10 C More on Theology and Engineering

Engineering and Common Grace

Recall that "common grace" is God's undeserved goodness to all mankind (as opposed to special, "saving grace.")

Gidley writes "Good engineering makes real provision against real evils, bringing by God's common grace longer life, ease of toil, and pleasurable recreation." To call engineering a common grace activity is to say that it is a gift of God, given both to those who do receive and to those who do not receive special grace. Both groups receive the same gift from the same Giver, so no substantial difference in the operation of the gift is expected. [1]

Deffenbaugh [2] and Che [3] further develop the concept of common grace:

- Science and technology are subsets of God's common grace.
- Engineering is specifically part of God's common grace to mankind.
- The field of engineering can be entered by both Christians and non-Christians.
- The results of our engineering can benefit everyone, Christian and non-Christian alike.

Che adds-

God's common grace is meant to lead us to appreciate and receive His special grace, as it is clearly stated I the Scriptures (Acts 14:17, Romans 2:4)

A peaceful life provided by God's common grace helps the spread of the Gospel, thus promoting the special grace of God. [4]

Engineers and Responsibility

Recognizing the real need in a given situation is essential to providing an engineering solution:

In Exodus 32 we find the story of the Golden Calf where the children of Israel asked Aaron to make them gods which would lead them out of the wilderness. Aaron took the people's gold and made a Calf. Aaron then led the people in worship of the idol. Moses came down the mountain and found the people dancing before the Calf, and was very angry. When Moses confronted Aaron with his sin, Aaron tried to pass the blame on to the people and tried to minimize his involvement in building the Calf…
This story is comparable to engineering a man-machine system. The people had the role of project sponsor, and Aaron had the role of engineer. His solution to their demands was to build the Golden Calf, but he failed to meet their need, because the Calf was incapable of leading them out of the wilderness. He catered to the rebellious purpose of the people, rather than pointing them to the living God. Aaron's problem is similar to that of the Christian engineer. The world demands a technological savior, but only the living God can solve the world's problems. The real problem is sin. The Christian engineer is often tempted to let the worldly sponsor assume that a

man-machine system is a technological savior. It may solve a technical problem, but in reality, no technical system can solve the real problem, sin, Only the grace of God can do that. [5]

Choi writes:

> *God created the birds that fly in the air. We learn from them and further created airplanes and rockets. God created our brains. We then created computers and supercomputers. Nature has electromagnetic phenomena. But we learn from it and have conceived electric power grids that supply energies to huge cities. We often hear that engineering is not doing something original (unlike new scientific discoveries) but is just an application of scientific knowledge. However, the biblical perspective is different. Engineers create something truly original that never existed before in our universe!...*

> *When we understand our calling to prepare for what God is about to do (the case of Noah's Ark, for example), the calling to meet the needs of God's people (the case of Nehemiah's rebuilding the city wall, for instance), and the calling to participate in God's vision (the case of Belzalel and Aholiab in building the Tabernacle, for example), our work will bear much fruit. We need to raise our future engineers with visions and callings from God. With the true sense of purpose and value, they will be able to discern what they need to do as they need to make important decisions.* [6]

Guiding Principles for Christian Engineering [7]

The Civil Engineering program at Dordt University employs the following principles in its curriculum:

1. The world (and everything in it) was created for God's glory.

"For from him and through him and for him are all things" (Rom. 11:36).

"God's goal at every stage of creation and salvation is to magnify his glory" (J. Piper).

2. God gave us dominion over creation and instructs us to develop and conserve it (at the same time).

We give creation its proper due by treating it with care that brings healing and renewal and enables it to unfold and grow (Gen. 1:28, 2:15).

3. We are creatures … always finite, currently sinful.

Humans are the crown of creation, we have a unique role … but salvation does not come from the work of our hands (Ps. 8:4-6, Eph. 2:8,9).

We are not saviors. We are finite, sinful, and corrupted.

4. Our sin caused creation's suffering. We have a responsibility to ease suffering by engaging the human and non-human creation.

"For the creation was subjected to frustration, not by its own choice, but by the will of the one who subjected it … the whole creation has been groaning" (Rom. 8:20-22)

5. We live in the already and not yet of Christ's kingdom.

Christ's kingdom is already here, and one day it will be fully consummated!

We work out of gratefulness for Christ's saving work, and we trust Christ to use our work as He wills to fulfill His perfect plan. We work to continue the Spirit's sanctifying work in our lives.

Laurel Dovich adds:

Structures are a big part of technology use in the Bible. The early Israelite laws gave safety instructions for building homes – putting a parapet around the roof to protect from a fall (Duet. 22:8). This is an early demonstration of how Christian values are embedded in our work as engineers. Putting a parapet indicates that we place high value on the care and safety of others. Structures are also highlighted in the Bible when God chose to dwell amongst the Israelites in a structure – the sanctuary. Christ used buildings as illustrations during His earthly teachings. He contrasted a house built on a rock and a house built on the sand to illustration foundational issues (Matt. 7:24-27, Lk. 6:47-49). He also used the illustrations of structural failure (Lk. 13:4) and structural planning (Lk 14:28-30) to illuminate His points. In the prophesies of Isaiah, we are told our technological skills will be needed in heaven, also! In Isaiah's description of the new heavens and new earth (Isa. 65:21-22), he says "They shall build houses and inhabit them. … They shall not build and another inhabit." We will all be structural engineers in heaven!

The Bible gives a rich heritage to our engineering careers. Engineers were direct appointees of God on large construction projects. We're given direct advice from God, including the precedent of being "inspired" to teach our trade. Christ has used our technology as illustrations of truth throughout the Bible. Our career has close ties to the Bible – from its very beginning, and will carry on through to heaven, where everyone will build houses.

The Christian foundations for engineering and the technology we create come from several facets. God created us in His creative image, to do creative things. The Bible shows engineering work as being appointed by God and implies principles for its use today. Christ used our engineering technology as illustrations in His teachings. Early Christian theologians gave a worldview where science could flourish and thus give engineers better tools to work from.
Christians have carried on the work of expanding the base of science and engineering.

Our careers have close ties to Christianity. Embrace that relationship in your daily work. Realize that your creativity comes from God, and that he has blessed you with "ability, intelligence, knowledge and all craftsmanship." Remember that God inspired the early engineering educators
– Bezalel and Oholiab. Ask for that same inspiration – whether teaching in a classroom or

mentoring younger engineers. Realize that you are following in the footsteps of the early Christians who developed technology in order to proclaim Christ better. And realize that your occupation is grounded in the Christian worldview that brought about the development of science that our occupation is based on. Add your name to the growing list of faithful Christians who are opening up frontiers in science and engineering. [8]

Anson looks at engineering from the perspective of Creation (God provided the raw materials and meaningful work), Fall (decay occurs), and Redemption (including our participation: work in fellowship with Christ and others):

After the Fall, creation was in "bondage to decay" as expressed in Romans 8:20-22 "For the creation was subjected to frustration, not by its own choice, but by the will of the one who subjected it, in hope that the creation itself will be liberated from its bondage to decay and brought into the freedom and glory of the children of God." (Emphasis added)

A great deal of engineering effort goes into preventing decay of materials, for example:

i. *Developing the process of pressure treating wood,*
ii. *Adding ultraviolet inhibitors to polymers to prevent photonic breaking of molecular bonds,*
iii. *Antioxidants to prevent metals from tarnishing,*
iv. *Paint and coating technology to preserve buildings and automobiles,*
v. *Sacrificial anodes to protect ocean going vessels from corrosion, and*
vi. *Oxygen barriers on food bags (e.g. potato chips) to keep fats from going rancid…*

In The Fall, both the souls of mankind and the living conditions of mankind suffered tragic loss. In Christ, the souls of mankind are restored and God involves us in the "ministry of reconciliation" as we are given the privilege of telling people about our confident faith in Christ. While the spiritual reconciliation is complete upon trusting Christ for forgiveness, the living conditions of mankind are not directly affected by their faith in Christ. As engineers it is incontestable that much of our effort is invested in improving living conditions outside of Eden; in this, there is a general and physical "ministry of reconciliation".

Engineering can help to restore order.

Engineering designs can reduce toil. [9]

Our privilege and responsibility

VanderLeest [10] has outlined some of the privileges and responsibilities of Christian engineers:

- Christians should find the creational good and fight the taint of sin on technology.
- Christian engineers should act as agents of redemption through the technology they design.
- We are co-creators when unfolding creation (cultural mandate), including technological cultural development.
- Preservation (including creation care, sustainability, and environmental stewardship) are tasks engineers are skilled to pursue, though technology can also cause problems in this regard.
- Cultivation (including unfolding of creation, cultural development) are tasks engineers are distinctly skilled to pursue. Furthermore, engineers are distinctly prepared to appreciate technology as a gift of God.
- Technology, by its very nature is practical and instrumental, can aid in loving others by solving their problems, improving their standard of living, helping them to flourish, (and) providing safety.
- Christians can serve the marginalized, including the poor, hungry, oppressed, physically challenged, and the stranger (cross-cultural, humanitarian projects). Compared to other Christians who also have a calling to serve the poor and otherwise marginalized, engineers are distinctly qualified to offer practical help, perform needs assessment, and design appropriate technology as part of the solution to their problems.
- Engineers act as redemptive agents:
- Engineers are distinctly qualified to design technology to ameliorate the effects of sin, to restore justice, and to bring shalom through their technological products.
- Engineers have prophetic witness opportunities related to technology, helping society understand the implications of technology.
- Engineers have skills to provide help (solving practical problems) and serve where others cannot, and thus gain access to that audience for the Gospel.
- (Engineers hold the anointed "Threefold office" of God's servants):

    a. Prophet giving witness regarding technology

    b. Priest providing mediation and service with technology

    c. King claiming dominion over technology

Using God the engineer as a model, the ideal engineer is a problem solver, applying his labor not as an end to itself, but rather for the particular good of others. This ideal engineer is a worker, at work in the world with knowledge of the limits of his human capabilities, developing and perfecting these capabilities. This ideal engineer is a steward, using the resources at hand, and considerate of the costs, long and short term, of their use, fully cognizant of the stability, truth, goodness, proper laws and order of

created things. This ideal engineer is an effective worker, accomplishing the tasks in the best way they can be, with a proper understanding of the risks involved in the undertaking, and a wonder for the greatness of creation and our participation in it. [11]

"According to a 'Christ in culture' or Christ as transformer narrative interpretation [Richard Neibuhr's categories], engineers are called to a vocation that is pleasing to God, redeems human endeavors and enterprises, and promotes good stewardship." [12]

Middleton [13] ponders the call of Psalm 148 for all of nature (mountains, seas, sun, moon, stars) to worship God:

Stars worship God by being stars, burning with nuclear energy according to their sizes and their life cycles, ranging from those like our own sun to red giants, white dwarfs, pulsars, and black holes.

If mountains worship God by being mountains and stars worship God by being stars, how do humans worship God? By being human, in the full glory of what that means… The human creature is made to worship God in a distinctive way: by interacting with the earth, using our God-given power to transform our earthly environment into a complex world (a sociocultural world) that glorifies our Creator.

The worship experienced by engineers is very special, according to VanderLeest [14]:

We worship by appreciation – When we discover new elements of creation, we are unwrapping the gift of creation a bit further, providing us with new opportunities to give God the glory for the wonder of the world He created…

We worship through stewardship- Proper care (of the natural world) requires appreciation, understanding, and judgment, so that we know how to be stewards of natural resources.

We worship through development- When discovery turns to development of features that do not occur naturally, then science has morphed into engineering, and our results are not simply the understanding of an existing aspect of creation, but a whole new invention, (and) we give God glory for providing raw materials that can be combined in new ways.

Robert Sloan expresses our duties this way [15]:

Engineers should be Agents of Life

Engineers are called to bring order to God's creation. That's what all of us are called to do. Engineers must be loyal and faithful to the task they have been given. They enable human lives, human families, human homes, human communities, and human nations to flourish. There is so much chaos in our world today, and associated with chaos is destruction and violence and the fragmentation of life and the abuse of power, but humans are created to be God's priests and

kings. In this dimension, we are made in his image to bring order to his creation, to bring beauty and goodness to it.

And we are called to live out our purpose with excellence – "God saw all that he had made, and it was very good." It wasn't very mediocre. It was very good.

One of the keywords of the creation is "life." That's what we mean when we say helping communities and people to flourish—help them have life. Help people and communities have the kind of beauty and order and goodness that God intended. Engineers must remember what they are called to do, to be agents of life, agents of goodness, agents of flourishing order, agents of building and extending the kingship of God.

Engineers are called to worship.

Finally, engineers and all of us must be loyal to why we do what we do. The why brings back that word "priest" or "priesthood" again. We do what we do as an act of devotion and worship. Adam and Eve were in the garden with God himself, and before they were cast out of the garden, they had this immediate access to his presence. So every breath they took was an act of worship. This was what they were supposed to do and what we're supposed to do.

As kings we extend the monarchy of God throughout all the earth. As priests, we gather up the praises and worship him.

Romans 1 says that the beginning of the fall of the creation was that "even though they knew God, they did not honor Him as God or give thanks" (Romans 1:21, NASB). To be truly human means we never forget the one who made us. It's not about the paycheck, not about the glory, not about the power or prestige. To be truly human means we begin by bowing the knee before God the king who has revealed himself through Jesus Christ.

I charge engineers, and all of us, never to forget that in all of the study, in all of the work, in all of the hardship, we offer God the worship, devotion, and service that he alone is due through Jesus Christ our Lord.

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