landscapes of our lives. It springs forth from hard rock, cuts deep canyons, carries and deposits the alluvium of our hopes and dreams. Its ripples echo through the soul. (p. 134)

In this manner, water as a theme also offers possibilities for more metaphorical reflection.

Water is also a theme running throughout scripture. De Gruchy (2010, p. 199) notes that a number of biblical narratives 'would collapse if there were no river, no flood, no well, no pool, no sea, no fountain'. Water further features in scripture in more symbolic and metaphorical ways, symbolising

forgiveness (Ezk 36:25; Heb 10:22; Eph 5:26), repentance (Mt 3:11), justice (Am 5:24), salvation (Is 12:3), the Lord's protection and providence (Is 43:2, 44:3, 49:10, 58:11; 2 Sm 22:17; Ps 23:2, 63:1) and the water of life (Rv 21:6, 22:1-2, 17). In John, Jesus answers that 'no one can enter the Kingdom of God unless they are born of the water and Spirit' (Jn 3:5). One of the most striking metaphors, and where this volume receives its name from, is the narrative in John 4, where Jesus also answers the Samaritan woman:

Everyone who drinks this water will be thirsty again, but whoever drinks the water I give them will never thirst. Indeed, the water I give them will become in them a spring of water welling up to eternal life. (vv. 13-14)

As indicated, within the natural sciences, the significance of water is stressed as a crucial aspect of all created life, fulfilling an abundance of essential functions in nature. Water purifies, nurtures and heals, but at the same time, it also wields awesome destructive power to inflict devastating damage and change the shape of landscapes. It further serves as a habitat for a great number of creatures and a bewildering diversity of dynamic, intertwined webs of life.

In this contribution, we hope to enter into an interdisciplinary conversation between these different fields, examining water as a theological metaphor with perspectives from natural science, agricultural science, systematic theology, biblical theology, Christian ethics and law. In this manner, we intend to offer an interdisciplinary exploration of how water can function as a theological theme and metaphor. This contribution provides the fields of theology, natural sciences and law with an opportunity to bring together emerging insights on the complex nexus of problems and discussions related to water as a theological symbol. It contains a variety of contributions from a number of disciplines on this important theme.

In Chapter 1, 'The water of deliverance', Koos Vorster notes that of the many water metaphors in biblical theology, the cleaving of the Red Sea, as narrated in Exodus 14, can be regarded as momentous. In this passage, water signifies captivity and deliverance, portraying the essence of the gospel of salvation. The metaphor of water, in this instance, underlies a new motif in modern-day systematic theology. This is the 'exodus motif'. In recent times, liberation theologies have introduced the exodus motif as the hermeneutical key to reinterpreting the Christian faith, the teachings of Jesus and the moral agency of Christians. Liberation theologies employ the exodus motif as a means to translate salvation as the liberation of enslaved people by way of socio-political liberation and freedom in a new Promised Land. Over the centuries, classical Reformed theology has argued that the exodus motif – as found in the narrative of Exodus 14 and in many Old Testament references to this history in the historical, prophetic and wisdom literature – encapsulates the messianic promise of God's judgement on evil, deliverance of God's people, cleansing of sins and renewal of creation under the constant reign of

God's Spirit. The notion that the Israelites 'went through the sea on dry ground, with a wall of water on their right and on their left' (Ex 14:22) became a metaphor for deliverance and cleansing through the sacrificial blood of Christ. Furthermore, the metaphor became the key to understanding the sacrament of baptism in the New Testament. The Belgic Confession in Article 34 refers to Christ as 'our Red Sea'. In this chapter, Vorster appraises the contributions of liberation theologies and argues that they enrich the classical Reformed perspective on this metaphor. The dictum 'Christ is our Red Sea' could then serve as a potent metaphor, not only for baptism but also for the all-encompassing salvation in Christ and new life under the immanent reign of God. The metaphor speaks of spiritual deliverance in a historical and eschatological sense, as well as of the call for the concrete liberation of oppressed people based on the new ethic emanating from the historical reality of the immanent reign of God.

In Chapter 2, 'Adequate water as a global bioethical principle: A broad Protestant-theological foundation in hindsight', Riaan Rheeder notes that the Protestant religious tradition, a potential companion, was excluded from discussion during the development of the Universal Declaration on Bioethics and Human Rights (UDBHR) in 2004. On the one hand, this cast doubt on the claim to the universality of the UDBHR, while on the other hand, the Protestant religious tradition was denied an opportunity to enter into discussion with the global water ethics of the UDBHR. This chapter attempts a preliminary solution for this challenge by formulating a broad Protestant-theological foundation for the water ethics of the UDBHR. The water ethics of the UDBHR comprise two global principles: (1) all humans have a right to access adequate water (art. 14) and, emanating from this, (2) the call for the protection of water (art. 17). The two global principles can be grounded in the Old Testament and creation perspective as well as the New Testament and the Kingdom of God. It can be provisionally accepted that the water ethics of the UDBHR comply with the test of broad Protestant ethics, and these can therefore be preached by the church as kingdom ethics.

In Chapter 3, 'Saving water? A theological exploration of "water as gift"', Nadia Marais states that Cape Town, South Africa, recently faced severe water shortages and the imminent possibility of the arrival of Day Zero: the projected day on which the remaining water supply would be outstripped by water demand. Churches and faith communities responded to the water crisis in a variety of ways - including calling for days of prayer and urging communities to continue to 'save water'. A recurring theological description for water, particularly in a time of drought and water scarcity, is that of 'water as gift'; this is also seen in the work of South African theologians who are writing about water. This chapter is a continuation of work that explores the soteriological meaning of water talk in a time of drought

but attempts to do so from the theological rhetoric of gift-giving that is prominent in the work of theologians like John Milbank and Kathryn Tanner. The locus of this exploration is that of the dynamics of gift-giving, and in particular, an exploration of 'gift' from the locus of soteriology, with some suggested contours for a theological rhetoric of 'saving water'.

In Chapter 4, 'The river of the water of life: Water as a theological symbol in Christian eschatology', Manitza Kotzé remarks that the Bible begins and ends with rivers and trees. In the very last chapter, we read about the river in the New Jerusalem, with the river of life running from the very throne of God. Everything is as it is meant to be and all creatures are nourished by its water, the nations healed. In this chapter, she examines water as an eschatological symbol. As with the majority of doctrinal loci, a number of other doctrinal elements overlap the discussion on eschatology, including notions of salvation and the sacraments, as well as the important role that the symbolism of water plays within this thematic overlap. The themes of hope and peace are of particular importance in this reflection, focusing on the notion of human flourishing, not only in the hereafter but also in the present, as an integral part of Christian eschatology.

Within the interdisciplinary scope of this volume, water as a theological theme is examined not only from theological disciplines but also in conversation with the natural sciences. Kobus van der Walt affirms in Chapter 5, 'The wonder of water', that water is found everywhere on Earth and in outer space and forms an indispensable part of everything that lives. In this chapter, some of the exceptional, unique scientific properties of water are elucidated, after which contemporary natural scientific evidence is analysed to show that water not only coincidentally acquired these properties through unguided, random physical and chemical processes, but that it was designed and manufactured with great accuracy down to the finest detail by a divine, almighty Creator.

In Chapter 6, 'The deeper meaning of water: Groundwater reflected in creation', Koos Vivier notes that the Creator's signature is embedded in his creation. The components of the earth contain similarities to the Godhead (trinity) with the amazing compound that we simply know as water. Water cycling through the atmosphere and subsurface is a vital enabler for life to metabolise and function. Water is not only portrayed as the substance of life in the baptism analogue, but also in the analogue of springs of living water that could gush forth from believing Christians who receive everlasting life (Jn 4:14). Groundwater was and is to this day a significant phenomenon, vital for the Israelites to migrate out from slavery and Egypt, providing sustenance en route to the Promised Land. Without springs that formed oases (e.g. Mara and Elim), the Israelites would not have made it through the journey. Springs occur where the water table intersects the surface and can only exist in permeable rock (Jesus is our Rock) that is fractured

(Broken at the Cross) to allow the Father's thoughts (the Word, Jesus) (Is 55:8) to infiltrate and saturate our minds (the aquifer). Flow at springs is driven by natural forces not requiring human effort, just as Jesus gave his Life and Word freely to the human race.

Wells can access life-giving water stored out of sight below our feet. Although requiring human effort, it can access deeper levels and supply water that supports millions of people in arid locations. God gave us the knowledge to find his word if we dig in the soil (Jesus, the Rock) for it. It is significant, then, that Jesus engages the Samaritan woman at a well that Jacob has dug. There he explains not only the physical water that supports life but also the water that he gives for everlasting life.

In Chapter 7, 'The role of groundwater in the Bible', Stephan J Pretorius states that groundwater plays a pivotal role in the history that unfolds during biblical recordings. Groundwater can thus be considered an important element that shapes the prophetic value of these events and, as such, serves to further our understanding of the theological concepts of the spiritual reality. The importance of groundwater is evident as far back as the history of Abraham, Isaac and Jacob as the founders of Israel, the journey of Israel from Egypt to the Promised Land, various moments in the unfolding of Israel's history thereafter and concluding in the ministry of Jesus Christ. In particular, certain biblical events and their geographical settings are closely associated with the inherent geohydrological environments and characteristics of the related groundwater regimes.

This is especially true for the Jordan River, which plays a major role in biblical history and is of great prophetic value in our understanding of the spiritual reality. This river arises from springs occurring at the foot of Mount Hermon, fed by meltwater flowing along subterranean waterways from snowfall on the peaks and upper slopes of the mountain. This geohydrological scenario portrays a wealth of spiritual concepts and, as such, its prophetic value cannot be understated. Drawing a line from the role of groundwater and the related groundwater regime to a prophetic application and understanding of the 'New Testament Israel', the expected New Jerusalem to come and the reality of the eternal Promised Land is an exciting journey. Along the way, it is expected that uncovered truths will contribute to our understanding of spiritual concepts unpacked in scripture. Progress will be made by applying the groundwater reality and related science as classic 'parables' - similar to those used by Jesus to explain the deeper meaning of various aspects of the spiritual reality not physically observable by other means.

In Chapter 8, 'The uniqueness of water', TN Lemmer indicates how God reveals himself through scripture and creation. An example of this is the role that water plays in both. We read of miracles involving water in

scripture, as well as it being a symbol of a cleansing agent and an essential nutrient in the spiritual sense. But these symbolic roles are consequences of unique physical properties and vital functions in nature, which reveal God's providence to us. These are so pertinent that scientists consider the presence of water as the essential requirement for life, not only on Earth but throughout the whole of the cosmos. It is the primary substance that spacecraft attempt to detect to open up the possibility that life exists anywhere. This is because water enables life through properties like heat capacity, electrochemistry, chemical dissociation, dipolarity, hydrogen bonding and phase characteristics. Water carries and distributes the elements required in ecosystems and takes part in biochemistry. Its hydrological and biochemical cycles also demonstrate the fundamental principles of environmental sustainability. Water as a subject of study in natural sciences thus augments the revelation of scripture on God's creation and sustenance of the world.

When reflecting on water as a theological theme in an interdisciplinary manner, legal perspectives also make a valuable contribution to this conversation. In Chapter 9, 'The transformed property regime of the *National Water Act 36 of 1998*: Reflections on the notion of "water as a God-given resource"', Germarié Viljoen notes that water is an essential but critically scarce natural resource. In South Africa, a water-stressed country, this scarce resource remains unequally available to the country's people because of its extremely complex political history. Studies show that the *Water Act 54 of 1956* imitated the apartheid policy that applied in South Africa. The Act, for example, formally distinguished between private and public water. The distinction effectively promoted the segregation of development of different ethnic races.

Although the *Water Act 54 of 1956* did not explicitly determine who the owner of water was but provided that exclusive use rights of private water could be exercised by a landowner on whose property the water had its source or over which it flowed. Land ownership (which was linked to access to water) generally resided in the hands of the white minority. Consequently, low-income individuals, generally the majority of black South Africans, were denied access to sufficient water as they either could not afford it or did not have riparian land rights. This race-based discriminatory policy divided the whole of South African society.

This chapter sets out to deliberate on the proprietary implications of the concept of public trusteeship in South Africa's water law and draws from it new ideas and understanding of 'water as a God-given resource'.

It is our hope that this volume will make a contribution to scholarly deliberations, as well as to a more profound and interdisciplinary reflection on the topic of water as a theological theme. By offering new and innovative

investigations, new themes for debate and new interpretations and insights into existing research, a wide-ranging perspective on the theme is presented. Simultaneously, we remain conscious that water as a theological theme and the related themes it raises are much more extensive than one book, even an interdisciplinary book, can contain. Accordingly, we hope that this book may play a part in the larger conversation on matters surrounding water within academic circles, within faith communities and broader.

The water of deliverance

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■ Introduction

Water serves as a prominent metaphor in biblical theology. The different metaphoric meanings contributed greatly to the development of Reformed systematic theology. We can refer, among others, to water as a metaphor for healing and a source of spiritual life (Ezk 47), for God as the source of life (Jr 2:13, 18), for wisdom (Pr 18:4), for salvation and regeneration (Jn 3:5), for the work of God's Spirit (Jn 7:38), for the church (Ep 5:26, 27), for eternal life (Jn 4:13, 14), for the cleansing of sin (Ac 10:47; Hb 10:22), for creation and judgement (1 Pt 3:5, 6), for doubt (Jm 1:6) and for Christ (1 Jn 5:8) (cf. Ritenbauch 1992).

One of the most prominent water metaphors in biblical theology stems from the narrative in Exodus 14:15–31 that describes the deliverance of God's people from slavery in Egypt. This narrative became an important part of Rabbinic mythmaking and poetry (Sysling et al. 2006, p. 139ff.). It also became a central motif in Jewish and Christian theology, especially as a call of remembrance at the *Pascha* in the Old Testament and the Passover in the New Testament. Estelle (2018, p. 104) is to the point when he explains that the exodus motif is the 'course of salvation in the miniature'. He identifies this motif as a 'synecdoche – a figure of speech by which a more inclusive term or the material of a thing is used for a less inclusive

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term and vice versa'. The motif 'echoes' through all the stages of salvation history in scripture. Clifford (2002, p. 345) explains that the motif mainly occurs in three 'cluster moments':

- the exodus in the *book of Exodus*, which is interpreted and applied in certain pre-exilic and prophetic passages
- the 6th-century exodus from exile as interpreted by Jeremiah, Ezekiel and Deutero-Isaiah
- the work of Jesus where the motif serves as an indicator of the salvation work of Christ.

Added to these 'cluster moments', we can add how the motif features in our understanding of the consummation and the final judgement of God on evil, as Song and Du Rand (2009, p. 96) posit in their study on the exodus theme in Revelation 12-13. In recent times, the exodus motif received renewed attention from liberation theologies. Liberation theologies focus on the liberation of enslaved people by way of socio-political liberation and freedom in a new Promised Land (see Fierro 1977, p. 222; Gutiérrez 1985, pp. 155-157; Shaull & Oglesby 1969, pp. 202-203).

Over the centuries, Reformed theology has argued that the exodus motif in the narrative of Exodus 14 and the many Old Testament references to this history in historical, prophetic and wisdom literature represent the messianic promise of God's judgement on evil, the deliverance of God's people, the cleansing of sins and renewal of the creation under the constant reign of God's Spirit. The notion that the Israelites 'went through the sea on dry ground, with a wall of water on their right and on their left' (Ex 14:22) became indicative of deliverance and cleansing through the sacrificial blood of Christ. To move 'through the water' became, in the Reformed tradition, a metaphor for redemption in Christ and sanctification by the Holy Spirit. Furthermore, the metaphor became the key to understanding the sacrament of baptism in the New Testament.

The way in which this metaphor forms part of the Reformed tradition's view of the essence of baptism becomes clear in Article 34 of the Belgic Confession (Christian Reformed Churches 2011), which asserts:

In this way (by baptising with water – JMV) God signifies to us that just as water washes away the dirt of the body when it is poured on us and as it is also seen on the bodies of those who are baptised when it is sprinkled on them, so too the blood of Christ does the same thing internally, in the soul, by the Holy Spirit. It washes and cleanses it from its sins and transforms us from being the children of wrath into the children of God. This does not happen by the physical water but by the sprinkling of the precious blood of the Son of God, who is our Red Sea, through which we must pass to escape the tyranny of Pharaoh, who is the devil, and to enter the spiritual land of Canaan. (n.p.)

What is striking in this explanation of the essence of baptism is the expression: 'Christ is our Red Sea'.

The question under investigation in this essay is whether the use of the 'through the water' metaphor and the expression 'Christ is our Red Sea' in classic Reformed theology can still serve as a messianic prophecy while also accommodating the interpretation of the exodus motif in modern-day liberation theologies? The central theoretical argument of the research is that the classical Reformed perspective on this metaphor could serve as a poignant indication of the all-encompassing salvation in Christ and the new life under the immanent reign of God. The metaphor speaks of spiritual deliverance in the historical and eschatological sense, as well as of the call to liberate oppressed people, in keeping with the new ethic emanating from the historical reality of the immanent reign of God. The angle of approach is systematic theology flowing from a hermeneutic of congruent biblical theology.¹ The study does not participate in the debate on whether these texts should be read as historical material or as a cultural script as Scoralick (2015, p. 109) suggests, or the debate regarding the Reed Sea hypothesis (see Batto 1983, p. 27; 1984, p. 61), nor does the discussion take on board the question of whether the exodus event could be proven by natural scientific research as Jacobovici (2019) claims.² To my mind, these debates have no actual bearing on the topic of captivity, judgement and deliverance in Exodus 14 or on the way in which Reformed theology uses the exodus motif as central to the understanding of the doctrine of salvation and baptism in classic Reformed systematic theology. In my opinion, these debates also have no real bearing on the use of the exodus motif in liberation theologies, where it serves as an indication of the reality of historic forms of captivity and oppression and the enduring call for structural liberation in situations of social enslavement. Also, the genre of the text and the choice between Reed Sea or Red Sea do not inhibit the systematic theological idea of captivity and liberation in classical Reformed theology or modern liberation theologies.

Clifford (2002, p. 355) defends, with good arguments, a typological reading of the exodus motif, as it finds expression in all the Old and New Testament references mentioned as a rhythm of movement under the active reign of God. The rhythm follows the pattern of captivity, liberation

1. I define a hermeneutic of congruent biblical theology as the interpretation of the biblical text (part of Scripture) within its socio-historical context and within the congruent development of biblical theology (wholeness of scripture and consent of the parts) (see Vorster 2021, ch. 1). From this angle of approach, I concur with Clifford's proposal of a 'paradigmatic' use of Exodus in both testaments, which biblical authors themselves employed to show ongoing divine action. A hermeneutic of congruent biblical theology is suitable to excavate the richness and comprehensiveness of the exodus motif and the symbolism of water as both a boundary (a limit) and a purifying remedy.

2. Harris (2007, p. 22) discusses with reference to various natural scientific studies a number of scientific, literary and mythological interpretations and several modern interpretations. His work provides a suitable tool to evaluate the discourse about a historical, mythological, geological or archaeological approach to the Exodus 14 narrative.

and formation. From this angle of approach, the reading of the exodus motif as a constant movement under the reign of God is discussed in three sections in this chapter. The first section deals with the theological meaning of the enslavement of God's people in Egypt and God's judgement on the enslaving forces. The second section investigates the movement of deliverance (liberation) from the yokes of enslavement and the symbolism of water in this movement. The last section aims to comprehend the meaning of the formation of God's people and its implications for a new life under the immanent reign of God.

■ Captivity and judgement

The sea in the narrative of Exodus 14 is rich in symbolism. With reference to other biblical passages, Scoralick (2015, p. 109) explains that the sea in this passage can be seen as a symbol of chaotic forces and, as such, it 'engulfs a system which itself has become chaotic and destructive'. Harris (2007, p. 16) contends that the sea symbolises a limitless sea at the end of the land and, therefore, the realisation of the mythological sea of *primaeva* chaos. Ancient cosmic myths in near-Eastern cultures where the sea serves as a symbol of chaotic forces rebelling against creator gods, as harbouring forces of evil and as an indestructible border which keeps humans imprisoned, support the Harris's thesis. The environment of God's people in Egypt had been one of chaos. They were slaves in Egypt, serving masters driven by the cult of the pharaoh. They had no identity as the people of the covenant. The sea was also a symbol of their captivity and the limitations on a life of freedom and flourishing. Between them and the Promised Land is the treacherous and impassable sea. They have left Egypt but are blocked by the mighty sea with the Egyptian forces following them, raising their fears of destruction or perennial slavery. Despite God's promise of deliverance, the fear of captivity lets them cry out to the Lord. They said to Moses (Ex 14):

Was it because there were no graves in Egypt that you brought us to the desert to die? What have you done to us by bringing us out of Egypt? Didn't we say to you in Egypt, 'Leave us alone; let us serve the Egyptians'? It would have been better for us to serve the Egyptians than to die in the desert! (vv. 11-12)

Facing the impenetrable sea and the fear of chaos in the form of death or enslavement, they lament their predicament and revolt against God and Moses.

Thirdly, the sea symbolised God's punishment and judgement for the ancient Jewish people. God uses the sea *to save* but also *to punish* (Van der Walt 2018, p. 42). Rothstein (2016, p. 172) refers to Exodus 15:4-5 in the light of Deuteronomy 11:4 in his explanation of this symbolic meaning. God punishes the forces of slavery and chaos by controlling the sea. God uses

the sea as a means to punish the forces of evil. Therefore, God's act of judgement with the aim to free his people should always be remembered. The covenant people are urged to remember (Dt 11):

[W]hat he did to the Egyptian army, to its horses and chariots, how he overwhelmed them with the waters of the Red Sea as they were pursuing you, and how the LORD brought lasting ruin on them. (v. 4)

Scoralick (2015, p. 115) agrees that the sea could be interpreted as a symbol of God's punishment and destruction.

Fourthly, the sea in this narrative becomes a symbol of God's omnipotence as it constantly reminds the people of what God can do. He has power over the chaos (Van der Walt 2018, p. 42). They can always call on God for help because '[t]he waters saw you, God, the waters saw you and writhed; the very depths were convulsed [...]' (Ps 77:17) and '[y]our path led through the sea, your way through the mighty waters, though your footprints were not seen [...]' (Ps 77:20). Throughout history, these symbols serve to remind God's people of his mighty acts of judgement and liberation and as the foundation of his call to love and worship him, to be obedient and to call on God alone in their time of need (Ps 78, 106). Fifthly, the Red Sea in Exodus 14 becomes a symbol of remembrance and healing. In this sense, the symbol encapsulates the essence of the song of triumph in Exodus 15:2, which reads: 'The Lord is my strength and my song; he has become my salvation'.

The symbolism of the water in the exodus narrative features very prominently in liberation theologies, specifically water as a symbol of captivity and chaotic power. Liberation theologians move from praxis to theology and propose, in line with recent theories in hermeneutics, a contextual reading of the text. They opt for the contexts of oppression in contemporary societies (West 2014, pp. 4, 8). These contexts include systemic violence, socio-political oppression, colonialism, sexism, racism, xenophobia and other forms of dehumanisation and violations of human dignity. From the premise of these contexts of 'chaos', liberation theologians approach the exodus as a historical event and regard its authenticity and symbolism as the master narrative in scripture. The exodus motif then serves as the point of departure and the hermeneutical key to unlock the core message of scripture, namely, the call for the liberation of people in captivity from the powers of chaos in the form of power structures. A prominent exponent of this pattern of reasoning was Gutiérrez (1985, pp. 155-157). He proposed the idea of a theology of liberation and explained that the essential meaning of creation, history and salvation becomes clear when the biblical text is read within the all-embracing and all-encompassing idea of exodus - the liberation from captivity through the 'mighty sea' of the chaos of oppression and evil forces. The exodus is reminiscent of the captivity of all people, forces of evil that oppress and God's judgement upon these forces of evil and his intended deed of liberation. There is a

constant movement of captivity, judgement and liberation in the history of humankind under the creation, re-creation and restorative actions of God. God's work never grinds to a halt because he is on the move in the histories of peoples and nations. The direction of God's movement is the constant liberation of people suffering under all yokes of oppression and bondage, and his people must follow him in this cause.

In the development of the liberation theologies over the past five decades, the exodus motif – as it is explained and applied by Gutiérrez, his contemporaries and that theological school of thought – has also become the hermeneutical key for the understanding of all the other prominent themes in the Bible, such as creation, covenant, the reign of God, salvation, pneumatology and eschatology. Interpreted through the lens of the exodus motif, these themes and others have one common denominator: The message of breaking with the past under the guidance and command of the ever-moving God. Creation was God's mighty act of breaking with the chaos of the disorderly reality and a movement to beauty and peace. The covenant is God's pact with humanity to break with the new chaos of inhumane power structures. The kingdom (reign of God) introduces new conditions of freedom, equality and dignity, of being fully human and of having peace and hope. Eschatology boils down to the constant promises of the new future for the poor, oppressed and marginalised that could and should dawn when oppressed people break with the past. The promised future is a new reality that could emerge from breaking with the chaotic past.

From its emergence in the 1970s, liberation theology embraced the notion of this contextual reading of Exodus and chose to read and interpret the symbolism as it appears here and in the other biblical passages from the modern context of the oppressed, the poor and the marginalised. Over the past decades, the movement has diverged into many different 'liberation theologies', in accordance with the many experiences of oppression and systemic violence that people endure. Apart from being a theology for the poor, the liberation paradigm also became a presupposition in modern feminist theology, eco-theology and other contextual theologies. This form of contextual Bible-reading also initiated a new ethic, which can be defined as an ethic of liberation.

Reformed theology traditionally interpreted the captivity facet of the exodus motif in a spiritual way, based on the perspective of the congruent history of revelation under the banner of '*heilsgeschichte*', salvation history, redemption history, covenant history, canonical holy scripture and others (for an explanation of these concepts, see Barton 1997, p. 152; Ciampa 2007, p. 254; Kelsey 2009, pp. 458–477; Van der Kooi & Van den Brink 2012, p. 554). The main line of thought in the Reformed tradition regards the wholeness of scripture as the definitive key for understanding the parts of

the biblical text. This was traditionally also the case for understanding the exodus motif in scripture. In a recent study, Morales (2020) reiterates this presupposition with his succinct explanation of the way in which the exodus motif features as a paradigm for a biblical theology of redemption. This is the angle of approach from which Reformed theology regarded captivity and slavery in Exodus. The symbolism of the sea in Exodus was then interpreted theologically as an indication of humankind's captivity because of the bondage of original sin and the total depravity of human beings, as well as the enslavement of creation to the 'bondage to decay' (Rm 8:21). Within the context of revelation or salvation history, the history of Exodus 14 typifies the deeper message of scripture, namely, the bondage, hopelessness and decay that will be turned around by the gracious God of the covenant. Exodus 14 is a nucleus gospel that points to the gospel of salvation and restoration by the Messiah. The Moses of Exodus is the cloaked-up redeemer of the captives, but in redemptive history he points to the 'Servant Messiah' - the new Moses (Estelle 2018, p. 209). The redeemer of Exodus points to the redeemer of humankind from the captivity of sin, of which seepage can be discerned in the human's inclination to lie, be egoistic, lust for power, take vengeance and their inborn tendency to hate and to 'other' others in disobedience to God. The judgement of God is a judgement against evil.

How could the meaning attached to the slavery and captivity of the ancient Jewish people and the judgement of God as proposed by traditional Reformed theology and contemporary liberation theologies be evaluated? Is the exodus motif essentially a spiritual paradigm or a socio-historical lesson of God's preference for liberation and God's antipathy to the inhumane treatment of people? My contention is that the contribution of liberation theologies in this regard can indeed add value to the traditional Reformed perspective. Arguing from the presupposition of the wholeness of scripture, the historic meaning of the exodus can also be appreciated as an indication of God's judgement on evil socio-political structures. This conclusion is supported by the constant way in which God teaches the people of the covenant to be humane and to respect people's dignity. God is consistently concerned about the predicaments of slaves, the poor, widows and orphans and the dispossessed. This concern becomes apparent from the jurisprudence God expects from his people and the many times God reprimands the leaders by way of the prophets for their lack of concern for the destitute. This ethic of concrete compassion and the moral agency to act against enslaving powers is also relevant in the New Testament and a central part of the teachings of Christ and the apostles.

The captivity in Egypt and the sea as a symbol of chaos and imprisonment can point to humankind's bondage by evil and the inherent inclination to revolt against God and the other. However, it also points to evil socio-political

structures where God's creatures can be enslaved and prevented from enjoying and exerting their innate dignity as beings created in the image of God. When we understand sin in this all-encompassing sense, we will be able to grasp the richness and breadth of salvation (see Welker 2013, p. 251ff.). This statement becomes evident when we reflect on the second movement in the narrative of Exodus 14, being God's deliverance of the ancient Jews.

■ Deliverance

The cleaving of the mighty sea, the journey of the people on dry land and the destruction of the Egyptian army are lauded in the song of triumph of Moses and Miriam (Ex 15). They sing about God's mighty act. God is highly exalted (v. 1); he is the strength and salvation of people (v. 2), the father (v. 2), a warrior (v. 3) and more powerful than the pharaoh (vv. 4-5). He tamed the sea and 'threw down those who oppose him' (v. 7). He is majestic in holiness and awesome in glory, and he works miracles (v. 11). He unleashed 'his burning anger'. Yet, 'in your unfailing love you will lead the people you have redeemed' (v. 13). And 'he will reign for ever and ever' (v. 18). God is a judging but also loving king, in close relationship with his creation. He is not a faraway god residing in temples and holy places on mountains, but YHWH – God in communion with people. This song and the repetition of all these exaltations in later biblical passages indicate that the deliverance is much more than a mere historic event and more than a liberation from slavery. The trek through the mighty sea is not an end but the means to an end (Estelle 2018, p. 104). God's purpose was not only to liberate the people but to create a royal priesthood of people who would be functional in the restoration of creation.

The movement of deliverance in Exodus 14 could be regarded as the prototype of all the other acts of the liberation of the people of God in times of despair, restoration in times of affliction and a return from exile. Time and again, the judging and loving God delivers them with the aim of restoring his covenant with them and portraying his reign. Every deed of liberation from affliction and restoration after judgement, when the people drifted away from God, contains the promise of a new future for humankind. The movement of deliverance is the essence of the covenant. The theme of 'God with us' is symbolised in the feast of the Passover, *Purim* and the feast of the Tabernacles; in the holy places such as the Tabernacle and the Temple; and in the cultic sites and altars. The psalms centre on the idea of deliverance and the prophets use the idea to comfort the people repeatedly, but also to call them to move with God in obedience. Their movement with God is the sign of their identity as a holy people in contrast to the surrounding nations. Gutiérrez (1985, pp. 155-157) and his school are correct with their assessment that the movement towards deliverance in the exodus

motif indicates the constant movement from captivity to judgement and liberation in the history of humankind by means of the creating, re-creating and restorative actions of God. However, clothing the movement largely in socio-political terms results in a detrimental diminution of the theme and reduces the movement of God with his people to mere immanent political actions. The exodus motif has a much deeper and far-reaching significance. The prophets were not only concerned with the freedom and the social well-being of the people but with their obedient and responsible movement with God as a holy people carrying the promise of the Messiah. He is sacrificed to evoke the all-encompassing liberation of people from the bondage of sin and evil and the harsh judgement of God on the revolt against his immanent and eschatological reign. That is the true and full gospel.

The cleft of the mighty waters is taken up in the New Testament to describe the coming of the true Messiah and to explain the true Israel. From the perspective of congruent biblical theology, Estelle (2018, p. 209ff.) discerns the new meaning of the exodus in the gospels of Matthew and Mark. After discussing the important Old Testament references in the prologue to the gospel, he says, with reference to the study of Watts (1997, p. 117), that 'the prologue of Mark is replete with new exodus imagery'. Taking the point raised by Estelle and Watts, I venture to argue that Mark 1:1-9 commences with the exodus motif in Isaiah 40:3 in combination with Malachi 3:1 for a specific reason. The reference to the wilderness theme on recounting the baptism by John the Baptist, who will baptise with water, but more importantly the Messiah who will baptise with the Holy Spirit, aims to introduce a new theology of exodus against the backdrop of Exodus 14. It begins with his baptism in water. The baptism is a sign of the endowment of Jesus as the Anointed One, the king, prophet and priest who has been appointed and equipped by the Father to fulfil the task of the new Moses - the Messiah - to bring the kingdom (reign of God) near. The Father appointed Jesus officially and empowered him to be the Messiah and to set the enormous and incalculable new exodus in motion. Furthermore, the baptism of Jesus in water signifies a holy relationship. God announces: 'You are my Son, whom I love; with you I am well pleased', (Mk 1:11) and then the Holy Spirit descended on him like a dove. The triune God is at work along the lines of the Exodus promise of a new dawn for God's world. Many Old Testament insinuations play a part in this description of 'the marshalling of the forces of deliverance' at the beginning of the message of good news (see Ps 2:7; Ex 4:22-23; Gn 5:3, 1:26). With this baptism and the heavenly events accompanying this event, the mighty waters become a new symbol - the symbol of identity and a whole divine relationship, but also a symbol of hope because evil can be overcome and people can repent, change and be forgiven. This theology of the new

exodus is the theology of all-encompassing deliverance from sin as the original state of humankind and its excesses in human existence.

After the baptism, the action starts: Jesus proclaims the good news and this is the long-predicted news of the Old Testament that: 'the Kingdom of God is near, repent and believe the good news' (Mk 1:15). Jesus then demonstrates his authority over evil by his victory over the temptations of the devil (Mt 4:1-11), driving out an evil spirit from a man possessed with it and giving new life to ill people by miraculous healings. The deliverance commences when Jesus comes out of the 'mighty water'. A total new dimension of the exodus motif emerges in these passages and links the themes of slavery, living in the wilderness and deliverance from evil to the baptism of Christ and his power over all evil. The theology of the new exodus overarches mere historical quests for freedom but does not exclude them, because historical liberations and renewals that benefit human dignity are important consequences of the immanent reign of God brought near by the Messiah.

The imagery in Mark of the wilderness, the water, the baptism, the endowment with the Spirit and their linkage to our understanding of the proclamation of the nearness of the kingdom and the call to repentance, as well as the demonstration of the power of Jesus over the devil and evil and sickness, reverberates through all the gospels. A new age has come. This new age and all it represents and commands and where it leads form the theology of the rest of the New Testament. In his seminal study on the theology of Paul, Ridderbos (1971) describes this 'new age' as the foundation of the apostle's theology, and he found his argument in the following pronounces of the apostle (2 Chr 5):

[...] if anyone is in Christ, he is a new creation; the old has gone, the new has come! All this is from God, who reconciled us to himself through Christ and gave us the ministry of reconciliation: that God has reconciling the world to himself in Christ, not counting men's sins against them. And he has committed to us the message of reconciliation. (vv. 17-19)

Our reconciliation with God is the ultimate purpose of his interest in humankind. This purpose flows from God's love for what is his - his love for creation and the human being created in his image. The new age does not suffer under the rule of evil and its agents. Although under the constant attack of evil, it is a fertile land that could produce the harvest of peace, beauty, joy and hope under the immanent rule of Christ. The new age presents a new ethic of life and love. Therefore, this new age embraces all the possibilities for the building of just socio-political structures, peaceful relationships between nations and different communities, the protection of human dignity and human rights, social and economic justice and freedom. In this sense, liberation theologies are correct, and they serve contemporary Christianity well by lifting this aspect of the new age out of its obscurity in

early 20th-century theological discourses. However, the new age is much more than systemic liberation; it is a completely new reality that penetrates our total existence and future because of the deliverance by the second Moses.

Deliverance and protection were part and parcel of God's covenant with Abraham. God said to Abraham (Gn 17):

I will establish my covenant as an everlasting covenant between me and you and your descendants after you for the generations to come, to be your God and the God of your descendants after you. The whole land of Canaan, where you now reside as a foreigner, I will give as an everlasting possession to you and your descendants after you; and I will be their God. (vv. 7-8)

God promised the land, the people then went into captivity and God delivered them by guiding them through the mighty water. The deliverance reiterates their identity as the people of God. As a sign of the covenant, God instructs them to circumcise every male among them. Circumcision among the Israelites signifies the covenant and everything it entails - God's promise of deliverance and protection and their obligation to be holy by following God's instructions. The covenant also points to a future of hope. The synecdoche of the exodus continues in the new exodus by the Messiah and the sign of circumcision continues in the sign of baptism. Jesus was circumcised (Lk 2:21-39), but he was also baptised (Lk 3:21-22). He comes *from* the people of the covenant *for* the people of the covenant. He bears the sign of both. His baptism forms the basis of the baptism of believers in the New Testament dispensation. Therefore, baptism signifies the power and wealth of the deliverance of the second exodus by Jesus, the Christ who proclaims the reign of God over God's people. In this, the people receive a new identity and can find inspiration, guidance and comfort from the Spirit of God and Christ (see Welker 2013, pp. 277-290). The baptism of converted believers and their children in the early churches was the sign of what deliverance and communion with God hold for them when they embrace Christ in faith (Gl 3:27).

The expression 'Christ is our Red Sea' in Article 34 of the Belgic Confession as an explanation of the meaning of the sacrament of baptism in the Reformed tradition is highly significant. In a few powerful words, the confession encapsulates the depth and extensiveness of the essence of the biblical revelation. It is God's powerful cosmic re-creation in the sacrificial offering on the Cross. God reinstated his immanent and transcendent reign over evil by way of the constant miraculous deliverance of the people of the covenant, which found its apex in the life and work of the pre-Easter Jesus and the post-Easter Christ. This reign overcomes all forms of captivity and threats of destruction that can overpower the human mind. It is the foundation of an existence of hope and flourishing personhood. The immanent reign enables the people of God to pursue freedom and a

dignified life in any time and age and to take up the historic struggle for justice and peace in the light of God's call for love, compassion and restoration. The transcendent reign enables people to live with hope that the future belongs to the living God and will become real by the power of the ever-present comforting, guiding and empowering Spirit. In the light of the accomplished future and the bright light of hope, humanity can prosper and find solace and inspiration for seeking what is good and noble in this age, as Moltmann (1967, 1975, 2012) reminds us in his epoch-making contributions about a theology and ethic of hope. The mighty waters of captivity have been breached by the Cross and humanity can enter a new future. The waters of captivity and restriction have become the waters of deliverance. This cosmic event is described in Article 34 of the Belgic Confession with the adage, 'Christ is our Red Sea'. In my opinion, this expression is still plausible and indeed pivotal for our understanding of the exodus motif.

The third movement discernible in the Exodus 14 narrative is God's act of forming a people with a common history and identity.

■ Formation

The deliverance of the people does not end with freedom as such. There is an ulterior motive. The deliverance is the means to an end. God's rule over water initiates a new beginning for the people (Ex 14-15; 2 Ki 2; Mt 14:22-33; cf. Van der Walt 2018, p. 40ff.). The end is the Promised Land, where the people can live as the people of God, with their own identity among the nations around them. The latter part of the exodus narrative is about the stay in the desert where they were fed by God and then the climax – the inauguration of the Sinai covenant: 'with its profound ramifications for the polity of the new minted people of God' (Estelle 2018, p. 235). God reaffirmed the covenant with the people, and if they are obedient, they will be God's treasured possession and they 'will be for me (God) a kingdom of priests and a holy nation' (Ex 19:6). God delivers the people from the slavery and captivity in Egypt, not for the sake of liberation alone, but to form a nation that will be a 'kingdom of priests' – a nation with a unique identity. A kingdom of priests refers to a culture of self-control and servitude, because obedience to God means to rule over the inclination to be and do evil and to be servants of God and fellow humans with an attitude of compassion and caring. God then constructs the new identity of his people with the Ten Commandments (Decalogue). They should live in a new relationship with God and with other humans.

Read as a synecdoche, the Decalogue demarcates and depicts the core values expected from the newly formed 'kingdom of priests'. The commandments instruct the people on how to live in a covenantal

relationship with God. They must honour and worship him alone; they must respect authority, the lives and property of others, the holiness of marriage, speak the truth and not covet what belongs to their neighbour. Many more ceremonial laws and rituals and moral codes are added over time to complete this basic structure of the holy covenantal life of the newly formed people of God (see De Vaux 1988, p. 327ff.). The covenant with God is their new identity, and this identity has to be demonstrated in all spheres of their existence as a holy people among the nations. This identity enfolds the promise of the eventual coming of the second Moses, the Messiah, in whom the reign of God will come to all nations.

Jesus is the new exodus and continues the movement of formation. The 'kingdom of priests' extends to all nations, everywhere that people embrace the living Christ in faith and obedience. A new people emerges, a new Israel with a new identity to carry forward the message of the immanent Kingdom of God. 1 Peter 2 testifies:

But you are a chosen people, a royal priesthood, a holy nation, God's special possession, that you may declare the praises of him who called you out of darkness into his wonderful light. Once you were not a people, but now you are the people of God; once you had not received mercy, but now you have received mercy. (vv. 9-10)

The echo of this testimony sounds also in Revelation 2:17, 3:12, 5:10, 21:2 and 21:5. The new people of God sing a new song of salvation. The song after the deliverance from the bondage in Egypt in Exodus 15 was, in the words of Estelle (2018, n.p.), 'the song of the sea, celebrated the at the birth of a particular people. Now the song of the Lamb is sung by an international assembly'.

The movement of formation becomes clear in the conduct and teaching of Jesus. He always has followers comprising the rich and the poor, men and women, young and old. They live in fellowship with him, and in this fellowship, social distinctions disappear. He marches through the institutions, mingles with the sinners and the outcasts, calls the street children to him and invites the marginalised in the Jewish community to follow him. Eventually, he unveils the foundation of a new community, the church (*ekklesia*). This foundation is the confession that he is 'the Christ, the Son of the living God' (Mt 16:16-18). The ecclesiology of the New Testament testifies by way of various metaphors that the formation of the church stands and falls with the recognition of Jesus the Christ as the Messiah who has suffered on the Cross, but who has been resurrected by the Father and has ascended to the throne of God, from where he rules as the king of God's people in the restoration of the reign of God over the whole creation. However, the exalted Christ is never without his people. 'Christ's reign can also be associated already with life on the present Earth, in the here and the now, to wit, in a form of discipleship that includes a

willingness to suffer' (Welker 2013, p. 235). For what? For doing 'the things of the kingdom' to the honour of God (Mt 5:16). For a seminal explanation of the formation of the church within the context of God's kingdom, see the thorough studies of Ridderbos (1969, p. 355) and Küng (1992 pp. 47, 107).

The formation of the church as God's people in the world becomes clear when the New Testament is interpreted by way of a hermeneutic of congruent biblical theology. 'Church' refers to the believers in a certain location, like Jerusalem, Corinth, the churches in Galatia, Ephesus, Colossae and Rome. The concept '*ekklesia*' also refers to the worldwide universal body of believers. The church is both a local congregation and a universal body of believers from all nations.

The newly formed people assemble in visible congregations that transcend the social barriers of the Mediterranean culture and the Jewish community. They worship God by preaching and praying, and they administer the sacraments and attempt to display their new identity of holiness by caring for the poor and the marginalised. They present new moral codes for relationships between husband and wife, families, master and slave, Jew and Greek, rich and poor and revolutionise in this way the social stratification of their *umwelt* at that time. The new morality also shapes their responses to the social ills of their time. The formation of the church, flowing from the movement of deliverance in the 'second exodus' under the 'second Moses', so becomes a striking event in the history of the world. The Christian church has developed as a potent force in the transformation of cultures and societies. Through the centuries, the church has added a new voice wherever it honoured its identity as a holy and transformative people among nations. This is the voice of love, peace, joy and hope.

However, sometimes the church loses its voice and abandons its true identity by compromising with ideologies and forces of evil. Just like the people of God in the Old Testament, churches occasionally drift after the gods of power and wealth and become followers of the causes inspired by these gods. Church history reveals many instances where churches sided with the political powers of the day and abandoned their prophetic calling on behalf of justice and peace. They became puppets of, for example, the old Western monarchies, the ideology and practices of colonialism and the Fascist regimes of the 20th century (see Vorster 2019). They forsook their identity as the holy people of God. Therefore, the exodus movement of formation cannot be a one-time event. Formation calls for continuous reformation, just as in the case of the people of the covenant in the Old Testament. They constantly had to reform with the purpose of being the holy formation of God, seeking his reign in a troubled world.

The emphasis of liberation theology on ongoing liberation and transformation, of constant movement to avoid the construction of rigid

socio-political structures harbouring systemic violence and new forms of captivity, is a valuable contribution to theology today. The notion of formation as a process is also deeply embedded in the ecclesiology of the classic Reformed tradition. With the dictum '*ecclesia reformata semper reformanda*' [the reformed church should always be reformed], Reformed scholars over the years have attempted to highlight the idea of constant reformation of the church, to avoid deformation in the form of fossilised structures in captivity of the powers of the day and an irrelevant prophetic testimony.³ According to Dreyer (2017, p. 4), Karl Barth used this dictum to mobilise the church in Germany to resist the rise of national socialism. Unfortunately, this dictum often gets lost in current reflections on the prophetic testimony of the church in the face of ever-emerging enslaving power structures.

Exodus reflects movement, and this characteristic is evident in all the echoes of the exodus in biblical revelation. The people of God in the Old Testament were a people on the move, answerable to God alone. Where they became trapped in new forms of captivity, they were delivered and reformed as the people of God – a holy nation among the nations. Deliverance and continuous reformation characterise the work of God with the '*ekklesia*' of the New Testament. It is also a striking feature of the history of the Church. Christ – the 'Red Sea' – offers deliverance, opens the route to a new life, forms and reforms the community of believers and indicates the way to a life of dignity, peace and joy. Through this 'water of deliverance', humans can enter the Kingdom of God and can become servants in the renewal of creation.

■ Conclusion

The question under investigation in this chapter is whether the use of the 'through the water' metaphor and the expression 'Christ is our Red Sea' in classic Reformed theology are plausible and can still serve as a messianic prophecy that can also accommodate the interpretation of the exodus motif in modern-day liberation theologies? In view of the discussion of the exodus motif as an expression of God's movement from captivity and judgement and the deliverance of his people from captivity to the formation and constant reformation of the community of believers, I contend that the classic Reformed perspective on this metaphor could still serve as a potent indication of the all-encompassing range of salvation in Christ and the new life under the immanent reign of God. The metaphor speaks of spiritual deliverance in the historical and eschatological sense as well as of the call to concrete liberation of oppressed people because of the new ethic emanating from the historical reality of the immanent reign of God.

3. For insightful discussions of the dictum, see Koffeman (2015) and Dreyer (2017).

'Christ is our Red Sea' is a striking expression of everything flowing from the immersion in Christ: freedom for the captives in the spiritual and historical sense and the emergence of a powerful force, the community of believers mandated to be the prophetic voice of freedom and renewal on behalf of humans enslaved by evil - the evil in the inner self and the evil in enslaving social structures that inhibit oppressed and vulnerable people from experiencing the wealth and splendour of life. This dictum presents the key to the understanding of the full meaning of the exodus motif and the power of the 'water of deliverance'.

Adequate water as a global bioethical principle: A broad Protestant-theological foundation in hindsight

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■ Introduction

In 2005, the Universal Declaration of Bioethics and Human Rights (UDBHR) was unanimously accepted by all member states of the United Nations Educational, Scientific and Cultural Organization (UNESCO). This consensus imbues the non-binding declaration with not only with symbolic meaning, but also with definitive authority and a sense of moral obligation. For the first time in the history of bioethics, all states of the international community committed themselves to pursuing fifteen global bioethical principles. The innovating dimension of the instrument is that states are now morally committed to compliance with a list of bioethical principles. Additional details that indicate the value of the declaration are (1) the fact that other influential declarations, such as that of Helsinki, were compiled exclusively

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by professional organisations such as the World Medical Association, (2) that the declaration grounds global bioethics in human rights, (3) that it broadens bioethical principles from the four Georgetown ones to a coherent list of fifteen principles, (4) that focus is not restricted to individual perspectives, but now also includes social and environmental values and (5) that global principles do not represent the internationalisation of bioethics from one country to another, but the globalisation of bioethics as such, that is, among all countries together (Ten Have 2017).

This chapter forms part of a larger research project in which I present a theological analysis of the fifteen principles (see e.g. Rheeder 2017). The overarching aim of the chapter is to formulate a broad Protestant-theological grounding for global water ethics as declared in the UDBHR. Marais (2017, p. 71) makes the important observation that a single theological approach to the water problem does not exist. She demonstrates that water ethics have been approached from different angles already, namely, in terms of water and religious systems, water and global economy, water and sewage, water and cholera, water and human dignity, as well as water and worship. This study offers a new approach in which the global water ethics of the UDBHR are viewed in conjunction with broad Protestant water ethics. In order to achieve this, special attention will be given to Articles 14 and 17 of the universal instrument.

Why is it desirable and essential to provide a Protestant-theological grounding to this matter? I want to begin the answer by referring to the following important and guiding observation by Garcia et al. (2017):

UNESCO's Universal Declaration on Bioethics and Human Rights is a comprehensive framework of norms governing the life sciences that purports to ground its authority and legitimacy in human rights and dignity. After the exploration of the various religions though, it is obvious the mere reference to human rights and dignity is not by itself a sufficient reason to accept the norms as they are written. That the states adopted them by consensus is also not sufficient reason. Both the reference to human rights and dignity and the consensus acclamation, may be necessary, but for substantive norms that the plural and diverse states can all adopt, a deeper layer of convergence between the political/ethical/legal communities must be sought. (p. 72)

The call for seeking 'a deeper layer of convergence between the political/ethical/legal communities' is foundational to the present project. Two main reasons exist for the fact that a convergence of a theological grounding is essential, also given that it could make a contribution to the public debate about water.

The first reason centres on the promotion of universality of the UDBHR. United Nations Educational, Scientific and Cultural Organization claims that the UDBHR embodies a document of which universality is an outstanding trait, which has therefore even been described as a framework

for universal principles (UNESCO 2006, Article 2a). The reasons for this conviction are that the compilers of the declaration consulted widely and inclusively as many cultures, traditions and faiths as possible and that the instrument was accepted unanimously by all member states of UNESCO (Ten Have & Jean 2009, p. 14). The problem around this presumption is that global religious consultations were made only with Buddhism, Hinduism, Islam and Confucianism, as well as the Jewish and Roman Catholic traditions, while the broad Protestant tradition was excluded from the dialogue (IBC 2004, pp. 119-151; Ten Have & Jean 2009, p. 14). This entails the exclusion of the 'deeper layer of convergence' of about 1 billion people (Pew Research Center 2020), which puts a question mark behind the allegation of a strong or deep universality. It must be mentioned that the Protestant religious tradition is not homogenous and will therefore entertain a diversity of viewpoints about matters. A 'monolithic Protestant viewpoint' around any bioethical question does not exist. But, most Protestant religious traditions recognise that one of the five founding points of Protestantism is the principle of scripture alone [*sola scriptura*] as the source of ethics and not a political process or democratic negotiations (Childress 2002, p. 187).

The first pertinent goal of the present research is to include the Protestant tradition or biblical perspective, though after the fact, in the discussion of August 2004 in Paris, where representatives of the different religious traditions were afforded the opportunity to give their perspective on different aspects of the UDBHR (Ten Have & Jean 2009, p. 31). By way of this study, the Protestant voice can participate in and possibly contribute to the greater credibility of the declaration's universality. This contribution can also assist in promoting the new, unique and historical document and its contents. Research has demonstrated that the UDBHR had no impact in South Africa, which has a large Protestant religious community (Langlois 2013, p. 45).

The second reason centres on the increase in acceptance of these principles within the Protestant religious tradition. The UDBHR presents itself as an instrument of shared ethical values (UNESCO 2006, introduction, par. 10). Ten Have (2016) describes these shared values as follows:

UDBHR is the outcome of a political process in which consensus is constructed, perhaps fabricated. It does not explicitly refer to rational explanations or foundations of the decisions that have been made during the negotiations. (p. 102)

Shared values should mean that the global community has reached consensus about ethical principles that must be accepted *prima facie* on the basis of global agreement. This is problematic with a view to a Protestant epistemology, as social ethical values are not determined solely by

democratic consensus, natural rights or emotion but primarily by the Bible as a source of faith. The use of the Bible as paradigm is a religious choice. Within the Protestant religious tradition, the Bible is the highest authority over faith, life and doctrines, as well as social ethics (Matz 2017, loc. 183; Pauls & Hutchinson 2008, p. 431). For this reason, Vorster (2015, p. 109) argues that '[u]ltimately, the written Word provides the principles for ethics and it is also the litmus test for all ethical codes and actions'; he grounds this viewpoint on the second command (Ex 20:4-6). In a certain sense, a global principle as a word-image is 'idolatry' until such time as it has met the test of scripture. It means that the Bible will be examined with a view to determining whether biblical values exist that can be used as a 'deeper layer of convergence' or agreement. Only once biblical values agree with global ones, Douma (1997, p. 70) avers, can global principles be accepted, which he then refers to as complete Protestant ethics.

The second pertinent goal of the research is to test the water ethics of the UDBHR at the hand of Christian scriptures. Up to the present moment, no Protestant perspective has been given about the water ethics of the UDBHR. Of course, practical value is carried by the grounding of the water ethics of the UDBHR. Theologians such as Hauerwas (2012) and philosophers such as Rawls (1993) and Habermas (2012) aver that global ethical values are accepted, internalised and eagerly promoted with greater difficulty by the Protestant religious tradition in the absence of a 'deeper layer of convergence' grounded in religious tradition. My hope is that this study will contribute to such an extent that the UDBHR will become a life-giving instrument within the Protestant religious tradition.

The central theoretical argument of this study is that the water ethics of the UDBHR's 'deeper layer of convergence' is possible on the grounds of the Bible. The methodology of this research is an analysis, in the first place, of the UDBHR's global water ethics, on the basis of which a biblical perspective will be provided about this global ethics.

■ The global principle

■ Introductory

On acceptance of the UDBHR in 2005, almost no attention was paid to an analysis of the UDBHR's ethical perspective on water. The only UNESCO (2011) study that did in fact pay attention to this theme was the document entitled *Water ethics and water resource management*, which treated the UDBHR very briefly. This document acknowledges that there does not exist much discussion on the water ethics of the UDBHR, but it does not undertake to fill the lacuna itself (UNESCO 2011, pp. 1, 42). Only a few further UNESCO documents discuss the UDBHR's view of water but, where

this does occur, it offers relatively scant analysis. A few of the declarations in that study will nonetheless be used here.

Before discussing the ethics of water in the UDBHR, it is important to make one or two introductory remarks about the declaration. Firstly, the UDBHR broadly focuses on the ethics of human health and well-being. It emphasises global bioethics (see the title of UDBHR, UNESCO 2006), which, as a discipline, centres on ethical questions related to human health (Ten Have 2019, p. 186). The implication of this is that the UDBHR will not be devoted to the ethics of water in general, but exclusively to the interest of water for human health. Secondly, the instrument is characterised by a national and global aspect. On the one hand, the declaration provides ethical guidelines for states around the management of water, to the advantage of all citizens. On the other hand, the declaration has a global scope that indicates the responsibility of states for one another regarding water and health (UNESCO 2006, arts. 1, 24).

Subsequently, the UDBHR's global guidelines will be analysed, including reasons for the fact that the principles are imperative.

■ Provide adequate water

The first global ethical principle is found in Article 14 of the UDBHR and carries the heading 'social responsibility and health'. This article states the principle of the social responsibility of the government and all sectors of society to improve the health of their people. 'The promotion of health and social development for their people is a central purpose of governments that all sectors of society share' (UNESCO 2006, art. 14.1). The reason for the call to social responsibility is that 'the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being' (UNESCO 2006, art. 14.1). The manner in which health is promoted as a fundamental right is formulated in Article 14a-e. Five ways or health determinants exist that can enhance or disadvantage human existence, of which access to water (second determinant) is of particular importance (UNESCO 2006, art. 14.2b). In the most direct sense, access to water can be viewed as a fundamental right.

The second determinant states that advancements in science and technology must promote access to adequate water (IBC 2010, p. 13; Tandon 2009, p. 249; UNESCO 2006, art. 14.2b). As indicated, the state and society are called upon to promote the health of all people. The highest achievable health condition must be viewed and pursued as the right of every human. One of the ways in which this ideal must be sought is by means of access to adequate water. The starting point of the UDBHR is that a high-quality, healthy life as a right is not attainable without water (UNESCO 2011, p. 18).

Access to adequate water comprises three derived norms. The first focuses on access to water as a duty. Not only should there be available water sources (such as underground water, rivers or dams), but governments and society must also ensure that the available water reaches the citizens of the country and that citizens are able to get to the water. This centres on social development and service delivery (including the matters of infrastructure, pumps, water delivery systems and so forth) (IBC 2010, p. 13; Ten Have 2019, p. 191, 195).

The second norm centres on access to adequate water, that is, the quantity of water. Humankind needs adequate water to lead a healthy and dignified life. Humankind also needs adequate water for various household duties such as preparing food, cleaning, sanitation and hygiene (IBC 2010, p. 22; Ten Have 2019, p. 186). This norm calls upon governments and society to supply at least the minimum amount of water to their citizens. It has been determined that every person needs at least 50 litres of water per day (5 L for drinking, 20 L for sanitation, 15 L for bathing and 10 L for the preparation of meals) (Ten Have 2019, p. 197). Without adequate water, agriculture, industry and a well-functioning ecosystem are not possible, and economic development cannot take place either.

Why did the world community decide that norms one and two are necessary? Approximately 1 billion people do not have access to basic drinking water. Concomitant with this, approximately 4 billion people do not have access to well-controlled flushing toilets and sewage facilities, while 3 billion people do not have access to facilities that would promote personal hygiene (World Health Organization [WHO] 2019a, 2019c). Access to drinking water denotes sources that are available on the premises where people live or, at least, available water within 30 minutes' walking distance from these premises. This water must always be available and free from pollution. It is commonly accepted that too little drinking water leads to dehydration, which can seriously disadvantage one's body and could even lead to death. The same is true of access to water that is necessary for more advanced toilet and sewage facilities on the premises which do not have to be shared with other households, and which is treated *in situ* or is safely diverted and treated. Important for good hygiene is the availability of water and soap at home (Ten Have 2019, p. 187; WHO 2019a).

Around 673 million people defecate in open spaces such as furrows in streets, behind bushes or in water puddles close by. Poor toilet and sewage facilities (because of a lack of access to adequate water) correlate considerably with various diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio. It is argued further that poor sanitation because of a lack of adequate water seriously hinders children's growth, because it irrevocably debilitates their physical and psychological development, therefore also handicapping their progress at school as a

result of the physical impact of diseases and absence. It is also calculated that inadequate sanitation is responsible for around 432,000 diarrhoea-related deaths annually, and it also engenders various tropical diseases, such as intestinal worms, schistosomiasis and trachoma (WHO 2019c). Where the availability of water is a major challenge, people may decide that hygienic practices (such as the washing of hands) are not a priority, increasing the likelihood of diseases in this manner (WHO 2019b). It is clear that the UDBHR, for good reason, directly connects access to adequate water in terms of quantity on the one hand and human health on the other.

The third norm focuses on the quality of water. Why did the world community decide that norm three is necessary? Polluted water causes and carries a variety of diseases. It is expected from the state and all sectors in society to ensure accessibility to clean and safe water, with a view toward drinking and hygiene. This entails the protection of water from pollution, including underground water, dams, rivers and reservoirs, as well as the removal of pollution from the water, including filtration and disinfection by means of chloride, in addition to protecting water during distribution by means of, for instance, removal of old and rusted water pipes (IBC 2010, p. 40; Ten Have 2019, p. 187, 196). At the global level, it is averred that about 2 billion people use water polluted by defecation (Ten Have 2019, p. 187; WHO 2019b). This polluted water is no doubt a major cause of several diseases, including cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio (WHO 2019b). Around 800 children die from diarrhoea every day because of unhealthy water. Again, polluted and unsafe water, in many cases, carries worms and parasites that indirectly transmit diseases such as yellow fever, dengue fever and malaria.

It is further discernible that the UDBHR, on the grounds of convincing arguments, acknowledges a direct link between the quality of water and human health.

■ **Protect adequate water**

Article 17 of the UDBHR stipulates a new global bioethical principle that departs from the conviction that the environment and human health can be separated (UNESCO 2008, p. 66). ‘Environmental security is no longer peripheral to the issues of human health’, says Tandon (2009, p. 253) in his commentary on Article 17. A number of UNESCO commentaries aver that the general point of departure of Article 17 is utilitarian, namely, that the environment holds far-reaching positive and negative consequences for human health (Hattingh 2014, p. 234; Tandon 2009, pp. 247–250; Ten Have 2019, p. 36).

The second global ethical principle around water is found in Article 17 of the UDBHR, namely, a call to the global community to protect the environment, the biosphere and biodiversity: ‘[d]ue regard is to be

given [...] to the role of human beings in the protection of the environment, the biosphere and biodiversity' (UNESCO 2006). The present article holds the protection of the environment as the goal for promoting human health. According to Hattingh (2014, pp. 228–232), the concepts found in Article 17 (environment, biosphere and biodiversity) can broadly be described as follows. Environment entails the larger whole of as well as the requirements for life in general, including the water cycle, photosynthesis and absorption of heat. Biosphere involves smaller, relatively autonomous parts of the environment and is a geographical term centring on rivers, dams, fountains and underground water, among others. Biodiversity comprises the differences among species, and between species and biospheres (Ten Have 2019, pp. 19–43; WHO 2015, pp. 1–43). Water is an inherent part of the environment, the biosphere and biodiversity (Ten Have 2019, p. 186; Ten Have & Patrão Neves 2021, p. 627). When the UDBHR calls to the global community to protect the environment, the biosphere and biodiversity, it is not restricted to the conservation of the atmosphere, animals and plants, but also one of the most fundamental aspects of the environment, namely water (Hattingh 2014, p. 232; Likinda 2016, p. 273; Ten Have 2019, p. 277).

The protection of water gives rise to two norms: conservation of the quantity and quality of water. The first of these comprises the protection of water against waste. It is averred that large parts of the world are subject to water stress and that this situation will increase. As indicated, Article 14 holds that access to adequate water is imperative for the promotion of human health. There is great fear that there will not be adequate water for household use, agriculture, industrial use and generating energy (Ten Have 2019, p. 189; UNESCO 2011, p. 11). Water must be conserved and wastage of water should be guarded against (UNESCO 2011, p. 38).

Around 4 trillion people, half of whom reside in People's Republic of China and India, experience annual water shortages equalling the duration of one month. It is accepted that around 600 million children will live in environments where there will be extreme water shortages by 2040 (Ten Have 2019, p. 189; WHO 2019b). Water stress is caused by population growth and exhaustion of underground resources (especially by agriculture) and rivers, lakes and dams. It must be kept in mind that not all countries have equal amounts of water and that some countries and regions have a faster rate of the decrease of water. Agriculture uses most of the water, making up 70% of all consumption. Around 15,000 L of water is needed to produce 1 kg of beef. Water is also necessary for biodiversity (Ten Have 2019, pp. 188, 191).

The second norm focuses on the protection of the quality of the water. Water must be protected against pollution. The comprehensive example of Lake Aral in Russia can be used to illustrate the interrelatedness of

environment, water quality (and quantity) and health. Lake Aral was the fourth largest freshwater lake in the world and acted as an important resource for the environment. During the 1960s, the Soviet regime decided to use two rivers that flow into the lake for irrigation and cotton, fruit and vegetable farming in the surrounding area. Over the years, most of the water was diverted, which engendered a dramatic decrease of water in the lake: only 10% of this remained. The consequences were enormous. The salt levels of the lake increased extravagantly, while water that flowed back polluted the lake with pesticides. Because access to available water decreased drastically, the inhabitants in the surrounding areas drank the local polluted water, which engendered health problems such as cancer and kidney problems. The polluted water, initially meant for human use, was also used by plants and animals, and this had an additional detrimental impact on humans. The mortality rate in the Aral Lake district was noticeably greater than in the rest of the country (Ten Have 2019, p. 189).

Two global bioethical principles that are also frequently linked with the water debate are Article 3 (human dignity) and Article 10 (equality) of the UDBHR. The meaning is clear, that access to clean water (Articles 14 and 17) is not only a resource that assists people in surviving, but it is also important for drinking, hygiene, bathing and cleaning, all of which are matters essential to the promotion of human dignity. Concomitant with this, one finds an unequal distribution and use of water in the world. In the United States of America (USA), an individual uses approximately 700 L of water per day, while the average use of water consumption in Senegal is approximately 29 L per day (Ten Have 2019, p. 189). The two global principles have been examined elsewhere and will not receive further attention in this study.

In summary, it is clear that the world community is convinced that water is a fundamental right. It has reached an overwhelming consensus that all people must have access to adequate water. Adequate water means that there will be adequate clean water, in the absence of which human health will be severely impaired. Because water is of such great importance to human existence and health, it must be conserved.

The UNESCO (2011) document entitled *Water Ethics and Water Resource Management* therefore rightfully states that:

Water is at the heart of many religions and culture. Cultural traditions, indigenous practices and societal values determine how people perceive and manage water, and provide useful references for water ethics construction. (p. 1)

Subsequently, the construction of water ethics as viewed from a Protestant perspective will be considered. In other words, the water ethics of the UDBHR will be tested on a theological, ethical basis.

■ Theological foundation

■ Hermeneutics

The introduction of the present project has observed that the Bible is used as a paradigmatic point of departure, which immediately gives rise to the question of how the interpretation of the Bible should be approached. One considerable danger to be avoided is the practice of Biblicism, where the focus is exclusively on one biblical verse outside its immediate context and the context of the Bible as a whole (Douma 1997, pp. 39–40). In contrast, a revelation-historical approach will be followed in this study, which entails that the Bible (1) is accepted as the authoritative Word of God, (2) is viewed as a unit, (3) is viewed as a text bound by progressive revelation and (4) is read in such a way that the socio-historical context of various cultural contexts will be taken into account. On the basis of the Bible as paradigm, theories or themes will be developed that will be used to construct a Protestant water ethics at the hand of which the UDBHR water ethics will be tested (see Vorster 2017, pp. 91–95).

Two particular themes that are accepted relatively widely within Protestant thinking – namely, the creation perspective of the Old Testament and the kingdom perspective of the New Testament – will be constructed in the development of a broad Protestant water ethics. In order to render this study as universally acceptable and practically convincing as possible within the Protestant religious tradition, a given individual religious tradition within Protestantism will not be the focus here.

■ Old Testament perspective

Holmes (1995, p. 268) makes the following observation against an evangelical-Protestant background: ‘The doctrine of creation is one of the major theological themes that informs a Christian ethic’. That the creation narrative enjoys bioethical meaning is supported by widely divergent Protestant thinkers such as Moltmann (1985, pp. 1–20), Østnor et al. (1995, p. 12), Brown (2011, p. 290) and Vorster (2017, pp. 354–355).

Within most Protestant religious traditions, it is generally accepted that the creation narrative (Gn 1 and 2) is interpreted in such a way that God created everything *ex nihilo* [from nothing] (Galvan 2012, p. 42; Vorster 2017, p. 355). Although it is not stated directly that God created water, the inference is that it has not always existed, but that God consciously created water, as he did heaven and Earth, in the beginning (Gn 1:1–2; Veldsman 2015, pp. 4–5). The fact that water is mentioned as the first given of creation points to the essential place and role of water in creation (Brown 2015, p. 290). It is clear that the creation narrative describes God as the origin and giver of water. Not only is God the giver of water but also the provider

of abundance of water (quantity) in the form of deep waters (Gn 1:2) and four rivers in the Garden of Eden that could feed the entire Earth (Gn 2:10; Chamberlain 2007, p. 41). The fact that water existed before anything else indicates that God makes access to water a reality: God gives adequate water to nature and humanity.

The existence of sea water and fresh water (Gn 1:6-9) – the latter in the form of rainwater (Gn 2:5), ground water (Gn 2:6) and rivers (Gn 2:10-11) – enables the creation and development of plants, trees (Gn 1:10), animals (Gn 1:10, 20-22, 24-25) and humanity in the image of God (Gn 1:26, 2:7) (Brown 2011, p. 187; Veldsman 2015, p. 5). Water goes ahead of life and, as Makgoba (2018, p. 113) states, it gives birth to life. It is clear that life and its continuation on Earth are not possible without water (Chamberlain 2007, pp. 40-41; De Gruchy 2010a, p. 198; Galvan 2012, p. 47; Veldsman 2015, p. 5). In this sense, the creation narrative supports Article 14 of the UDBHR, which holds that health and that which is necessary for health, namely water, must be a fundamental right of all people. Without adequate water, no human can live a healthy life. Therefore, access to water is not optional, a luxury or an entity driven purely by economics. Water is a fundamental right simply because life is not possible without it.

Not only is the quantity of water important to God but also the quality. It must be mentioned that God decided that his created nature and humanity were 'very good' (Gn 1:31; Galvan 2012, p. 42). According to Berkhof (1985, p. 162), created reality and everything that forms part of it are described as good, including water. To be created well, Berkhof says, means that '*niets is slecht*' [nothing is bad] about water, neither can anything about it cause damage. Holmes (1995, p. 270) also entertains this point of departure when he judges that 'good' can be interpreted negatively or positively. In the negative sense, 'good' entails the absence of evil, and in the positive sense, water is meant to promote good current and future life. The inference can be made that water is a good substance, which points to unpolluted water. This water is good for nature and humanity.

In his analysis of the ethical implications of the creation narrative, Frame (2008, p. 744) reaches the conclusion that already prior to the fall, the instruction is found that creation must be respected and conserved: 'we must protect plant and animal life, and their habitats, if we and our descendants are to survive'. This inference is based on the fact that God prohibits humanity from eating of the tree of the knowledge of good and evil (Gn 2:16-17). In this, an instruction is found to conserve the goodness of creation. Although water is not mentioned directly, the implication is clear: if the tree of the knowledge of good and evil must be conserved, the presupposition is that that which gives life to the tree, namely water, must also be protected.

All of these creation perspectives are confirmed in the remainder of the Old Testament. The symbolic use of water in the Old Testament confirms the physical understanding of water as found in the creation perspective. In Jeremiah 2:13, God is revealed as the 'fountain of living water'. The fact that water is used as the symbol for God indicates its importance. In an in-depth study of the use of metaphors in Jeremiah, Jindo (2010) explains the essence of the metaphor as follows:

The essence of metaphor is understanding and experiencing one kind of thing in term of another [...] metaphors are mapping of structure from one domain onto another [...] When a target domain is understood in terms of a source domain, there is a set systematic correspondences between these domains. That is, constituent elements of the source domain correspond to constituents elements of the target domain- these correspondences are called mapping. (pp. 28-32)

In other words, the metaphor (i.e. the fountain of living water) stems from an understanding and experience of physical water (i.e. the fountain of physical water). A systematic correspondence, therefore, occurs between the target fountain (fountain of living water) and the source domain (fountain of physical water). In other words, what is said about the fountain of living water is true of the fountain of physical water, and that which is revealed about the fountain of physical water is true of the fountain of living water (Brown 2015, p. 290). The source domain and target domain are irrevocably dependent on each other (Peppard & Zenner 2018, p. 176). The focus of the symbol, in general, is not restricted to the spiritual but includes the physical. In the words of Rutledge (2019, p. 23): 'living water is not just a metaphor'. Chamberlain (2007) summarises this recognition as follows:

Yahweh God is the source of spiritual drink, nourishment, a conviction echoed in the Christian scriptures; at the same time, Yahweh God is the origin of the physical water that nurture God's people [and] water symbolism forms a typology of a biblical valorization of physical water. (p. 41)

God is revealed as the 'fountain of living water' (Jr 2:13). The concept 'sins' [*raw-aw'*] of the people, which introduces Verse 13, enjoys a moral meaning according to Mackay (2017, p. 145) and provides a framework in accordance with which the physical and symbolic meaning of the metaphor should be understood. A fountain, as the source of water, is the giver of water. The context indicates God to be the source of spiritual life or belief in the true God. However, God is not only the source of spiritual water or life. God is also the giver of physical water (Lalleman 2013 p. 61). In Isaiah 41 we read:

The helpless and the poor look for water, but there is none; they languish of thirst. But I, the Lord, will hear their prayers, I, the God of Israel, will not depart from them. I will make rivers spring from the naked mountain tops, and make fountains bubble from the lowlands. I will change desert areas into wetlands of reeds, arid land into a world of fountains. (vv. 17-18)

God provides drinking water (Nm 8:20). God does not only supply water, but he is also a fountain of adequate water. A fountain also carries the meaning of abundant water: it is a water source that will not readily dry out (Is 58:11) and is a source from which water bubbles. God is not a burst water container that constantly loses its water. In tandem with this, God is also described as a giver of living water. The link between life and water is striking and enjoys a double meaning here. On the one hand, it is the recognition that, without God and water, spiritual life and physical-psychological life are not possible. Water is a condition for life. That life cannot exist without water confirms the thought that it must be viewed as a right. This truth is boosted by the invitation in Isaiah 55:1 to come to the water and drink, even if one does not have the necessary money for it. On the other hand, living water indicates water that gives life and sustains life and therefore carries the meaning of the quality of water that is so good that it can promote life and health (Mackay 2017, pp. 145-146).

The creation truth that water is conserved returns in the symbolism of Jeremiah 2:13. Again, water is viewed to be of such importance as a substance that it is connected with God metaphorically. In this pericope, the Israelites are accused of the fact that they had left behind in favour of other gods the source of the living water, namely, God. This departure is described symbolically as the cutting of water containers from rock. They did not stay with God (the Fountain) but created their own gods, their own water containers cut from rock. And then, these gods or self-made containers are described as burst water containers that cannot hold water. When water is wasted, especially in times of drought, it is life-threatening (Jr 38:6; Van den Brink 2013, p. 151). The spiritual meaning is that God is the only source of living water and that a truly spiritually edifying life goes to waste among idols. Spiritual water can be lost by means of irresponsible deeds and cause death. Spiritual water must be conserved by staying with God. Wastage of water is judged so seriously that it is used as a metaphor for describing godlessness and is viewed ethically as so repugnant that it becomes a deed of betrayal. Water must not be wasted, but must be eagerly conserved.

Resane (2010, p. 37) avers that humanity as the image of God is an important theme within the creation perspective and contributes to water ethics of social responsibility (see also Galvan 2012). God is the sovereign Lord of creation and the created (Ps 93, 145). As the image of God, humanity is also the ruler, like God, of creation and the created. As stewards, it is the duty of humanity to personify God in his essence and actions by acting like God (Bouma-Prediger 2017, p. 222; Veldsman 2015, p. 6). How does one personify God within the context of biblical water ethics? Like God, humanity is the 'creator' of water, which means that adequate water must be provided to people.

In terms of the creation narrative and the Old Testament, one can reach the careful conclusion that a right to adequate water as well as the call to the protection of water, as declared in the UDBHR, can be grounded on broad Protestant ethics, thus complying with the biblical test.

■ New Testament perspective

The Kingdom of God, in contrast with the theocracy of the Old Testament, remains a prominent theme in the New Testament and the Bible as a whole and enjoys pride of place within Protestant thought (Beach 2012, p. 53; Ridderbos 1985, pp. 5–23; Vorster 2017, p. 136). Regarding the value of the kingdom for social ethics, Vorster (2007) makes the following guiding remark:

The Kingdom of God is the work of God Himself. Its significance for social ethics lies therein that it relates God reign to the whole creation, all spheres of human life, to the world and history. (p. 132)

The importance of the theme of the kingdom is found in the fact that it is central to Jesus' preaching, and it is for this reason that Matthew speaks of the gospel of the kingdom (Mt 4:23, 9:35). The basic point of departure of the Kingdom of God is that he is the king who governs from now until eternity (Rv 11:15, 17; Vorster 2017, pp. 133–134). It is accepted that there is only one kingdom, which is of a dialectical nature. One can distinguish between the current phase, also known as the 'already phase' (Lk 17:21) and a future phase, also known as the 'not yet phase' of the kingdom of heaven (Mt 6:10, 8:11). The shared character of the one kingdom is the ideal and reality of the same justice (Mt 6:33; Rm 4:17; Beach 2012). The kingdom centres on that which God does and that which his subjects must do.

What is the nature of God's governance at the present time? God governs by means of the work of Christ on Earth (Rv 1:5; 1:13–29; Beach 2012, p. 62). The governance of Christ also includes cosmological justice aimed at full human existence when he has brought about liberation (Mt 12:28), healing (Mt 4:23) and reconciliation amidst chaos, disease, brokenness and despair. Kingship is aimed at the total cosmos and all people (Col 1:16; Vorster 2017, p. 137). God also governs by means of his church on Earth. Believers are God's collaborators in his kingdom of governance (Col 4:11). It is expected from the church to follow Christ by searching for and promoting the justice of the kingdom. The keys to the kingdom have been given to the church (Mt 16:19). The church must pronounce justice to the world in terms of the principles of the kingdom (Mt 16:19, 28:19; Beach 2012, pp. 61–62). Humanity must be called to the acceptance of the soteriological justice by means of belief in God and Christ. Like Christ, the church must also bring cosmological justice by preaching the principles of the kingdom regarding water. Kingdom ethics of water must be developed and pronounced.

Water is an imperative subject in the present Kingdom of God with a clear cosmological implication. In Matthew 25 (vv. 34–35), Jesus connects water and the Kingdom of God when he says (Veldsman 2015):

Then the King will say to those on his right hand side: “Come, you who have been blessed by my Father! The kingdom has been prepared for you since creation. Take it into possession as inheritance, because I was hungry, and you gave me something to eat; I was thirsty, and you gave me something to drink; I was a stranger, and you lodged me”. (p. 6)

Because water is a very rare commodity in Israel, the underlying thought in the water metaphor is the exceptional value of physical water (Osborne 2017, p. 68). The value of water within the kingdom is confirmed in John 4, when water is again used as a metaphor (De Gruchy 2010b, p. 22). Understanding of the metaphor in Jeremiah 2 is also valid for the metaphor in John 4 (Mackay 2017, p. 146). Upon her in-depth study of the metaphorical use of the living water in John 4, Marais (2017, p. 79) reaches the following conclusion: ‘Stated somewhat differently, the rhetoric of the water of life becomes a soteriological image of, or metaphor for human and ecological flourishing’.

Jesus meets a Samaritan woman at the fountain of Jacob where she fetches water daily (Jn 4:5). It can be inferred from the Greek word for fountain [*ρῆγῆ*] that the source of water was constant, while water bubbled up from it perpetually (Louw & Nida 1988, p. 15, 90). The fountain’s water was therefore clean and safe because it was not stagnant, and there always was adequate water, therefore living water (Osborne 2017, p. 69). Jesus asks the woman for water to drink, but she hesitates to give him water, because Jews and Samaritans are not interested in each other’s physical and spiritual needs (Osborne 2017, p. 68). Jesus uses the occasion to reveal that he cares about the spiritual needs of the Samaritans. Responding to the hesitation of the woman, Jesus asks if she knows that he is the fountain that can give her living water. Living water is belief in Christ, which brings salvation (Jn 3:16, 36; Marais 2017, p. 79; Osborne 2017, p. 68). In a spiritual sense, Jesus is the fountain that gives living water, that is, a gift from God (v. 10), a belief that bubbles up like water giving eternal life (v. 14). The belief given by Jesus will always be abundant (bubbling up) (Brown 2015, pp. 293–296). However, Jesus does not only care about the spiritual needs of people but also their physical needs. According to Peppard and Zenner (2018, p. 176), as in the Old Testament, water for life and the living water are irrevocably dependent on each other: ‘well water and living water, matter and spirit, are all part of the same flow’. If it is not true that Jesus also gives physical water, as a symbol water carries no meaning; therefore, it can be accepted that, just as God gives living water, so he also gives physical water. Jesus indeed speaks of the giving of living water at a physical fountain. The fountain is proof that God gives water. The physical fountain indicates the importance of access to water and infrastructure.

The promise is that God does not only give water but also gives adequate water (that bubbles up) and clean water that will promote health and life (it gives eternal life). The fact that water is described as a gift indicates that water must be viewed as a right. Köstenberger (2002, p. 150) emphasises that the gospel of John focuses not only on the connection between water and life but also on the connection between water, disease, healing and health. In this regard, Köstenberger calls for attention to Jewish ceremonial cleansing (Jn 2:6, 3:25) and healing when the sick person comes into contact with the water (Jn 5:7, 9:7).

The Kingdom of God is also a future reality. As only one kingdom exists, justice, as revealed in the completed kingdom, must also be sought and promoted in the present kingdom (Mt 6:11), although it will never be achieved in full (1 Jn 1:8). The justice of the eternal kingdom must also be sought and promoted now. The things that are above where Christ is, where he sits at the right hand of God, must also be strived for (Col 3:1-2). According to Chamberlain (2007, p. 49), the coming eternal kingdom as depicted in Revelation 21-22 also provides important guidelines regarding biblical water ethics (see also De Gruchy 2010a, p. 199, pp. 113-114; Makgoba 2018; Rossing 2020, p. 41). The symbolic reference to water in Jeremiah 2:13 anticipates the use of living water in Revelation 21-22 (Osborne 2017, p. 68). In the New Jerusalem, there will be a river with 'the water of life' (Rv 21:6; 22:17). Chamberlain is convinced that the subsequent four inferences can be made: (1) that reference is made here not only to spiritual water; (2) that God is the giver of water; (3) that it is confirmed that water is a prerequisite for life, while emphasising the right to water in this way; and (4) that the quality of water is such that it will promote a healthy life and not impair it. Consider that the truth of point (3) is confirmed in the invitation to come and fetch water for free (Rv 21:6, 22:17; Rossing 2020, pp. 41-41).

It is striking that water is described to be as clear as crystal (Rv 22:1; Makgoba 2018, p. 114). This point of view is underscored by the striking reference to the water of life in contrast with water that has turned bitter, where the latter leads to the death of people because it has been contaminated (Rv 8:11). Chamberlain (2007, p. 49) writes: 'This vision instils motivation to clean polluted water, share water resources more equitably, and envision God's Spirit flowing throughout the rivers of the earth'.

Justice in the eternal Kingdom of God also entails the conservation of the environment; this is inferred from Revelation 11:18, where God judges the destruction of the environment (Kreider 2019, p. 221). The reason for the judgement is that the destruction of the earth radically works against an environment and society where people can be happy (that is, there is no sorrow), lead a safe life (that is, there is no death) and lead a

healthy life (i.e. there is no pain or sickness) (Rv 21:4; 22:2). Water is vital for a prosperous environment, and that is why conservation is necessary. In his commentary on Revelation 11:18, Kreider (2019) makes the following observation:

[F]ailure to care for the earth is tantamount to destroying it [...] Several practical implications follow. (1) Creation care is a gospel concern, for it is a life issue. Healthy human and animal life depends on a good environment that includes clean air and water and one in which disease and decay is controlled. (p. 221)

Measured against a kingdom perspective and the New Testament, one can reach the preliminary conclusion that a right to adequate water as well as the call for the protection of water, as declared in the UDBHR, can be grounded in a broad Protestant social ethics.

■ Conclusion

The Protestant religious tradition, a potential companion, was excluded from discussion during the development of the UDBHR in 2004. On the one hand, this cast doubt on the claim to the universality of the UDBHR, while, on the other hand the Protestant religious tradition was denied an opportunity to enter into discussion with the global water ethics of the UDBHR. This chapter attempted a preliminary solution for this challenge by formulating a broad Protestant-theological foundation for the water ethics of the UDBHR. The water ethics of the UDBHR comprise two global principles, namely, that all humans have a right to access adequate water (art. 14) and, emanating from this, the call for the protection of water (art. 17). The two global principles can be grounded in the Old Testament and creation perspective as well as the New Testament and the Kingdom of God. It can be provisionally accepted that the water ethics of the UDBHR comply with the test of broad Protestant ethics, and these can therefore be preached by the church as kingdom ethics.

Saving water? A theological exploration of ‘water as gift’

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■ Introduction⁴

South Africa recently experienced one of its worst droughts, with projections that the city of Cape Town may become one of the first large cities in the world to run out of water. A variety of campaigns have called for responsible everyday use of water resources, including campaigns at universities to become ‘water wise’ (University of the Western Cape)⁵ or ‘water smart’ (Stellenbosch University).⁶ The City of Cape Town likewise continually

4. This paper was presented as part of the Ecotheology Section at the annual conference of the Theological Society of South Africa, with the conference theme ‘From Versailles to Kempton Park: Theological and ethical reflection on peace and peacemaking’ (Howick, KwaZulu-Natal, South Africa, 20–22 June 2018).

5. See <https://www.uwc.ac.za/News/Pages/UWC-Earth-Day-2018--Take-The-MyGreenUWC-Pledge.aspx>.

6. See <https://www.sun.ac.za/english/Pages/Water-crisis.aspx?TermStoreId=d4aca01e-c7ae-4dc1-b7b2-54492a41081c&TermSetId=7989b2c1-6fd7-4cbf-a8ae-07ebb77dc18b&TermId=affb20f9-cebe-4c12-b235-2721bc4306ce>.

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urges residents to 'think water'⁷ and to 'save water'.⁸ These campaigns are, however, not limited to Cape Town or the Western Cape; these include national campaigns, such as the National Department of Water and Sanitation's #savewater campaign.⁹ The rhetorical choice for invoking soteriological language – 'saving water', in particular – for such public campaigns is therefore well worth theological consideration.

The call to 'save water' becomes theologically significant when it is considered in light of the experiences of drought and thirst. Such experiences shape the theological rhetoric employed by churches and faith communities, particularly where the metaphor of water is invoked in faith claims about salvation. Water saves us, but we are also those called upon to save water. I have argued elsewhere that the very notions 'drought' and 'thirst' therein become complicated theological notions that rely upon the negotiation of water language and water talk.¹⁰

In this chapter the theological exploration of water talk is continued, but with a specific interest in the manner in which water talk performs when water is regarded as (a) gift. A theological exploration of 'water', 'salvation' and 'gift' may therefore be one way in which to make sense of the rhetorical negotiations regarding the theological meaning of 'water as gift' in a time of drought and water shortages. What are the rhetorical quality and implied responsibilities invoked in the description of water as a gift? What are the intended rhetorical and theological effects of such an image? And how is such meaning-making managed when received by an audience that is very much aware of the importance of 'saving water'?

■ Can a gift be given? Water and gift-giving

A number of South African theologians have reflected on water in different ways.¹¹ Amidst a plethora of images and metaphors for water – including water as life's foundation (De Gruchy n.d.a) and water as a divine symbol

7. See <http://www.capetown.gov.za/Family%20and%20home/residential-utility-services/residential-water-and-sanitation-services/make-water-saving-a-way-of-life>.

8. See <http://www.capetown.gov.za/Media-and-news/Drought%20crisis%20City%20urges%20residents%20not%20to%20ease%20up%20on%20saving%20water>.

9. See <http://www.capetalk.co.za/articles/292145/water-and-sanitation-dept-kicks-off-savewater-campaign-in-cape-town>.

10. Cf. an article and a chapter wherein I explored this, titled '#rainmustfall: A theological reflection on drought, thirst, and the water of life' (Marais 2017) and 'Blue is the warmest colour: theology, ethics, water' (Marais 2018), respectively.

11. See, for instance, Danie Veldsman's '*Geen water, geen volheid: Die dringende boodskap van die eksistensieël-teologiese betekenis van water*' [No water, no fullness: The urgent message of the existential-theological meaning of water] (Veldsman 2015).

(De Gruchy n.d.c) – the theological and rhetorical ladenness of this description, ‘water as gift’, may be understandably overlooked. It is worth noting that South African theologian Steve de Gruchy would indicate – in his work on water – a gift-giving rhetoric evident in theological imaginings of the meaning of water for the sake of deeper exploration of what this could mean and imply for our theological reflections on water (De Gruchy n.d.c). He relates this directly to the imagery employed in the Bible (cf. De Gruchy 2010), but also invokes this particular theological description of water in his reflection on issues in development, including the role of water in recent cholera outbreaks (cf. De Gruchy 2010), water and sewage (cf. De Gruchy 2009) and water and poverty (cf. De Gruchy 2007).

In Steve de Gruchy’s description of water as gift it is worth noting that the politics of gift-giving extends in two ways: (1) water as *gift* (from God) (De Gruchy n.d.c) and (2) water as *giver* (of life) (De Gruchy 2010, pp. 198–199). A theological exploration of some of the contours for such water talk may therefore need to provide a more careful consideration of the rhetoric of gift-giving, because it may not be immediately evident what this metaphor’s intended rhetorical effect may be. Who gives this gift? What is this gift? And what kind of a response does this gift evoke or require?

In Marcell Mauss’ classic work *The Gift* (1990), ‘the gift [...] form[s] the primary social bond’, writes John Milbank (2006, p. 444).¹² The language of gift-giving has raised important questions about the description ‘gift’ – including John Milbank’s classic question: Can a gift be given? In an essay with this title, John Milbank (1995, pp. 119–121) explores such related terms as ‘gift’, ‘give’ and ‘present’. He points out that ‘present’ may mean ‘the present moment’, but it may also refer to ‘a gift’.¹³ ‘Gift’ is similarly ambiguous, since the Old English term *gif* (similarly *Gibt* in German, and the Greek or Latin *dosís*) can mean both ‘gift’ and ‘poison’ – ‘we can still receive a “dose” of something either healing or harmful’ (Milbank 1995, 120). The rhetoric of gifting is thereby deeply ambiguous, Milbank suggests, in that not all that we receive works in favour of our health, wholeness and flourishing.

12. In a section entitled ‘Moral conclusions’, Marcel Mauss (1990, p. 177) writes that ‘[a] considerable part of our ethics and of our lives themselves still exists within this same atmosphere of the gift [...] of obligation and of liberty mixed together. Happily, everything is not yet classified exclusively in terms of purchase and sale. Things still have sentimental value beyond their venal value, assuming that there are in fact values uniquely of this kind. We do not only have a market ethic. There remain among us people and classes who still have the moral customs of a bygone age, and almost all of us observe them, at least at certain times of the year or on certain occasions’.

13. He argues that these two emphases may also be closely connected, in that the present moment itself may be ‘held as a gift’. The present ‘lies entirely in the passage of time and cannot be owned by a subject after it has been given to him [sic] (thereby obliterating its gratuitous origin)’. The gift-like dynamics inherent to ‘the present’ may be particularly evident in ‘[t]he moment [which] never stays as present, even for a fleeting instance’ (cf. Milbank 1995, p. 121).

Stated somewhat differently, 'gift' can therefore signify both 'good transference' (a present received) and 'bad transference' (a poison administered).¹⁴ A third possibility is a combination of these two meanings, because it is also possible, Milbank (1995, p. 125) notes, to 'give an entirely poisoned gift, a "gift" of spoliation'. What would make a gift a good gift, then? Milbank (1995, p. 125) argues that the goodness of giving is determined by 'appropriateness in the content of the gift', which includes 'the degree that it respects various obligations', including (1) expectation of return and (2) using a gift in a manner that maintains its gift-like character. What is signified by not only the choice of gift but also the act of gift-giving – and the attitude and manner whereby the exchange of gift(s) takes place – is that the dynamic of gift-giving implies certain obligations or responsibilities by both parties involved, both the giver and the receiver.

Arguably, 'water as gift' is similarly caught up in the politics of gift-giving, which two small examples may illustrate. Water may be deadly, such as in the case of cholera or other waterborne sicknesses, and therein become a harbinger of death instead of a giver of life. Drought and thirst cannot be met by just any kind of water but require clean, fresh water. No other kind of water will do. The gift of water is therefore a particular gift, bound to specific requirements, if it is to be life-giving and not life-denying. It is exactly this recognition, namely that water as God's gift may not necessarily 'work for life' but may instead work for death, that causes 'cognitive shock', argues Steve de Gruchy (2010, p. 197). Water may be a gift, but water may also be a poison; instead of contributing to life, health and wholeness, water could instead cause illness, suffering and death.¹⁵

14. This is the second ambiguity in a series of ambiguities that Milbank lists (1995, pp. 120–121). The first ambiguity has to do with 'give and take': giving already implies pliability, or 'the capacity to receive', and therein both 'giving' and 'giving way'. The second ambiguity is that a gift is not inherently positive, beneficial, or good – but could also involve the gifting of the negative, lethal or bad. The third ambiguity is that 'giving' has a neutral inflection: it is neither inherently good nor bad, for 'one may give a blow as well as a present, and bad advice besides good'. Milbank summarises these three characteristic ambiguities of gift-giving as follows (1995, pp. 120–121): 'the gift [...] is caught up in three ambiguities: to give is also to take; a good gift is also a bad gift [...]; and finally "the given" is both the result of a deliberate generous donation and a brute unyielding fact or principle, alien to will or affect'.

15. The ambiguity of water is, for instance, also present in popular books and movies. In the book *Dune* (1965), written by Frank Herbert and recently remade into a movie, water on the fictitious planet Arrakis is so scarce that body fluids are recycled and shedding a tear is regarded as a rare gift: a sacrifice of precious bodily water. Every activity in the story revolves around water – the availability thereof, the recycling thereof, the control thereof, the use thereof and the striving towards a future wherein water scarcity will be known only as hearsay. In this story, water is a central theme, and much of the conflict and war effort in the book has to do with water. Yet, in this story water is also deeply ambiguous, for it is not only associated with life or survival. The Water of Life, for instance, is a poison; deadly to those who would drink it. It is therefore of interest to note that this ambiguity is present also in public imaginings of water, where the theologically laden description 'water of life' (think here of Jn 4 and the rhetorical negotiation between Jesus and the Samaritan woman regarding water, and water of life in particular) is employed to signal this second, less prominent, darker meaning to water.

Moreover, not only the quality of the water is at stake, but also the quantity of water: too little water – such as lack of rainfall in times of drought – is problematic, but so also is too much water – such as an overabundance of rainfall that causes floods and flash floods. The necessity of the goodness of water is thereby troubled, for ‘water as gift’ does not necessarily mean ‘water as *good* gift’, but may also be ‘water as *bad* gift’.

Stated somewhat differently, the appropriateness of water as gift needs to be determined by both its quality and its quantity. The dose of water given may be determinative of whether water is a blessing or a curse in a given moment. ‘Water as gift’ is therefore no less entangled in the politics of the discourse on gift-giving than other gifts may be, and it is therefore also subject to the inevitable negotiation of meaning that needs to take place when water is described as a gift. In Steve de Gruchy’s words (2009, p. 61): ‘This water itself is ambiguous’.

■ If everything is gift, nothing is gift? A Trinitarian soteriology of gift

Many theologians have responded to the theological implications of the discourse on gift-giving,¹⁶ including Todd Billings,¹⁷ Kathryn Tanner,¹⁸ Risto Saarinen¹⁹ and Sarah Coakley.²⁰ John Milbank’s classic essay on the notion ‘gift’ is helpful in describing the dynamic of giving and receiving gifts, which may enable us to explore some important theological contours of the popular description of ‘water as gift’ – but as Todd Billings points out, the categories of ‘gift’ and ‘gift-giving’ may ultimately also be theologically problematic. Todd Billings warns that should the theological discourse on ‘gift’ act as a ‘central dogma’ or overarching scheme or ‘central paradigm’ for rearranging and reinterpreting the entire scope of Christian doctrine, this ultimately reduces the complexity, richness and theological multivalence of a tradition that is able to hold within itself the very ambiguities that

16. See the classic work of Marcel Mauss (1990), on which much of the discussion of this discourse is based, titled *The Gift: The Form and Reason for Exchange in Archaic Societies*. See also the collection of philosophical essays on this topic, edited by Alan D. Schrift (1997), titled *Logic of the Gift: An Ethic of Generosity*.

17. See Todd Billings’ article titled ‘John Milbank’s Theology of the ‘Gift’ and Calvin’s Theology of Grace: A Critical Comparison’ (2005), as well as his book titled *Calvin, Participation and the Gift* (2007).

18. See in particular her *Jesus, Humanity and the Trinity* (2001) and *Economy of Grace* (2005). See also the festschrift dedicated to Tanner, edited by her former students Rosemary Carbine and Hilda Koster (2017), with the significant title *The Gift of Theology*.

19. See in particular his *God and the Gift* (with the subtitle *An Ecumenical Theology of Giving*) (2005), as well as his ‘Forgiveness, the Gift, and Ecclesiology’ (2006), and *Luther and the Gift* (2017).

20. See her article titled ‘Why gift? Gift, gender and trinitarian relations in Milbank and Tanner’ (2008) in this regard.

Milbank himself outlines (Billings 2005, pp. 98-99). For Billings (2005, p. 98), 'Milbank's project seems to do just that: to read doctrinal loci through the schematic structure provided by the "gift" discussion, functioning as a "central dogma".'

In short, 'Milbank's limitations seem to come from trying to do too much with too little', argues Billings (2005, p. 100), in that it extrapolates 'anthropological language from the gift-giving discussion to describe a trinitarian soteriology of the "gift"'. This lacks 'speculative' or 'apophatic' modesty, notes Billings (2005, p. 100), 'in making the gift scheme central to trinitarian metaphysics' – especially since such a theology of gift-giving lacks biblical exegesis and diverts at key moments from the tradition (and in particular Augustine and Aquinas, from whom Milbank draws). If the entire scope of the work of the economic Trinity is 'gift', then it stands to reason that the rhetoric of gift-giving itself becomes vague, superficial in its broadness and ultimately, non-sensical.

The caution that everything cannot and should not be made to fit into a schema of gift-giving is especially worth hearing in a theological consideration of 'water as gift', particularly if we also want to honour the boundaries and limitations to the scope of the rhetoric of gift-giving. There may very well be a point beyond which the negotiation of meaning of 'water as gift' does not take place, or does not matter, particularly if it should seek to remain open to the multiple theological descriptions of water that abound in the Bible and in the tradition.

'Water as gift' cannot, therefore, become a super-description for water, elevated above all other metaphors or descriptions of water, and even less so as a naïvely positive or romanticised portrayal that is theologically dishonest about the realities of death and destruction that often accompany water. The gift of water may not necessarily be a good or even wanted gift, in other words; water as gift may also not necessarily be an appropriate metaphor in all circumstances.

The dilemma of gift-giving talk – as encountered in the description of water as gift – extends even further than this, however: not only do we need to consider whether a gift is good, or even if a gift is wanted, but also whether a gift is free.

John Milbank (1995) argues that modern associations with 'gift' – as opposed to 'contract' – presupposes this 'freeness', which 'never has to be given or received, since it is by definition not subject to prior agreement' (p. 122). Such freedom needs to include a measure of indifference that encompasses everything from the content of the gift ('complete indifference to the content of the gift [...] [for] the gift may be anything') to unaffectedness by the receiver of the gift (it is 'unaffected in its gift-character by the gratitude or lack of it on the part of the recipient') to a lack of expectation

of a return (it is 'non-compulsory' to offer or expect 'a return-gift' in response to a gift given) (p. 122). Indifference is thereby a crucial element in the communicated 'freeness' of the gift in the gift-giving exchange.

However, insofar as indifference signals that the gift is free, the distinction between contract and gift does not hold, argues Milbank (1995, p. 123), because generosity itself creates obligation (even if this involves small, subtle, unambitious, unarticulated obligation). Generosity is, after all, bound and determined by 'the context of prior attachments, or at the very least in the making of such attachments' (Milbank 1995, p. 124). Indifference may not be entirely possible, in other words, even if it is desired. Yet this is exactly Milbank's dilemma, for this blurs the distinction between a contractual relationship and an exchange of gifts (Milbank 1995);

[/]f gifts are only good according to the measure of concealed moral contracts, debts and obligations, what is a gift after all? What distinguishes it from the fulfilling, albeit the just fulfilling, of a binding contract? (p. 124)

This observation is no less important when considering water as gift, particularly in a society where fresh, clean water has a price and can be bought and sold as a product on the open market. How we think about 'water as gift', 'water as commodity' and 'water as right' becomes all the more important in a time of drought and thirst, because it determines the appropriateness of the responses offered to the realities of drought and thirst.²¹

■ A gift that keeps on giving? Water and the reciprocity of grace

For John Milbank (1995, p. 125), a gift generates some kind of response because '[a] good, a sensible gift ... always does receive something back [...] [always] comes back to us'. He (Milbank 1995, p. 122) observes that modern notions of 'the gift' give preference to its 'formalist' and 'unilateral nature' – as opposed to 'demanded reciprocity' – wherein a clear 'cleavage between gift and contract' can be observed.²² In other words, 'water as gift' need not

21. For instance, if water is given out of generosity, whose generosity is at play? By whom and from where is water 'given'? To whom is water not given? If we gain access to water through municipal services, such as the water gathered in dams that is made available through pipes for a certain fee, on whose generosity are we reliant? What kind of obligation does this generosity create and sustain? How far does this generosity extend? And could there be multiple, simultaneous generosity – such as the generosity of God and the generosity of the state – at work? In short, what kind of an exchange does such generosity and obligation necessitate? And then, we still need to ask whether water is, in fact, free? Is its gift-like character evident in the ways in which we trade in water, deal with water, manage water, negotiate regarding water and speak about water?

22. Milbank (1995, pp. 125–126) argues that even 'the freest gift is still "contaminated" by contract', since 'giving' remains 'grounded in various exercises of coercive power'.

mean that no response, no exchange, no obligation and no return may be possible or desired.

Indeed, gift-giving is inseparable from exchange, notes John Milbank (1995, p. 121), and therefore, some consideration of reciprocity, receptivity and reflexivity is necessary, since exchange essentially means gift-giving 'giving back'. This exchange – regardless of the form such an exchange may ultimately take (whether as returning the gift, as in reciprocity; accepting the gift, as in receptivity; or sharing the gift, as in reflexivity) – is 'risk-laden', but nonetheless maintains the 'inalienability of the gift' (Milbank 1995, p. 126). In short, gift-giving always requires giving back: 'if not to the individual donor then at least to the wider social forces which that individual represents' (Milbank 1995, p. 125).

Gift-giving therefore requires a return of a gift. This may create 'some confusion', observes Milbank (1995, p. 120), about 'where the giving ends and taking begins'. But the point stands that 'a gift must come back' in one way or another. It is with this in mind that he outlines three characteristics that trace the subtleties of 'gift return' in reaction to a gift given. Firstly, gift-giving requires a 'delay or return': the return of the gift must not happen too soon (Milbank 1995, p. 125).²³ Secondly, gift-giving involves 'non-identical repetition': there must be a return-gift that is similar but not exactly the same as the initial gift (Milbank 1995, p. 125).²⁴ Thirdly, gift-giving calls for 'non-exact mimesis': the return-gift mimics and continues the gift-giving interaction with a prior gift (Milbank 1995, p. 125).²⁵ In short, these features illustrate that it is not just any kind of reciprocity invoked by the discourse on gift-giving, but a very particular 'returning gift' that may be required, namely, a 'return-gift' that appropriately responds to the gift-giving. An appropriate response to a gift given, then, is an expression of reciprocity in gift-giving. Gifting begets gifting.

'Water as gift' is no less caught up in the dynamics of reciprocity, reflexivity and receptivity. The observation that 'we all live downstream' (De Gruchy 2009, p. 57; cf. Veldsman 2015, pp. 6–7) reminds us that water

23. Milbank (1995, p. 125) explains this as follows: 'To give a return gift straightaway, to have people back to dinner the very next day, implies a lack of gratitude, a desire to discharge a debt as soon as possible'.

24. Milbank (1995, p. 125) notes that while 'the gift given back must be different' or even 'equivalent', it must also 'not [be] obviously equivalent', since a return of the exact same gift could be 'an evident insult'.

25. Milbank (1995, p. 125) points out that this involves not just any kind of mimesis, but a mimesis 'of the first gesture in unpredictably different circumstances, at unpredictable times and to unpredictably various recipients'.

is continually moving within a closed cycle, for '[t]here is one stream of water from which we all drink' (De Gruchy 2009, p. 57). The gift of water is not given unilaterally but is, per definition, reciprocally given, a gift recycled within the hydrological cycle²⁶ – which is to say, a closed system, or 'spaceship economy' (De Gruchy 2010, p. 198). Within this cycle, the gift of water may be spread unevenly, cleansed or poisoned – but it cannot be multiplied beyond the water resources already present within the cycle (De Gruchy 2010, p. 198). Water continually returns from whence it came, for '[t]here is only one stream of water' that passes through all of us (De Gruchy 2010), and this:

[...] passes through the bodies of humans passes through the bodies of animals, insects and plants. It flushes through our sanitation systems, flows through the rivers, seeps through wetlands, rises to the heavens to become clouds, and returns to nourish us and all living things. There is no life outside this cycle. (p. 198)

All water is, therefore, recycled water. The gift of water is inherently reciprocal, which binds all living beings – all those who rely on water to live – together. Exactly in our shared dependence upon water for life lies the inevitable, continual return of the gift. Indeed, 'water is life's foundation', for 'no living thing – human, animal or plant – can survive without it' (De Gruchy n.d.a, p. 22). Water as gift highlights that this is a shared gift, for all living beings partake of the same water cycle (De Gruchy 2010, p. 198). In short, this highlights the gift-giving dynamic inherent to water as gift: water is not only itself a gift, but also gives a gift – namely, the gift of life (De Gruchy 2010, p. 198), for water itself is 'a living thing, a gift from God' (De Gruchy n.d.c, p. 22). The Bible's recognition that water makes life possible, or that there is 'no life without water', closely ties water to the work of the God of Life (De Gruchy n.d.b, p. 22). As a condition for life, water is portrayed as no less than God's gift to all that is not God (cf. Ferris 2006, p. 8).²⁷

26. Sylvie Shaw and Andrew Francis (eds. 2008, p. 10) describe the hydrological cycle, or the water cycle, as 'the continuous movement of water and the essential interchange between saltwater and freshwater, between oceans and rivers, between clouds and rain, and between land, sea and sky, and between all the creatures that live in these ecological domains [...] [this is] the relationship between the perpetual movement of waters and the ongoing life of the planet, including humans'. As such, '[t]he water cycle marks the passage from creation to dissolution, and then regeneration, the turning of the wheel of life' (p. 11).

27. Margaret Ferris (2006) explains that '[in] several biblical passages, water is given by God as a life-sustaining gift' (p. 8). She adds to the description of water as gift, that water is 'beloved by God' (p. 8). Understanding water's gift-like character means that 'we value our water' (p. 13) and recognise water as 'intrinsically valuable'. It is this recognition of water as intrinsically valuable that Ferris regards as an important starting point for the rehabilitation of faith communities' aquatic imagination (p. 18).

Yet water is not only God's gift – it is God's *special* gift.²⁸ Steve de Gruchy (n.d.b, p. 22) adds this qualifier – 'special' – to his description of water in a popular theological reflection on water as God's gift. He explains, in this reflection, that 'rain is special because it comes from heaven and falls down on the earth, and makes things grow' (De Gruchy n.d.b, p. 22). Rain is the fundamental way in which water comes to us, remarks De Gruchy, as a key expression of 'water as (God's) gift' (De Gruchy n.d.b, p. 22). Water is thereby a provision – namely, a provision without which no kind of life is possible (De Gruchy n.d.b, p. 22). This 'very special gift from God' is gathered under one theological term: blessing.²⁹ Steve de Gruchy invokes the term '*pula*' in Botswana, which is the word used for both rain and blessing (and is also the official currency in Botswana; 'a sign of prosperity in the life of the people'), as an example of this close rhetorical link (De Gruchy n.d.b, p. 22).

It is, however, from the whole scope of the economy of salvation – the entirety of the work of the trinitarian God – that this soteriological concern for blessing and gift-giving is expressed. 'Water as gift' is therefore determined by a deeply reciprocal logic – of a gift that keeps on giving – that is embedded and shaped by the self-giving, other-affirming love and grace of the triune God. It is this God that 'uses the gift of water to create and sustain life' (De Gruchy n.d.b, p. 22). The water of life may, therefore, very well provide us with 'an aquacentric moment in salvation history' (De Gruchy 2010, p. 200). Water therein comes to symbolise 'life in the coming Kingdom of God' and reminds us that we, too, 'participate in the

28. See, for instance, the Entebbe Statement (World Council of Churches [WCC] 2007), issued jointly by the Ecumenical Water Network and the All Africa Conference of Churches (that met in Entebbe, Uganda, from 21 to 25 May 2007 to discuss 'Churches for Water in Africa'), that includes the following affirmation: 'As churches and faith based organisations we affirm water as the cradle and source of life, an expression of God's grace in perpetuity for the whole of creation. We are called to exercise responsible stewardship for this unique trust, and to preserve and share it for the benefit of humanity and all creation. Further we share the following convictions: that access to water is a fundamental human right, that the protection and control of water resources is a central public responsibility, and that water must not be treated as a commodity but as an essential social good for the present and future generations. We recognise water as a sacred gift of God'.

29. De Gruchy (n.d.b, p. 22). The Reformed theologian David Kelsey (2009, pp. 447–450) – who works with careful distinction between different kinds of blessing (creative and eschatological, respectively), as well as between blessing and flourishing, also employs 'gift' and 'blessing' as proximate, or rhetorically linked, terms. God commits Godself to creative and eschatological blessings simultaneously, argues Kelsey (2009, p. 479), which includes blessing in living and bringing forth life. God's creative blessing is expressed in God's commitment to God's creative project – and therefore includes the blessing of all that is not God (Kelsey 2009, pp. 447–450). God's eschatological blessing is expressed in God's promise and embodied in the life, death and resurrection of Jesus Christ – and transformed by the promise of God's new creation (Kelsey 2009, p. 442). These two blessings are distinct and interrelated and share a concern for the particular and universal flourishing of all living beings.

covenant of grace' (De Gruchy n.d.c, p. 22), for water as gift is itself a gift of grace.³⁰ Moreover, water as gift is God's gift of grace.

■ Whose gift is it anyway? Water as God's donation

"No one owns water, it is God's gift."

This is the title of the Malawian theologian Fulata Moyo's contribution to the *Ecumenical Water Network's Seven Weeks of Water*.³¹ Water is the source of all life; this is 'the truth of evolution', notes Steve de Gruchy (2010, p. 198), namely that creation is deeply reliant upon water. The affirmation that 'water is a gift' traces a final theological strand within such water talk, namely *whose* gift water is. The Bible is consistent in affirming that the gift of water is given by God.³² Gift-giving involves generosity, argues John Milbank (1995, p. 126); for gift-exchange involves at least four traits: (1) the obligation to give, (2) the obligation to receive, (3) the obligation to give *back* and (4) the obligation to give back *more*. This 'more' signifies the divine excess from which such a gift-giving exchange takes place.

Yet exactly such generosity may also become a way to leverage power and prestige – in that gratitude for a gift becomes payment to the giver (Milbank 1995, p. 130) – or simply create what Milbank calls 'category confusion' – by disrupting the relationship between generosity and exchange (Milbank 1995, p. 128). Generosity and the donation that stems from this may therefore not be of good faith but could be an attempt to

30. Stephen Chester (2017, pp. 150–169) points out that there is 'a shared exegetical grammar' between Paul and the Reformers with regard to their rhetoric of gift-giving, but although 'gift' and 'grace' came to be used synonymously in the work of Erasmus and others, there are also important differences for figures such as Philip Melancton between 'gift' and 'grace', so that it is by no means self-evident that these are simply synonyms. Indeed, some 'regarded the distinction between "gift" and "grace" as theologically crucial [...] The traditional view of grace makes grace into a gift, but Melancton articulates what was to become the usual Protestant view of justifying grace. Although closely connected, grace and gift are not the same. Grace motivates divine gift and assuredly leads to gift, but is not itself the gift and, unlike gift, remains as something in God and not in human beings' (Chester 2017, pp. 150–169). In summary, '[i]n key Pauline texts concerning justification, grace denotes a divine disposition, the favor or mercy that is God's desire to forgive sins on the basis of Christ's saving sacrifice. As such, grace is gratuitous and depends not at all on human actions since it remains unconditioned by anything outside of God. Grace is the indispensable basis of the divine gift that makes obedient human actions possible, but it is not itself to be identified with this gift' (Chester 2017, p. 170).

31. See <https://water.oikoumene.org/en/whatwedo/seven-weeks-for-water/past/2009-water-and-justice/no-one-owns-water-it-is-god-s-gift/no-one-owns-water-it-is-god-s-gift>.

32. In the Ecumenical Water Network's publication titled *Ripples in the Water*, editors Susan Kim and Maïke Gorsboth (eds. 2014, pp. xi–xii) write that '[t]he biblical stories of water reflect our present-day reality and engagement with this basic element of life and death. From the moment our lives begin, water is key to our future. Without it, we will die. We drink it, cook with it, bathe in it, wash clothes and dishes and floors with it, nourish animals and plants with it, and use it in manufacturing of all kinds. As Christians, we are baptized in it'.

manipulate the obligatory patterns and rules encoded in the gift-exchange (Milbank 1995, p. 128). The theological power and rhetorical potential of the notion 'water as gift' may therefore itself not be entirely innocent but intended to convince, manipulate, or overpower. The intended effect of a gift-giving discourse on water needs to take the seductive power and potential abuse of such talk seriously, particularly if it takes place in contexts where water and access to water resources already portray patterns – or even the potential for future patterns to develop – of inequality, injustice and exploitation.

In her engagement with the discourse on gift-giving, Sarah Coakley (2008, p. 225) argues that it is important to understand 'why gift?': namely, why the language of the gift became important to theologians in the wake of Marcel Mauss's work. In Marcel Mauss's (1990) classic work titled *The Gift*, there is – according to Coakley (2008, p. 225) – an attempt 'to resurrect a utopian vision of [...] gift-exchange' wherein 'a complex system of codified interactions' ultimately 'create a society of remarkable cohesiveness'. She is particularly interested in 'gift' as 'a code for divine excess', wherein such exchange becomes (endlessly) repetitive and continually defers meaning (Coakley 2008, p. 225).³³ When one considers water as gift from this perspective, God's gift-like generosity brings forth 'water as gift' from the overabundance of God's creative work and concern for the life and flourishing of all living beings.

Water is no less than the triune God's donation – and it is this donation from self-giving, other-affirming love that provides the horizon of meaning for what it means to speak about water as God's gift. Water as God's special gift is the divine donation given not unilaterally (only), but continually; a gift not only private, but also public; and a gift shared among living beings for the sake of the flourishing of all. It is with the challenges of drought and thirst in mind that reflection on 'water talk' may again be of interest, especially the notion 'water as gift', and particularly toward doing the work of 'theological exploration' of the language – and meaningful images and metaphors – of salvation.

Water may therefore also be described as 'God's donation', for water is loved by God and 'dear to God', writes Margaret Ferris (2006, p. 19). Water as 'the given' points toward 'deliberate generous donation', argues Milbank (1995, p. 121). This may involve at least two kinds of donation: (1) creative donation and (2) soteriological donation. Water as *creative* donation is a gift given from the life-giving depths of God's creative work. Steve de

33. She refers in particular to Jacques Derrida's work in this regard, wherein a critique of Marcel Mauss's work is offered. In short, she notes that Derrida makes a distinction between 'pure gift' – which is an impossible ideal, since all 'gift' is 'corrupted by Maussian exchange' as soon as 'gift [...] hits the timeline' – and 'final gift', or the gift of death, which 'escapes such besmirchment' as an 'endlessly alluring [...] remaining token of the divine' (cf. Coakley 2008, p. 225).

Gruchy (2010, pp. 200–201) argues that water is both a created gift *and* the creative possibility for further creation. Water gives life, but it also makes the condition for life possible, because water is the base condition for the rest of creation.

Moreover, water as *soteriological* donation points to God's gift-like grace that draws all living beings into a life-giving relationship with the living God and has no lesser ambition than their fulfilment and flourishing as its scope. This twofold donation is given for the flourishing of living beings who are deeply reliant upon water. Water is foundational to our flourishing because we 'flourish in the web of life' (De Gruchy 2010, p. 201); but water is also key to our flourishing because we carry water in our bodies.

As water bodies – living beings whose bodies consist mostly of water – the way in which water functions in our language and imaginings of flourishing and salvation lies just below the surface of our skin. In times of drought and thirst, the water in our bodies calls to the water around us, the water below the earth and the water in the air that just does not seem to want to come to us – human beings, animals, plants; those that are in such need of it. It is here that water is most deeply expressive of a trinitarian soteriology of the gift – of the good news that the economy of salvation, the whole work of the economic Trinity, deals in the currency of the gift. Water therein becomes a grace, undeserved and unreturnable, that is gifted to both the righteous and the unrighteous, both those who have more need of it and those who have lesser need of it, in both excess and short supply.

'Saving water' therefore not only calls for theological reflection, and in particular for an interest in and critical analysis of the kind of rhetoric – such as 'water as gift' – that we employ in times of water scarcity, but also requires a hydrological imagination that can make sense of what it means to carry water in our bodies. Our bodies (like the bodies of animals and plants) store and recycle water, and in this way we ourselves live with the everyday realities of the hydrological cycle – also present in our own bodies, through which fluids and liquids pass – upon which our survival, and the survival of many other living beings, depends.

■ Conclusion

The short film *Pumzi* (see Phathom 2021),³⁴ set 35 years after World War 3 ('The Water War', the film adds in its description), tells the story of a future

34. This short film is on show at the ZEITZ MOCAA museum in Cape Town, South Africa. For more information on this particular exhibition, see <https://zeitzmocaa.museum/art/pumzi/>. The film is also, fortunately, available on YouTube (see Phathom 2021). There is also a very helpful and insightful interview with the writer and director of this film, Wanuri Kahiu (see XamXam 2013), where she discusses this particular film and her inspiration and motivation behind this film.

without water. Human beings live in compounds in a desert that has become inhospitable to human living and water is a scarce commodity whose careful use, reuse and recycling are key to this future human community's survival. The heroine of the story dreams about a large tree growing in the otherwise treeless (and radioactive) desert and receives an anonymous package with viable soil, a seed pod and global positioning system (GPS) coordinates that may lead to evidence of possible life beyond the compound. She decides – against all rules and protocols – to go in search of this tree in the desert, but when she arrives, the trees have all died. She plants the seed pod and donates the last of her water – not only the water in her water bottle, but also her sweat and tears – to the small seedling in order to give it the best possible chance possible to survive in the desert.

She dies protecting the tiny seedling, and through her death she donates all of the remaining water in her body to the tree. Her gift to the tree, and to the future, is the gift of her body's water. The gift of water is a gift of life itself, and its price is her life. Perhaps this story is a reminder of what we ought to already know, namely, that our bodies are nothing less than a conduit for the gift of water, one among many bodies through which the same water will pass. The gift of water is thereby no exclusive gift. This gift cannot be held onto, cannot be retained, cannot be kept, for it is only through flowing, unhindered, through our bodies that water is most deeply gift-like. Water wants to be shared and is therein necessarily restless, always moving, always flowing. True to its gift-like origin in God's donation, the hydrological cycle itself continues the repetitive cycle of gift-giving.

The metaphor of 'water as gift' is therefore no sterile, neutral, possibly beautiful but ultimately distant description of God's grace. While 'water as gift' has in view both the redeeming potential of water and the ethical responsibility to use water sparingly, this portrayal of water is also deeply personal, intimate even. The soteriological image of 'water as gift' is situated within the rhetorical negotiation of gift-giving and provides the potential to explore the rhetorical dynamic of water, gift and salvation in a time of water shortages and water scarcity toward the recognition that human bodies also store and recycle water. Water as gift is a reminder that we living beings flourish as those who have water and are water-carrying, water-storing, water-recycling bodies, and that our flourishing as water bodies is deeply dependent upon the flourishing of our present and future neighbours, whose flourishing should be no less a priority than our own. Saving water makes for the flourishing of all.

The river of the water of life: Water as a theological symbol in Christian eschatology

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■ Introduction

As far as the popularity of doctrines in recent scholarly reflection goes, eschatology is not the most written about. This could be the result of a number of factors, including – in much of the developed world, at least – the improved potential of ‘the quality of life here and now’ (Ferguson 1997, p. 226). With medical and technological progress leading to a greatly reduced mortality rate for children, a higher standard of living and access to material goods compared with other times in history, a greater deal of human focus appears to be set on the present than the afterlife (Ferguson 1997, p. 226). Previous accusations of Christian theology busying itself with the afterlife at the expense of dealing with problems in the present might also very well play into this shift away from eschatological reflection. Eschatology, however, remains one of the central loci of Christian doctrine.

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Theological reflection on the eschatological is also, in most instances, focused on individual salvation or, at least, the salvation of human beings. 'When asked about the future', Van der Kooi and Van den Brink (2017, p. 712; [*emphasis in original*]) remark, 'we instinctively relate the matter first of all to ourselves: what will *our* future be like? Even more personally, what will *my* future be?' This is also supported by the common theological themes that usually feature in eschatological discussions, such as life after death, eternal life, the resurrection of the body, the final judgement, purgatory, heaven and hell.

Southgate (2008, p. 79) also indicates that some of the most important recent work on redemption, such as David Kelsey's *Imagining Redemption* 'never mentions the non-human creation at all', and in the edited volume, *The Redemption: An Interdisciplinary Symposium on Christ as Redeemer*, edited by Stephen T Davis, Daniel Kendall and Gerald O'Collins (2004), there is only one contribution from fourteen that references cosmic redemption (Southgate 2017, p. 79).

An important 'moment in human cultural history' and one of the gifts of the 20th century, Edwards (2010, p. 1) indicates, is the realisation of the earth as our 'shared home'; humanity sharing in the worldwide community in an interconnected manner, being part of and playing a part in the lives of other species and life systems on our planet. Eschatology always carries the risk of focusing on the themes at hand as they relate to the individual person. The importance of the earth and history is equally stressed in scripture and theological thought, and Van der Kooi and Van den Brink (2017, p. 713) accordingly also stress that 'humanity and the world belong indissolubly together', also in eschatological reflection.

While human responsibility for and the sacredness of the earth has been increasingly stressed in academic publications, Ferris (2008, p. 197) remarks that 'bodies of water have been almost entirely overlooked in these debates'. As such, she formulates a 'blue theology' in response to the disaster of the insufficiency of water, particularly safe and unpolluted water, worldwide. This chapter aims to add to the often-neglected reflection on water in theological thought by focusing in particular on Christian eschatology.

Eschatology, Moltmann (1999, p. 189) indicates, not only has to do with the 'last things' but also with the 'first things'; it is 'the end of the system of this world and the beginning of the new order of all things'. Eschatology's subject is more than merely the future; it specifically has to do with God's future, the future of time itself. In this future, God draws close to God's creation and, through God's righteousness, liberates it for God's kingdom, making it the place where God's glory dwells (Moltmann 1999, p. 189). In such a perspective, eschatology moves away from the narrow reflection on

what awaits human beings at the end of times and into a more cosmic reflection, where all of creation is involved.

Moltmann (1999, p. 198) refers to a number of victims of the present system, one of which he identifies as nature, 'driven into ecological catastrophe'. When anticipating God's future in history, this means that not only is social justice for human beings an important aspect, but so too is ecological justice for the earth. 'God's righteousness and justice are not confined to human society' (Moltmann 1999, 201). In this chapter, I will argue that utilising water as a theological theme can assist in eschatological thinking that is less anthropocentric and has a more cosmic focus in mind, a perspective where it is not only the last things and eternal future for human beings that are reflected on and in the foreground, but for all of creation. In the first section of this contribution, I will discuss the groaning of all creation and a cosmic eschatology, followed by a reflection on water as an eschatological theme.

■ The groaning of creation and a cosmic eschatology

Christian theology has often disregarded the importance of the body and the material world, 'focusing all [its] energy on preparing the soul for some future, immaterial, invisible existence in spiritual heaven' (Sider 2000, p. 46). The 'fullness of God's salvation', however, 'also has a cosmic dimension' (Rausch 2012, p. 113). In this regard, Rausch also stresses the theme of ecological theology and mentions the complete meaning of the resurrection as an eschatological event which encompasses all of creation from beginning to end. This is a new creation, not completely new or *ex nihilo*, but the old creation transformed or 'a redeemed creation' (Polkinghorne, cited in Rausch 2012, p. 114). Polkinghorne (2004, p. 147) reproaches theologians for the generally anthropocentric view that usually permeates eschatological discussion, noting that it 'has made it difficult for many of them to appreciate fully the necessarily cosmic scope of the Creator's total concern'. Ferris's 'blue theology' is beholden to other theologies, including eco-theology, which emphasises the vital task of theology in ecological advocacy (Ferris 2008, p. 198). A number of themes come to the fore in eco-theology, including the assertion that all of creation is significant and loved by God, which for blue theology also includes water. Water is important and loved by God, 'both for its intrinsic value and also for its instrumental value to all creatures and ecological systems on Earth' (Ferris 2008, p. 201).

It is also in systematic theology where eschatology plays an important role as one of the main doctrinal loci. One of the key figures in modern eschatological contemplation, Moltmann, noted the importance of hope in eschatology, but hope that is not grounded in notions of social

transformation, but in God's promises of creation and resurrection. 'The Christian hope', Moltmann (1967, p. 17) indicates, 'is directed towards a *novum ultimum*, towards a new creation of all things by the God of the resurrection of Jesus Christ'. In this way, he continues, it (Moltmann 1967):

[O]pens a future outlook that embraces all things, including also death, and into this it can and must also take the limited hopes of a renewal of life, stimulating them, relativising them, giving them direction. (p. 17)

Moltmann, Wilkinson (2010, p. 36) indicates, 'goes some way in showing the importance of non-anthropocentric eschatology'. 'Eschatology must go beyond personal salvation and embrace the whole cosmos as creation' (Wilkinson 2010, p. 36). Moltmann (2010, p. 205) also further explains the current state of the world in creation theology to God's continuous creation, where God maintains and conserves creation while we eagerly anticipate the future of promise in God's kingdom. The Kingdom of God - the resurrection and the new creation - is present here as the promise and hope for its future consummation. Its presence is determined by the contradiction to the present reality, leading us to the recognition of the real absence of the kingdom. In the words of the Reformers, the Kingdom of God is *tectum sub cruce et sub contrario*; it is here, hidden beneath that which is its opposite (Moltmann 2007, p. 203).

For Moltmann, the created world can also be comprehended as both a promise and anticipation. In view of its glorifying and redeeming future, in understanding creation in the present, one can interpret the world as a parable, like Barth did. Similar to the parables of Jesus, in such an understanding, ordinary and commonplace experiences can become signs and present realisations of the kingdom of heaven. The world as a parable alludes to its correspondence with the kingdom of heaven, which it does not resemble yet, but there is a resemblance in its distinctive dissimilarity (Moltmann 1993, pp. 60-61). Regarding the eschatological dimension of creation, Moltmann (1993) further notes:

The world as creation can be and has to be a parable of its own future, the Kingdom of God; but it is not a parable of God himself. It is only in the kingdom of glory that the world will become God's image and likeness, because it will become his own dwelling. (p. 62)

The eschatological dimension of creation and the vision of the coming glory of God is intimately tied to the doctrine of sin in the sense that the liberation of the suffering of this world (both human and the rest of creation) is the final redemption of sin. Conradie (2005, p. 36) investigates three components of what he calls the 'ecological dimensions of despair', noting that the 'ecological dimension of the evil effects of sin is obviously manifested in the ecological crisis itself'. More particularly, it displays itself in 'environmental injustice: the devastating effects of the material greed of some on both the environment and on other human beings' (Conradie 2005, p. 36).

The dilemma of temporal finitude is a further dimension of despair that affects not only humanity but all of creation, and Conradie (2005, p. 36) indicates that this also has ecological components, such as ‘the extinction of species, the loss of biodiversity, and the limited life span of the human species, ecosystems, the earth and possibly the universe itself’. In addition, there are also ecological components to the pursuit of human knowledge and power, which are displayed in the ‘desacralization of nature [...] and the devastating effects of technocracy within the context of industrial capitalism’ (Conradie 2005, p. 36).

The idea of approaching eschatology in a more cosmic manner can also be based on ecological theology, where Haught’s method of three approaches to ecological theology, namely, the apologetic,³⁵ sacramental³⁶ or the eschatological,³⁷ can be of particular value (Conradie 1998a, p. 169). The most fundamental insight of this approach is that ‘an environment spirituality and praxis can (only) be empowered on the basis of a notion of (Christian) hope that includes hope for the earth itself’ (Conradie 1998a, p. 169).

Boff’s (1997) liberation theology also associates the weeping of oppressed humanity and the weeping of the earth, noting that:

[7]he logic that exploits classes and subjects peoples to the interests of a few rich and powerful countries is the same as the logic that devastates the earth and plunders its wealth, showing no solidarity with the rest of humankind and future generations. (p. xi)

This idea is also echoed by the Accra Confession, where the suffering of human beings and the suffering (or groaning) of creation are closely correlated, including the call to action to not only respond to the weeping of people who suffer, but to creation itself. The liberation that is referred to in Article 5 of the Accra can then also be seen as a manifestation of cosmic eschatology (WCRC 2004):

We have heard that creation continues to groan, in bondage, waiting for its liberation (Rom 8.22). We are challenged by the cries of the people who suffer and by the woundedness of creation itself. We see a dramatic convergence between the suffering of the people and the damage done to the rest of creation. (art. 5)

35. The apologetic approach is related to the efforts to retrieve from Christianity’s biblical roots and subsequent history, ‘a more harmonious relationship between humanity and nature’ (Conradie 1998b, p. 279), moving further than a theology where dominion is viewed as domination to one where stewardship is emphasised and human beings are viewed as the stewards or caretakers of creation, tending to the Earth with respect and wisdom (Conradie 1998b, p. 279).

36. The sacramental approach focuses more on human beings and nature as being interrelated, and emphasises their unity. Nature is perceived as sacred, where the divine presence can be experienced, and this sacredness should be celebrated and respected by humanity (Conradie 1998b, p. 280).

37. The eschatological approach is the one then proposed by Haught, who calls for ‘a transformation of an ecological vision towards the future’ (Conradie 1998b, p. 280).

The Accra Confession also moves away from a purely anthropocentric focus, and in Article 20, it continues to indicate that God has not only made a covenant with human beings, but (WCRC 2004):

We believe that God has made a covenant with all of creation (Gen 9.8-12) [...] It is an economy of grace for the household of all creation. Jesus shows that this is an inclusive covenant in which the poor and marginalized are preferential partners and calls us to put justice for the 'least of these' (Mt 25.40) at the centre of the community of life. All creation is blessed and included in this covenant (Hos 2.18ff.). (art. 20)

A branch of liberation theology, feminist theology has also emphasised the cosmic nature of eschatology. Pui-lan indicates that white feminists in the 1970s remarked that seeing as nature has often been viewed as lesser than the rational, and women were often seen as being closer to nature than men, in a similar manner, women were viewed as lesser than and inferior to men (1999, p. 145; cf. Ferris 2008, p. 202). While earlier movements subsequently challenged the perceived association between women and nature, later conversations focused on reclaiming the constructive aspects of women's connection to nature and embodiment (Pui-lan 1999, p. 145). Rosemary Radford Ruether (1975, pp. 186-211) relates the emancipation of women from sexism to the regeneration of creation. Feminist theology is also one of the theologies that has a particular influence on Ferris's blue theology, and she remarks that blue theology acknowledges the feminisation of nature that takes authority from nature (and water) and turns it into an object to utilise and exploit. In the second place, blue theology also emphasises solidarity among the oppressed and calls for the realisation of the interconnectedness of human and non-human creation in a manner that does not leave room for hierarchies of marginalisation (Ferris 2008, p. 202). This aspect of power is also an important notion when it comes to a cosmic eschatology, and in particular, how it relates to water.

When it comes to bio-power, Scott (2019, p. 147) remarks that '[w]ater is life and life in its deepest aspects is commodified'. He continues to indicate that Hardt and Negri's recent work (2009, 2017), which builds on the Foucauldian trope of bio-power (Foucault 1977), defines a process where the challenge of power is not enacted upon but rather also within the human body, on and in the most individual and private facets of our existence. Power has changed to be not only external, but also internal and all over, 'thus a useful way of considering the new materialism evoked by water' (Scott 2019, p. 147). This also makes it possible to consider the strong threat it poses. Jewett and Garavan state that 'the waters are stronger than us' and, consequently, what is offered is both an 'offering and a warning'. On the one hand, it is '[a]n offering to forestall planetary disaster by recalibrating the relationship with our environment to one of responsibility' (Scott 2019, p. 147), while on the other hand, it is 'a warning of extinction if the realignment in our collective behaviours is not made'.

If power is then located not only in the state or human beliefs and ideologies, but also in the ecosystem itself – as is clear in the acknowledgement that the waters are stronger than we are, holding the potential to quite literally wash us away – we arrive at a place of ‘being both interconnected and beyond the anthropocentric’ (Scott 2019, p. 147). Clark further explains a course of seizing power from below, in the instance of water, connecting it to ‘the right to water as a process of communing’ (Scott 2019, p. 148). Power from below is also a notable feature in liberation theology, which was mentioned previously. In this regard, rethinking the ways that we view power in eschatological thought as well can be a way of arriving at this less anthropocentric space, one that is more cosmic and universal in nature and includes all of creation.

Some eschatological tension remains, however, also in a more cosmic perspective on eschatology. This includes the tension between the ‘already’ and the ‘not yet’ in terms of the Christian hope for deliverance from sin and oppression and conquest over evil; the tension between the endurance and transience of this existence and eternal life, including this world and the next; and the tension between God’s immanence and transcendence (Conradie 2005, p. 37). This is the case not only for individual eschatology, or eschatological thought, where human beings stand at the centre, but also in a cosmic eschatological vision where all of creation is at the forefront.

Haught notes that the Christian prophetic tradition and its distinguishing stress on hope could also form part of a distinctive contribution of eschatological thought to a ‘global ecological vision’ (Conradie 1998b, p. 280). As such, a cosmic eschatology not only expands eschatological thought in a meaningful manner, but eschatological reflection adds to the cosmic vision. When reflecting on eschatology in terms of the groaning of all creation, it is not a difficult task to relate this also to bodies of water. Supplies of water are threatened worldwide, and the World Health Organization (WHO) has reported that more than 1 billion people across the globe do not have access to safe drinking water, a number that is predicted to swiftly keep growing (Ferris 2008, p. 195). Furthermore, water-borne diseases as a result of a deficiency of clean water for drinking and hygiene practices have the consequence of a significant number of deaths, including that of 1.8 million children worldwide every year (Ferris 2008, p. 195). Like the rest of the planet, water bodies, including the ocean and coral reefs, are deeply affected by global warming, and the ice caps continue to melt as the temperature of the water rises (Shaw 2008, p. 137). The water of our planet is groaning with the rest of creation.

Water further emphasises the interrelatedness of all of creation, as not only do we as human beings rely on water for our continued existence, but the environmental threat to our waters, in turn, threatens animal, bird and marine species (Shaw 2008, p. 137). In addition, the human exploitation of

marine life becomes clear when looking at the extinction of fish species, with the United Nations' Food and Agriculture Organization (FAO) estimating approximately '80% of commercial fish species are overexploited' (Shaw 2008, p. 137). Dead zones in the ocean are also expanding, where the water has become starved of oxygen and smothered with algae by surplus nutrients, nitrogen and phosphorus caused by pollution (Shaw 2008, p. 142).

A Christian eschatology 'has to touch on all the human, environmental, planetary and indeed cosmic dimensions of the future' (Conradie 1998b, p. 301). It is my argument in this chapter that this notion can be strengthened and an anthropocentric understanding of eschatological thought guarded against when water as a theological symbol is emphasised. In the following section, I turn to water as an eschatological theme in this regard.

■ Water as an eschatological theme

There are numerous examples of water in scripture. As stated in the introduction of this book, several narratives in scripture, De Gruchy (2010, p. 199) notes, 'would collapse if there were no river, no flood, no well, no pool, no sea, no fountain'. In addition, water as a theme is also used in more figurative and allegorical manners, referring to theological concepts such as forgiveness, repentance, justice, salvation, providence and the protection of the Lord.

In this chapter, I am especially interested in water as it features in eschatological thought, having to do with the 'first things' and the 'last things'. At the very beginning of the Bible and at the very end, we read about rivers and trees (Gn 1-2; Rv 21-22). It is to the rivers, in particular, in line with the theme of water, that I would now like to turn my focus. In Genesis 2, we read about the river arising from the Garden of Eden, separating into four branches that flowed to the four corners of the then-known world (Bouma-Prediger 2012, p. 49). These rivers, Bouma-Prediger (2012, p. 49) remarks, 'were and are crucial waterways in the crucible of human history. In an often parched part of the planet, Eden provided life-giving water to the world'.

In the very last chapter of the Bible, in Revelation 22, we again read about a river, this time in the New Jerusalem, the 'river of the water of life' (Rv 22:1), which flows as clear as crystal: 'This river of life, shimmering and dancing and clapping its hands, flows from the very throne of God the Creator Redeemer and the Lamb, the Lamb that was slain and now reigns as Lord' (Bouma-Prediger 2012, p. 49). This water nourishes the Tree of Life, which bears fruit throughout the entire year and whose leaves can heal the nations.

In both accounts, at the beginning and the end, the water of the rivers flows out toward the earth and nourishes all of creation. The theme of water is here not fixated on human sustenance but rather the nourishing of all of creation, and while that includes human life, it is not explicitly stated or emphasised. All things are as they should be, with non-human creation standing at the forefront.

A further vision of the eschatological future where water is particularly prevalent is found in Ezekiel 47:1-11. Water is all around, flowing from the threshold of the temple to the east, and the south, and the north. The river here, while at first shallow, fast becomes a river that is too deep to cross. Non-human creation also takes centre stage in this vision, with the swarms of living creatures and fish being nourished by its fresh water and many kinds of fruit trees growing along the banks, bearing fruit all year long. Similar to the trees in the vision in Revelation, the leaves of these trees also offer healing. Where this river flows, it brings life. 'This is a sacred river, a river of life, a sign of God's shalom' (Bouma-Prediger 2012, p. 49).

As in the vision of the river in Revelation, all creation, human and non-human alike, is nourished by the river in Ezekiel's vision. It is not only human beings that share in the eschatological shalom, but all of creation. In this way, the eschatological theme of water stresses the interconnectedness of all creation.

The notion of solidarity with the poor in liberation theology has been mentioned earlier. This is also connected to Ferris's (2008, p. 204) blue theology, which is indebted to liberation theology in particular then, also in eschatological thought. It is also relevant when turning to water as a theological theme, as water shortages and water-borne diseases are problems faced disproportionately by poor and developing countries, where the problem is typically multifaceted and threefold: 'inadequate supplies of native surface or ground water; deficient clean water, and a lack of infrastructure to capture, store and move water' (Ferris 2008, p. 196). As liberation theology stresses the need for liberation of the poor and exploited, this includes not only the poor who lack access to safe water but also the exploited bodies of water themselves.

Bergmann (2021, p. 173) refers to the Christian confession of the new world to come, remarking that this can hardly refer to the present Anthropocene, 'a time of human mismanagement and an uninhabitable place for humans to live in as God's images'. The world, in need of liberation, is transformed by the integration of present and future, by both spatial and placial encounters with the God who creates, gives life and liberates and is 'the source of the new creation to come' (Bergmann 2021, p. 173). As referred to previously, with the groaning of all creation also encompassing the bodies of water, with the oceans and rivers suffering from pollution,

exploitation and global warming, the Anthropocene as a time of human misconduct also encompasses water. Liberation theology's concern for the exploited in such a discourse then also includes our planet's water sources. "Eschatology as imagining the end" must necessarily stretch beyond the life-threatening anthropogenic impact that the rich nations have executed in the great transformation' (Bergmann 2021, p. 173). This includes a cosmic eschatology where liberation is envisaged not only for human beings but also for all creation, including water.

Water as a theme further serves to emphasise humility and an awareness of something bigger than ourselves, something we cannot tame or control. Shaw (2008, p. 138) reports on interviews with sea-carers, 'marine scientists, ocean activists, environmental educators and sea adventurers' working towards environmental change and remarks that a great number of them comment on the realisation that 'they are the interloper and their visit is always on the sea's terms' (Shaw 2008, p. 139). The ocean remains an alien environment and, unlike many other natural elements that humanity has domesticated and cultivated into ordered agriculture, we have no control over the tides and waves of the sea. In this manner, also when turning to eschatological thought, water as a theme reminds us how much remains outside of our control.

'[T]he theological rhetoric of water is embedded in soteriological imagination', Marais notes (2017, p. 81). In the discussion of Jesus and the Samaritan woman, the water of life as freely given by God is stressed, and the effect of this gift is life in abundance (Marais 2017, p. 81). Eschatology as a Christian doctrine frequently overlaps with soteriology. While for individual believers, individual salvation is what is usually most prominent in soteriological reflection, eschatological salvation also emphasises the cosmic nature of not only the first and last things, but of salvation. In this manner, water as an eschatological theme can further serve to guard against anthropocentrism and emphasises a cosmic eschatology.

■ Conclusion

Christian eschatology is more than mere optimism about the future. The future vision that is depicted in eschatological thought is one focused on God and the confession that all of creation – not only human life but all that exists – is in God's hands. In this chapter, I have argued in favour of a cosmic eschatology that takes the whole of creation seriously in this regard and sees the deliverance and salvation that is both 'already' and 'not yet', that is fully realised in the eschaton, to be for human and non-human creation. Water as a theological theme, and an eschatological theme in particular, stresses this notion and can guard against an eschatology that is only concerned (or mostly concerned) with the fate and destiny of human beings.

'The Christian hope will always be expressed in words and images that are borrowed from our own world and imagination' (Leith 1993, p. 728). 'The language of Christian hope', Migliore (2004, p. 340) further remarks, 'is language stretched to the limits, language rich in symbol and image':

Genuine Christian hope - hope in the final triumph of God, in the completion of God's redemptive work in Christ, in God's promise of resurrection - moves and empowers believers to enter into real solidarity with afflicted humanity and with the whole groaning creation. (p. 349)

Migliore (2004, p. 349) continues to relate this especially with entering into solidarity with those who suffer, not only other human beings, but 'with the whole groaning creation'.

What is necessary, Scott (2019, p. 150) indicates, is 'a new understanding of community and commons to really meet the challenge of an interconnected world that has truly moved on from an anthropocentric outlook'. It is my contention that the life-affirming theme of water, which gives life to not only human beings but all of creation, can serve as such a theme, also in theological thought.

In line with this metaphorical and symbolic language, in this contribution, I have argued that water as a theological theme can emphasise the interrelatedness of all of creation and, in eschatological reflection, serve to emphasise cosmic eschatology and a shift away from an anthropocentric focus in thinking about 'the last things'.

The wonder of water

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■ Introduction

Water is an extraordinary liquid that exhibits several exceptional properties that are found in few other substances. Water is, however, unique in the sense that the specific combination of properties observed in all phases is found in no other liquid (Franks 1972, p. 1). Without water's exceptional combination of properties, life would have been impossible (Chaplin 2001, p. 54). These properties include how water in its solid form can be as hard as stone, but still light enough to float on liquid water, as well as how water in its liquid form can sometimes overcome the action of gravity. In this chapter, some of these unique properties of water will be discussed. It will be demonstrated by exploring contemporary scientific evidence that the unique combination of attributes did not come about by random chance, with evidence from several natural scientific disciplines. All of these indicate the involvement of a 'Mind', not only through the ages since the moment of creation but also in the present (Meyer 2021, p. 419).

■ Unique scientific properties of water

In most cases, solid forms of substances are heavier than liquid forms and will sink to the bottom of a container. However, water is exceptional in that

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ice floats on top of liquid water, indicating that it has a lower density per volumetric unit than liquid water. No other natural chemical displays this particular property (Vigoureux & Vigoureux 2018, p. 2). The reason for this can be found in the fact that water molecules are non-symmetrical (polar). In most chemical compounds, atoms will be in a straight line (such as in carbon dioxide [CO_2]), but in the case of water, the molecule is curved. Water's chemical formula is H_2O , which means that in each water molecule, there are two hydrogen atoms attached to a single oxygen atom. Each of the two hydrogen atoms has a single electron involved in the bond with the oxygen atom, but each oxygen atom has eight electrons, which means that in the case of water, there are still six unbound electrons present in the oxygen atom. The reason why these unbound electrons are responsible for the curved shape of a water molecule lies in the difference in electron negativity between hydrogen and oxygen. The electron negativity of oxygen is 3.5, while the electron negativity of hydrogen is 2.1, with the result that electrons are located closer to the oxygen atom nucleus than to the hydrogen atom nuclei. The bond between hydrogen and oxygen is therefore not covalent but polar-covalent, which gives the H_2O molecule a tetrahedral curved geometric structure. Each water molecule, therefore, forms a type of 'magnet' with a positive and a negative pole (although the molecule as a whole still has a neutral charge with ten protons and ten electrons). Because of this unique molecular form of water, when water freezes, the polar nature of each molecule results in molecules combining in a structure in which there is more empty space than would be found in the liquid form.

The result of this is, firstly, that ice has a lower density than water, which causes ice to float on top of liquid water. This property of ice is vital for aquatic organisms, because floating ice isolates the deeper parts of any water body so that it does not freeze as well when the air temperature cools down to below 0°C (Gaidos, Nealson & Kirschvink 1999, p. 1632). If ice did not float on water, it would sink to the bottom so that the whole body of water would eventually freeze solid, which would naturally lead to the death of all aquatic organisms.

Secondly, the expansion of water when it freezes can exert tremendous forces that can break apart rocks or cause water pipes to burst in buildings. The pressure that freezing water can exert is able to reach 9,330 MPa (Vigoureux & Vigoureux 2018, p. 5). To visualise the magnitude of this force, it can be compared to passenger car's tyres, which are typically inflated to pressures of between 0.2 MPa and 0.25 MPa. This ability of water to flow as a liquid into cracks in rocks and then break it apart when freezing constantly contributes to the formation of new soil. Since erosion constantly depletes the soil volume on Earth, the medium in which most plants need to grow would have disappeared a long time ago if no new soil was continually formed by, among others, the working of water.

Snowflakes are a particularly interesting variation of frozen water. Although all snowflakes share a basic hexagonal geometry, there is an almost unlimited variation in the detail shapes. Ice crystals initially form around small particles in the air, such as salt or dust. As the crystals move through the atmosphere, additional water condenses on each crystal so that the crystals grow to eventually form snowflakes. The staggering morphological variation in the shapes of snowflakes is the result of micro-differences in air temperature, wind patterns and humidity levels in the atmosphere. Indeed, many complex studies on snowflake morphology indicate that given the complex and highly variable migration history that each snowflake experiences during its formation, it is highly unlikely that any two snowflakes will ever be identical in all aspects (Family, Platt & Vicsekt 1987, p. 1181).

Another characteristic of water that is important for life on Earth is the fact that it can be found in three phases under conditions that regularly occur on Earth. In the solid phase, water molecules are arranged in an orderly manner and cannot move relative to each other. In the liquid phase, the molecules are no longer in a solid structure and can move around freely, while in the gaseous phase, water molecules are far apart and can move around more actively through the atmosphere (Franks 1972, p. 2). The three phases of water *per se* are not unique – there are many substances that occur in three phases – but the uniqueness of water is that all three phases are found at temperatures and pressures conducive to life, in contrast to, for example, CO₂ that is only naturally found on Earth in the gas phase. This unique property of water means that water can move through the entire biosphere, and water has rightly been called ‘the blood of the biosphere’ (Ripl 2003, p. 1921). In the gaseous phase, it blows with the wind until it condenses and precipitates as a liquid or solid. As a liquid, it can form rivers that eventually drain to the oceans, or it can seep into the ground to form underground water resources. This hydrological cycle is infinite, and all water has been moving continuously through the biosphere since creation. In this way, water can absorb life-giving nutrients at one location and transport them to organisms that could not exist without them. But, at the same time, water can also spread pollutants through the biosphere if it is not handled with the necessary care.

A very interesting property of water is the fact that so-called hydrogen bonds are found between molecules (Vigoureux & Vigoureux 2018, p. 3). These bonds cause water molecules to ‘stick’ together via a force called ‘cohesion’. At the same time, water can also adhere to other substances via adhesion forces. This property of water contributes to its ability to penetrate other substances, such as easily seeping into soil to sustain the life of soil organisms or to participate in metabolic processes in all living organisms, without which life would not be possible. Hydrogen bonds also cause surface tension, which enables some organisms to walk on water.

Without cohesion and adhesion, the capillary action that enables water to overcome the force of gravity by moving up from the roots through the trunks of tall trees to provide nutrients even to the highest leaves would have been impossible.

Another notable feature of water is that it has a high specific heat (Cox & Smith 1959, p. 51). This means that a lot of energy is required to change the temperature of water, which is a further consequence of the hydrogen bonds found in water. Every substance that undergoes a phase change absorbs or releases energy, but in the case of water, more energy is needed than with other substances to break the hydrogen bonds. This property results in water absorbing or releasing more energy during phase changes than most other substances. This ability of water to absorb a lot of heat stabilises the earth's temperature so that extraordinarily high or low temperatures are relatively scarce both spatially and temporally. Furthermore, the high specific heat of water causes the temperature of oceans to remain relatively constant so that stable conditions for marine organisms occur throughout. Because evaporating water consumes a lot of energy, the high specific heat of water also serves as a very effective coolant for organisms that need to get rid of excess heat through the process of homeostasis. Some organisms sweat, while others lose water (and therefore energy) through their mouths to maintain a stable body temperature.

A special property of water is that it is a strong solvent that can dissolve more substances than any other liquid (Lubineau & Augé 1999, p. 2). This means that water can transport a wide range of nutritious substances to places in the biosphere where they are necessary for the effective functioning of all living organisms, much like nutrients in the bloodstreams of organisms or nutrients travelling from plant roots to leaves.

In summary, it is abundantly clear that if water was not present on Earth, life would be impossible. This fact is the reason why the exploration of our solar system focuses mainly on the search for water on other celestial bodies.

■ The origin of water

Since the era of modernism (and even earlier), it has been propagated that valid science can only flow from a materialistic paradigm (Meyer 2021, p. 58). Charles Darwin's theory of evolution has done much to establish normative materialism as the only viable framework in the natural sciences. Since then, however, science has evolved in huge strides, driven by technological innovations that enable researchers to make increasingly accurate observations from sub-atomic to galactic levels. The result is that

a growing number of formerly materialistic natural scientists from all disciplines recognise the need for 'extra-terrestrial intelligence', because observed data from a wide variety of natural sciences can simply have no other explanation. Over the past few decades, 'inexplicable' discoveries have been made in several disciplines that only make sense when the best metaphysical explanation is impartially and unabashedly sought. Some of these discoveries will be briefly elucidated.

■ The age of the universe

Contemporary research, particularly in physics, indisputably indicates that there must have been a beginning of the universe as opposed to a view that the universe existed as a static entity from eternity as proposed by, for example, Aristotle and Kant (Craig 2000, p. 723). On philosophical grounds, it was attempted to refute the eternity view by the Kalam cosmological argument, which argued that everything that begins to exist has a cause. Because the universe began to exist, it must therefore have a cause. Furthermore, since the universe has a cause, then an uncaused, personal creator of the universe exists who is beginningless, consistent, eternal, omnipresent and omnipotent. According to Craig (1979):

[...] transcending the entire universe there exists a cause which brought the universe into being ex nihilo [...] our whole universe was caused to exist by something beyond it and greater than it. For it is no secret that one of the most important conceptions of what theists mean by 'God' is Creator of heaven and earth. (p. 149)

Theologians and philosophers such as Aquinas and Augustine, however, claimed that reason alone could not provide clarity on this issue, and they affirmed the belief by mere faith (Swindal 2001, p. 7).

At the same time as people contemplated the age of the universe, philosophers and scientists also wondered about the size of the universe. Olbers' paradox states that an infinite universe with a uniform distribution of stars would result in every line of sight eventually terminating in a star, resulting in a completely illuminated night sky (Harrison 1964, p. 272). Researchers such as Newton tried to account for a dark sky by postulating that the size of the universe is infinite, but that the number of stars is finite. Other scientists thought that the 'ether' absorbs light from distant stars. Eventually, it was the poet Edgar Allen Poe who proposed the idea that the immense size of the universe resulted in light from distant stars not having had enough time to reach the earth since their moment of origin (Stamos 2017, p. 196). This view was later scientifically confirmed by Hubble, who discovered that numerous other galaxies besides the Milky Way exist and that all objects in the universe are moving away from each other at a rate directly correlating with the distance between them (Sandage 1989, p. 353).

This expanding universe implied that all matter originated at a specific time and location in the distant past and that the universe must therefore have had a definite beginning in space and time – a theory that later became known as the ‘big bang theory’.

Albert Einstein, applying his theory of general relativity to the findings of Hubble, concluded that massive objects curve space itself and that this curvature of space determines how objects move through space. This would eventually result in the congealing of all matter and spacetime in one place due to gravity. However, since not all bodies have congealed in one space, it followed that there must be a counteracting force to account for the observations of the universe as matter surrounded by empty space. Einstein named this repulsive force the ‘cosmological constant’, and he was able to assign a precise value to this constant to sustain the universe in a state of static equilibrium (Meyer 2021, p. 89).

Friedman, however, challenged Einstein’s arbitrary assumption of a static universe by proving that the density and radius of the universe change over time, which led to the realisation that the universe inevitably must contract or expand. This postulation was expanded by Lemaitre, who used observational data about distant galaxies to formulate a definitive cosmological model of the universe, suggesting a spherical expansion in all directions (Nussbaumer 2014, p. 37). This implied that space itself is expanding (as opposed to just the matter within pre-existing space), leading to the deduction that at some specific moment in the past, the distance between neighbouring galaxies must have been zero. The universe thus originated at a specific location from nothing at a specific moment in the past and has been expanding ever since. Miller (2021) states that all energy, time, space and matter originated from this location. According to Lennox (2019), this is what Genesis has been telling humanity all along. Genesis goes even further than that, telling us the ultimate cause of the beginning, which is God.

Even though the universe has been proven to be expanding, even the slightest imbalance in mass-energy would cause space to either expand forever or collapse upon itself. Eddington showed that, to account for observations of the universe, the values of the cosmological constant, the curvature of the universe and the mass-energy density needed to be perfectly set and maintained (Meyer 2021, p. 151). The ‘big bang theory’ was decisively confirmed by the discovery of low energy background cosmic radiation in 1965 – the existence of which was predicted by the theory (Penzias & Wilson 1965, p. 419). A further strong observational astronomical reinforcement indicating that the universe had a beginning came from the Hawking-Penrose-Ellis cosmological singularity, which described the conditions under which black holes would form (Meyer 2021, p. 115).

These theorems served as robust confirmations of Einstein's general theory of relativity. The most recent confirmation came from the detection of gravitational waves in 2015 (Abbott et al. 2016).

There have been some challenges to the 'big bang theory', mainly proposed by materialistic physicists in an attempt to negate the necessity for a creator. Such naturalistic cosmological theories include the multiverse (Linde 1984) and the cyclic model (Baum & Frampton 2007). However, besides logical inconsistencies in the theories themselves, none of them can account for the incredible fine-tuning of the universe even before the moment of creation (Lennox 2019), as described in the next section.

■ The fine-tuning of the universe and the anthropic principle

The best inference to observed data as well as theoretical physical models implies the existence of a creator who determined the conditions for the universe to exist before the moment of creation (Meyer 2021, p. 416).

Since the 1950s numerous discoveries have been made which indicate that life depends on a highly improbable combination of forces, features and balances in the universe - with fundamental forces having exactly the right magnitudes, contingent properties having exactly the right characteristics and the initial configuration of matter and energy being perfectly tuned to allow for life. These life-allowing properties fall within highly improbable, narrow ranges, commonly referred to as 'anthropic coincidences' by materialistic scholars such as Dawkins (2009, p. 7). If any one of these properties were to be changed, even in an infinitesimal way, the conditions conducive to life would not exist.

Some of these properties, to name but a few, include the strength of gravitational attraction, which enables carbon to form from beryllium and helium in dying stars. If gravitational pull were to be changed ever so slightly, stars would not exist for a sufficient time to form solar systems capable of sustaining life. Another constant is the electromagnetic force that exhibits a fine-tuning of 1 : 25, whereas the strong nuclear force has a fine-tuning of 1 : 200. More impressive, though, is the ratio between the two forces, which has been fine-tuned to a precision of 1 : 10,000. Even more impressive is the ratio of electromagnetism to gravity, which is accurate to 1 : 10^{40} in order to enable stars to undergo nuclear reactions at a rate suitable to produce the variety of elements observed in the universe. If one considers the fine-tuning of the initial conditions of the universe, the initial expansion rate of the universe was fine-tuned to 1 : 10^{24} , and initial entropy conditions had to be fine-tuned to a value of $10^{10^{123}}$ If you want to write out this number

by with a one followed by zeros, you will need more zeros than there are elementary particles in the entire universe (Meyer 2021, p. 151).

The fine-tuning of the universe occupied the minds of scientists and philosophers since the discovery thereof (Weinberg 1976, p. 13). Not only is the simultaneous, contingent precision highly improbable, but there seems to be no conceivable physical cause (reason) or philosophical necessity to explain why these parameters are the way they are. Contrary to scholars with a materialistic worldview who attribute the fine-tuning to a happy coincidence (a fortuitous accident of physics), a growing number of scientists and philosophers conclude that the universe was designed with great care (Barnes 2012, p. 531). Wilczek (2006) states that:

It is logically possible that parameters determined uniquely by abstract theoretical principles just happen to exhibit all the apparent fine-tunings required to produce, by a lucky coincidence, a universe containing complex structures. But that, I think, really strains credulity.(n.p.)

However, not all scholars were convinced that the fine-tuning of the universe proves the existence of God. Attempting to find naturalistic explanations, the 'weak anthropic principle' was proposed by Carter (1974), which states that it is logical that humans observe fine-tuned parameters in the universe, for if conditions were different, humans would not exist at all. This principle was, however, severely criticised, and it was subsequently followed by the 'strong anthropic principle', proposing that it is inevitable that the universe must have had conditions conducive to life at some stage in its developmental history (Hawking 1988). However, no attempt was made to explain the origin of the fine-tuning.

The improbability of the ensemble of exquisitely fine-tuned, functional parameters, however, precludes the appeal to random chance and the existence of a super-intellect – a 'mind', seems intuitively obvious. This has led to a revived interest and a profound intellectual shift towards natural theology among philosophers and scientists alike. This intellectual movement has, however, been severely criticised by naturalists as being just another 'God of the gaps' argument (Meyer 2021, p. 409).

Materialistic explanations, however, display a fundamental causal inadequacy – something that can only be accounted for by the acceptance of God as the Creator of the universe. An ensemble of physical constants must have been established already before the moment of creation, with an accuracy that transcends the human mind. The only logical explanation for this is that the Creator must transcend time, matter, space and energy to account for the fine-tuning of conditions before the moment of creation – in other words, the Creator cannot be part of the universe itself but must be transcendent (Lennox 2019). Furthermore, evidence from biological sciences, such as the digital information contained in DNA, as well as the

huge injection of novel information during the Cambrian explosion (Behe 2019, p. 10), suggests that the Creator not only sets the initial conditions and physical constants of the universe but is also actively involved in the history of the universe as an omnipresent, conscious agent with free will (Meyer 2021, p. 449).

■ The origin of life

There is a huge difference in terms of complexity between inorganic and organic chemical reactions and biochemistry in living organisms, such as biological molecular machines and the highly complex storage system in the nucleus of every living cell, which contains the four-digit digital coded blueprint for life in all its splendour and variability (Meyer 2009, p. 215).

In terms of observations in the geological record, various discontinuities can be distinguished, of which the 'Cambrian explosion' is prominent. During a very short period of time (geologically speaking), a vast 'injection' of data into living organisms occurred, resulting in a vast number of completely new species with advanced attributes such as brains with neural networks, digestive systems and cardiovascular systems – something that did not occur before the Cambrian explosion. These new organisms do not have any discernible connection to any previous organisms. Similar discontinuities can be found throughout geological time, proving that life on Earth developed discontinuously, which naturally leads to the origin of novel data in DNA to result in completely novel organisms (Morris 2000, p. 4426).

Materialists propose that purely random processes of mutations and natural selection of conducive characteristics have been able to result in all life forms observed on Earth (Dawkins 2009, p. 18). This claim can, however, easily be refuted by considering the required data to produce the vast multitude and variety of life forms that existed through the ages. According to Crick (1958, p. 159), the sequential arrangement of base pairs in DNA contains the data necessary for building functional proteins and systems needed for life to occur, similar to machine code in computers. Bill Gates states that 'DNA is like a computer program but far, far more advanced than any software ever created' (Meyer 2009, p. 12).

Materialists propose that unguided processes, given enough time, will inevitably result in new functional information in DNA. However, for such random processes to have the desired effect, time is needed, and this is where the argument for randomness fails. It has been calculated that the odds of random mutation creating the data required to obtain a novel functional gene capable of producing a very modest protein consisting of only 150 amino acids is 10^{-77} . This is improbable since the total number

of atoms in our galaxy is estimated at 10^{65} . A random process capable of producing a single new functional sequence can be compared to successfully searching for one specific atom in 1 trillion galaxies the size of the Milky Way (Meyer 2009, p. 212). Because paleontological data indicate that life on Earth existed for 4 billion years, there was simply not enough time for random, unguided processes to result in all the life forms that have existed since the beginning of life on Earth (Meyer 2009, p. 212). The example mentioned relates only to a very simple functional protein, which underscores the complete improbability of acquiring the vast volume of data required to account for the multitude of life observed. The only plausible origin of such information is an intelligent designer (Meyer 2009, p. 218).

All hypothetical mechanisms proposed by naturalists to get around the indications for intelligent design have been refuted, such as the Miller-Urey experiment in 1952, RNA world thesis (Goodman & Rich 1962), punctuated equilibrium (Eldredge & Gould 1972) and natural genetic engineering (Shapiro 1992). The fatal flaw with all these proposals remains the origin of the initial information, which strengthens the cause for a designing 'mind' in the universe.

■ Water as referred to in the Bible

The Bible refers to water mainly in three main ways, namely, a resource, a symbol and a metaphor (Ellis 1991). Water is essential for all life. Both revelations of God (special and general, as observed in science) teach us that he created water and that he exercises sovereign right over it (Gn 1 & 2; Is 40:12). The availability of water is usually associated with God's provision (Dt 11), but in certain cases, water is also associated with the punishment for sin (e.g. the flood or droughts; Gn 6; 1 Ki 17). He controls and manages the hydrological cycle so that it rains where he wills it (Job 5:10; Job 36:27; Job 37:10; Ps 33:7; Ps 107:33; Pr 8:29).

In addition to the reference to water as a central part of many miracles that we read about in the Bible, the life-giving, healing and cleansing properties of water are especially symbolised in the pronouncements associated with 'living water'. In this regard, many metaphorical references can be found, such as God's presence (Ps 72:6), marital fidelity (Pr 5:15-16), the knowledge of God (Is 11:9), salvation (Is 12:3), the Spirit (Is 44:3-4 & Jn 4:10), God's blessings (Is 58:11), God's voice (Ezk 43:2), God's wrath (Hs 5:10), justice (Am 5:24), birth (Jn 3:5), spiritual training (1 Cor 3:6) and life (Rv 7:17) (Ellis 1991).

In Jeremiah 2:13 and 17:13, the prophet describes God as 'the spring of living water', who has been forsaken by his chosen people Israel: 'If you

knew the gift of God and who it is that asks you for a drink, you would have asked Him, and he would have given you living water' (Jn 4:10).

In John 7:38, Jesus was speaking metaphorically about the Holy Spirit. 'Living' water referred to highly valued fresh running water, as opposed to well water. Having a steady supply of running water would be a life-sustaining blessing. Furthermore, 'living water' is moving water that has been provided by the means and power of God and specifically not provided, contained or controlled by the power of human beings.

■ Conclusion

Robust contemporary scientific evidence enables humankind to formulate an empirically based 'God hypothesis' (corresponding to scripture) that informs us about what we should observe in nature regarding the works of his hands (Meyer 2021, p. 449). An increasing number of scientific observations confirm that the universe was created by God. Before the moment of creation, there must have been an immaterial, timeless, infinitely powerful and personal creator, 'since only a personal being can choose to act with purpose' (Miller 2019). It can therefore be inferred from natural science that God is actively present in the universe and, therefore, also in the daily lives of people.

This insight continues to inspire the work of many eminent scientists who acknowledge God as the source and upholder of mathematically describable order in the universe, as well as the intelligent designer of all life. This conclusion resonates with the fact that after more than a century, during which time mainstream natural science largely denied the existence of God, scripture was fulfilled when it stated: 'I tell you', he replied, 'if they keep quiet, the stones will cry out'. (Lk 19:40; New International Version).

Since natural science increasingly confirms the existence and continued involvement of God in creation, it is abundantly clear that the composition and properties of water are likewise not merely a product of chance and randomness. God created the atoms and physical laws needed to form water with great care and deliberate accuracy so that it possesses the numerous, unique properties that are essential to all life. Water exists in a cycle of perpetual iterations. It is complex and beautiful and is designed down to the most delicate details. It is found everywhere in creation and is imperative for life to exist. Without water, there is only the absence of life. Water is purifying, it serves as protection, and it distributes life-sustaining nutrients throughout the biosphere. It is freely available to all, and it is dynamic, for even in its solid and gaseous forms, it moves and sets other bodies in motion. It penetrates everywhere and everything and brings balance, stability and a state of equilibrium. Water can exert great force in

all its phases, and it can have devastating consequences if contaminated or not handled correctly.

Given the unique, exceptional, life-giving and sustaining properties of water, it is not surprising that the gospel of Jesus Christ is compared to 'living water' in the Bible. Similar to water, the gospel is intricate and beautiful and undisputedly inspired by God. 'Living water' gives and sustains spiritual life, is freely available to all, is imperative for life in this dispensation as well as in everlasting life, cleanses us of our sins, protects us, feeds us with everlasting bread, is dynamic and results in fundamental change, penetrates the deepest realms, brings balance and peace, and it is everlasting. It is also powerful and can be devastating if distorted or misused. Just as things can go very wrong if water is mismanaged, many regrettable incidents in human history show that things can likewise go very wrong if the gospel is distorted and not handled with due respect, caution and knowledge.

In conclusion, water was used in this chapter to reveal the amazing reality of natural sciences, progressively indicating that everything in nature (and therefore humankind itself) has been created for a reason by God and that, therefore, every individual's existence means something. Natural scientific data show that God created water and that God is still presently involved with water - just like he is within the whole of creation with regard to 'living water'.

The deeper meaning of water: Groundwater reflected in creation

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■ Introduction

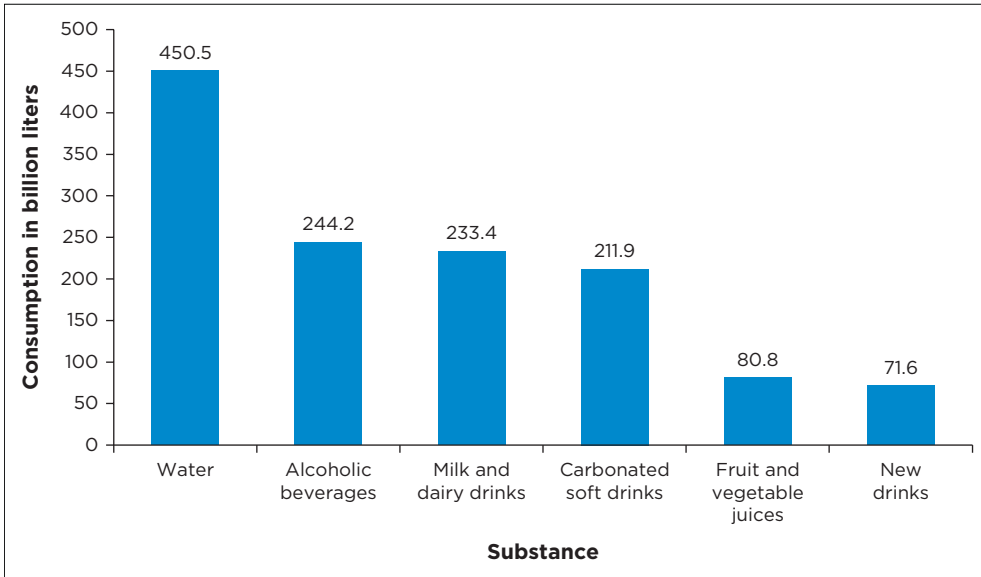
God embedded his character in his creation. The human body is analogous to an ecosystem (Papalois & Papalois 2020), and the New Testament refers to the church as the body of Christ (Rm 12:5). It is a well-known fact that without water, there can be no living ecosystems on Earth. Similarly, water plays a vital role in the human body, which consists mostly of water (60%), with the main function of acting as building material for every cell (see Water Science School 2019).

Water is also used in the Bible, where baptism is referenced as an important step in the process that symbolises the death of the old, carnal person, cleansing, rebirth and resurrection of the new spirit-filled life (Gl 3:26; Mt 28:19; 1 Pt 3:21; Rv 21:6³⁸).

In this chapter, I explore the unique characteristics of water and how water as part of the physical world reflects the characteristics of its creator.

38. Unless otherwise indicated, Bible quotes are from the King James Version.

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Source: Statista (2021).

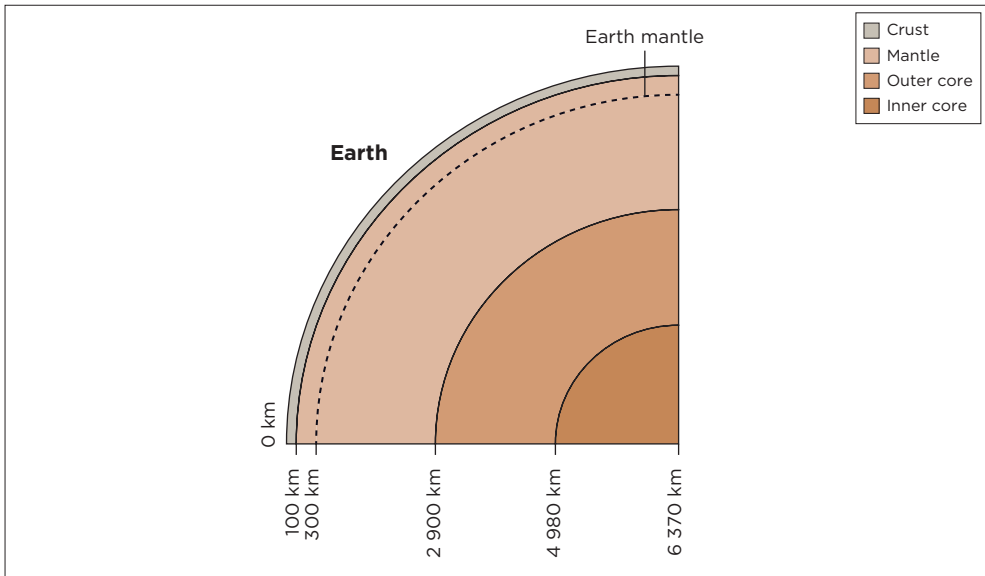
FIGURE 6.1: Consumption of packed beverages worldwide in 2020, by beverage type.

Two-thirds of our bodies consist of water, which is the very substance of life itself and by far the most popular drink for human beings (see Statista 2021; Figure 6.1). Water carried through the atmosphere rains down and infiltrates the soil, where it enables growth and replenishes groundwater resources in rock formations to support life on Earth. Human beings can have access to life-giving water *via* streams, lakes, springs and wells. These bodies of water also played an important role in both the Old Testament and the New Testament as the Israelites migrated from slavery in Egypt to the Promised Land, and are still relevant to us today.

■ The earth

It is interesting to note that a number of important aspects in the Bible occur in a triune form, such as time (past history, present active and prophetic future). The Godhead (Father-Son-Holy Spirit) consists of three in one. Human beings, made in his image (Gn 1:27), also consist of three main components (a spirit-soul-body combination) (1 Tes 5:23, Erickson 2013, p. 473). Similarly, the earth consists of three main parts: the core, mantle and crust (Figure 6.2). The earth's core could be equated to the human spirit, the mantle to the soul and the thin crust to the body.

More than 99% of gold and other precious metals occur in the earth's core (www.discovermagazine.com; Wood & Halliday 2005). Dense materials



Source: 'Moon and Earth internal structure', originally designed by Luis Maria Benitez in 2019, obtained from Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Moon_and_earth_cores-en.svg), released by the creator and reproduced by the publisher under the applicable Creative Commons Attribution-Share Alike 3.0 Unported License <https://creativecommons.org/licenses/by-sa/3.0/deed.en> and GNU Free Documentation License.

FIGURE 6.2: Earth's internal structure.

like precious or noble metals³⁹ concentrated in the core during the early stages of formation before the earth cooled off. Precious metals and diamonds are the only physical constituents known to humanity that do not degrade over time.

Since the fall of humanity (Gn 3), everything except precious metals and diamonds degrades with time (Erickson 2013, p. 556). Could it be that humanity's inherent valuation of precious metals and diamonds could be ascribed to our subconscious longing for everlasting life, being made in God's image? Gold is dug out from deep under the earth, only to be hoarded in vaults in the earth as a representation of long-term value. It is ironic, then, that although humanity historically looked up and searched the sky for a god and dug deep into the earth in search of something physical representing sustainable value, these might be flipped around.

God spoke to the earth to bring forth living creatures as if it were the origin of fauna and flora (Gn 1:24). After the fall of humanity, God did not curse human beings, but rather the serpent and the earth (soil) and ground humanity walks on and works in (Gn 3:17). Since the curse, the ground would bring forth thorns and human beings would toil painfully to get food from the ground to eat. Following the flood of Noah, God not only made a

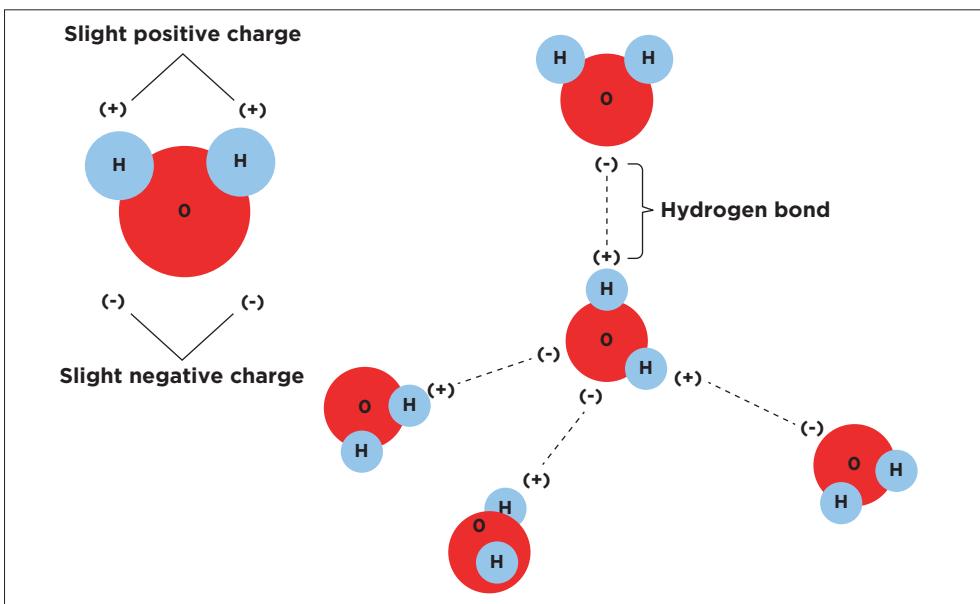
39. These are silver, gold and the platinum group metals: platinum, palladium, rhodium, ruthenium, iridium and osmium (see Lyon 2010, pp. 2205-2223).

covenant with Noah and his descendants, of which the rainbow⁴⁰ is a sign, but also with the earth (Gn 9:13).⁴¹

■ Unique characteristics of water

Pure water is an amazing and unique substance. It is colourless, tasteless and odourless and is used as a reference for the International System of Units (SI) measurements of volume, density and temperature. Water's physical and chemical properties are very different from most other liquids (Brownlow 1979).

The unusual characteristics of water can be explained by the structure of the water molecule and the intermolecular hydrogen bond forces. Water consists of two hydrogen atoms on either side of an oxygen atom resulting in a dipolar molecule. The dipolar molecular structure of water is the cause of the unusual properties (Brownlow 1979). The dipolar nature of water explains its ability to dissolve other chemicals and why it is the most widely used cleansing agent, a characteristic that is also reflected in baptism.



Source: Image sourced from <https://bodell.mtchs.org/OnlineBio/BIOCD/text/chapter4/concept4.4.html>, redrawn and published with appropriate permissions from the copyright holder.

FIGURE 6.3: Schematic representation of a water molecule showing the hydrogen bonds.

40. It is interesting to note that a rainbow is an interaction between water and light to display seven magnificent colours (see <https://en.wikipedia.org/wiki/Rainbow>) - water being a symbol of the Holy Spirit and light a representation of Jesus (Jn 1:5).

41. See Genesis 9:13: 'I do set my bow in the cloud, and it shall be for a token of a covenant between me and the earth'.

Water is further unique in the sense that ice expands when water freezes as a result of the crystal structure. Water is the only natural substance that expands when it cools. It has the ability to store and transport dissolved mass and heat (energy).

The specific heat capacity of water is 4,200 joules per kg per degree Celsius, which is high for naturally stable substances (iron is at 450 J/kg/°C) (Quick et al. 2019, pp. 12–20). Because of this capacity, water is used to transfer heat in geothermal heating/cooling systems used in cold and hot regions. Water expands by 1,700 times when converted to steam, which is the basis of old steam engines and is still used in power generation stations today.

Water is an amazing solvent with the capability to dissolve and transport solute mass, increasing its density and keeping the volume the same. Seawater has a total dissolved solid content of 34,500 mg/L (parts per million or 34.5 kg/m³), which gives the sea and our climate its important characteristics (Bolles 2022). It is these characteristics – that is, to dissolve and transport both solutes and heat – that enable plants to grow and ecosystems to function. Water is the agent that transports the nutrients in plants, facilitates photosynthesis and cools down plants, which enables life on Earth.

■ Groundwater

In Genesis 7, we read that:

In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened. (v. 11)

While this seems impossible that so much water could emanate from the subsurface, recent research has shown that there is at least as much water in the deep earth as in the oceans (Fei 2020; <https://www.newscientist.com>). The water is locked up in mineral crystal structures in the crust and from water-rich rocks in the upper mantle. Water also occurs as impurities in mantle rocks and lubricates movement between tectonic plates (Hirschmann 2006; <https://physicstoday.scitation.org>). From this perspective, it would be possible for God to release not only groundwater from subsurface pore volumes, which could range between 1% and 10% of the earth's subsurface, but also from the deep crust and mantle where it has been scientifically proven to exist.

The geographic settings of Israel, Egypt and Syria are located in arid or desert environments. Underground water is significant in the biblical theme as surface water was limited to specific small areas, such as the Nile River, the Sea of Galilee and the Jordan River. Groundwater occurs in pore spaces and fractures in broken rock that act as hidden reservoirs for water.

Groundwater in hard rock⁴² aquifers is obtained in usable quantities where the rock is significantly fractured.

When Moses wanted to see God's glory (Ex 33:22), he had to be kept safe in a cleft (fracture), just as Jesus, the broken Rock, would keep us safe from judgement *via* the Cross (Anon 2023). Just as the water flows through the fractured and broken Rock, the Holy Spirit was outpoured through Jesus to provide everlasting life to Christians (Jn 4:14, Jn 7:37) (Stewart 2020). This also provides a picture of how, just as the pore spaces in a sandstone becomes saturated with water, we can be saturated with the Holy Spirit and become a spring with living water gushing out. Of specific interest here is that the physical phenomenon of how solid sandstone grains and pore spaces form an entity known as an *aquifer* that consists of three parts: the sand particles (solid), the open pore spaces (gas) and water (fluid).

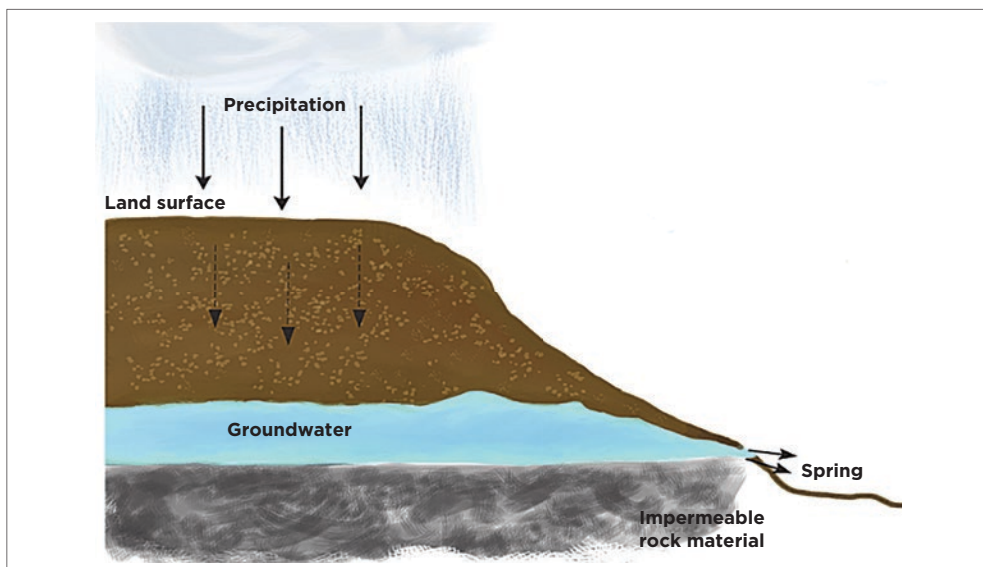
■ Springs

The top surface of underground water is commonly known as the water table, and where the water table intersects the ground surface, springs arise (Figure 6.1–Figure 6.4) (Lehosmaa 2018a, p. 18). Springs are interesting because they are natural phenomena where water is not forced from the subsurface using human efforts like at a well, but freely flows out, driven by natural energy.

Springs that formed oases were critical for the survival of the nomadic people in biblical times. Settlements were chosen near springs where the flow was enhanced by underground tunnels, for example, at Jerusalem and Megiddo (Aharoni 1979). Of interest is that a spring represents permeable rock (fractured/broken) that intersects the ground surface. It is where Jesus becomes visible to people where real heavenly life is sustained (Godly or Zoe Everlasting Life Gr. 2 Cor 5:17).

As springs were important for life in biblical times, Jesus is the Rock (Ps 18:2; Ps 78:35; Lk 20:18) that was broken on the Cross for us, to give life to dried-out (lifeless) souls. If the rock is not broken, the water cannot flow through it to supply water to a spring or a well. A spring that occurs at a specific point has to receive inflow known as *recharge* from rainfall over a much wider area, a catchment to provide a sustainable flow of water. In Isaiah 55:8–10, God says that just like the clouds of life-giving moisture are above the earth, his thoughts are higher than our thoughts, and that like rain and snow they come down to infiltrate and wet the earth to bring life. This infiltration (access) of precipitation (God's Thoughts or Word) leads to

42. Porous aquifers are formed by sand or sandstone formed by sedimentary layers. Hard rock aquifers are formed by fracturing of igneous and compacted sedimentary rocks.



Source: Lehosmaa (2018a, p. 18), republished with appropriate permissions.

FIGURE 6.4: Illustrative presentation on how springs are formed.⁴³

springs of living water (Jn 4:14). Where the collection and infiltration of God's thoughts over time and space collect and are concentrated, they can flow from a person's inner depths, like from the eye of a spring. Where this happens across a large catchment and through highly permeable (i.e. broken) rock, it can even lead to the formation of downstream rivers.

The biggest spring in South Africa is the Kuruman Eye,⁴⁴ flowing from fractured dolomitic formations in the semi-arid Northern Cape province. It forms an important part of the Kuruman River that gave rise to the settlement of Kuruman town.

God demonstrated his authority and care when Moses struck the rock in the desert⁴⁵ and water flowed from it to sustain the life of human beings and their animals (Nm 20:8). This is of great significance for Christians who can find themselves in a spiritual and material desert with no hope. The hope for them is that God can provide living water that will sustain them, even in a desert where it seems impossible, from an unseen source.

The Bible also notes that the eyes are the window to the soul (Mt 6:22), just as the eye of a spring is a window to the origin of the spring.

43. See Lehosmaa (2018b).

44. The largest spring in South Africa, flowing at a rate of 200,000–500,000 cubic meters per month (78–200 L per second).

45. The location where Moses struck the first rock is known as Hajar Musa and is located near Mount Horeb (<https://www.loc.gov/resource>).

The quality of the water is determined by the nature of the host rock and the flow-path that the spring water flows through. A spring can provide bitter water, as the Israelites experienced at Mara.⁴⁶ The quality of the spring water testifies to its origin (Ja 3:11). A spring cannot give both sweet and bitter water. Like the Word of God, water from precipitation is always clean and distilled by the process of evaporation and condensation. Now, from this verse, it is evident that the *enemy* (Satan and his fallen angels) has the ability to pollute clean water, which can then result in a bitter spring which is the opposite of clean, living water. There is, however, hope and a solution to this problem. The Israelites arrived at the bitter waters of Mara, where God commanded Moses to throw a piece of a tree (wood) into the water and it became sweet (Ex 15:23). Around 1,400 years later, on the Cross, Jesus died on a piece of a tree (wooden cross) for our sins, to make our bitter water clean and sweet. It is interesting to note that activated carbon, made from wood, is often used to purify water in treatment systems.

From Mara, the Israelites arrived at Elim,⁴⁷ approximately 20 km further and the seventh stop.⁴⁸ In contrast to Mara, Elim had twelve wells and 70 palm trees (Ex 15:27; Nm 33:9). Elim represents abundant and sustainable water of good quality in a desert environment. It signified a period of enlightenment and consolation after a test.⁴⁹ The shallow groundwater at Elim not only provided life-sustaining water but also supported the palm trees to provide shade and nutrition. Palm trees signify *holy festivity* originating from *good* (Jn 12:12). This is of significance because the holy festivity is supported by a deep and clean resource, fully infiltrated (i.e. recharged) and saturated (i.e. stored Words of God) by God's thoughts (Is 55:8).

The Bible distinguishes between sustainable and non-sustainable springs. Sustainable springs (*where the waters fail not*, Is 58:11) flow from a groundwater reservoir that has a sufficiently large storage capacity to sustain flow through dry seasons. From a spiritual perspective, all people go through cycles or seasons of highs and lows where the input from the Word is such that it can sustain the person during times of spiritual drought. The apostle Paul was able to rejoice in the Lord even when he was in jail (Phlp 4:4). Paul's mind and soul were drenched from the input (recharge)

46. Mara means bitter. It is the sixth station where the Israelites stopped while murmuring and being bitter themselves (<https://en.wikipedia.org/wiki/Marah>). It is also where they received their first set of ordinances to keep the Shabbat. This is significant, as the number 6 is the number of humanity (Rv 13:17) without God and is incomplete.

47. Elim has been identified with the Wadi Ghurundel (<https://www.biblestudytools.com>). A Wadi is a dry riverbed that has groundwater flowing below in the subsurface.

48. Seven represent the number of God the Father (Yahweh) (https://en.wikipedia.org/wiki/Symbolism_of_the_number_7). The fact that Elim was the seventh station with 70 palm trees was not a coincidence.

49. See <http://www.biblemeanings.info>.

of God's thoughts through the Holy Spirit so that he could be a spring of living water to his fellow inmates and even to the prison wardens (Jn 4:14). This could only happen if his mind had sufficient inflow and storage capacity for God's Word. The opposite is also true if a spring (or person) has limited input water through recharge (the Word; Ps 107:35) and does not store it in one's heart (Ps 119:11; ESV). Difficult circumstances would quickly drain the system and it would dry up and lose hope.

■ Wells

Wells were dug in biblical times to reach water that was below the ground surface. Similar to springs, wells have to intersect sufficiently permeable (fractured/weathered) rock to enable usable supplies of water. In the case of a well, human skill and energy are required to reach and lift water to the surface. Abraham is referenced as the first to have a well⁵⁰ dug at Beersheba in the Negev desert, almost 6,000 years ago.⁵¹ The well site still attracts tourists to this day. Wells were critically important; Abraham and Abimelech's servants fought over a well, and Abraham made an oath over the ownership of a water well.⁵² Water is not only a symbol of life in the Bible but has tangible survival and economic benefits. Water as a scarce resource often results in disputes over water rights that lead to exhaustive environmental legislation. In contrast, Jesus' supply of living water is unlimited, has no economical price tag and is invaluable.

Jacob dug wells in his time, which he must have learnt from his grandfather Abraham. A specific well, known as Jacob's Well, is located in Shechem, Israel, which still exists to this day. The well is seven feet, six inches in diameter and was measured to be 41 m deep in 1935 (see Bromiley 1982, p. 955).

It is not a coincidence that Jesus met the Samaritan woman at this exact same Jacob's Well, where he asked her for water (Jn 4:4). It is at this well that Jesus did not only bridge racial and gender divides but also confirmed living water to people who choose to believe in him. Abraham's servant Eliezer went to a well where he waited for the future wife of Isaac. Rebecca not only cared for her father's camels but was also willing to provide a stranger with life-giving water she drew from a well (Gn 24:11). The future mother of God's chosen nation, Israel, was identified and qualified at a significant place, a well with specific deeper reason and meaning.

50. The well has a diameter of 3.75 m and is 13 m deep. Note that while the well site is known, wells tend to collapse and are refurbished or new wells dug around the older wells.

51. See <https://www.jpost.com>.

52. See <https://www.christianity.com/bible/>.

■ Conclusion

God, the Father and the Originator of the physical world from a spiritual origin, crafted his characteristics into his physical creation. God gave humanity a commission to reign on Earth in Genesis 1:27. He said, '*let them reign*'. Leaving his created beings with free will to explore and also to find him in creation in Romans 1:

For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made, even his eternal power and Godhead; so that they are without excuse. (v. 20)

This means that all invisible (spiritual) things are clearly seen in the visible. God's very image is visible in nature - what a thought. Water, being an important component supporting life on Earth, is a special substance representing God's life-giving Spirit. Sometimes it is visible and tangible, like when rain falls or one swims in a lake. However, in areas or times of seeming absence of water on the surface, it is stored underground, but to access this life-giving resource (1 Cor 5:45), we must seek it out (a spring) or dig for it (a well). For those that do, there is life in abundance (Jn 10:10).

The Word of God reveals how water in the clouds represents God's thoughts being higher than our thoughts (Is 55:8), which comes down and drenches the soil (our minds). Then, it produces lovely plants (nourishing fruit) and recharges our inner beings (stored deep in our hearts, like underground water). Not to be kept only for ourselves but to overflow from our innermost beings like a spring of everlasting life.

The role of groundwater in the Bible

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■ Introduction

The Bible was written from a religious and spiritual perspective, reflecting the narrative and historic picture of God and humanity rather than with a scientific objective in mind. Careful study is therefore required to understand what the text says about the natural environment in history (Ross 2007). Many of the metaphors conveyed in scripture relate to the natural setting as they were experienced and understood at that time. It is therefore important to reconstruct the original setting to have a better understanding of the biblical narrative and related metaphors (Hillel 2006).

Humanity has a deep-rooted tendency to give expression to abstract ideas and the unseen world of the spiritual reality by referencing tangible or visible forms. In this light, the reader must recognise the prophetic nature of the writings of the Bible and strive to discover the symbolism of various aspects regarding the biblical narrative. This is also applied to the many metaphorical references that can be found regarding water (Ellis 1991).

Nature, including groundwater, played an important role as life-giving resource and in the narrative and symbolic world of the arid physical

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environment of the Palestine area. Springs and wells acted as cultic centres and sacred places where communal and corporate actions took place for thousands of years. Klopper (2002) concluded that 'this made their springs and wells localities of integration, meaning and order amidst the threatened forces of chaos'.

The primary aim of this chapter is, therefore, to investigate the roles that groundwater and the related geo-environmental setting played in specific events during the unfolding of biblical history and to use this understanding to perceive the hidden truths conveyed through these narratives on a deeper level.

■ Groundwater as the parable

We all know groundwater as an almost 'mystic' part of nature and the related geo-environmental setting. Boreholes in desolate places and the nearly supernatural miracle of springs in the desert come to mind. The truth is that groundwater is an important part of the natural water cycle of Planet Earth, representing a freshwater reservoir estimated to be almost 1,000 times greater than the volume of fresh water in all rivers and lakes on the earth's surface (Appelo & Postma 2005). It is an important water resource, acting as natural storage of water (aquifers) that can bridge shortages of surface water over extended periods of time. It is, therefore, obvious that groundwater will play an important role as a water resource in the history of humanity.

To further our understanding of theological concepts from a deeper insight in the role of groundwater in the unfolding of biblical recordings, it is very important to initially review the broader setting and characteristics of groundwater in these areas. This includes reference to the geological and the climatological conditions that have an effect on groundwater in general and more specifically in those areas involved in the biblical history and related events.

The close association between geographical setting and the inherent geohydrological environments and characteristics of the related groundwater regimes is considered an important element in studying the prophetic value of biblical events. This is a very relevant consideration, as the biblical narrative is set in an arid, desert-like geo-environment in which water (more specifically, groundwater) plays a major role. This reality was the norm of the time, determining everyday life of farmers, herders and travellers within ancient Israel. It is therefore not only essential to understand these conditions to develop a deeper understanding of the biblical events as well as the concepts that are conveyed in the Bible. Various prophets formulated deep spiritual concepts by referencing the natural environment prevailing at the time in which they found themselves (Ross 2007).

This insight will allow us to draw a line from the role of groundwater and the related groundwater regime to a prophetic application and understanding of 'New Testament Israel', the expected perspective on the future 'New Jerusalem' and the reality of the eternal Promised Land as spiritual concepts unpacked in scripture. Additionally, this understanding allows us to apply our knowledge of the groundwater reality and related science to construct classic 'parables' – similar to those used by Jesus to explain the deeper meaning of various aspects of the spiritual reality not physically observable by other means.

■ Groundwater as part of the geo-environmental reality

■ A constantly changing regime

The development of groundwater resources is governed and regulated by ongoing natural processes within two major regimes:

- Groundwater accumulates and moves in fractured and weathered zones within rocks. The physical character of geological formations and the influence of geological structures play a major role in groundwater availability (Heath 2004).
- Rainwater/surface water constitutes the most important source of groundwater globally (Appelo & Postma 2005), with recharge moving the surface water component of the water cycle into a more long-term groundwater reservoir (Gleeson et al. 2016).

Groundwater is therefore affected by changing geological and climatological conditions over time. This contributes to the 'mystic character' of groundwater as this represents specific geo-environmental conditions resulting from processes that took place in most cases over periods not falling in our normal observation of a lifetime. Groundwater represents, therefore, water that has accumulated during processes occurring long before our lifetime.

Although the study of geological processes and related timeframes is considered too comprehensive for inclusion in this chapter, it is important to understand that geology deals with timeframes beyond our perception of time. Although the age of the oldest rocks on Earth is defined as around 4.5 billion years (Dalrymple 2001), the much younger Cenozoic geological era (spanning from roughly 65 million years ago to the present) played a major role in the formation of the earth's modern-day geomorphological features (Hurter 2015), including the majestic canyons, lakes and mountain ranges. The highly complex but interesting principles behind geology and meteorology provide us with some appreciation of the level of detail prepared by an eternal god to set the table and landscape ready to act as the playground for his narrative on Earth.

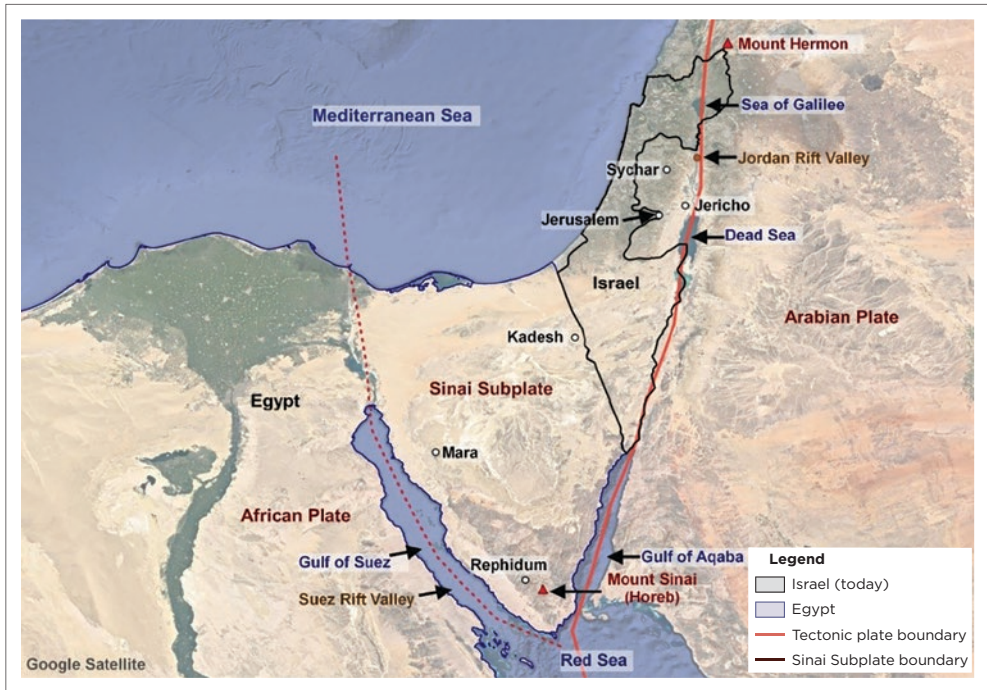
The youngest of the geological timeframes, the Quaternary period (encompassing the last 1.8 million years) reflects drastic climatological changes affecting river flow patterns, sedimentation processes and vegetation variation (Tooth et al. 2004). Even more recently, it is evident that these climatological changes are a reality that keeps on colouring the final picture of planet Earth that we have today. The earth's current surface and atmospheric conditions reflect the dominant conditions that have prevailed for approximately the last 10,000 years. The last glacial maximum occurred from 18,000 to 10,000 years ago during which time various ice sheets covered most of the northern hemisphere of the earth (McCarthy & Rubidge 2005).

Given this broad introduction, we can now focus more on the occurrence of groundwater in those areas that played an important role during the recording of biblical history.

■ **Groundwater in the ancient world of biblical history**

The very complex and unique geology of Israel resulted from geological processes that took place over extended periods of time. The land of Israel is underlaid by various igneous and metamorphic basement rocks from the Sinai-subplate located between Africa and the Arabian Plate (Garfunkel & Bartov 1970). These are known as Precambrian rocks that originated in the geological timeframe of 4.5 billion to 500 million years. These strata are overlaid by various sedimentary and volcanic rocks formed 500–65 million years ago. The complex geological picture is completed with a topping of alluvium, sand and desert basin deposits placed in the period between 65 million years ago and the present (Sneh, Bartov & Rosensaft 1998).

The geo-environment in which biblical history unfolds is shaped by the geological plate tectonic forces that formed the roughly triangular Sinai Peninsula and the Negev area, bordered by two major rift valleys, namely, the Suez Rift Valley to the south and the Jordan Rift Valley to the east (Figure 7.1). Deep troughs along these rift valleys dictate regional drainage patterns and surface water flow (Garfunkel 1977). These major geological fault systems and plate tectonic forces gave rise to the development of a prominent mountainous area on which most of the biblical story of humanity played out. On the contrary, the geo-environmental character of the area imparted a fractured nature to the strata with related weathering along faults at depth. This setting affects and defines the subsurface flow of groundwater and the associated presence of springs (Issar et al. 1971).



Source: Original work by Stephan J Pretorius, published with permission from Stephan J Pretorius.

FIGURE 7.1: Map of Israel and Egypt.

These geological pre-conditions, the faults and fractures, extensive limestone and dolomite deposits and related groundwater aquifers and the mountainous landscape all integrated and created localised hydrological conditions that aided the survival of the inhabitants of this ancient arid land over thousands of years (Issar 2008).

The study of climate change and its effects on groundwater in these areas cultivates a growing sense of appreciation of a long-term divine plan set in motion to establish the stage for the narrative of God's interaction with humanity over an extended period of time. Although a very interesting study topic, we will only focus on a few examples applicable to the local groundwater setting. It is important to note that the impact of climate change on the history of humanity is very evident from studies in the Middle East, as this area is very sensitive to changes in climatic conditions. Globally, colder eras are inferred to have led to higher humidity and rainfall on a local scale, while warmer eras led to local droughts and famine. This extreme climatic variability over thousands of years, together with the availability of groundwater, is considered the most important factor affecting the inhabitants and their spatial behaviour in the land where biblical history was recorded over many generations (Issar 2014).

This is best illustrated on the hand of the following important climatological events (Conazarene 2015), namely:

- The last Global Glacial high is inferred to have occurred in the period between 18,000 and 10,000 years ago. This took place way before the documented biblical era and other well-known developments like the Great Pyramids of Egypt (reported to have been constructed around 2600 BC). This last glacial event contributed to the storage of most of the groundwater in the desert settings of the ancient biblical recordings (Issar 2014).
- A well-known, severe global climatic aridification event occurred in and around 2200 BC, during which time the known ancient eastern world suffered a significantly dryer climatic setting that had a drastic effect on culture, popular movement and even led to the fall of some civilisations (De Menocal 2001).
- This global event set the table for the geo-environmental conditions defining the times in which Abraham and the patriarchs in the Bible moved into the more desolated areas (around 2090 BC) while having to depend on groundwater accumulated during the more humid climatic cycle prior to the aridification era.
- A period of unusually cold conditions over the North Atlantic occurred between 1800 BC and 1500 BC, activated by a series of severe volcanic eruptions elsewhere (Siklosy et al. 2007). This climatic setting caused higher rainfall in the desert areas of Asia, northeast from Egypt, in combination with low flow volumes along the Nile River. This unique set of circumstances set the table for the exodus of Israel from the land of Egypt, affected by a significant geo-environmental constraint to a desert land with a more accommodative climate around 1400 BC (Issar 2014).

Over time, these radical climatic variations repeated on both a regional and local scale with many more documented examples. Various climatic studies have been concluded in this regard and can be used to facilitate a better understanding of the geo-environmental conditions during specific events and to fill in gaps in our understanding of some of the historical events referenced in the Bible.

■ The role of groundwater in the history of biblical recordings

Groundwater played a major role in the development of Israel throughout its history, but also in modern times. Groundwater aquifers underlie vast portions of the country and are broadly subdivided into the Mountain Aquifers (Western, North-Eastern and Eastern aquifers), the Coastal Aquifer and smaller localised aquifers in the Galilee and Negev basins. The spatial distribution of groundwater occurrences varies drastically within the area as a result of the complex structural geology that governs groundwater recharge and movement (Dafny, Gvirtzman & Burg 2013; Dafny et al. 2003).

The occurrence of groundwater is crucial to the spatial development and land-use management on a global scale (Pretorius 2009). This is also true for the areas where biblical history unfolded. OE Meinzer, who is considered the father of modern-day geohydrology, once referred to Genesis 26 as a 'water-supply paper' (Meinzer 1934). The Egyptians constructed wells for the supply of water as early as 2100 BC, with accounts of the digging of fourteen wells by 3,000 men unearthed by scholars (Johnson 1966). More extraordinary works for the utilisation of groundwater by ancient people are also recorded during the history and development in Persia (present-day Iran) (Stetson 1983).

Our focus is, in particular, on the geohydrological settings behind specific biblical events that are closely associated with the inherent geohydrological environments and characteristics of the related groundwater regimes. The focus on each of these specific cases confirms the words by the well-known geologist and geo-environmental specialist Arrie S Issar (2014) from Israel:

Many stories of the Bible contain an historical core, which a scientist knowing and understanding the natural environments of the region, can bring to light and share with an interested audience. (n.p.)

■ Era of the patriarchs

When Abraham and the Patriarch family moved southwards from ancient Mesopotamia into the area known today as Israel, there were two major geo-environmental regimes behind the covers of this unfolding biblical narrative. The Jordan Rift Valley is a prominent north-south depression between modern-day Israel to the west and Jordan to the east. The whole Jordan River, from its source through the Sea of Galilee and the Dead Sea, occurs within this valley, the latter being the lowest land surface on Earth (400 m below sea level). The Rift Valley was originally formed through powerful geological forces associated with plate tectonics and defines the boundary between the Arabian Plate to the east and the Sinai and Africa Plate to the west (Joffe & Garfunkel 1987). This fault-dominated structure gave rise to the development of many springs along its flank, fed from groundwater aquifers in the adjacent mountain ranges. The land to the north of the Dead Sea is renowned for rich agricultural development over thousands of years (Issar 2014). Conversely, this area had also been subjected to volcanic and destructive earth displacement forces related to mega faulting along the rift. This geo-environmental setting correlates well with the description in Genesis 13:

And Lot lifted up his eyes and saw that the Jordan Valley was well watered everywhere like the garden of the Lord, like the land of Egypt, in the direction of Zoar (This was before the Lord destroyed Sodom and Gomorrah). (vv. 10, 11)

The mountainous part of Canaan is a very dry, desert-like area in Negev that comprises the southern part of modern-day Israel. These highlands and mountainous deserts with dry riverbeds are underscored by geo-environmental conditions that set the stage for Abraham and the patriarchs playing their part in God's narrative (Gn 20:1 'From there Abraham journeyed toward the territory of the Negev and lived between Kadesh and Shur; and he sojourned in Gerar'). Survival in this hostile environment depended on special knowledge to accurately site and develop wells while dictating the spatial setting and struggle between various tribes as reflected in the conflict between Abraham and Abimelech's people (Gn 21:25). This struggle repeated time after time in this desolate area, with details about the fights between Isaac's people and the herdsmen of Gerar following the development of various wells at Esek, Sitnah and Rehoboth recorded in Genesis 26:19–23.

The results of research conducted in this area indicate that vast experience in the interpretation of basic geology, structural geology and nature in general was essential to locate and development wells that yielded fresh water. Knowledge regarding groundwater resources in the Negev was passed along over time by those that had learnt it from personal experience (Issar 2014).

As a geohydrologist dealing with the challenges posed by the use of structural geological principles in the identification of underground resources in semi-arid areas, I can surely relate to the excitement among Isaac's servants when they came to inform him: 'We found water'. (Gn 26:32). This appreciation grows when, during a visit to Israel in 2010, I realised that some of the ancient wells were excavated to depths of up to 80 m below the surface. Somehow, Abraham and his people found a method to locate wells not only associated with shallow riverbeds, but utilising knowledge regarding deeper structurally controlled geological conditions, even along the crests of hills and ridges (Issar 2014).

It is recorded that Abraham had dug many wells in his time, and after his death, his son, Isaac, exhibited the same proficiency to provide water (Gn 26:18). It is a possibility that this geo-environmental understanding gave the patriarchs an advantage that enabled them to act as pioneers, resulting in being accepted and receiving favour in the new land where they had established themselves.

Being in geo-environmental practice myself, this serves as a personal inspiration while conducting pioneering work in the search for groundwater resources in the arid parts of Southern Africa.

■ Journey from Egypt to the Promised Land

We all know the story of how the people of Israel escaped Egypt, their challenges in the desert, and their entering into the Promised Land.

We also agree on the symbolic and prophetic value that this account holds for Christians in general, escaping their 'Egypt', being on a spiritual journey, to eventually enter the Promised Land on a personal level (Małgorzata 2017).

In this section, we will be looking at specific moments during this historical event from a geo-environmental perspective focusing on the major role that the availability of water played. Hopefully, this perspective will allow a perception of our own personal journey from a different angle.

■ Geo-environmental setting of biblical Egypt

Issar (2014), also in reference to Wilson (1985), provides a very good summary of the changing geo-environmental setting of Egypt in the time of the exodus (around 1300 BC), preceded by a southward drifting of regional climatic belts. This brought a humid era to the previously drier land of Canaan, Negev and Sinai, with the higher rainfall leading to an abundance of water from springs spread throughout the area. The land therefore became more attractive, drawing people from far and wide, and it is recorded that the population of the area significantly increased over hundreds of years. However, the southward movement of the climatic belt caused the sub-tropic drainage basin of the Nile to become more arid. Records show that this new geo-environment posed serious challenges to the people of Egypt, with tales of a red Nile because of enormous sandstorms and drastic weather pattern changes that introduced extreme storms and parasites with plagues in Egypt over an extended period of time. This sets the stage for a population moving northward from Egypt to areas exhibiting more acceptable geo-environmental conditions and for the timeframe in which Moses, after hearing from God, led the Hebrews out of slavery to their new destiny.

Understanding this geo-environmental reality provides valuable insights into our personal journey from our 'Egypt' to the 'Promised Land'. God did not change the natural circumstances on our request, as is frequently the expectation along our personal journey. As the creator, God has set forces in place that result in specific natural environments and rhythms of change. However, supernatural outcomes are founded on the hearing of God's voice instructing and leading his people to act upon what will happen during these processes, like Moses at the burning bush (Ex 3). By hearing God's voice, we become his story in the midst of an endlessly changing natural process. Conversely, if we do not hear his voice, we just become part of the process and miss the opportunity to become part of God's narrative at a specific point in time.

■ The narrative at Mara

Along the journey from Egypt to the Promised Land, the narrative of Mara and its 'bitter water' is particularly interesting from a geo-environmental perspective (Ex 15:23; Nm 33:8). Issar (2014) refers to the biblical story regarding this spring located in the Sinai Peninsula as one of the first 'hydro-chemical' reports ever rendered. This spring occurs along a fault system associated with the Suez Rift Valley and is associated with 'fossil water', representing water accumulated over thousands of years from distant places and climates, governed by regionally specific structural geological and climatic conditions. The water had a 'bitter' taste because of the accumulation of sulphate salts typical of this geohydrological setting (Issar 2014). However, sulphate salts (e.g. magnesium sulphate, known as Epsom salt) held medicinal value as mineral compounds used to treat different health and medical issues. This reality, as revealed in the 'ancient hydro-chemical report' recorded in the Bible, provides geo-environmental context to these words by God to the people of Israel: 'If you will diligently listen to the voice of the Lord your God, and do that which is right in his eyes, and give ear to his commandments and keep all his statutes, I will put none of the diseases on you that I put on the Egyptians, for I am the Lord, your healer' (Ex 15:26). While emphasis is usually placed on the sweetening of the water, this was actually an opportunity for the people of Israel to be cleansed from all the parasites and germs they brought from Egypt.

This account of a biblical happening is also applicable to our own personal journey in noting that the encountering of 'bitter water' in our lives could be an opportunity to be cleansed from whatever contaminates us from past events.

■ Striking the rock

The geo-environmental setting in the southern Sinai desert and mountains provides a unique opportunity to supply water at very specific localities within very dry and desolated areas. Calcite (a type of calcium carbonate) veins filling localised fractures along specific fault systems in otherwise competent and solid granite bedrock. Mechanical excavation into the veins can free groundwater trapped within the fracture fillings that are fed from higher elevations at the foot of mountains. Additionally, excavation into the brittle edges of fractured weathered diabase dyke intrusions within the solid granite bedrock could also yield groundwater. According to Issar (2014), modern-day Bedouins in the southern Sinai area still use their knowledge of the local geo-environmental setting to open up fractures to obtain access to groundwater.

In this light, we turn to the biblical recording of a quarrel between the people of Israel and Moses near a place called Rephidim in southern Sinai regarding a lack of water. The Lord instructed Moses to strike the rock, and within the geo-environmental setting as described above, water came out and the people could drink (Ex 17:1-6). This scene illustrates the natural way of things, but also the opportunity nature provides those who tap into the right applicable knowledge. The action of hitting the rock to release the trapped water is therefore a metaphor for humanity's own efforts and growing knowledge of the forces and realities of nature around them.

But then there is a twist in this Godly narrative. Forty years later and in a much-frustrated status, after the death of Aaron and his sister Miriam, Moses again faced a thirsty congregation, this time at a place called Kadesh located in the desert of sin (Nm 20:1-12). This was the same place where the people of Israel rejected the faith-based report from Joshua and Caleb to move into the Promised Land, rather choosing the report by the ten spies in unbelief (Nm 13 and 14). Here at Kadesh, 40 years later, the Lord instructed Moses not to strike the rock (symbolic of the natural and own effort way of doing) but only to *speak* to the rock – an action that did not require knowledge of the natural environment but adding an element of *faith*. In this case, when Moses struck the rock while ignoring the opportunity to act in a more spiritual manner, the Lord's reaction was that he 'did not believe in me' (Nm 20:12). As a result of this action, Moses was not allowed to lead the people of Israel into the Promised Land. Over the years, this rather harsh reaction resulting from one act of unbelief has been met with an almost critical mindset by Christians. How can one act of unbelief disqualify Moses from leading the people into the Promised Land after a lifetime of acting in faith? However, this becomes clearer when we realise that this act occurred in precisely the same place of unbelief 40 years earlier. However, the geo-environmental character of the area can also possibly further enlighten our understanding of this narrative.

The geohydrological setting at Kadesh has been known for over thousands of years to be the location of a major spring named Kadesh Barney, associated with underlying limestone fed by surface water recharge from the mountainous areas in Negev (Kafri & Yechieli 2021). This condition that leads to the presence of many springs seeping from rocks in the surrounding area does not require 'striking the rock' to release water as Moses had attempted. While the local geo-environmental character provides an explanation as to why the people of Israel stayed over in this area while awaiting the return of the spies, it does not give us an understanding of why Moses decided to strike the rock – as this was not necessary in this specific geo-environment.

The 'speaking' versus 'striking', as well as the difference in geo-environmental setting, could yield a deeper insight, given that the New Testament scripture refers to the rock in the desert as a typology of Christ (1 Cor 10:4). This Godly narrative then gives us a deeper insight into understanding 'Christ', and as such our own being today as the 'body of Christ' (1 Cor 12:27). This narrative intended to establish a picture of Christ, 'struck' once on the Cross, bringing forth streams of living water. This was a *once-off* action, requiring no further sacrifice. The instruction to 'speak' the second time would support this spiritual concept, but Moses distorted this picture and became a symbol of the 'own effort' of religious practices as contribution to salvation through our own efforts and abilities. Such actions stand against grace that leads us into the Promised Land, of which Moses' unbelief in this case became symbolic.

The two distinctly different geo-environmental settings during the 'strike instruction' and 'speak instruction' are symbolic of two opposite spiritual settings. In the first setting, we deal with the spiritual reality in which it is necessary to strike the rock, being Jesus on the Cross, while the second setting took place in a totally different environment where striking is not required. That said, it is evident that we are presently still in a spiritual dispensation where we have yet to learn that good works cannot contribute to salvation – it is not only a matter of unbelief but also just not necessary.

■ The city of Jericho

The city of Jericho plays a major role in the recording of the journey of Israel's exodus from Egypt to the Promised Land as it was the first official land with its 'king and mighty men of valour' that the people of Israel encountered after crossing the Jordan River (Jos 6:2). However, the deeper meaning and symbolic value of Jericho become evident when regarded from a groundwater and related, broader geo-environmental historical perspective.

According to Issar (2014), Jericho can claim the title as one of the oldest corporate agricultural settlements in the world. Its occupation started around 12,000 years ago in a very stable environment created by an oasis called the Spring of Elisha that is fed from rainfall infiltrating the water-bearing limestone and dolomite layers within the mountains of Judea and Samaria. Over thousands of years, this area became the cradle of humanity's agricultural prowess, and as such, represents the development of humanity into a community where its own decisions and abilities are used to overcome natural conditions in barren desert areas (Issar 2014). It is very interesting to note that this age-old monument to human achievement was targeted to be the first to fall in the process of Israel's takeover of the Promised Land. This apparent expression of two

opposing sides of authority – one celebrating the achievement of humanity and the other expressing the authority of God (as illustrated by the dealings of Israel), deepens our understanding of the actions that took place during this event. The fall of Jericho resulted from the destruction of the wall surrounding the city, not because of Israel's effort and ability, but as a result of God's intervention. This is made even more poignant when one realises that this was the place where Joshua (representing humanity) met the 'commander of the army of the Lord', fell on his face and worshipped him (Jos 5:16). Throughout biblical history, this battle between flesh and spirit continues in Jericho, as this was the place where Jesus gave sight (representing spiritual enlightenment) to the blind beggar (representing spiritually blind humanity) (Markus 10:46). Furthermore, the prophetic nature of this event is confirmed by the fact that the name of the blind beggar was Bartimaeus, meaning 'son of the polluted' (Strong 2011).

■ The story of Jerusalem

The biblical Jerusalem was built on a hill underlaid by limestone and dolomite in which groundwater had, over time, carved a network of caves (known as karst). The founding and sustained existence over thousands of years of this ancient city was made possible by a constant supply of water from the Gihan Spring within this karstic environment. The spring, located in the Kidron Valley to the east of the ancient city, is mentioned many times in the Bible (Israel Ministry of Foreign Affairs 2003).

The Bible records (2 Chr 32:2-4; 2 Ki 20:20) that prior to the Assyrian invasion of Judah in 701 BC, King Hezekiah built a tunnel under the city of David to bring the waters of the Gihon Spring to the Siloam Pool in the south-western part of the city. Hezekiah's Tunnel was excavated by two teams who worked in opposite directions and met in the middle, to prepare for the invasion of Sennacherib (Bible History Daily 2021). This ancient mega waterworks was studied and researched by various teams over the last 100 years, with the gathered evidence indicating that the complicated tunnel system followed existing fault systems within the dolomitic rocks. The natural karstic structures within the rocks have been optimised, and advantages were taken from the geo-environmental setting to make it possible to connect the city with the spring, to ensure sustainability (Israel Ministry of Foreign Affairs 2003).

Again, the geo-environmental conditions that determine groundwater flow in a karstic environment speak as a typology of the flow of the Spirit of God, bringing sustainability to the spiritual New Jerusalem. In this narrative, it is interesting to note that Hezekiah's name means, 'God has strengthened' (Strong 2011).

■ The Jordan River

The Jordan River and its associated natural geo-environmental setting play a major role in the biblical narrative and related prophetic value across thousands of years. In a well-recognised book on the biblical world, as referenced by Leeper (1900), it is stated that ‘the Jordan River is unique in nature and in history. Other planets may have a river like unto that of the Land of Promise, but not other countries’. Without going into too much detail on the statistics and extreme physical characteristics of this river, we will rather focus on a few geo-environmental elements that deepen our understanding of specific aspects illustrating the major metaphoric role that this river plays in the divine narrative of the biblical world.

The Mount Hermon range is located in the north of Israel along the borders with Syria and Lebanon. It is mainly underlaid by limestone, exhibiting a karstic character that gives rise to the development of many springs along major fault systems at the foot of the mountain. This geo-environmental setting comprises the primary source of the Upper Jordan River (Hartmann 2008). Precipitation on the mountain crest and upper slopes (including rain and melting snow) reaches the Jordan River along major faults and fractures and interconnected caves within the bedrock (Gur, Bar-Matthews & Sass 2003). The presence of relatively impermeable alluvium along the valleys hampers further ingress of the water at depth, with the groundwater thus arising at the foot of Mount Hermon mainly from numerous springs.

This geo-environmental setting is of special interest when applied as a metaphor, which David used to explain the concept of brotherhood in *unity*: ‘It is like the “dew” of Hermon, which falls in the mountains of Zion’ (Ps 133:2). This image is a prophetic illustration of the *unity* that flows in the body of Christ within a New Testament context as expressed in Jesus’ prayer, that the *unity* between the Father and the Son should be the benchmark against which the *unity* among believers should be measured (Jn 17:20–23). This *unity* also points to the ultimate purpose, the ‘mystery of His will’, to *unite all things in him* (Eph 1:9–10).

In this metaphor, the ‘dew of Hermon’ was used to describe the blessing of brotherly unity, with the Hebrew word *talal*, meaning ‘to cover’ or ‘to strew over’ (Strong 2011). Mount Hermon is always covered with snow and forms a prominent landmark on the horizon to the north of Israel. Through the infiltration of rain and melt water that feed many springs at its foot, this mountain is the source of water for the arid lands to the south. Within this geo-environmental setting, we can now understand the following: *unity* among brothers is like the uninterrupted water supply from Mount Hermon, being in distinct contrast to the dry wilderness, which changes this wilderness into a place where life can thrive and be healthy.

■ The ministry of Jesus Christ

■ Revealed identity

Jesus and his disciples visited one of the fountains located at the foot of Mount Hermon at a place called Caesarea Philippi (Mt 16:13). Again, the geo-environmental setting of the area provides a deeper spiritual insight into the narrative of God and humanity.

For thousands of years, Caesarea Philippi was an important religious centre where many different forms of pagan, Greek and Roman gods, including Baal, were worshipped. The groundwater flowing from the mountain created a prominent and well-known cave regarded as a 'gate to the underworld', later referred to as the Gates of Hell (Van Derlaan 2021). This cave was also popular with tourists for many centuries as a site of geological curiosity, being situated in a sheer rock face (Lindquist 2014).

It was at this site – in the face of religious activities honouring the pagan gods for thousands of years and in front of the cave with flowing water considered to be the 'gates of hell' – that Jesus stood with his disciples. Here, he asked them who among 'the people' (representing humanity) understood his identity as the 'Son of Man' – referring to his human bodily appearance (Mt 16:13). After the disciples explain the confusion regarding his identity among the people, Simon replied that Jesus 'is the Christ, the Son of the living God' (Mt 16:16).

When visiting this site in 2010, I came under the deep impression of how the geo-environmental setting of the area enriches our understanding of Jesus' declaration at this locality. This was made even more poignant when I recognised that the rocks in which this conversation most likely took place represent a shear zone along which the rocks have undergone major deformation: Jesus declared Peter's identity as 'the rock' on which the foundation of the church will be built (Mt 16:18). Standing on the fractured and sheared rock outcrops, I could develop an appreciation for the broken state that we are born into, but also of 'the rock' on which, through Christ, God's people of today will be built.

With the geo-environmental reality of brokenness and the darkness of the cave as a backdrop (access to the spiritual world), Jesus' declaration regarding the church became even more important (Mt 16:18, 19):

1. The 'gates of hell shall not prevail and can stand against this church' (even more so when read in context of Ps 133 as noted previously – when this corporate body stands in *unity*).
2. The access to the 'keys of the kingdom of heaven', to 'bind or loose on Earth', with the reference that it 'shall be bound or loose in heaven'.

This geohydrological scenario portrays a wealth of spiritual concepts, and as such, its prophetic value cannot be understated. It is, however, evident that there are still more spiritual truths and symbolic values to be learnt from this specific geo-environmental setting, especially with regard to the corporate expression of the body of Christ in thousands of years to come.

■ Spreading the gospel

According to the gospel of John, Jesus started his public ministry in the town of Sychar in Samaria, where he first publicly declared that he is the Messiah (Johannes 4:1-26). This took place at a very historical site called Jacob's Well, located in the field that Jacob had given to Joseph. This takes us back to the era of the Patriarchs, as previously described. The geohydrological setting again sets the stage, allowing Jesus to discuss the difference between 'water', which is a physical resource that brings temporary relief from thirst, and 'living water', which gives eternal life. This became a profoundly important moment in the history of humanity, as this represents the first public revelation of the message of redemption through Jesus Christ as the Messiah.

Although the geographical setting of the scene in Judea has not aroused particular interest in recent literature (Beutler 2015), the question arises: why did Jesus choose to reveal his identity for the first time to the public community in this specific geo-environmental setting? This was the same well where Jacob had met Rachel, his wife-to-be, according to Genesis 29:1-11. It was considered an important source of water in a very arid environment and access was strictly regulated by its owner. Additionally, some scholars link this well to the recordings by Moses regarding a well found by the people of Israel on their way to Moab (e.g. Kot 2020). The Israelites had composed a song to honour this well, singing: 'Spring up, O well. Sing to it. The well that the princes made, that the nobles of the people dug, with the sceptres and with their staffs' (Nm 21:16-18). It is interesting to note that this well was along the way from the place where Moses had hung the copper snake on a cross - a symbol of the healing brought by Jesus Christ on the Cross (Nm 21:8/9).

Research has shown that the town of Sychar is in the same locality as Shechem (Pudelko, as referenced by Kot 2020), where Abraham built his first altar after originally arriving in Canaan. This was the place where the Lord had appeared to Abram and had promised: 'to your offspring I will give this land' (Gn 12:6, 7). At the same place, it is recorded that the woman from Samaria had set eyes on Jesus, in 'whom all promises were fulfilled'. From water from the well in the land of Canaan to the living water of eternal life. The place is in itself an answer to the question raised by the woman (Jn 4:12) - he is indeed greater than Moses and Jacob. He is the Messiah (Jn 4:25).

■ Groundwater and our understanding of God's narrative

The descriptions in the previous sections make it clear that the application of knowledge regarding the local geo-environmental setting in which these events had occurred, with a particular focus on groundwater, contributes to our appreciation of spiritual concepts unpacked in scripture and helps to explain the prophetic value of events and places to such extent that it almost acts as classic 'parables', similar to those used by Jesus to explain unseen aspects of the spiritual reality. Groundwater can therefore be considered an important element that shapes the prophetic value of these events and, as such, serves to further our understanding of the theological concepts of the spiritual reality (Bookless 2004). Based on the processes and principles set out in this chapter, further study of spiritual concepts related to the 'New Testament Israel', the expected New Jerusalem as the eternal Promised Land and other uses of 'parables' is expected to be an exciting ongoing journey (Falusi 1982). We conclude this chapter with a few additional references to better our understanding of such spiritual concepts.

■ Groundwater as a metaphor for the work of the Spirit of God

The prophet Isaiah lived in the Kingdom of Judah, which formed part of the relatively arid geo-environment described in this chapter. It can be accepted that he lived in an era where the people had a nominally good understanding of this arid geo-environment (Ross 2007). Taking these aspects into consideration, we can now obtain a better insight into his well-known prophecies regarding the work and nature of the Spirit of God in times to come (Is 44):

For I will pour water on the thirsty land, and streams on the dry ground; I will pour my Spirit upon your offspring, and my blessing on your descendants. They shall spring up among the grass like willows by flowing streams. (vv. 3, 4)

Within the geo-environmental setting of the arid natural environment that Isaiah refers to in this prophecy, water from sporadic rain showers flows downstream along streams and rivers in the form of flash floods, during which the shallow groundwater table in the upper soil gets replenished relatively rapidly and the water infiltrates into the underlying strata. These showers are typically separated by periods of little to no rainfall spanning many years. Within this understanding of the geo-environmental setting, the above-mentioned metaphor can be paraphrased as follows (Ross 2007):

I will pour out my Spirit as suddenly and overwhelmingly as a rainstorm in the desert. After such a storm, the willow does not fade like grass, but is kept green

for many years by the groundwater that recharges in the storm. Your offspring will be like the willows and not like the grass; they will draw spiritual substance from the sudden outpouring for years afterwards and remain faithful to Me. (n.p.)

The natural environment of the sporadic rainstorm in the desert versus a perennial stream, as understood by many biblical scholars today, because of their contrasting natural environments tell the story of a totally different aspect of the character of the Spirit of God.

It is now interesting to compare different understandings of Jesus' promise recorded in John 14:16, that he will send us 'another helper' to always be with us. The Greek language used the word *parakletos* (meaning 'intercessor', 'advocate' and 'comforter'), which refers to continuous assistance, similar to standing next to a continuously flowing stream. However, the Aramaic word for the same principle is *paragleta*, which means to 'end the curse' (Bible 2020; Smith 2009), which brings to mind an image of a once-off, sudden outpouring that ends an era of drought and famine. This relates more to the geo-environmental reality that Isaiah was used to when he coined this divine metaphor.

■ Understanding the future: Geo-environmental restoration

In general, the modern-day Christian apocalyptic viewpoint anticipates the earth's demise following intensifying human derogation. This is in contrast with the prophetic rhetorical tradition that articulates divine salvation and healing in terms of renewal, rather than destruction, of the earth (Myers 2014). In this, Isaiah again took the lead when prophesying the following (Is 35):

[...] For waters break forth in the wilderness, and streams in the desert; the burning sand shall become a pool, and the thirsty ground springs of water; in the haunt of jackals, where they lie down, the grass shall become reeds and rushes. (vv. 6, 7)

Joel prophesied that 'all the streambeds of Judah shall flow with water; and a fountain shall come forth from the house of the Lord and water the Valley of Shittim' (Jl 3:18). Zechariah (Zch 14) stated that:

[L]iving waters shall flow out from Jerusalem, half of them to the eastern sea and half of them to the western sea. It shall continue in summer as in winter. (v. 8)

Ezekiel provided the most comprehensive description of this 'water-rich' restoration, describing water flowing from the temple in Jerusalem, a rising tide, a greened Palestine desert, life-giving rivers and ecological restoration (Ezk 40-48). This correlates well with 'springs of living water' (Rv 7:16, 17) and water as a gift to all who thirst (Rv 21:6; 22:17). The prophetic value of the metaphor of environmental restoration and a 'new earth' finds a climax with the statement that the water of life springs up 'from the throne of God

and of the Lamb' (Rv 22:1). This water will eventually provide a habitat for the Tree of Life and its fruit (Rv 22:2), with leaves that are for the healing of the nations and the kings of the earth (Rv 21:24). All of these prophetic visions articulate a social and environmental restoration of immense proportions (Myers 2014).

The history of humanity starts with rivers and trees (Gn 1-2) and ends with rivers and trees (Rv 21-22). Our geo-environmental narratives are metaphors from beginning to end. This understanding of a new heaven and a new earth - renewed, not destroyed - Heaven and Earth in a restored ONENESS, a place where God dwells with us (Bouma-Prediger 2012), excites me on a personal level.

This reality challenges us to refresh our mindset, moving from a religious visitation culture where we entertain a distant God with our actions to a habitation culture where we become the growing habitation of God.

■ The geo-environmental metaphor in God's narrative

The geo-environment is functioning and changing according to a set rhythm governed by natural laws that God, as the creator of the universe, had put into place. During this study, it became evident that although we generally perceive God's intervention as a 'supernatural' interference with natural processes, it is more a case of a 'supernatural' communication to allow humanity to position itself to be at the right place at the right time, to be favoured by the natural course of creation. Through the divinely-given ability of humanity to 'hear' God's voice, we become his narrative with the ability to advance his kingdom on Earth, repeatedly throughout the history of humanity. This makes us co-workers in the restoration of the fallen planet Earth and includes us in his plan to create his habitation in the 'new earth' to come. It is also obvious that humanity's (or individuals') inability or unavailability to hear his voice reduces our involvement in this divine plan. Then, we become only part of the natural rhythm on Earth in a 'normal' life pattern and not partakers in the narrative of the coming of the Kingdom of God on Earth.

The importance of this 'supernatural' communication is aligned with the principle that faith is the cornerstone of righteousness (Rm 1:17) and results from hearing the Word of Christ (Rm 10:17). The natural rhythm of God's creation is taking place every day. The choice to be a part of God's Story can be unlocked by hearing.

More than 2,600 years ago, Nebuchadnezzar had a dream of the future Earth. In this dream, he saw a stone that destroyed a great image, subsequently shown (as revealed to Daniel by the Lord) to represent all

kingdoms of the earth over all of history. While explaining the dream, Daniel declared that ‘in the days of those kings’ (surely the timeframe in which we live), the God of Heaven will set up a kingdom that brings an end to the earthly authorities, a rock that will grow to become a great mountain that will fill the whole Earth (Dn 2).

Looking at this explanation of the growing rock, in the light of the geo-environmental reality of the sheared and fractured rock at the mouth of the ‘gate of hell’ as described earlier, we surely have to rethink some of our religious models. We must allow the clear geo-environmental metaphors to talk to us from scripture with an excited expectation of the growing reality of God’s Kingdom on Earth.

This interface between science, the natural environment and the spiritual reality, which focuses on the expression of the Kingdom of God, has become a driving force for me on a personal level. This motivated our team and me on a corporate level within our organisation, ‘Touching Africa’,⁵³ to make a difference. It is our desire to act as stewards in the household of God (Tt 1:7) through all our projects to address water shortages and establish various developments while making a difference to society on a very practical level.

■ Conclusion

In this chapter, it was demonstrated that the Bible mainly contains a religious and spiritual perspective reflecting on the relationship between God and humanity rather than a scientific-mechanistic description of creation and sustenance. Regarding metaphors related to nature conveyed in scripture, it was shown that it is imperative to take careful cognisance of the way in which such metaphors were experienced and understood in biblical times. Abstract ideas and spiritual reality are often alluded to in the Bible by referring to tangible physical objects. The prophetic nature of scripture should be considered to guide the reader in understanding the symbolism of such references to natural attributes of the environment. A brief investigation of the role that groundwater and related geo-environmental settings played in specific events during the unfolding of biblical history has elevated the understanding of hidden truths conveyed through these biblical narratives.

53. See www.touching-africa.com

The uniqueness of water

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■ Introduction

One of the great questions of all times, including our own, is about the possibility of knowing with certainty any work of God. It is commonplace to hear and read nowadays that there is no God, that not only does God not exist, but that science has proven that the whole concept of the existence of such a being has become moot. Nature, indeed the whole cosmos, explains itself quite adequately and sufficiently in and of itself through the natural sciences, particularly cosmology, geology and biology. The creator of all is evolution and the means is chance. Everything we observe around us supposedly confirms this, not only through our senses but also by means of the increasingly accurate measuring equipment in our laboratories and observatories, as well as the impeccable logic of our theories. To doubt this is to be a naïve primitive clinging desperately and unreasonably to the last vestiges of superstition and witchcraft within an intellectually mature humanity. The enlightened modern human can and must transcend to a new spirituality based on scientific knowledge of nature. Jurie van den Heever (2017, p. 123) quotes from Carl Sagan's television series *Cosmos: A Personal Voyage* that 'real spirituality doesn't have to include a supernatural entity; meaning and a deep satisfaction can be achieved by the pursuit of knowledge, especially scientific knowledge'. In the same book, he writes: 'Dogma therefore ought to make way for

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a worldly spirituality (nature spirituality, ecomorality)' (p. 136). The science correspondent George Claassen (2021a; my translation from the original Afrikaans) writes in a letter to the *Beeld* daily newspaper, on 28 January 2021:

 Gaum's letter demonstrates precisely the clinging to old (modes of) thought and the convulsive refusal to take note of scientific discoveries that refute the irrational fairy tales so characteristic of all faiths. (n.p.)

In an article in the weekly newspaper, *Rapport*, on 24 January 2021, Claassen (2021b; my translation from the original Afrikaans) asks: 'What makes people [...] so afraid to be freed from the chains of ignorance and the darkness of religion?'

 But is it indeed the case? Has science indeed made the 'God delusion', as Richard Dawkins (2006) calls it, redundant and ridiculous?

 I, for one, am a scientist that begs to differ. It is my contention that not only does science not contradict scripture, it actually augments it. It does so because it reveals even more gloriously the wonder of God's creation in everything in the cosmos than we can ever possibly know merely through the observations provided by our senses and the deductions possible from our logic.

 Ironically enough, Richard Dawkins, in the last pages of his book *The Greatest Show on Earth* (2010, 425), writes that 'the fact of our own existence is almost too surprising to bear'. He then continues a few lines further: 'How is it that we find ourselves not merely existing but surrounded by such complexity, such elegance, such endless forms most beautiful and most wonderful?'

 John Calvin (1975), in his commentary on Genesis, answered Dawkins' question half a millennium before from Psalm 19:1:

 We know God, who is himself invisible, only through his works. [...] And that declaration of David is most true, that the heavens, though without a tongue, are yet eloquent heralds of the glory of God, and that this most beautiful order of nature silently proclaims his admirable wisdom. (p. 59)

In the same commentary, Calvin (1975, p. 86) also writes: 'For astronomy is not only pleasant, but is very useful to be known; it cannot be denied that this art unfolds the admirable wisdom of God'.

 The mutual illumination of science and scripture is expressed beautifully in Article 2 of the Belgic Confession, which declares that we know God by two means: Firstly, by the creation, preservation and government of the universe, since that universe is before our eyes like a beautiful book in which all creatures, great and small, are as letters to make us ponder the invisible things of God: God's eternal power and divinity, as the apostle Paul says in Romans 1:20. All these things are enough to convict humans and to leave them without excuse. Secondly, God makes himself known to

us more clearly by his holy and divine Word, as much as we need in this life, for God's glory and for our salvation.

Note what a beautiful analogy the Belgic Confession uses to describe creation: it is a beautiful book and its creatures are letters. Not a vague vision with nebulous images, but a consistent work with clear, exact letters telling a wonderful story.

Calvin, Sagan and Dawkins wrote of revelation on the scale of the cosmic book. In this chapter, we shall confine ourselves to just one of its many words: 'water'. Water figures in so many passages in scripture in terms of miracles, symbols and sustenance that it can be stated that it is indeed a significant concept therein. Other authors in this book will focus on those aspects. In this chapter, the emphasis will be on water as one of the significant words or concepts in creation, thus demonstrating the reciprocal revelation in both books. Knowing the wonder of water in nature as revealed to us by science serves as an emphatic confirmation of its importance in scripture. Water plays important and similar roles in both.

■ The association of water with life

It needs to be understood that it is not only the fact that water is the universal nutrient that makes it essential for all living organisms. Every living cell requires it. There are a great many living organisms that can live without oxygen, but none can live without water. But there is so much more about it that makes it a very special substance. It is the essential nutrient for all living organisms. Where there is no water, one finds no life. Where water is scarce, life is scarce. Where water is abundant, so is life. In fact, many living organisms of all size scales deal with the need for water by simply making it the environment they live in. This applies from the smallest microbes to the largest single organisms: the whales in the oceans. Because water is their habitat, their whole being is determined by it: their shapes, their locomotion and their food sources. The unique properties of water make this possible, which is why it is one of the most important substances in nature and an absolutely essential and irreplaceable requirement for life. In fact, water is so intimately associated with life that, together with carbon, it is considered to be the quintessential requirement and, therefore, also the prime indicator for life's existence. That is why spacecraft visiting other bodies in space are equipped with sensors to detect its presence. If water is present on the celestial body, then life is assumed to be possible there, be it in the past, present or future.

It is not only in scripture that water is associated with life in a variety of ways. Science clearly confirms that it is indeed the case.

■ What is water?

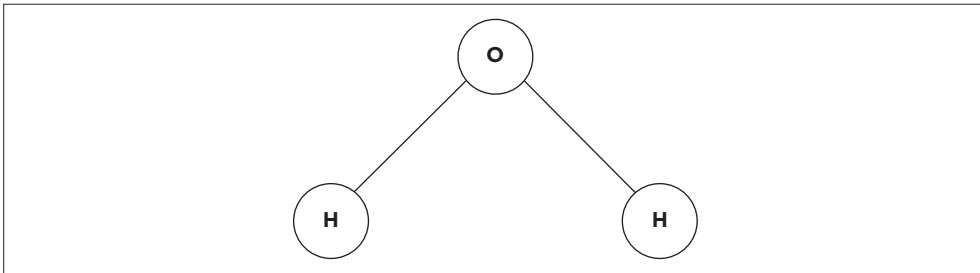
To understand this, we need to know a bit about what makes water unique as a substance in its three naturally occurring phases: liquid, solid and gaseous. About the physical nature of water: firstly, it can be stated that it is quite deceptive, being both very simple and very complex as a substance. As a physical molecule, it is actually one of the simplest, consisting of only two atoms of hydrogen (H) and one atom of oxygen (O). The simplicity of its composition belies the amazing specialness of its physical properties. This is reflected by the great trouble it gives scientists to give it a formal scientific, chemical name. Believe it or not, but during a Google search for scientific names for water, I found ten names listed. This multitude of formal names reflects the variety of complex chemical reactions this very simple molecule can take part in. Before you laugh at this, please understand that chemists need to be completely unambiguous when naming substances. The term 'water' is reserved for the familiar liquid we all know and drink. Other forms are ice, steam, vapour and all the different types of precipitation. Apart from its physical state, it also takes part in a diversity of chemical reactions. Formal scientific names are normally given to reflect the typical chemical behaviour; therefore, it is no wonder that chemists cannot agree on which one is the most important to use as a basis. The supreme organisation of chemists, the International Union of Pure and Applied Chemistry (IUPAC), which sets the rules for naming every known chemical scientifically, decided to call it oxidane. I myself had never known this name until I searched for the official scientific name for water, and I have been a specialist in water science and technology for almost 40 years. My point is: For such a very simple substance, it certainly behaves itself in a complicated enough manner to befuddle some very clever brains.

Official names and professional arguments aside, it is necessary to distinguish between water as the pure substance H_2O and water as it is found in the world around us. Water as we know and experience it is actually a complex physical, chemical and biological system. The pure substance is actually quite hard to get a hold of and can only be obtained through highly developed techniques. Natural water is filled with a multitude of dissolved substances, undissolved suspended particles and miniature droplets of substances not soluble in water, like oils. Normally, it also contains all sorts of living organisms. When we talk of purified water, it actually means treated until pure enough for specific purposes, not really pure. Even the ubiquitous bottles of pure water we buy usually have on their labels a little table with concentrations of some of the more significant substances still remaining dissolved in it after purification. At the time of writing this section, there is a bottle of commercial water in front of me simply labelled 'pure still', with its table listing the upper limits of the concentrations of twelve substances as well as the total dissolved solids in it. So 'pure' is a very relative concept when we talk about water.

■ Dissociation

In fact, even if we were able to remove all other substances from water, it is still a physical impossibility to have pure liquid water. That is because some of the molecules in it are always breaking up and recombining through a process called dissociation. Some of the products of these dissociations react with one another to form reagents that play very important roles in the natural functions of water. In very pure water, at 25°C, one out of every 10,000,000 water molecules is dissociated into an H^+ and an OH^- part. The H^+ is chemically extremely reactive, so it either immediately recombines with the OH^- or reacts with another water molecule to form the hydronium ion, H_3O^+ . The OH^- is known as the hydroxyl ion. The hydronium ion is an extremely strong acid and oxidant. The hydroxyl ion is an equally strong alkali. This makes both ions very corrosive and able to dissolve a great many materials, including all metals and salts, most minerals and even many types of organic substances like sugars and alcohols. The most important exception to this are oily and fatty substances, but even these tend to break up into tiny droplets when vigorously stirred, with the droplets then also carried in the water. Because of the corrosivity of the mentioned ions, they are also very hazardous. So pure water actually self-dissociates and reacts to form two very hazardous substances! The hydronium ion is also a very strong oxidant. The reason why it is not immediately fatal when ingested is because the relative concentration of the dissociated water molecules is so small. The next time someone gives you a sermon about eating some food containing cancer-causing oxidants, you can checkmate the person in a tongue-in-cheek manner by stating that so does water.

This is not to leave the reader in anguish for being compelled to consume a toxic substance to survive; it is to point out the amazing fact that, in theory, water is supposed to be hazardous, containing as it does some very strongly acidic, alkaline, oxidising and reducing substances. Yet, it is not. That in itself is a little short of miraculous. It can all be explained away by means of technical arguments about chemical equilibria and energy states, but the fact remains that, in theory, we should be avoiding using it in excess the same as we do for alcohol. Water really does have these substances in it, and they are vital because they take part not only in the multitude of complex biochemical reactions that occur in all living cells but also at the start of the food chain in the essential processes of dissolving the essential minerals (like calcium, potassium and phosphorus) from rocks and soils, as well as carbon dioxide and nitrogen compounds from the atmosphere to be incorporated into the polysaccharides and amino acids that form all living organisms and the enzymes that enable and control the biochemical processes within them, up to the DNA (deoxyribonucleic acid) and RNA (Ribonucleic acid) that control genetics and the construction of proteins.



Source: Image designed by Miriam Lemmer, published with permission from Miriam Lemmer.

FIGURE 8.1: Diagrammatic representation of the water molecule.

■ Water's structure and bonding

But let us return to the simple water molecule itself, in order to understand something of its very special nature. The most basic single unit of water is the water molecule, and as stated before, it consists of two hydrogen atoms combined with a single oxygen atom. This combination, or chemical bonding as it is known, is caused by the oxygen atom having a stronger attraction for electrons than hydrogen. In a sense, the oxygen tries to grab the hydrogen atoms' electrons and the hydrogens try to pull their electrons back. This causes the atoms to be bound to one another, with the oxygen becoming slightly negatively charged and the hydrogen slightly positive. Because of the quantum structure of the oxygen atom's electrons, it can form only two bonds, which is why water molecules are all H_2O . One would expect these molecules to have a simple straight-lined structure, with the oxygen atom between the two hydrogens. However, again because of the specific quantum structure of the oxygen atom's electrons, this is not the case, and the molecule is actually V-shaped, with the hydrogen atoms at the ends of the two legs of the 'V' and the oxygen at the hinge point. It is a very wide V (Figure 8.1), with the angle between the two legs at 105° (Barrow 1979, p. 557).

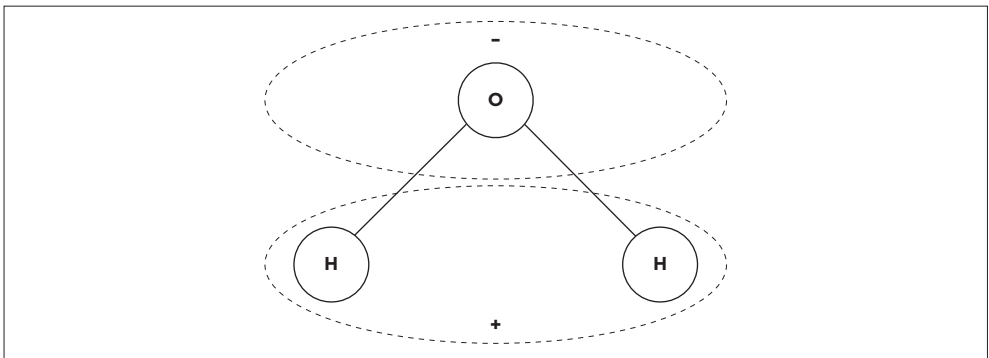
Now, surprising as it may seem, it is this very simple V-shaped structure that gives water so many of its rather exceptional characteristics. The sorts of things that are listed if one looks up the properties of water in reference sources. Let us first look at the reason for this and then at the consequences.

■ Hydrogen bonding

As mentioned, the nature of the chemical bond between the oxygen and hydrogen atoms is such that the oxygen atom becomes slightly negatively charged and the hydrogen atoms become slightly positively charged. Because of this, the whole V-shaped molecule becomes what is known as a bipolar molecule, with the slightly electrically negative side at the oxygen atom and the slightly electrically positive side around and between the two hydrogen atoms at the ends of the V's legs, as shown in Figure 8.2.

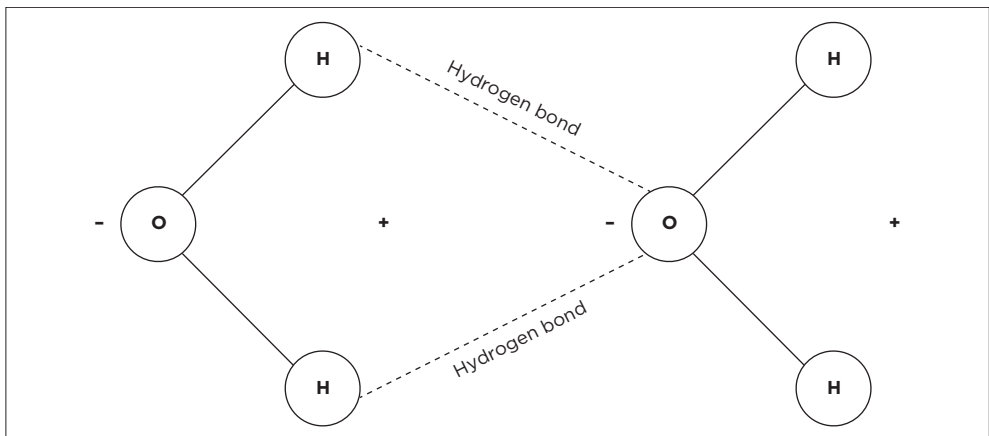
This leads to a very strange result: the water that we all think of as the archetypical liquid is, strictly scientifically speaking, not really a typical liquid. That is because its molecules are not completely free to move randomly, which is how the liquid phase is defined in physics. Because of the polarity of the molecules of water, they interact with one another in a way that restrains their freedom. Their slightly electric poles attract one another, causing them to become electrically associated and lined up, forming chains and clusters of molecules. This is an example of the phenomenon known as hydrogen bonding (see Figure 8.3).

Hydrogen bonding also causes liquid water molecules to be, on average, somewhat closer together than is the case for other liquids. In fact, they come closer together than they do in ice. This is a unique characteristic of water. In liquids, the molecules slide around and over one another. As the liquid cools down, the molecules move less and less until they lose so much energy that instead of moving around randomly, they start packing



Source: Image designed by Miriam Lemmer, published with permission from Miriam Lemmer.

FIGURE 8.2: Representation of the bipolar nature of the water molecule.

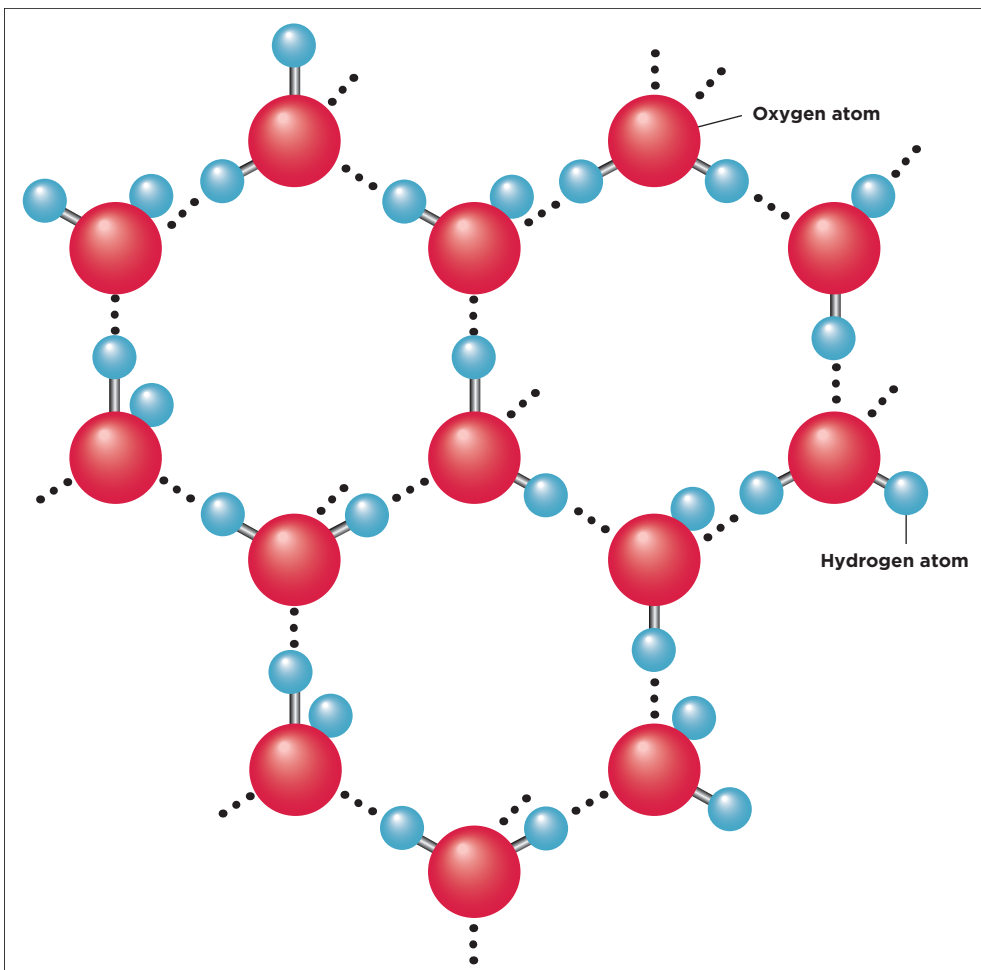


Source: Image designed by Miriam Lemmer, published with permission from Miriam Lemmer.

FIGURE 8.3: Hydrogen bonding between water molecules.

themselves into an organised structure like LEGO® blocks, forming a solid. But water molecules only do this until they cool down to about six degrees Celsius. When they also start organising themselves into solid ice, the orderly solid actually forces the molecules to pack themselves into a structure that has holes in it, like LEGO® blocks that are stuck together only on their ends. Because of this, the ice is less dense than the liquid water and floats on it. As all liquids become warmer, their molecules move further apart, and thus the liquid becomes less dense. Even so, the density of ice is sufficiently less that it will float even on boiling water. Figure 8.4 illustrates the structure of ice crystals with the spaces between the water molecules.

Hydrogen bonding also occurs in other molecules; for instance, it plays an absolutely essential role in the molecules of life, like DNA and proteins.



Source: Ebbing and Gammon (2009, p. 463), republished with appropriate permissions.

FIGURE 8.4: Structure of ice crystals showing its open structure.

That is an amazing scientific tale in itself and will not be addressed here, except to mention that all the hydrogen in these molecules originates from water too. But what is unique about the simple water molecule is that it has two hydrogen atoms bound to the oxygen atom in each molecule. This very greatly amplifies the strength of the hydrogen bonds it forms and gives it very special properties that make it so essential to all life.

■ Thermal properties of water

Not only is ice less dense than water, but it is also a much poorer conductor of heat. This makes it a very good isolator. The combination of the lower density and the good thermal isolation of ice is absolutely essential for the preservation of life. If ice did not have these combined properties, then in winter, most water on Earth would freeze. However, it would not all melt again in summer. Apart from the fact that the sun's heat would conduct too slowly through the ice, it is also a good reflector of sunlight. This reduces the amount of sunlight that is absorbed and that can melt the ice. There would be a runaway ice age because once frozen, the ice would not only tend to remain so but to increase more and more every winter. This will freeze out all life, not only in the water but also on land. However, because of the lower density and heat conduction of ice than water, it forms an insulating layer on top of the water as soon as it begins to freeze, maintaining liquid water below it. When the weather heats up again, only the insulating layer on top has to melt to have the rivers, lakes and soil beneath it ready for the new cycles of spring.

Heat energy from the environment causes atoms and molecules to move. In solids, they literally jitter in their fixed places. In gases, they fly around randomly at very high speeds, colliding with one another all the time (these collisions are what create gas pressure). In liquids, they do a bit of both, depending on the temperature. In water, however, the electrostatic interaction, because of the polarity of the molecules, significantly affects the thermal movement. It takes more heat energy than would normally be the case for molecules the size and weight of water's to cause the same degree of movement. The amount of heat energy stored in the thermal movement is related to a property of matter called the specific heat capacity. The greater the heat capacity of a substance, the more heat energy it requires to heat up – that is, for its molecules to move more rapidly – and the greater the amount of heat energy it gives off as it cools down – that is, move less rapidly. Because of its polarity and hydrogen bonding, water has a much higher heat capacity than would be the case if it was not polar. It takes 4.184 Joules of heat energy to raise the temperature of one litre of water by one degree Celsius. The comparable value for copper is 0.385 Joules, and for lead, it is only 129 Joules (Walker 2020, p. 454).

TABLE 8.1: Specific latent heat of some substances.

Substance	Specific latent heat of fusion (kJ/kg)	Specific latent heat of vaporisation (kJ/kg)
Water	333	2,256
Oxygen	13.9	213
Lead	23.2	858
Copper	207	4,750

Source: Adapted from Walker (2020, p. 454).

This means that water acts very effectively as a heat reservoir and moderates changes in environmental temperature.

The hydrogen bonding not only affects the specific heat capacity of liquid water but also affects what is known as the latent heat of the freezing and evaporation of water. For any solid substance to melt and become a liquid takes significantly more heat than what it takes for the liquid to heat up once it has become molten. While it melts, its temperature does not change. The atoms or molecules simply absorb heat energy by jittering faster and faster in place until they jitter so fast that they actually scatter themselves away. The heat absorbed in this process is called the latent heat of melting. The same amount of heat is released when the liquid freezes again and is then called the latent heat of freezing. For solid, frozen water (what we call ice) to melt, it takes much more latent heat than is the norm for similar molecules. The same applies to the evaporation of water when it boils. Table 8.1 shows the values for the fusion (freezing) and evaporation of water, oxygen, lead and copper.

Note that oxygen molecules, which also have two chemical bonds but no hydrogen bonds, have only one-twenty-fourth of the latent heat of fusion and less than one-tenth the latent heat of the vaporisation of water. Even lead metal has significantly lower values.

■ Surface tension

One of the fond memories of my childhood is floating on our farm dam's water on hot summer days and watching insects called water striders running around on the water. In reality, it is not such a rare occurrence – millions of mosquitos all over the world do it every day (Figure 8.5).

The limitation of the size of the creature that can do it is only because of the actual value of a physical constant, not the walking taking place on a liquid. This is because of another amazing property of water caused by hydrogen bonding: its surface tension. It causes water surfaces to act like films or membranes, which is why soap bubbles behave like balloons and falling water forms round droplets. Surface tension makes possible the miracle of standing, walking and running on water.



Source: 'Water Strider1 Isar River Garching', originally photographed by Fatemeh Deyhim in 2019, obtained from Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Water_Strider1_Isar_River_Garching.jpg), released by the creator and reproduced by the publisher under the applicable Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) License <https://creativecommons.org/licenses/by-sa/4.0/deed.en>.

FIGURE 8.5: Water strider standing on water.

Water has the second highest surface tension of all liquids at room temperature, namely, 72 mN/m. The only liquid that has a higher value is mercury at 487 mN/m, but mercury is an exceptional case, being a metal that has such a low melting point that it is a liquid at room temperature. Typical values for organic liquids like ethanol vary between 20 mN/m and 22 mN/m, less than a third of water's. Blood is a rather thick liquid in our perception, and it has a surface tension of 55.9 mN/m, but that is because it mostly consists of water.

As a rule, I disagree with efforts to explain miraculous events as related in scripture by trying to find some exotic explanation. In the particular case of Jesus and Peter walking on water, as told in Matthew 14:25–32, I think it is justified to point out that all that may be required is a momentarily significant increase in surface tension beneath the feet and water. This does not make it any less of a miracle, because a very specific physical value must still be changed. Nevertheless, it does demonstrate that there can be a very simple physical explanation in this particular case. The gospels make it clear that Christ is not constrained by physical matter, space and time and has commanding power over the elements, as demonstrated by his command to the wind and water in the storm (Mt 8:26). He could thus have moved himself without having a solid surface underfoot. Peter, however, was an ordinary mortal human being, and therefore he was physically limited to the ordinary laws of nature. This indicates that the nature of his walking on the water to Jesus was likely the result of such momentary changes.

■ The molecular mass and density of water vapour

The air surrounding us that we breathe all the time consists of more than 99% of oxygen and nitrogen molecules, the rest being primarily water vapour and carbon dioxide, with small but variable traces of a large number of other gases like hydrogen, methane, neon, sulphur oxides, nitrogen oxides and ozone. For many practical purposes, the characteristics of the atmosphere are determined by the oxygen, nitrogen, water vapour and carbon dioxide. Now oxygen and nitrogen both consist of diatomic molecules, that is, two oxygen atoms bonded to form an oxygen molecule and two nitrogen atoms bonded to form a nitrogen molecule. Water consists of three atoms, but because hydrogen is the lightest atom, a water molecule is considerably lighter than that of oxygen or nitrogen. In fact, a water molecule weighs only slightly more than 71% of a nitrogen molecule and slightly less than 63% of oxygen. One would tend to think that when water evaporates, the water vapour molecules are simply added to the rest of the air molecules above the water surface, thus increasing the concentration and therefore also the weight of the air. But one of the laws of nature is that a specific volume of any mixture of gases (let us take one litre for example) will always contain exactly the same number of gas molecules inside it. Because of this, if water molecules are added to the one-litre volume, an equal number of oxygen and nitrogen molecules have to leave it, and the weight and density of the litre of air actually decrease in proportion to the change. The moist air then rises. This is a primary driver of the whole earth's weather systems.

■ Consequences of the unique properties of water for the environment and life

In the beginning of this chapter, it was mentioned that for a multitude of living organisms, water is not only a food but also their living environment or habitat. Apart from being an environment in and of itself in the form of pools, rivers, lakes and oceans, water also creates, modifies and controls other environments, all because of its unique characteristics. These aspects will be addressed more extensively by other authors in the other chapters of this book. I just want to briefly draw through some lines in order to demonstrate the consequences.

■ Landscaping and nutrient release

A major effect of water is that it is constantly eroding solid rock into soil and salts. In doing so, it continually renews the world around us in shape and nutrients, making fresh minerals available to living organisms.

We tend to think of the work of water on landscapes as disastrous, like during floods and cyclones, but without the periodic dynamic action of water on the landscape, it would be much less able to sustain life in all its forms. Flooding water does cause erosion, which is detrimental to agriculture. But it also exposes new surfaces and leaches minerals from them, especially scarce ones like phosphates. This augments the depleting supply. Furthermore, as explained previously, ice is less dense and more voluminous than water. Water that seeps into cracks and crevices in rocks and then freezes inside also exposes fresh surfaces. Because of the production of hydronium and hydroxide by the dissociation of water molecules, the water also dissolves essential minerals by its acidic and oxidising action.

■ Processes that cause and maintain climate and weather

The continual cycles of nature are so closely connected to the hydrological cycle of the evaporation of water from the oceans to fall as rain and snow on land that we think of it as being the same thing. But the changing weather during the seasons does more than just provide a rhythm to nature. The thermal properties of water are essential to moderating the global climate. Because of the high specific heat capacity of water, the moisture in the atmosphere is a significant reservoir and transporter of heat energy. Moist winds redistribute not only the moisture itself but also heat from the tropical oceans to the continents and polar areas. Without this redistribution of solar energy all over the globe, we would have had much more extreme temperature variations over the surface of the earth, rendering significant areas of land uninhabitable.

When it gets very hot, water moderates the temperature by absorbing heat; when it gets cold, it releases heat. This effect is much greater than for other substances like air, rock and soil because water has a much greater heat capacity than the molecules of comparable substances. Even more than that, because of its high latent heat of freezing and boiling, it is also able to release an even greater amount of heat when it freezes than when it merely cools down. In a similar way, it also absorbs a much greater amount of heat when it evaporates than when it just heats up. Because of this, it is able to stabilise environmental temperatures within a relatively narrow range of temperatures between freezing at 0 °C and boiling at 100 °C under normal atmospheric pressure. That is why farmers spray water over their crops on very cold mornings to save them from frost. The water spray not only releases enough heat to prevent the plants from freezing, but when it freezes on the plant surfaces it also creates an insulating blanket that protects the plant underneath.

We are all familiar with the headache-causing oven-like heat of summer and the freezing cold of winter in arid areas like the Karoo. Because the air is so dry it has a lower heat capacity than moist air. That is why it heats up and cools down much more and more rapidly than wetter areas.

■ Providing habitats for living organisms

Because of its high latent heat, water provides a hospitable environment in areas that are otherwise too desolate and extreme for the majority of living organisms except those very specially adapted to it, thus enabling greater biodiversity and wider ranges. A typical example is the poles, especially Antarctica. Because it is covered with ice, very cold, very dry (almost all of its water being frozen) and has long, dark winters, almost no plant life exists there. The little plant life found there is very slow growing, like lichens. So, it cannot sustain animal life either. Yet, penguins and seals abound on its fringes because they use the sea as their source of food. The sea around it is as teeming with life while the land is barren. The water is cold, but this actually causes more oxygen to dissolve in it, making much more available for all the creatures living in it, like krill.

Another example is the Red Sea. It lies between the Sahara and Arabian deserts, yet it is famous for the wonderful coral reefs with colourful tropical fish inhabiting it.

■ Plankton and algae

Water forms the habitat for some of the most abundant and essential living organisms on Earth: phytoplankton and algae. Both types photosynthesise, transforming carbon dioxide into oxygen and organic food for other organisms. Not only do they form a very important lower link on the food chain of living things, but their photosynthesis also plays the biggest role in maintaining the proper concentrations of oxygen and carbon dioxide in the atmosphere to sustain life. Algae are also very important purifiers of contaminated and polluted water. Water can be their habitat because its chemical and physical characteristics once again make it perfectly suitable for them to live in. Also, it is able to provide them with all the nutrients they need because it can dissolve, carry and distribute them all over water bodies like lakes and oceans.

■ Conclusion

This chapter started out by claiming that looking scientifically at water will serve as a confirmation of the work of God as described in scripture.

Even when reading the normally laconic scientific literature, words like ‘amazing’, ‘unique’, ‘miraculous’, ‘significant’ and ‘exceptional’ keep cropping up as they did in this piece. I sincerely hope and believe that it convinces the reader that these terms are indeed apt to describe it from both the general and the scientific perspectives. The natural sciences confirm over and over that there is hardly any other such a fitting symbol of providence in nature. As stated, it is principally a very simple molecule, but practically it plays exceedingly complex roles because of its structure, leading to unique and marvellous properties and characteristics that make it quite indispensable in a variety of ways for the existence and maintenance of all forms of life. It not only nurtures life, it actually makes it possible. It is the essential prerequisite for physical biological life in all its diversity and richness.

Much is made of the importance of scientific knowledge of nature as proof of intelligent design that declares the cosmos to be a created one. It is indeed a very strong argument. Atheists really have their work cut out for them if they deny it. Theoretical knowledge of the science of water is such an astoundingly elegant demonstration of providence that it can only be negated by an actual faith to the contrary rather than by any stretch of logic. It is an absolutely miraculous substance. It is really a small step to proclaim that the science itself is a witness of what Paul states in Romans 1:

For since the creation of the world God’s invisible qualities – his eternal power and divine nature – have been clearly seen, being understood from has been, so that men are without excuse. (v. 20)

How ironic and tragic, then, that authors like Richard Dawkins not only admit to the glories of creation but actually praise it, only to shirk at the last step of admitting its source.

Science does not contradict the gospel; science sings a new psalm to God’s glory in our time, skilfully and joyously as Psalm 33:3 tells us to do.

And yet the revelation of water goes even further and deeper when we consider how the scientific theories about it relate to the texts in scripture. When Christ tells us that he gives us life, that he cleanses and purifies us, that he nourishes and comforts us and that he is the living water, he is using a metaphor that we all know from life experience. But to really understand the full richness of the metaphor, the revelation of water as a word in the book of created nature provides us with an altogether deeper understanding of the complete essence of his being as the essential element in our total life – biological and spiritual.

We are polluted; he washes us clean (1 Cor 6:11). We thirst for justice (Matthew 5:6); he quenches our thirst everlasting (Jn 4:13). We toil in a

barren spiritual world; he leads us to the waters of rest - himself (Ps 23:2). For our sake, God not only created water with all its uniqueness, but in the Son he became the living water for us.

I wish to thank Miriam Lemmer who drew the diagrams used in Figure 8.1-Figure 8.3, depicting various aspects of the water molecule for me.

The transformed property regime of the *National Water Act 36 of 1998*: Reflections on the conception of stewardship and the dominion over water as a ‘God-given resource’

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■ Introduction⁵⁴

Water is an essential natural resource, but it is critically scarce. Because of climate change, droughts, other natural disasters and urbanisation, many

54. The theoretical basis of some property law concepts used in this chapter has been drawn from the author’s thesis, which was since further developed in a research article (see Viljoen 2016, 2021).

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regions around the world increasingly face water scarcity-related challenges. Whenever this life-sustaining resource is threatened, Christians are challenged to deepen their appreciation of water as a 'gift of God'. In fact, it is trite that water has a strong moral and ethical significance from a Christian perspective.⁵⁵ As this picture of potential complex relationships with water emerges, it is accepted that water, as a scarce and sacred gift, needs specific and special governance and protection. This is particularly true for countries in the southern African region, where the demand for water is often more than the resource's physical availability (Davis-Reddy & Vincent 2017, p. 82; Strang 2020, p. 1). South Africa, a naturally water-stressed country, faces a particularly gloomy water reality. Millions of South Africans, mostly the poor, lack access to water. In fact, this scarce natural resource remains unequally available because of the country's complex political history (Cooper 2017, pp. 60-61; Kidd 2009, pp. 87-88).

Under the previous political regime, the *Water Act 54 of 1956* (Water Act) imitated the apartheid policy that was previously applied in South Africa. The said Act differentiated between private and public water (ss. 1[xiii] and 1[xiv] of the Water Act). This distinction not only resulted in competing claims for private water resources but also effectively promoted segregation and differentiated the development of different ethnic races (Kidd 2009, pp. 87-88). The Water Act did not explicitly determine who the owner of water was, but it provided that exclusive use rights of private water could be exercised by a landowner on whose property the water had its source, or over which it flowed (s. 5[2] of the Water Act). It is trite that land ownership (which was linked to access to water) generally resided in the hands of the white minority. Consequently, low-income individuals, generally black South Africans, were denied access to sufficient water as they either could not afford it or did not have riparian land rights (Cooper 2017, pp. 57-58).

Following democratisation in 1994, and as part of the transformation project to '[h]eal the divisions of the past and to establish a society based on democratic values, social justice and fundamental human rights', the Constitution of the Republic of South Africa (the Constitution) (Republic of South Africa [RSA] 1996) was promulgated (see the preamble to the Constitution). Section 27(1)(b) of the Constitution enshrines the right to have access to sufficient water. In fact, Section 27 of the Constitution imposes specific duties or obligations on the state to provide every person with access to sufficient water. The nature of state obligations to realise the

55. The notion of water ethics from a Christian perspective is directed at responding to different challenges, including the conflict of interests in using scarce water resources or water pollution (Grunwald 2016, p. 11). Notably, water is also a centerpiece of Christian symbolism. It has the power to heal (2 Ki 5:1-14), purify, cleanse (Eph 5:26) and provide deliverance (Gn 6:17), for example.

Section 27(1)(b) water right is concretised by Sections 7(2) and 27(2) of the Constitution (Du Plessis 2010, p. 316, 326). The latter sections stipulate that ‘the state must take reasonable legislative measures to achieve the progressive realisation’ of the right to have access to sufficient water.

This constitutional mandate resulted in the development of the White Paper on a *National Water Policy for South Africa of 1997* (NWP) (RSA 1997), outlining the integrated policy positions for the country’s new water law. Notably, the NWP stated that ‘the national government will act as custodian of the nation’s water resources and its powers in this regard will be exercised as a public trust’ (RSA 1997, n.p.). This idea, of the reservation of resources subject to a public trust, may have relevance for understanding and developing the idea of establishing dominion over water as a ‘God-given resource’.

In taking the policy positions of the NWP forward, the *National Water Act 36 of 1998* (NWA) (RSA 1998, n.p.) was subsequently drafted and enacted. The primary aim of the NWA has been formulated ‘to provide for fundamental reform of the law relating to water resources’ (long title of the NWA). The preamble to the NWA further posits that water is ‘a scarce natural resource that belongs to all people’ and that the national government has ‘overall responsibility for and authority over the nation’s water resources’. To facilitate these notions, the legislature formally introduced the concept of public trusteeship into the country’s water law. Section 3 of the NWA (RSA 1998) reads:

3(1) As the public trustee of the nation’s water resources the National Government, acting through the Minister, must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable manner, for the benefit of all persons and in accordance with its constitutional mandate.

(2) Without limiting subsection (1), the Minister is ultimately responsible to ensure that water is allocated equitably and used beneficially in the public interest, while promoting environmental values.

(3) The National Government, acting through the Minister, has the power to regulate the use, flow and control of all water in the Republic. (n.p.)

Although the concept of public trusteeship entered the South African realm without much fanfare, it fundamentally changed the foundation of the South African water law dispensation (Backeberg 2005, pp. 107–108). The accompanying legal framework provides for a licensing or permitting system whereby the public trustee, or national government, publicly allocates and regulates South Africa’s water resources in the ‘public interest’ (Viljoen 2017, p. 178). Accordingly, this new system that provides for water allowances granted at the discretion of the national government replaced the old system that provided for exclusive rights to water use (Viljoen 2017, p. 178). This means, among other things, that riparian or privately allocated water allocations no longer carry any permanent property rights. We are

therefore witnesses to a transformation; where property rights were redefined, often to the disadvantage of landowners who previously enjoyed access to water as an 'extension' of land ownership (Viljoen 2017, p. 196).

Diverse and difficult property-related questions arise when Section 3 of the NWA is considered. Controversial questions typically relate to a 'struggle' between public interests and private property rights; compensable expropriation (Du Plessis 2011, p. 512); whether the concept of public trusteeship perhaps dissolved preconceptions about private property rights; or if it violated the nature of ownership. One may even ask who, then, has dominion over the country's water resources? These questions and related uncertainties originate because South Africans are accustomed to a legal system that primarily acknowledges private property rights, and as a result, we want to know what ours is and how we can protect our property from harm caused by any other party, including government (Jacobs 2004, p. 1; Merrill & Smith 2001, p. 357). Although South African courts have briefly referred to 'the State fulfilling its role as custodian holding the environment in public trust for the people' (*Hichange Investments [Pty] Ltd v Cape Produce Co [Pty] Ltd t/a Pelts Products 2004 2 SA 393 [E] 418*), there has been no attempt in reported case law to provide a thorough exposition of the meaning or impact of the concept of public trusteeship in the water law context.

In her attempt to define public trusteeship, Van der Schyff (2013, pp. 370-371) immediately draws to the notion of stewardship for interpretative guidance. She posits that public trusteeship is often seen as a specific manifestation of stewardship or that the principle of stewardship underlies public trusteeship (Van der Schyff 2013, p. 371). The concept of stewardship, which is often used to describe goals, principles and actions that aim to achieve sustainability, however, finds broad expression in many different subject matters (such as ethics, philosophy or finances) and disciplines (such as environmental law or religious studies). Subsequently, wide-ranging notions of stewardship continue to develop in different subject matters and disciplines. While this chapter is not set to offer neat conclusions with regard to the concept of stewardship, it reflects on some of its manifestations and uses them to unravel and expand the concept of public trusteeship in the context of South Africa's water law.

It is against this background that this chapter sets out to achieve three objectives: (1) To deliberate on the proprietary implications of the concept of public trusteeship in South Africa's water law; (2) to critically reflect whether notions of stewardship may expand or even add an extra dimension as to how the concept of public trusteeship may be conceived in the South African water law; and (3) to establish whether there is a possible association, relationship or parallel existence between public trusteeship and the exercise of stewardship or dominion over water as a God-given resource.

The discussion is structured as follows: the first part examines dominant streams of literature dealing with property arrangements in water. To understand the interplay between public interests and private rights, the discussion begins with the concept of private property and continues to describe ‘common property’ and ‘public property’ as two favourable property paradigms against which the statutorily introduced, public trusteeship-based property regime in water resources can be measured. Insights gained are expected to put forward a suitable property paradigm for the public trusteeship-based governance model and draw from it an understanding of the proprietary implications of the concept of public trusteeship. The second part explores, in general terms, different concepts of stewardship as well as foreign law and sets out to establish an extra dimension as to how the concept of public trusteeship should be conceived in South Africa’s water law context. The discussion goes beyond the legalistic or technical understandings of stewardship espoused by custodial, managerial and proprietorial relationships, as first identified by Barrit (2014, pp. 1–23), to a Christian ethical conception, to illustrate its normative potential for the concept of public trusteeship. Naturally flowing from the latter, the chapter concludes with reflections on the possible association between the public trust model and the exercise of Christian ethical stewardship or dominion over water as a God-given resource.

■ Property arrangements in water⁵⁶

Generally, the function of the law of property has always been to provide a set of rules that governs the control of, and access to, a variety of objects, things or resources (Waldron 1985, p. 35). In the context of natural resources governance, the law of property consequently has an important role to play. The notions of private property, public property and common property each provide a set of different or alternative rules for the allocation of use and access rights to water as a natural resource (Ostrom & Hess 2008, p. 1, 4). It is expected that these established property rights regimes may provide insight into the new public trusteeship-based property rights regime of the NWA.

■ Private property

Private property regimes are most familiar in property scholarship, mainly because people want to know what is theirs, how they may use it and how they can protect it (Jacobs 2004, p. 1; Merrill & Smith 2001, p. 357). Ownership is a pivotal property right in a private property regime.

56. Sections of the chapter are based on an amalgamation of two sources (Viljoen 2016, 2020).

Ownership refers to the most 'complete', 'strong' or 'absolute' right that a legal subject can have regarding the property or a resource (Kaser 1968, p. 195; Van der Walt 2011, p. 109). While 'ownership' offers only one conceivable way of allocating property rights in a private property regime, ownership provides to its holder the exclusive authority to determine how the resource in question is used (Waldron 1988, p. 327). Notably, however, individual ownership is not necessarily so 'absolute' as one may expect (Van der Walt 2002, p. 254). In fact, various duties and limitations are imposed upon the rights or entitlements of an owner in a private property regime (Lucy & Mitchell 1996, p. 568). States or governments often limit the use of these ownership rights by statutory measures such as statutes, regulations and other land-use management measures. For example, whereas a private individual owner of a residential property is allowed to use his property as he sees fit, the state may limit the usage rights through, *inter alia*, strict land-use zoning requirements, rates and taxes. In addition, exclusionary ownership rights may also be limited by limited real rights (the rights of others) (Badenhorst, Pienaar & Mostert 2006, p. 321) and in terms of creditors' rights (Van der Walt & Pienaar 2009, pp. 86-88). Nevertheless, despite the dominance and importance of the private property regime, it cannot be used to evaluate the property rights regime of the NWA. In fact, the preamble to the NWA, read with Section 3 of the Act, abolished the idea of private, exclusionary water rights in its entirety. The NWA, therefore, necessitates a better understanding of property arrangements and regimes that directly speak to the interests of the community or the public in water as property.

Historical sources indicate that the Institutes and Digest of Justinian, the codification of Roman law, written about 530 AD, have been providing for non-private property (in the form of common or public property) for millennia. The Institutes were *inter alia* based on the 2nd-century work of Gaius. The Institutes were an effort to classify property, or lands, things and resources rationally. Things that could be bought, sold and inherited were recognised as private property. Things that could not be classified in this way fell into the 'commons' (*res communes*). Things that could not be owned privately were classified by Gaius as being *res extra nostrum patrimonium* (Gaius 2.1) and were further subdivided between *res divini iuris* and the class of *res humani iuris* (Badenhorst et al. 2006, p. 30; Van Zyl 2003, p. 122). On its turn, the sub-categories of *res humani iuris* were (1) *res omnium communes*, common property or things that are common to all of mankind (Bouckaert 1990, p. 784; Rose 2002, p. 923) on the one hand, and (2) *res publicae*, public property or things that belonged to the state but destined to be used by the general public on the other (Van der Vyver 1989, p. 261).

■ Common property

The Roman law notion of *res omnium communes* (common property) included things that were available for the use and enjoyment of the 'entire human race' (Van der Vyver 1989, p. 264). Things such as the air, the sea or running water were regarded as common property, or the 'common heritage of mankind', and therefore available to all citizens collectively (Lucy & Mitchell 1996, p. 580; Olivier, Pienaar & Van der Walt 1992, p. 20). Common property was therefore incapable of entire exclusive appropriation. Things categorised under the category of *res communes omnium* could therefore not belong to any person individually. Rather, they were subjected to special group entitlements, which allowed all interested parties to make use of them collectively (Ostrom & Hess 2008, p. 6).

The contemporary notion of common property can be associated with Roman law concept of *res omnium communes*. The contemporary notion refers to 'interests for which there is a shared right of use conferred on all' (Waldron 1988, p. 41; Ziff 2010, p. 8). Associated with the Roman law foundations, Barnes defines common property as 'rights of access' rather than 'rights of exclusion' (Barnes 2009, p. 153). A more contemporary conception is provided by Heltberg, when he argues that common property refers to resources under 'communal ownership' where access rights are defined with respect to 'community membership' (Heltberg 2002, p. 193).

Notably, the Supreme Court of Appeal, in the case of *Mostert Snr and Another v S* 2010 2 All SA 482 (SCA) (the *Mostert* case), engaged with the classification of water as common property in the post-constitutional, public trusteeship paradigm. The legal dispute originated after a farmer and his son, who grew sugarcane on a farm riparian to the Lomati River, intentionally omitted to register a pump to monitor water usage from the river. The respective parties further tampered with another pump station meter to reflect a lower than actual water usage. Their actions resulted in charges of theft, fraud and further criminal charges for the contravention of Section 151(1)(e) and (5) of the NWA. In other words, they were charged for unlawfully tampering or interfering with a pump and for unlawfully, intentionally or negligently abstracting water from the Lomati River.

To establish whether the water from the Lomati River was capable of being stolen in terms of the common law, the court had to establish whether the water was private or public in nature. The court concluded that water, whether running in a river or stream, is classified as *res omnium communes*. The court held:

Roman law recognised certain things as being *res extra patrimonium* which were incapable of being owned, including those things classified as *res communes* being "things of common enjoyment, available to all living persons by virtue of their existence". Public water, running in a river or a stream, was recognised as

being *res communes* and therefore incapable of being owned. These Roman law principles were adopted by Roman-Dutch law and subsequently recognised in South Africa. (n.p.)

The Supreme Court of Appeal therefore concluded that the water contained in rivers is *res omnium communes*, or common property, and therefore incapable of ownership. If it is not owned, it cannot be stolen. This judgement has, however, been criticised. It is argued that the Supreme Court of Appeal failed to properly analyse the distinctions made between the Roman and Roman-Dutch law concepts of *res publicae* and *res omnium communes* (Young 2014, p. 138). Young argues that the court might have erred and posits that *res publicae* would have been a more suitable categorisation. When the government regulates the use of water resources, and where extraction of water is subject to limitations, the resource should be public property and not common property.⁵⁷

■ Public property

The Roman law concept of *res publicae* included all things that belonged to the government or the general public, as these things were used in the interest of the public and were open to the public by operation of law. Classic examples of Roman law *res publicae* included roads, bridges, rivers and harbours (Rose 2002, p. 96). This Roman law understanding arguably provides a theoretical foundation for understanding the public property regime. The term *res publicae* effectively describes the *character* of the ownership of public property, namely, state or public ownership, and it defines the *use* to which the property is put, namely, that it should be used in the public interest (Barnes 2009, p. 154; Blumm 1989, p. 595).

In a public property regime, resources generally vest in a public authority, the government or the state. Scholars therefore often refer to 'state or public ownership' when deliberating 'things' or resources in a public property regime. This public property conception of 'ownership' should, however, be distinguished from the exclusionary interests normally associated with private ownership. The state does not necessarily hold public property with the same title as property that is for sale (private property). Rather, as conceptualised by CJ de Villiers in his judgement of *Anderson & Murison v Colonial Government 1891 8 (SC)*, a case that dealt with the seashore, the idea of public property should be understood as the state being the custodian thereof on behalf of the public.

57. If the court correctly found that this type of water was *res publicae* it would have been required to engage with the nature of ownership of water and whether it is owned by the public or the state. Further, regardless of by whom it is owned, the fact that it is owned at all would have resulted in a finding that this water had in fact been stolen. The decision may therefore in future be set aside.

The public property regime therefore effectively separates the 'ownership', control, management or custodianship of the public property, on the one hand, and the actual use thereof on the other (Viljoen 2016, p. 79). Whereas 'ownership' or central control usually vests in the state that controls and manages public property, the statutorily regulated use and access rights reside with the public. In a public property regime, the state structures, allocates, protects and governs public property in such a way that they meet the needs and purposes of society as a whole and not only the needs of individuals (Waldron 1988, p. 40).

The state's authority to regulate the use and access rights in public property is a particularly important feature of a public property regime (Viljoen 2017, p. 184). This feature can be used to curb the abuse of public property; to ensure more prudent use of such property; and to ultimately improve the quality, quantity and accessibility thereof for the public's use and in the public interest. So understood, the public property regime provides a useful framework for the state to develop a legal framework that provides for an administrative decision-making paradigm in the form of a licensing or permitting system. The state may therefore allocate and control the use or access rights in the public property in such a manner that it serves the public interest or the needs of society.

In benchmarking the public property regime against the novel public trusteeship-based water governance model of the NWA, the proprietary implications of the concept of public trusteeship seem uncontested. Accordingly, the legal title of the country's water vests in the national government as public trustee (section 3(1) of the NWA); the public trustee is responsible to ensure that water is allocated equitably and used beneficially in the public interest (Section 3(2) of the NWA); and the national government has the power to regulate the use, flow and control of all water in the Republic (Section 3(3) of the NWA).

Although valuable lessons may be learnt from the public property regime in the process of clarifying the concept of public trusteeship, the writer hereof is cautious of the argument that the concept of public trusteeship merely (re-) introduced the Roman law *res publicae* concept into the South African water realm. The cautionary sentiment is based on the fact that the concept of *res publicae* is truly a concept of common law. It is certainly not the common law, but the statutory law (more specifically, the NWA) that regulates South Africa's water regulatory framework. Therefore, although the discussion above highlighted an understanding of possible propriety implications of public trusteeship, the statutorily introduced concept of public trusteeship may (and should) mean much more than originally expressed by the common law (Viljoen 2016, p. 206).

The concept of public trusteeship cannot merely be an exercise of ‘putting old public property wine in a gleaming new bottle’. Public trusteeship is set to mean more. In fact, the NWA was specifically promulgated with the primary aim to ‘provide for fundamental reform of the law relating to water resources’. To eventually understand the full impact of the statutorily introduced concept of public trusteeship on South Africa’s water law, it is necessary to reflect on the building blocks of public trust thinking.

■ Unpacking the concept of public trusteeship as embodied in South African water law

■ The stewardship metaphor

In her attempt to define public trust thinking as a philosophy, Van der Schyff (2013, pp. 370–371) immediately draws to the notion of stewardship. She posits that public trusteeship can be seen as a manifestation of stewardship or that the principle of stewardship underlies public trusteeship. It therefore makes sense to first reflect on the term ‘stewardship’ and then to move on to the philosophical foundations of the notion of ‘public trusteeship’.

As already mentioned, the concept of stewardship is a broad concept that finds expression in many different subject matters and disciplines. Even within an environmental context, its definition, interpretation and permutations vary greatly in scale and application. For example, in environmental law, stewardship constitutes not only a universal duty but also specific duties to the resource in question. It constitutes a general or universal duty to care for the earth and everything in it. Literature on this topic often adds the term ‘custodianship’ to describe this general duty and to empower individuals to be good environmental citizens (Barritt 2014, p. 2). On the other hand, stewardship is directed at imposing specific duties in relation to the environment on landowners (Roach 2006, p. 43). It would not only require landowners to carefully look after and manage their property but may even amend their proprietary relationship by imposing burdens on landowners. While the concept of stewardship gives rise to a spectrum of duties, it is also relational. It is notable that the concept also speaks to the nature of care in relation to the control, authority or dominion over the land or resource in question (Barritt 2014, pp. 1–2). The Gauteng High Court, in its judgement of *HTF Developers (Pty) Ltd v Minister of Environmental Affairs and Tourism and Others 2006 5 SA 512 (T) para. 19*, confirmed this understanding in the context of South Africa’s environmental law when it stated that the imperative flowing from Section 24 of the Constitution (RSA 1996), the so-called environmental right:

[...] confers upon the authorities a *stewardship* whereby the present generation is constituted as the custodian or trustee of the environment for future generations.

From this follows that *owners of land* no longer enjoy the absolute real rights known to earlier generations. An owner *may not use his or her land* in a way which may prejudice the community in which he or she lives because to a degree he or she holds the land in trust for future generations. (n.p.; [*author's added emphasis*])

The argument follows that, properly understood, the concept of stewardship bears specific relevance for understanding the present generation's duties in respect of, and relationship with, the natural environment. In fact, a deeper look into stewardship relationships, as earlier recognised by Barritt, which includes custodial, managerial, proprietorial and Christian ethical relational understandings, reveals a concept rich in values and normative appeal.

■ Custodianship

The 'custodial stewardship relationship' is often found in stewardship literature. The reason being that custodial stewardship arguably represents the minimum content of a stewardship duty. In the legal context, custody is generally construed as the keeping, guarding, caring or preservation of a thing, object or resource (Roach et al. 2006, p. 48). In relation to water, therefore, the steward is expected to protect, conserve, preserve and use water resources in a sustainable, responsible or wise manner. Bratspies and Van der Schyff add to the understanding of custodial stewardship when he attaches to it a long-term perspective (Bratspies 2001, pp. 213–214; Van der Schyff 2013, p. 372). The custodial stewardship relationship is then described as a 'cross generational' duty towards current and future generations in respect of water resources (Barritt 2014, p. 16). Custodial stewardship is, however, only one way of conceptualising the duty of stewardship. Welchman, for example, rather conceives stewardship in terms of management (Welchman 2012, p. 302).

■ Management

Managerial stewardship marks a 'step up' from the custodial stewardship relationship described above. A managerial stewardship relationship requires stewards to 'actively care for and manage the natural resource under their control' (Barritt 2014, p. 17). The managerial stewardship relationship clearly goes beyond the idea of caring for or protecting water resources and includes an 'active engagement' to improve or enhance the resource. Remarkably, from the custodial and management conceptualisations briefly presented, it seems as if there is a progression in the strength of the duties placed on the steward. This progression continues in the relationships outlined hereafter (Barritt 2014, p. 14).

■ Property

A third permutation of the stewardship relationship may be found in the nexus between property and stewardship. While some property lawyers may argue that stewardship and property are incompatible concepts, the reality of a proprietorial stewardship relationship is uncontested. Research suggests that there are at least two competing proprietary relationships. The first of which is founded on the private property regime. It recognises the idea of private property rights in land or resources, in the sense that the owner would retain some form of control, but attaches thereto restrictions or attendant duties of stewardship. This relationship then instils existing property rights with stewardship duties, but with the aim of taking proper account of the needs of the public, which would include ecological needs, for example. Naturally, this line of thought requires a balancing act between public and private rights when dealing with the property relationship. Conversely, the second permutation of the proprietorial relationship rejects the coherence of private property in its entirety. In fact, it replaces private property rights in natural resources with a pure stewardship relationship. In the context of water resources, one can, however, not abandon property altogether. It is rather contended that stewardship would introduce an institutional regime change, from private property to public property, for example (Viljoen 2016, p. 207). Accordingly, both the competing understandings of a proprietary relationship acknowledge that existing private property rights are 'modified' by values of stewardship.

■ Christian ethics

The last element of stewardship relationships marks the culmination of the relational spectrum. Whereas the discussion on stewardship started with a 'technical understanding' of a custodial relationship, a moral conception of stewardship is found in a more Christian ethical understanding of the notion.

The morality aspect of stewardship is not new. In fact, early attempts to define the said relationship are rooted in a theological understanding of the position of mankind in creation (Lucy & Mitchell 1996, p. 583). Notably, Genesis 1:26–28 states that God made humans in his own image and gave them 'dominion' over the earth. Incidentally, this verse is commonly known as a 'dominion verse'. Such description may, however, be challenged and may even be regarded technically incorrect. Properly construed, God did not provide humans with any private property rights or dominion over natural resources. The text, therefore, does not provide that humans have more value than the rest of the Creation in the sense that they may exploit it for their own personal needs (Bouckaert 1990, p. 786). Genesis 1:26–28 rather provides humankind with the responsibility to care for the resources in a way that is consistent with God's will.

While it is not an aim of this chapter to reach any certainty about God's will, insight into God's attitudes towards the natural environment may, however, be of relevance. Leviticus 25, for example, reveals a God who wants the land and its resources to be looked after and for all people to have access thereto. Remarkably, Leviticus 25:23 states that land must not be sold permanently, because it belongs to God (also see Ps 24:1-2).

Nevertheless, as God's representatives, Genesis 1:26-28 calls for a caretaking or stewardship role. The stewardship role is also not limited to landowners but intended to include the entire human race. The relational conception of ethical or biblical stewardship is founded on the principle that God owns everything, but that humans are managers, administrators, stewards or 'trustees' acting on his behalf (Lucy & Mitchell 1996, p. 583). A progression of this principle is seen in Genesis 2:8-15, wherein God instructed Adam to cultivate and guard the Garden of Eden, to actively enhance its already great fruitfulness and to protect it. While the ethical stewardship duty may well be based on internal reasons, the motivation thereof is external to the actor and is based on a duty to God.

Notably, all the previously discussed elements of stewardship (custodial, managerial and proprietorial) involved a shared anthropocentric assumption in the sense that humans are the dominant members of the environmental community (whether this is by benefitting, managing, owning or governing water as a natural resource). The last element, being the Christian ethical stewardship duty, however, adds an extra dimension that goes beyond existing anthropocentric understandings in terms whereof humans are traditionally regarded as the dominant members of the environmental community (Barritt 2014, p. 21). By re-prioritising the position of humans in relation to the natural environment, natural resources can be seen as the primary beneficiary of the stewardship duty, alongside present and future generations. It is held that this broad conception of stewardship, with its multidimensional relationships and perhaps even overlapping elements, may add an extra dimension as to how the concept of public trusteeship should be conceived in South Africa's water law.

■ **Conceptual support: The Anglo-American public trust doctrine**

Scholars such as Blumm and Guthrie argue that the public trust concept originated from the jurisprudence of the United States of America (Blumm & Guthrie 2012, p. 791). Consequently, some may believe that the principles underpinning the Anglo-American public trust doctrine have been statutorily introduced in the NWA in South Africa (Thompson 2006, p. 280). It falls beyond the scope of this chapter to provide an in-depth discussion of the development and complexities of the Anglo-American public

trust doctrine. To provide a general understanding of the Anglo-American public trust doctrine, key and underlying principles are briefly set out.

Proponents of the Anglo-American public trust doctrine argue that certain resources or interests in natural resources, navigation and fishing, for example, must be placed under the guardianship of trustees to be preserved for the benefit of the public. The doctrine then effectively places certain natural resources under the central control of the public trustee, which holds them in an 'inalienable public trust' (Van der Schyff 2013, p. 375). The public trust is set aside to receive 'special judicial attention and protection' (Sax 1970, p. 484). The public trustee is then cloaked with a 'fiduciary responsibility' to allocate and regulate the use of the protected resources to the benefit of the public. It follows that the public trust doctrine speaks to the concepts of 'public ownership', the public's rights in natural resources, the protection of the public interest in natural resources, as well as the state's fiduciary responsibilities (Blumm 1989, pp. 580, 587).

To support the idea that certain resources or interests are entitled to the special protection of an 'inalienable trust', Joseph Sax (1970, p. 484) argues that at least three foundational principles underlie or expand the doctrine. The first being that certain interests 'are so intrinsically important to every citizen' that they cannot be held privately by certain individuals, but must be freely available to all. The public trust is therefore set up to protect those important rights, to guard against any particular individual or group to acquire power and control over them. This principle was unambiguously adopted in the North West Ordinance of 13 July 1787, art. IV, 1 Stat 51, for example (Yale Law School n.d.):

[T]he navigable waters leading into the Mississippi and St. Lawrence and the carrying places between the same, shall be common highways, and forever free, as well to the inhabitants of the said territory as to the citizens of the United States [...] without any tax, impost, or duty therefor. (n.p.)

The second underlying principle, which also holds that certain resources should be set aside, however, adds an extra dimension. It holds that certain interests are so particularly the gifts of 'God's bounty' that they ought to be set aside or be reserved for all people (Sax 1970, p. 484). Sax argues that this principle, for example, led to the reservation of the 'great ponds' in New England and later led to the creation of national parks built around unique 'natural wonders' (Sax 1970, pp. 484-485). Finally, the third principle holds that certain uses are 'peculiarly public' in nature, which makes any private or exclusionary use inappropriate (Sax 1970, p. 485).

At least two lessons can be drawn from the Anglo-American public trust doctrine for the notion of public trusteeship in South Africa. The first is that the Anglo-American public trust doctrine, strengthened by its underlying

principles, calls for an ethical perspective on property law (similar to that of the stewardship metaphor discussed above). The ethical perspective is justified by the fact that the doctrine and its principles advocate the imposition of a public trust on any private landowner, as well as the state or public authority, in certain or appropriate circumstances. Secondly, the Anglo-American public trust doctrine provides guidance as to identify resources or interests that are entitled to the special protection of an 'inalienable trust'. From the principles, it can be deduced that water, as a vital and extremely scarce natural resource, especially in South Africa, is suitable for being held in trust for special protection.

■ A proposed understanding of the concept of public trusteeship

As indicated, a novel legal framework for water resources regulation has been developed in South Africa following the advent of the Constitution. This framework broke new ground by introducing the concept of public trusteeship into the country's water law.

As argued in the earlier 'Common property' section, a basic understanding of a public property regime is necessary to inform some of the implications of the statutorily introduced concept of public trusteeship. It was, for example, indicated that the state controls and manages the public property, while the statutorily regulated use and access rights reside with the public at large. It follows that, in a public property regime, the extent of use and access rights to resources is structured, allocated and governed in such a way that it meets the needs and purposes of society as a whole and not only the needs of individuals (Viljoen 2016, p. 81). In fact, under a public property regime, the property at hand cannot be owned by private individuals to serve any exclusionary or self-serving interests normally associated with 'ownership' under a private property regime. From this, it is argued that the public property regime highlights the relevance that a particular property regime has for the regulation of access to the resource; the extent of a government's regulatory powers; and the nature of use rights that can be acquired in the resource (Viljoen 2016, p. 19).

When the public trusteeship paradigm is evaluated against the public property regime, it makes sense that the NWA provides for the public trustee to publicly allocate and regulate the use of South Africa's water resources by means of a licensing or permitting system. The public nature of such use rights is also upheld when the accompanying regulatory framework is assessed.

An individual can apply for, and hold, a general authorisation or licence to use water in a private or official capacity, but the holder thereof cannot

deal with the authorisation of a licence as a private property owner. Rather, Section 28 of the NWA provides that all water licenses are subject to conditions and are issued for a fixed period that may not exceed 40 years (Section 28[1][d]-[e] of the NWA). Clearly, as the holder of the water use right or license cannot freely decide on the unlimited use or exploitation of the resource, Section 28 of the NWA does not recognise private exclusionary rights in water. Sections 53–55 of the NWA also disregard the possibility of private ownership of water resources when dealing with the consequences of contraventions of licence conditions. The consequences of contraventions range from the responsible authority requiring the licensee to take remedial action (Section 53[1][c] of the NWA) or to suspend or withdraw a licence (section 54 of the NWA). These forms of regulatory control are conducive to what was envisioned with the adoption of the notion of public trusteeship over water resources, vesting central authority over water resources in the national sphere of government and not in the hands of individuals.

It follows that the question of water rights allocation in terms of the NWA is answered by the application of the rule that water use rights should be determined by the public or collective interests of the society as a whole (Habdas 2011, p. 630). Waldron then proposes that if there is a question about how or by whom public water resources are to be used, the question can be resolved by favouring the water use right that is most closely related to the public interest (Waldron 1985, p. 328). Consequently, a private individual will not be able to claim any exclusionary rights if the claim is not shaped by the public interest (Van der Schyff 2013, pp. 383–384). The public interest concept is, in the South African water regulatory regime, delimited primarily by the values and fundamental rights of the Constitution together with the objectives of the NWA (Section 2 of the NWA).

The concept of public trusteeship, which advocates a public rights system that allocates water in the public interest, effectively converted water into public property, thereby changing the legal nature of South Africa's water resources (Van der Schyff & Viljoen 2008, p. 340). A system that provided for exclusive and private rights to water use, which was generally to the detriment of the majority of South Africans (Pienaar & Van der Schyff 2007, p. 181), has been replaced by a system that provides for water rights granted at the discretion of the government. This transformation affected the property rights regime of South Africa in which water resources are managed, in the sense that it elevated the public interest above any private interests in the resource.

In addition to the valuable insights gained from the notion of public property, this chapter further introduced the notion of stewardship as well as the Anglo-American public trust doctrine to also inform the understanding of the South African concept of public trusteeship. The environmental stewardship metaphor, which exceeds the basic understanding of the

responsible use and protection of natural resources through conservation and sustainable practices, and carries normative appeal, adds to the public trusteeship discourse. In fact, the spectrum of different relational stewardship understandings, including conceptions of custodial, managerial proprietorial, and even ethical or spiritual relationships, portrays a clear progression in the strength of the obligations that could be placed on the national government or public trustee.

In its turn, the Anglo-American public trust doctrine also contributed and added dimensions to understanding the concept of public trusteeship. In typical trust law terms, the Anglo-American public trust doctrine acknowledges that a sovereign or certain authority is designated as the 'public trustee' of certain resources; cloaked with the authority and fiduciary responsibility to regulate and protect the resource in question to the benefit of the country's citizens, who are the 'beneficiaries' of the inalienable public trust. The latter doctrine therefore speaks to concepts such as public ownership, the public's rights in natural resources, the state's fiduciary responsibilities, as well as the protection of the public interest in natural resources. Accordingly, and if applied to South Africa's water sector, the national government, as a public trustee, has a fiduciary responsibility to allocate and regulate the use of the country's water resources in the public interest. This is facilitated by means of a licensing or permitting system.

Section 3 of the NWA therefore incorporated into the country's water dispensation the stewardship ethic of a public trust in terms whereof a public authority or government exercises a fiduciary trust on behalf of their people and that 'certain interests are so particularly the gifts of nature's bounty that they ought to be reserved for the whole of the populace' (Van der Schyff 2013, pp. 369–370).

■ Conclusion

Water scarcity is one of the largest global risks of our time, with the demand for water on the increase. Recent episodes of severe drought in South Africa highlighted the necessity, but also the vulnerability, of natural water resources. Naturally, this emphasises the importance of responsible and sustainable water governance for current and future generations.

Following the advent of the Constitution, a novel legal framework for water resources regulation was introduced. The national legislature statutorily introduced the concept of public trusteeship into South Africa's water regulatory framework. The concept not only altered the nature of ownership but also introduced a novel regulatory regime that redefined property rights. The concept of public trusteeship effectively converted all water to public property. The legal title to all water resources now vests in the state as the public trustee. Accordingly, all South Africa's water

resources are part of an 'inalienable public trust' that is the fiduciary responsibility of the public trustee. This transformation affected the property rights regime of South Africa whereby water resources are being managed. The statutory transformation elevated the public interest above any private interests in the resource and defined the national government's claim to the country's water resources as fiduciary.

This chapter further argued that Section 3 of the NWA incorporated into the country's water dispensation a stewardship ethic. The discussion on the stewardship metaphor added to the discourse by identifying a progression in strength of the different obligations placed on the public trustee. In fact, the public trust fiduciary duty exceeds a mere technical conception of stewardship, but includes a moral element. While executing its public trust fiduciary duty, the public trustee must employ, *inter alia*, equitable and sustainability principles to protect the resource and to meet the needs and purposes of society as a whole, as well as the needs of individuals of current and future generations.

The transformed property regime of the NWA seemingly underwrites the ethical and religious idea that humankind is the guardian of the earth and its natural resources, and not their owner. In fact, there seems to be a possible association, relationship or parallel existence between public trusteeship and the exercise of stewardship or dominion (in the sense of control or authority) over water as a God-given resource. Neither the public trust regulatory framework nor the biblical understanding of the dominion over water resources allows for exclusive private property rights that may be used as an excuse to exploit the resource for their own personal gain. Other similarities include that both the regimes proclaim that public interests in water trump private interests; that both give rise to a fiduciary responsibility towards the natural environment and community; and that both encourage and compel people to fulfil stewardship duties. These associations, relationships or even a possible parallel existence between the transformed property regime of the NWA and the dominion over water as a God-given resource provide significant scope for future discourse. To date, there has been no scholarly consideration on how these different notions might interact or overlap. It may, for example, from a theological perspective be useful to investigate whether and to what extent the concept of public trusteeship may convert the aspirational biblical stewardship goals to substantive and legal trusteeship duties.

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Living Water: An interdisciplinary exploration of water as a theological theme deals with the very significant and complex issue of water, as the authors discuss the necessity of water for human communities as a gift from God. The authors investigate the complexities of water in human communities and how water becomes a subject of war, conflict and destruction. In this book, the challenge of water is also regarded as an ethical dilemma, where issues of justice, stewardship and accountability become necessary when dealing with water crises or challenges. Christians in human communities are challenged to play a crucial role in water conservation. This book provides unique scholarly contributions and adds value to theological debates on climate change.

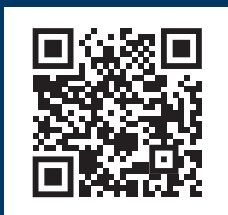
**Dr Siphon Mahokoto, Department of Systematic Theology and Ecclesiology,
Faculty of Theology, Stellenbosch University, Cape Town, South Africa**

In *Living Water: An interdisciplinary exploration of water as a theological theme*, the editors Kotzé and Van der Walt succeed in drawing together a diverse group of scholars from several theological disciplines, as well as from the fields of the natural sciences and law, to contribute toward the overarching theme of water. In their quest to highlight the importance of water and the necessity of using water responsibly and ethically, all the authors start from the premise that water is essential for all life on earth.

The main title of the book, *Living Water*, refers to the narrative in John 4:1–26, where Jesus interacts with a Samaritan woman at the well in Sychar. Jesus reveals himself as the source of living water by using the metaphor of a well as a Jewish man, enabling the Samaritan woman to access living water and empowering her to share this living water with others in her community.

All contributors to this book successfully argue that water is a vital resource to protect. As such, this book emphasises the need for the church in its entirety to rethink the importance of water as a divine gift. In the recent past, the ecumenical community has taken strong views on various ecological issues. Through this compilation of scholarly studies, the church receives the tools to prophetically call upon its congregants to responsibly exercise stewardship over this gift, not only for our own sake but also for future generations.

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of Theology, University of Pretoria, Pretoria, South Africa**



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