A MAGAZINE FOR THE CHRISTIAN FAMILY

REFORMED Perspective

A Christian Perspective on 2+2

Volume 27
Number 4
February 2008

What's inside?

A world in revolt against God

With a Promise

It's Hard to Catch Waves

MATH REALLY MATTERS

God's fingerprints are everywhere

Editorial

by Jon Dykstra

This education-themed issue of *RP* was first conceived of at least seven years ago. That's when the editor and assistant editor began looking for someone who knew how Mathematics could be taught from a Christian perspective. We didn't think it would be an easy topic to write on – in fact we picked it because we thought of all the school subjects, Math was probably the most difficult to teach in a distinctly Christian manner – but we never thought it would take us this long to find our man.

As the years went by the search did get… discouraging. Not only could we not find our man, we couldn't even find a sympathetic ear. Most of the people we talked to – parents and teachers – didn't seem to understand why we would bother with such a search. Teaching Math from a Christian perspective? What a silly notion! Biology, English, History, Social Studies: *these* are subjects that can be taught with a textbook in one hand and a Bible in the other. But Math? Doesn't two plus two equal four, whether you're a Christian or an atheist?

More than "just the facts ma'am"

It does indeed.

But something is wrong with this type of thinking. If we were to apply it to other subjects we would soon lose any reason we had for Christian schooling. In History class, for example, it doesn't matter what religious convictions a student or his teacher hold to, Columbus still sailed the ocean blue in 1492. In English class verbs will still be verbs, nouns still nouns no matter the teacher's spiritual beliefs. If we make the mistake of believing that teaching is just about passing on facts – whether it's 2+2 or the ocean blue in 1492 – we don't need Reformed schools. Facts are facts, and they remain the same. . . even in public schools.

Our Christian schools are about something much more important than the facts; we want our children taught how the facts *fit*. We want to give them a foundation, a framework that will allow them to properly place the facts they learn. We want to teach them to understand the world as it truly is, so that when they look around they'll see God's fingerprints everywhere.

More than sticking it to Satan

That seems a lot easier to do in subjects like Biology English, and Social Studies but perhaps that's only because it's in these same subjects that it's easiest to see the Devil's deeds. In Biology we can see the destructive influence of Evolution; in English and Social Studies we encounter evil "isms" of all kinds: the Humanism of the French Revolution, the Soviet Union's Communism; our own society's increasing Atheism and Materialism.

But it is also easier in these subjects to make the mistake of focusing on what the Enemy is up to – giving the Devil his due – rather than delving into God's work and His plan. It's easy indeed to make the evils of Evolution a bigger topic than the wonders of Creation.

> ***Doesn't two plus two equal four, whether you're a Christian or an atheist?***

If Christian schooling was simply about sticking it to Satan, then it would be silly to talk about Christian Math classes. The Enemy's inroads in this area aren't nearly as obvious; it's hard to see what we would need to preach *against*.

However, if we believe, as Abraham Kuyper puts it, that "There is not a square inch in the whole domain of our human existence over which Christ, who

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Address for Administrative Matters (Subscriptions, Advertisements, Change of Address):
Premier Printing
One Beghin Avenue, Winnipeg, Manitoba, Canada R2J 3X5
Telephone: (204) 663-9000
Email: subscribe@reformedperspective.ca
Editor: *Jon Dykstra*
Address for Editorial Matters (Letters and Submissions):
Reformed Perspective
3573 McKinley Drive,
Abbotsford, BC, Canada V2S 8M7
E-mail: editor@reformedperspective.ca
Managing Editor:
Wilhelm Gortemaker
Regular Contributors:
Sharon Bratcher, Jane deGlint, Christine Farenhorst, Margaret Helder, Johan Tangelder, Rene Vermeulen, Michael Wagner
Board of Directors:
John Voorhorst, Chairman; James Teitsma, Secretary/Treasurer; Peter DeBoer, Wilhelm Gortemaker, Jakob Kuik, Henk VanderVelde, Theresa Weessies
Secretarial Address (Board Matters):
James Teitsma
449 Almey Avenue, Winnipeg, MB Canada R3W 1P6
Contact Address for South Africa:
Arie Roos, Box 584
Kuilsrivier
7580 Republic of South Africa
Contact Address for Australia:
Pro Ecclesia Bookshop
PO Box 189
Kelmscott, W. Australia 6111

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is Sovereign over all, does not cry: 'Mine!'" then talking about Christian Mathematics is far from silly. Maybe the Devil hasn't left much of a mark in Math. . . but God has. That's why Christian Math matters.

Look inside

So in this issue we delve into just what it means to have a Christian perspective on Math. John Byl, a Mathematics professor at Trinity Western University, takes the lead with an article that is both fascinating and intimidating. He packs a lot of material into it and if you don't remember much of the Math you learned in school there may be parts you won't fully understand. I want to encourage you to skip those parts but to keep on reading. Whether you understand it all, or only some, this will be an article you'll be glad you read. Dr. Byl has also included a smaller article with specifics on how to teach Math from a Christian perspective.

A couple book reviews follow, including one on James Nickel's groundbreaking math text. His book is so good it's hard to find the proper words. Mark Sonmor, a blogger, put it this way: "to simply say that *Mathematics: Is God Silent?* is a good book is like saying Michael Jordan is a good basketball player. Even though the statement is true, it falls woefully short of conveying its full meaning."

We conclude with an article by Dan Vander Ark on the broader topic of Christian education, and how important it is to revisit just why we're doing what we're doing. In our Reformed community we are very involved in our Christian schools, but it is still easy to lose the vision our parents and grandparents had when they first started these institutions. If we focus too much on marks, on the schools' sports programs, on the number of course options available, or even on what the Devil is doing, we can easily overlook the real reason for these schools: to equip our children to have ears to hear and eyes to see God's handiwork in all areas of life.

Including Math.

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Nota Bene

News worth noting

by Sarah Meerstra

Religious freedom?

The family of Samuel Golubchuk, an 84-year-old Orthodox Jew in Manitoba, has been waging a battle to keep him alive, despite doctors' desires to take him off life support. The Jewish family argues that hastening his death would be a sin and equivalent to murder.

A recent poll by Angus Reid has found that over two thirds (68%) of Canadians agree that the family should have the right to make this life and death decision, while only 15% believe the doctor should decide. However the Manitoba College of Physicians and Surgeons is drafting a policy that would allow doctors exclusive decision making rights in certain situations, regardless of whether patients or family members disagree on matters of faith.

SOURCE: CBC News, Dec. 12, 2007

Embryo destruction from IVF

More than 1 million embryos created for fertility treatment have been destroyed over the last 14 years in Britain, recent government figures have shown. The enormous scale of this destruction has caused politicians and infertility specialists to call for ways to produce fewer embryos for treatment. Others suggest that it should be made easier for couples to adopt these embryos to give them a chance to grow and be born. Embryo adoption is legal, but rare.

SOURCE : The Times Online, Dec. 30, 2007

Israel and abortion

Despite lax abortion laws, a recent study has found that Israeli public opinion is significantly divided on the issue. Only 39% believe that it is an acceptable procedure when necessary, while 31% consider it an exceptionally painful last resort, and 30% believe it is murder. The study comes on the heels of a ruling by Israel's religious leaders that abortion is a grave sin and is delaying the coming of the Messiah.

SOURCE : Angus Reid Global Monitor, Jan. 6, 2008

No Sunday voting

A proposal by the Harper government to implement an advance polling day the Sunday before a federal election day has been met with little support. A parliamentary committee set up to study this proposal received testimony from Christians that such legislation would interrupt both churchgoers and churches. Statistics indicate that approximately 1/3 of Canadians attend church at least once a month, and that more than 1 in 10 polling stations are set up in churches.

Pleased that the bill was dropped, Evangelical Fellowship of Canada leader Bruce Clemenger stated in a press release, "Every effort must be made to accommodate the cultural and religious diversity and practices of Canadians. The intent to increase voter turnout is laudable and it is important to find means that will encourage rather than frustrate participation." According to current law, elections must always be held on a Monday, unless there is a statutory holiday, in which case the election day will the on the Tuesday. An amended bill is now back before the House of Commons.

SOURCE: The Ottawa Citizen, The Evangelical Fellowship of Canada

Family issues in Spain

The institution of the family continues to be attacked by the Socialist government in Spain. Since coming to power in 2004, the government has legalized homosexual marriage and adoption (2005), approved no-fault divorce (2006) and mandated the teaching of the homosexual lifestyle in schools to children as young as 10 years old. Most recently, it has legislated a complete ban on all forms of corporal punishment for children. In addition to this, abortion rates have skyrocketed in recent years, to over 100,000 per year, and there has been an increase in late term abortions. At the end of 2007, a Spanish television channel was the first to show the entire abortion of two 5-month-old fetuses on television, including showing the children's remains.

There has, however, been significant public reaction to these policies. Of approximately 200,000 students in the Spanish school system, there have been more than 15,000 reports of conscientious objection to the program of homosexual education, with more likely unreported. On an even larger scale, an enormous crowd gathered in Madrid at the end of the year to protest the government's attack on the family and to affirm traditional values on marriage and family.

SOURCE: LifesiteNews.com

Canadian moral values

A recent Angus Reid poll provides a revealing glimpse into Canadian moral values – or what's left of them. The survey queried respondents on a wide range of moral and ethical issues. It found that more than three quarters of those surveyed had no objection to premarital sex (81%), having children out of wedlock (77%), or divorce (83%). Approximately 60% condoned homosexual relations, embryonic stem cell research, assisted suicide, gambling and abortion.

What don't Canadians approve of? The results show that a majority still do oppose marital infidelity (76%), polygamy (84%), cloning of humans (78%), prostitution (55%), pornography (54%), the use of illegal drugs (68%), and pedophilia (99%).

SOURCE: Angus Reid Strategies, Dec. 20 2007

by Rene Vermeulen

A world in revolt against God

Are their attitudes affecting our attitudes?

Do we understand how we are being influenced by the world? We can sometimes come to the conclusion that what is happening in the world around us is passing us by. After all in our congregations we still have faithful office bearers carrying out their God given task of supervising the congregation, and we still have ministers who faithfully preach the Word on a weekly basis. We have our own schools where the children of the Covenant are taught a Christian way of life, where what is taught in the home is also taught in school and parents and teachers are on the same wavelength.

So the world may be rejecting God but we are free from its influence. And yet, is that so?

It is not – we can see the impact in our own circles. There are families where there are more important things to do than worship together, where Reformed magazines are seldom seen and where the parents do not recommend such material to their children. The truth is, our world is rejecting God and all of us, some more and some less, are being influenced by the world around us.

Children: many or any?

So it is worth examining two big issues in the world today, and the world's faulty thinking on these issues. Of course one that has been of great concern lately is global warming. Even while I am writing this we are being informed that our new Prime Minister, Kevin Rudd, and his government are going to sign the Kyoto Agreement.

Now some years ago the Federal Government under Prime Minister Howard was concerned that the number of births in Australia had dropped below the numbers necessary to allow for some population growth. So he set about creating a bonus system that would encourage people to have larger families. Australia declining birth rate wasn't a problem unique to our country – others such as the USA and Canada are also facing this problem. The problem that can result is there may soon be not enough young people to take care of the older section of society.

Many Christian doctors have also yielded to pressure. . .

I read the following in John Jefferson Davis's *Evangelical Ethics:* "In 1950 the ratio of workers paying into the [retirement] system to retirees drawing benefits was 16 to 1. Today the ratio is 3.5 to 1. By the time the baby boom generation is ready to retire, the ratio will be down to 2 to 1. Increasingly heavy tax burdens will be placed on younger workers to keep the system solvent. "

Keep this in mind now as I relate what a more recent article stated in our newspaper:

> "Couples who have more than two children should be taxed a $5,000 carbon tax at birth and then up to $800 a year for subsequent children to offset their greenhouse gas emissions, a leading Perth obstetrician has proposed. King Edward Memorial Hospital's clinical associate professor of obstetric medicine Barry Walters said that although his controversial proposal was slightly tongue-in-cheek, there was a legitimate scientific argument to think twice about having big families that could not be sustained by the environment."

Later in the same article he says: "On the other hand, contraceptives such as the pill and condoms should attract carbon credits that could be used to offset people's income tax liability."

But Professor Davis points out that population growth is needed and is good for our countries. He writes:

> "Demographic experts are now beginning to give greater recognition to the positive long-range benefits of population growth. As Professor Julian Simon of the University of Illinois has stated, 'People bring not only mouths and hands into the world but also heads and brains.'"

He lists other considerations as well and finally comes to the conclusion,

> "These considerations mean that Christians who have larger families, and who raise their children well, are making a contribution of great significance to both society and the kingdom of God. Such Christian families produce young people of character

> and diligence who will contribute to the solution of the difficult problems facing the Social Security system and other facets of American life. Christians who have larger families are also contributing to the expansion of God's kingdom in the world. Humanists who consistently practice the Zero Population Growth philosophy are literally breeding themselves out of existence. Christians, on the other hand, who have a philosophy of positive population growth, will, under the blessing of God, achieve a position of cultural dominance over the course of several generations. . . . God wants his kingdom to expand through evangelism and through the raising up of a godly seed (Mal. 2:15)."

So will the world's global warming worry cause us to view children as bad for the planet, or will we continue to see them as the blessing from God that they most certainly are?

STDs: the price for immorality?

Dr. Chris Richards is a Pediatrician and the director of a Christian relationship organization in Britain called Lovewise. While writing in the November 2007 issue of *The Banner of Truth* (www.banneroftruth.org) he warned readers of another impacting issue of our day. He asserted that we are in the midst of an epidemic. "On both sides of the Atlantic, infections caught through sexual activity are spreading rapidly, causing fear and destruction, and overwhelming health services."

After giving some detail about these infections he goes on to ask how the medical profession views this epidemic.

> "It has taken its attitude from an increasingly secular society, whose immorality has been the cause of the problem. Doctors have tried to remove any moral dimension from their clinical practices (this approach is also reflected in their general acceptance of abortion and willingness to consider the introduction of euthanasia). Such infections are then labeled an unfortunate consequence of a 'lifestyle choice'. Patients choose the way they want to live, and doctors come to their help with a powerful array of treatments. A doctor could expect professional censure if he expressed a view that [Sexually Transmitted Diseases (STDs)] were the price to be paid for sexual immorality or were a sign of God's judgment. He would be seen as abusing his expected moral neutrality and as returning to mediaeval judgmentalism. Sadly, many Christian doctors have also yielded to pressure from society by attempting to leave all moral considerations outside their consulting rooms."

Dr. Richards then continues to show the relationship between Sexual Sin and Disease. He points out that much of what is happening in our society is brought about by what our young people are being taught in the education system.

Most school systems believe that young people should be taught "safe sex". This means that young people are taught the use of condoms and other means of "sound" sexual practices. The result has been that many school students believe that one is old fashioned if one does not have sexual relations with others. They no longer believe, as John Stott puts it, that, "illicit sex degrades people's humanness, sex in marriage, as God intended, ennobles".

Dr. Richards, in his articles, points out that many young people, even though they accept the perverse message they are being taught, still find themselves feeling demeaned. Somehow they realize that what they accept as being normal leads to a decline in feminine charm and masculine chivalry.

Conclusion

Now I realize that in many instances our young people are given a better pattern to live by. But we must all realize that nevertheless the danger is there of being influenced by the world and its attitudes.

As parents we have the God-given duty to guide our young people and help them to avoid the dangers that surround them. We can be thankful that most of our people are able to have their children instructed in a Christian environment. And yet, we must be on our guard to know the influences they come under, through the TV and their computers and the people they come into contact with.

Can we save the planet by having more kids, or less? The world is confused; we don't need to be.

The Outcome of Suffering

by Jane deGlint

Suffering is like the impact of an enormous ball which turns into a multi-tentacled blob as soon as it hits you. Whether you had seen it come or not, it strikes with an overwhelming force. As it wipes you off your feet, it spreads itself over you and holds you in its grip with its many protruding branches and globs. You become powerless. Your mind stops functioning rationally. The harder you try to fight it off, the more it tightens its grip on you. It bears down on you till you have turned into a blob as well. Then it absorbs you.

Your first reaction is surrender. You are in no position to make heads or tails out of it. You hope that with your capitulation you have convinced the monster to leave. And it seems to be working. You are a free person again! You believe it firmly, till the blob returns with another blow.

It is possible that you are the type that refuses to surrender. You will keep fighting. You refuse to accept that you are in severe trouble. You convince yourself that you can handle it. You ignore the warning signs and push on. Till you lose your stamina. You turn into water and dissipate into a puddle. Who can overcome the monster?

There are in fact several options in dealing with the monster. You do not even have to believe in a higher power to discover ways to shake the monster off. Escape routes present themselves to those who find the fortitude to analyze their distress. Even fallen man is capable of devising ingenious solutions to overwhelming problems, especially if a group of people stands together in the conquest of suffering.

Examples of these rescue missions abound. When an army has established itself in enemy territory, the conquered nation will initially appear docile. The ruthless takeover has left the people dazed. Some will try to ally themselves with the invader, only to be absorbed by him. Others fight themselves to death. But still others stand back. They realize the predicament in which they find themselves, but they resolve to break the enemy's force. They analyze his habits and customs. They look for people in the free world who would be willing to help their cause, for whatever reasons. They locate individuals who are in a position to supply money, materials and man power. Slowly but surely they poke holes in the tight regime of terror. Their cause starts to gain momentum. History has proven that such concerted and insisted efforts are able to shake off a powerful enemy.

Another example is the fight against disease. A sickness strikes with great force. Some succumb at the first onslaught. Others fight back with the appearance of success; but the sickness returns and decisively wins the battle. Yet others arise who scientifically describe the course of the illness, who research its patterns, who discover methods to alleviate its devastating effects, who design ways to stop its progress, and who succeed in preventing it all together.

Whereas the benefits of such triumphs cannot be denied, they are only a limited victory. In the end all people have to cross the threshold of death. Moreover, there is much suffering that cannot be alleviated by either political or medical means. There is the individual suffering of broken relationships. There are situations of physical and mental abuse. There are many ailments for which there is no cure. There is systematic oppression by regimes who claim to have legally obtained the power to rule. There are children who suffer in the school system at the hand of bullies or teachers. There are adults who are constantly harassed at work. There are seniors who are treated unfairly by their caregivers. For many of these situation there are no immediate solutions.

Moreover, even though the search for solutions helps to alleviate the problem in some cases, it fails to place suffering in a larger context. The pain of suffering might be temporarily alleviated with human solutions, but it can only be permanently understood when seen from the spiritual angle. Only when the cause and outcome of human suffering is considered in the light of God's revelation, will the impact of suffering be alleviated. The blob takes on a different appearance. It receives a positive dimension. In the light of the Word our suffering becomes a source of joy.

This spiritual process takes time. Believers may need many lessons to internalize their trust in their heavenly Father. The knowledge that he will look after them will have to travel from their minds to their hearts. As long as they begin to doubt the Lord's faithfulness when the monster hits, they cannot see the purpose of their troubles yet. But once they have obtained the confidence that their Father is firmly in charge, the monster begins to shrink. Rather than doubtful, they now become encouraged at the time of trouble. Their weakness has directed them to the strength of their Father.

With spiritually illuminated minds they begin to understand why the Lord tests them with such intense suffering. Whether their pain is physical, mental or spiritual, or all three, it is meant to elevate them from the realm of the fallen world to the kingdom of heaven. When a believer

accepts his pain as part of the Lord's care, his rebellion and smugness disappear. He realizes that the entire creation suffers under the burden of sin. His feels a tinge of joy when he sees a glimpse of God's ingenious ways. Through suffering the Lord reminds us of our sin and makes us feel the consequences of man's rebellion. But suffering also serves as a cleansing from sin. Under the guidance of the Spirit it leads the believers into the paths of righteousness and gives him a taste of the exuberance of faith.

The outcome of suffering in the life of a child of God is often very personal and intimate, yet the resulting peace is observed by others. Some will not understand what they see. Others are jealous for this superhuman gift. But fellow-believers recognize the Lord's hand; they rejoice with the hurting believer for the way in which the Lord works all things together for good for those who trust in him.

Once we have accepted our suffering as the Lord's care for us, we learn to depend on him during new setbacks or continuing pains. If the Lord has helped us in the past by turning all our troubles for good, he will do so again and again, till we enter the eternal bliss. The gratitude of our heart will spill over our lips into a song of praise. "Because your love is better than life, my lips will glorify you. I will praise you as long as I live, and in your name I will lift up my hands" (Psalm 63:3-4).

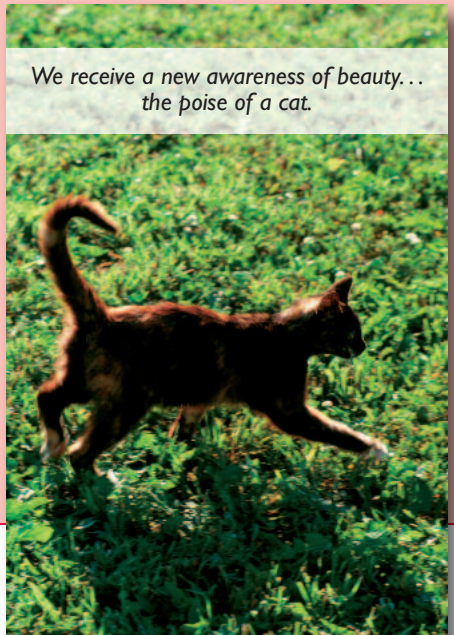
As our gratitude becomes audible in our psalms of joy, so it will turn visible in our life of holiness. Our suffering has taught us to trust the wisdom of our Father. We want to walk in his wise ways, staying in step with his Spirit.

Guided by the Spirit we embark on a path of discovery. To our amazement we notice that we receive a never-ending supply of inner joy. Unexpectedly we might feel a smile on our face at a time when our eyes are filled with tears of sadness. Moreover, we observe that we make God-pleasing choices. We learn better to say no to temptations. We start to dedicate our labors to the glory of our Father. Becoming more aware of the need for a Savior, our love for Jesus grows and becomes a guiding force in our lives. As the burden of our sins is lifted, we start to view eternity differently. Whereas before we would consider eternity to be the end of our trouble, we now understand that our entrance into eternity begins when we dedicate our lives into the service of our King. Our hope of glory soars. How good it must be to serve the King perfectly!

The pain of suffering might be temporarily alleviated with human solutions. . .

To our amazement we also notice that we are receiving a new awareness of beauty. A moving cloud over a solid mountain. The innocent charm of a child's face. The painting of a master. The wrinkled hand of an aging woman. A chorus from Mendelssohn's Elijah. A well-kept flowerbed. A line of poetry. The furrowed smile of an old man. The poise of a cat… If this world can still be so beautiful, how awesome and fair shall the new world be?

As we start to live closer to the Father, we talk with him more often. We thank him for his continued protection. We need his help to remain on course with the Spirit. We express our gratitude to King Jesus for saving us from the realm of death. The words of Paul in Colossians 4:2 become a new reality. "Devote yourselves to prayer, being watchful and thankful."



We receive a new awareness of beauty. . . the poise of a cat.

Our thoughts go out to other believers who suffered. We marvel at the testimony of the apostles after they were beaten by the Jewish council for proclaiming the risen Jesus to the crowds in the temple. The apostles rejoiced that they were counted worthy to suffer dishonor for the name of their Lord. Such is the intensity of spiritual strength, that physical suffering is endured with joy! The apostle Paul widens the scope of suffering further when he connects his suffering for the sake of his brothers to the suffering of Christ himself. When we suffer for the body of Christ, we complement the suffering of Christ. Our suffering has an essential function in the story of salvation (See Colossians 1:24).

In the strength of the Spirit we are able to take on the final step of suffering: our transition from our body of sin to our body of glory. Although every believer prepares himself for the passage through this door, it takes on a special meaning for those who die as a direct result of their faith. Their death serves to complement the suffering of Christ.

Acceptance of suffering as instrument of the Father does not imply that believers must refuse means to alleviate their pain. Refusal of such means could be an indication that the believers have cultivated their suffering as a form of self-righteousness. Often the Lord employs medical, mechanical or political means to save his people from their suffering.

Our suffering for Jesus' sake is not a curse, but a blessing. It serves to purify our souls and connects us to the suffering of our Savior. How blessed we are, when we receive the grace to experience our suffering as God's way to accomplish his purpose for our lives!

"Then one of the elders asked me, 'These in white robes - who are they, and where did they come from?' I answered, 'Sir, you know.' And he said, 'These are they who have come out of the great tribulation; they have washed their robes and made them white in the blood of the Lamb."
Revelation 7:13-14

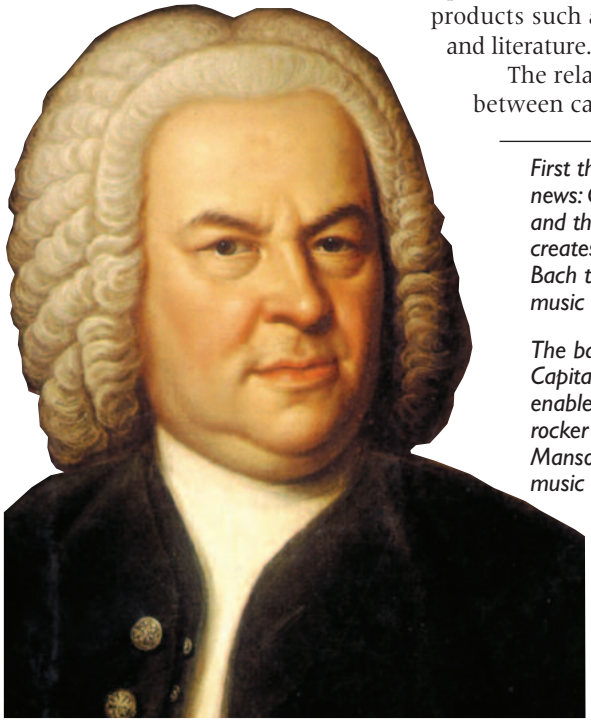
MONEY CULTURE:

What Capitalism has done for the Arts

by Michael Wagner

The arts in Canada receive considerable financial support from both the federal and provincial levels of government. Government funding for these kinds of cultural pursuits is also common in other Western countries, even the USA. The argument for such funding is that the free market will not support many important artistic and cultural endeavors such as orchestras, drama companies, poetry, etc. and if the government doesn't fund the arts, they will virtually disappear. Government financial support is essential for the survival of the arts.

While it is certainly true that eliminating government funding for the arts would lead to the collapse of many contemporary artistic groups, it would be a mistake to see the free market (a.k.a. capitalism) as hostile to artistic and cultural production. The rise and spread of capitalism has, in fact, been a major factor in the development and increasing accessibility of valuable cultural products such as music and literature. The relationship between capitalism and the flourishing of the arts is described in detail by economist Tyler Cowen in his book *In Praise of Commercial Culture.* Generally speaking, capitalism is a powerful force for creating wealth and fuelling technological development. Both of these effects play important roles in increasing artistic activity.



First the good news: Capitalism and the wealth it creates enabled Bach to make music for his living.

The bad news? Capitalism also enabled shock rocker Marilyn Manson to make music for his living.

With wealth comes time for creativity

Throughout history it has been very difficult for artists of various kinds to support themselves through their creative products. Some (such as Jane Austen) have lived off of their family's wealth. Others, like T. S. Eliot for a while, worked at regular (non-artistic) jobs. And sometimes wealthy patrons (including governments) would fund the work of an artist like Johann Sebastian Bach. But with capitalist economic development, wealth became more widely spread, and the purchasing power of the common man and woman created markets that could support artists whose work had some degree of popular appeal.

Cowen summarizes the overall impact of capitalist economic development on art as follows:

> Capitalism generates the wealth that enables individuals to support themselves through art. The artistic professions, a relatively recent development in human history, flourish with economic growth. Increasing levels of wealth and comfort have freed creative individuals from tiresome physical labor and have supplied them with the means to pursue their flights of fancy. Wealthy societies usually consume the greatest quantities of non-pecuniary enjoyments. The ability of wealth to fulfill our basic physical needs elevates goals and our interest in the aesthetic. In accord with this mechanism, the number of individuals who can support themselves as full-time creators has risen steadily for centuries.

These people can support themselves through their artistic endeavors because there is a market for what they produce. They no longer need to obtain the support of a patron, or live off of their family's wealth, or even have another job on the side, in many cases at least. They can sell their cultural products to earn a living. "Today, most of the important work in film, music, literature, painting, and sculpture is sold as a commodity. Contemporary art is capitalist art, and the history of art has been a history of the struggle to establish markets."

Literature spawned by technology

The development of new technologies that has gone hand-in-hand with capitalist economic development has also been extremely beneficial for the arts. The invention of the printing press by Johann Gutenberg would lead to a flourishing of literature, and even helped in the spread of classical music through printed sheet music. "Gutenberg and most other early printers were businessmen intent on making profits, and they viewed books as a lucrative form of commercial merchandise. From the very beginning, publishing was a capitalist enterprise driven by consumer demand and marketing considerations."

Technological progress aided much more than just literature, however. Innovations in the chemical industry led to new kinds of paint that contributed to developments in painting. The invention of radio and audio recording had a dramatic effect on the world of music. Rock and roll music only really became possible after the invention of the electric guitar. Some people understandably might not be pleased about that development, but the new technologies have been a major boost to good music as well. "The sound of classical music today flourishes like never before. The works of Bach, Mozart, and Beethoven have never before been so accessible, through both concerts and recordings."

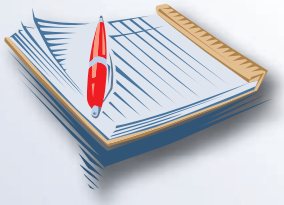
Conclusion

Despite the tremendous impetus given to artistic production by capitalist economic and technological development, most aspiring artists of all kinds are unable to earn a living in their field of talent. This may seem like a paradox, but it's not. "We find a greater number of individuals who work as professional artists than ever before; the absolute quantity of successes has risen rather than fallen. Success nonetheless appears more difficult because the number of competitors has risen even more rapidly than the number of winners."

Clearly, capitalism has been a boon to the arts. Economic development has made it possible for more artists than ever before to earn a living from their talents. And technological progress has led to new art forms and even the better preservation and spread of older forms such as classical music. Capitalist economics is significantly more important to the flourishing of the arts than government funding. The arts could easily survive without the latter, but not without the former.

Michael Wagner's first book, entitled On Guard For Thee: the Past, Present and Future of Canada's Christian Right *is available now at www.ecpcentre.org.*

Readers' Response



Dear Editor,

Credit where it's due, please.

Mark Penninga's article *It's Time for a Royal Commisssion on the Family* (*RP*, Dec. 2007) says The Institute for Marriage and the Family Canada (IMFC) "brought forward an interesting idea earlier this year that few people have given much thought to. Why not have a Royal Commission that studies the state of the family in Canada?"

However, the Christian Heritage Party has been calling for a Royal Commission on Marriage and the Family since mid-2006!

We're glad the IMFC is also calling for a Royal Commission – the more voices, the better; and it may be that their social conservative think-tank will get more attention from the Harper Conservatives than a competing political party. We understand that. But it's hard for the CHP to win support in the Christian community when even Christian writers ignore the good things this Party is trying to accomplish for Canada.

Thanks for setting the record straight.

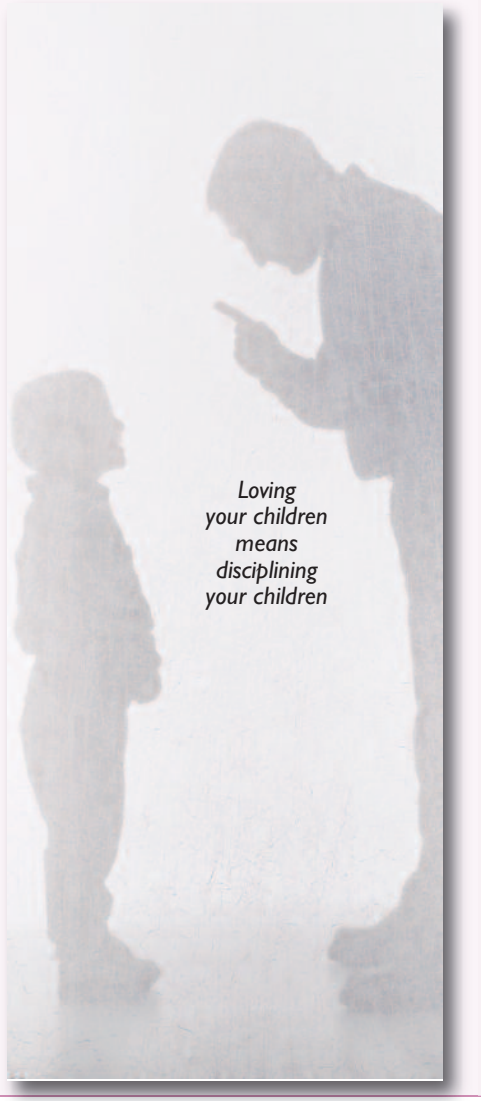
Ron Gray
National Leader
Christian Heritage Party of Canada

With A Promise

by Christine Farenhorst

It is with considerable sadness that I often see children disregarding, if not completely disobeying, their parents. Whether it is the child in the line-up at the bank who whines because he or she may not touch something, or whether it is the child being carted around at a grocery store or Wal-Mart who demands to be bought some candy bar or some toy, the story is the same – a total disregard for the parent who says "no." Not to completely put blame on the willful child, there is a certain amount of laxness and fear in many parents to confront children in their sin. As well, grocery stores and Wal-Mart put one in mind of secular parents, but Reformed people by no means have a clean slate when it comes to discipline. The "for examples" are quite a few. Immodest dress codes have been known to fill the pews on Sunday morning with parents alongside just as sloppy in their apparel as their children; fathers and mothers reneging on their baptismal vows when they let young ones watch inappropriate TV programs or listen to disharmony on the radio; and guardians defending rude behavior as well as taking lip from their offspring in private and in public without taking them to task. These are just a few examples of a serious flaw in understanding what it means to raise godly offspring.

The commandment given in Deuteronomy 5:16 to "Honor your father and your mother" is not some ancient saying to be shelved for future reference. No, it is an express command reiterated by the Lord Jesus Himself in the Gospels. Paul, in Ephesians 6:1 puts his finger on it when he says, "Children, obey your parents *in the Lord."* That children obey parents is the will of the Lord. This makes obedience not just a service given because, after all, Mom and Dad are nice and children love them, but an act of service which is to God Himself. As well, obedience to parents, honor to mother and father, has a specific promise attached to it, the promise being "that it may be well with you, and that you may live long on the earth."



Loving your children means disciplining your children

A summons

There is a Jewish folk tale about a father who had three sons. The oldest two left home when they were fairly young to, as the proverbial fairy tales relate, seek their fortunes. The oldest prospered and became wealthy, but the middle son did not do very well. Indeed, he became quite poor and had to struggle to make ends meet.

One day, many years after they had left home, the father sent a letter to the oldest son telling him that the youngest sibling was getting married and that the wedding was to take place shortly. The letter read, in part: *"Son, please come home and be sure to bring with you your younger brother so that we may all celebrate together at the wedding. I promise to pay all the traveling expenses that you may incur in fulfilling the commandment, 'Honor thy father and thy mother.'"*

The oldest son read the letter to his wife and children and together they went on a shopping spree. They bought themselves costly materials and had dressmakers sew the materials into rich gowns and suits. They preened and pranced about before mirrors and did not even waste one moment of thought on the middle brother with whom they had very little contact and whom they had not told about the wedding. As the day of departure for the ancestral home dawned, however, the oldest brother did recall that he had been asked to bring his disgraced sibling along. Consequently he had a servant call around to tell him to come immediately. The poor fellow came and was told to step inside the

carriage. Upon his entrance the horses took off at great speed.

"Why did you ask me to come? Where are we going?"

The middle son, pushed into the corner of the carriage by his older brother, was bewildered and when he was told, in the tersest of terms their destination, he fingered his threadbare clothes with shame. Many people were watching as the great carriage stopped in front of the father's house. When the oldest son alighted, in all his finery, many people ooh'd and ah'd. But when the younger son came out in his rags, people shook their heads and turned away.

The wedding was celebrated with much merriment. There was fine food, dancing, singing and gaiety and the bride and groom were sweet to behold.

After some days had passed in this fashion, the older son went to the father and said, "Father, I have obeyed you and have come to celebrate at this wedding feast of my younger brother. I rejoiced with you and the couple, but now I have to go back home. As you know, I'm a merchant and my business can't prosper when I'm not in town."

"Do what you think is best, my son," the father answered.

The son packed his things and gathered up his family but his heart was overflowing with hidden anger. Shouldn't his father have confirmed by this time that he was ready to pay for the clothes that he had bought for himself and his wife and children? Shouldn't he have sat down with him to tabulate all the expenses he had drawn up by traveling all this way? Irritated beyond words, he sat down at his dressing table and itemized all the bills on a piece of paper. This paper he handed to his father on his way out.

"What's this, son? Bills for clothes, bills for inns, and bills for fodder for the horses?"

"Yes," the son said, his resentment increasing by the minute, "and did you not promise to repay me for all my expenses if I came to the wedding?"

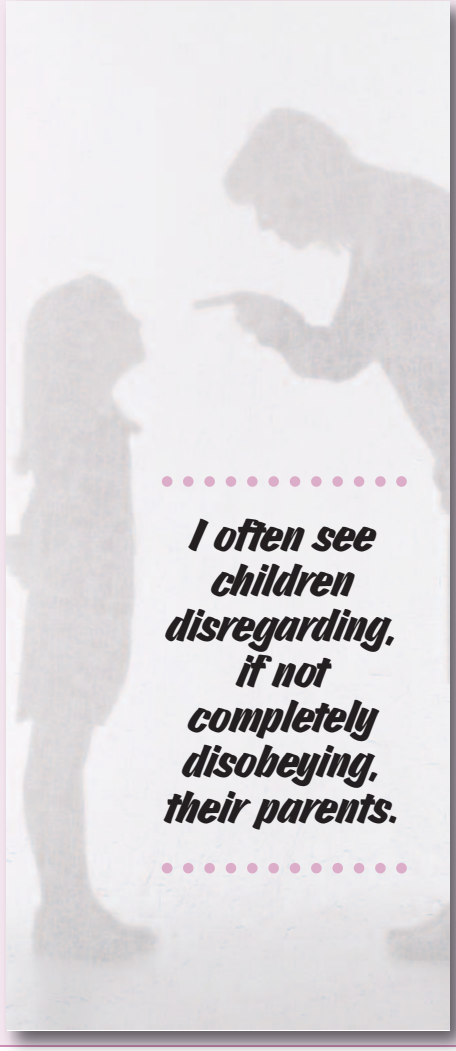
The father looked at the son in mild astonishment.

"I did not make any such promise," he said firmly.

The eldest son reached into his coat pocket and drew out the letter which his father had written to him and read the pertinent sentence out loud.

"I promise to pay all the traveling expenses that you may incur in fulfilling the commandment, 'Honor thy father and thy mother.'

Then he stood quietly in front of his father, staring at him in a forceful manner before continuing in a demanding voice.



"So what have you to say now, father? Did you promise or did you not promise?"

"Well," said his father, steadily returning his oldest son's gaze as he answered, "let us just go over carefully what exactly I wrote to you. I promised to reimburse you for all the expenses that you would incur in the fulfillment of the commandment, 'Honor thy father and thy mother.'"

The son nodded and the father went on.

"Had you really wished to honor me you would have taken pity on your poor brother and you would have clothed him suitably when you brought him with you. You would have understood that to honor me was to clothe him decently and to help him. So you see, that the expenses you incurred for the wedding were only for your own honor. And for your own honor, son, I did not promise to pay."

The gift of discipline

It is a Biblical given that children who obey their parents receive a blessing. The words read, "That it may be well with you, and that you may live long on the earth." Proverbs 10:27 reiterates this command and blessing. "The fear of the Lord prolongs life, but the years of the wicked will be short." This promise of blessing undergirds a stable society. Without obedience to a strong moral law, there is no abiding blessing.

Parents who refuse to punish children when they are little, are not training their children properly and are, in effect, withdrawing them from God's blessing. As a general rule, obedient children are happy and content and disobedient children are unhappy and discontent.

Although it may appear easier not to punish and to let a child have his or her own way, in the long run the benefits reaped from proper discipline are eternal. If you did not get your child a rod for Christmas, buy him one for his birthday. Remember, "he who spares the rod, hates his son," but "he who loves him is diligent to discipline him" (Prov. 13:24).

THE END OF CHRISTIAN EDUCATION

by Daniel R. Vander Ark

Is this an article about the slippery slope of Christian schools? One more doomsday warning, now applied to Reformed Christian schools? Sometimes we parents who have sacrificed for decades wonder whether the passion that built these schools is fading more in each successive generation. Some parents, themselves the beneficiaries of a Reformed Christian school, are sending their children off to public schools. A pastor friend five years ago told me that he thought Reformed Christian schools would be few and far between within two decades.

No, these schools will not die. The reason they will survive, despite the high cost, is that they belong to God and His people. But unless we Reformed Christians step up to insist that these schools intentionally carry out in *practice* what they *preach* in foundational statements, we will be spending thousands for a thimble full of substance. Our children will be less equipped to be servants in the Kingdom of our Lord Jesus Christ if what we profess as the purpose of these schools produces little evidence in the classroom.

The title for this article I borrowed almost word-for-word from Neil Postman who has written many books on education, this one called *The End of Education*. In it he criticized America's public schools for having no stated purpose – they had no end in mind and were therefore in danger of "ending." But he went on to say what he thought should be the purpose, or "end," of education: essentially to learn American history well.

Reformed Christian schools need to sharpen their end, their purpose, and help students learn deeply how to *live* that purpose now and beyond.

Learning from history

Many writers, Marsden and Longfield among them in *The Secularization of the Academy,* have pointed out how the great universities of the Western world began with strong Christian purposes. McMaster, Yale, Harvard, Oxford, and Chicago all began with a stated Christian end. Here's an excerpt from the College of Law's purpose at Harvard University in 1642:

> Let every student. . . consider well the main end of his life and studies is to know God and Jesus Christ which is eternal life, John 17:3, and therefore to lay Christ in the bottom, as the only foundation of all sound knowledge and learning. Seeking the Lord giveth wisdom; everyone shall seriously by prayer, in secret, seek wisdom of Him.

Few today will find God at Harvard, certainly not in the classrooms. Marsden and Longfield trace the gradual fade of Christianity in the most prestigious universities through the Western world. They suggest that an increasing dependence on scientific knowledge as truth by faculty led to the secularization. Any study of American independent (called "private" in the U.S.) day schools with a history longer than a century will illustrate the same process. These schools, too, began with a Christian purpose, have become secular, and pride themselves in their academic rigor.

Is that where Reformed Christian day schools are headed? In the early 90s, a Reformed Christian school principal did his graduate thesis (Hoeksema, *A Study of Dutch Calvinist Day School Distinctiveness,* 1991) on the Reformed character of two Reformed Christian schools in California. He spent two weeks in each school, interviewing students, teachers, board members, and parents; he visited classes. His conclusion was this: all could articulate the Reformed principles of the school's purpose; however, he saw little evidence of those principles taught in the classrooms, wondering whether our vision for Reformed education is more "rhetoric than reality."

A current danger

A ream of research over the last decade has brought to public light another problem of living an integrated whole Christian life. We Reformed Christians have prided ourselves in seeing all of life without seams or partitions, resonating with Kuyper's "every square inch" of the creation belonging to Christ. We make no divisions between piety (singing, praying,

"Teacher, is this going to be on the test?" Kids know all the important stuff will be on the test.

Bible reading) and the choices in life (handling an acre of ground, behavior in relationships, choosing what we eat or see). We have faulted other Christians for their other-worldly piety and their living life otherwise as the worldly do. Today Reformed Christians often live in two different worlds: God in prayer and worship; shopping, eating, and business without Him.

This divorce between principle and practice is apparent, too, among our youth. A recent study of more than 3,000 American teenagers, summarized in a book *Soul Searching: the Religious and Spiritual Lives of American Teenagers* (Smith and Denton, Oxford, 2005), offers convincing evidence of this separation, even among conservative Protestant youth: "…religion seems to become rather compartmentalized and backgrounded in the lived experience of most U.S. teenagers." The writers go on to say, "We found very few teens from any religious background who are able to articulate well their religious beliefs and explain how these beliefs connect to the rest of their lives."

Having noticed this separation, the writers do, however, illustrate that the interviewed teens do believe religion is important in their lives. The majority of teens believe in God, are not generally rebellious, and do participate in religious rituals with their parents. Their understanding of God, say Smith and Denton, is of a "Divine Butler." The authors describe the mindset of these young people as "Moralistic Therapeutic Deists." Religion "is very important in the strictly *religious* sector of their lives. Religion influences them religiously – that is, when it comes to church attendance, basic beliefs, prayer, and so on – but not necessarily in other ways." Religion "is mostly part of the furniture in the background of their lives."

Does this digital photo of America's religious culture match the religious landscape of youth in Canada? If it does, and the end or purpose of Reformed Christian day schools is to teach students that God is sovereign over all things and will certainly bring His full kingdom to completion, how can Reformed Christians be faithful in educating their youth toward this end? How can we avoid the twin ditches of gradual secularism and the divorce of faith and life?

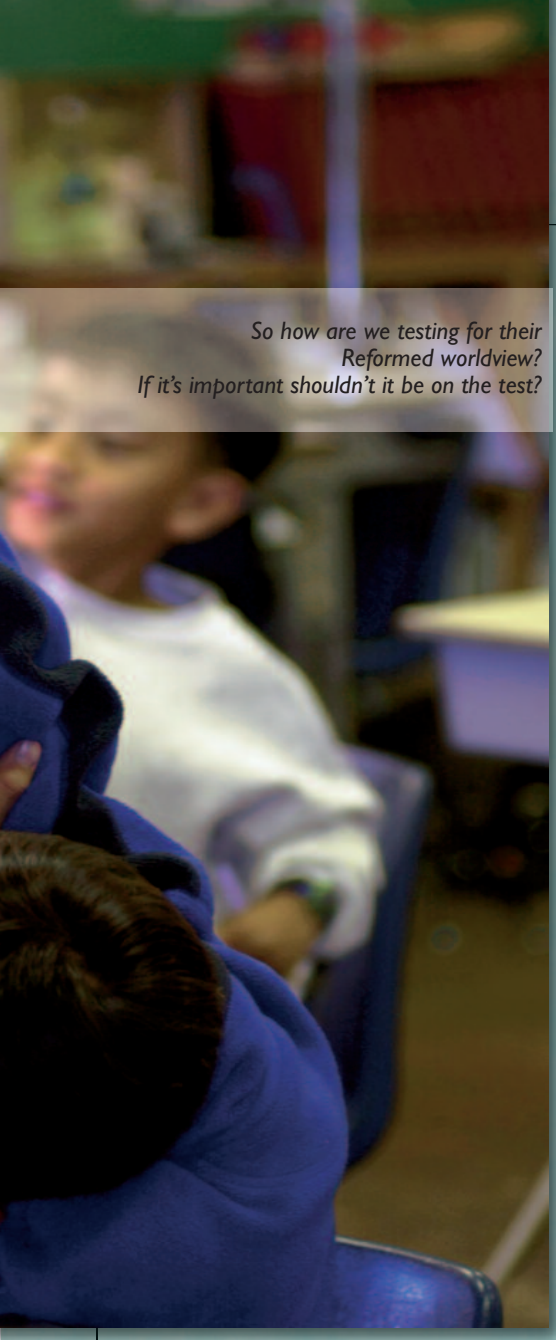
Sharpening the purpose

Most Reformed Christian schools are built on twin pillars: the covenant and the kingdom. These pillars rest on the bedrock that the Bible is the true account of God and His people and, at the same time, God's living Word that guides living life back then, now, and until Christ comes again. These schools often state boldly that part of their purpose is to teach students to see all of life "through the spectacles of Scripture" (Calvin). The schools' foundation statements make claims about all of life "centering in the Lordship of Jesus Christ," and "all things holding together in Christ," and make claims that they are teaching students to be "in the world but not of the world."

Covenant is more the *basis* for these schools. On this general cultural landscape dwell God's covenant people, his "holy nation." We Reformed Christians believe that God chose us to keep covenant with Him. We also believe that this covenant includes God's children and that part of our promise as parents and as a church is to educate our children in the truth: "These commandments that I give you today are to be upon your hearts. Impress them on your children. Talk about them when you sit at home and when you walk along the road, when you lie down and when you get up" (Deut. 6:6-7). This full-orbed instruction, we believe, includes the Christian school.

Kingdom is the *end* for these schools. God made everything good; humans warped this creation, including ourselves. God offered a rescue through his perfect Son. When this Son came to earth, He gave peace to those who believed He was God and accepted His grace. At the same time, He declared His intent to bring all things under His rule. He commissioned His people to be agents to extend this rule until He comes again at the end of time.

Of course, the Reformed churches and homes stand on these pillars too. They,



So how are we testing for their Reformed worldview? If it's important shouldn't it be on the test?

too, seek to see all of life through the glasses of the Bible. What is unique about the role of Reformed Christian schools? More than two decades ago, D. Bruce Lockerbie compared these three roles – of the Christian home, of the church, and of the Christian school. In *Who Educates Your Child?* (Zondervan, 1980), he said,

> The Christian home *incubates* a child's character, providing those moral and spiritual conditions favorable to the child's healthy development as a believer. The church *inculcates* knowledge of the creeds and doctrines. By preaching and teaching, by observance of the holy sacraments, and by being a community held together in common worship, fellowship, and service, the church impresses the child with his responsibility to participate in the Body of Christ. But the Christian school *integrates* every element of human knowledge and experience into a view of life that is whole and wholly Christian.

The Reformed Christian school is the most appropriate agency to teach children how a Christian worldview intersects with life in all aspects. It is the place where piety and perspective ought to lead to Christian practice. It is the place for students to learn the longing of every Christian, expressed in the lyrics of an old hymn, "So shall no part of day or night from sacredness be free, / but all my life, in every step, be fellowship with thee."

Teaching toward the end

In *From Mission to Measurement* (CSI, 2000), I have described ways to teach toward these ends. Here, I'll just briefly explain three: *intersections*, interpretation, and testing. To counter the temptation that young people have to box faith into a Sunday or catechism box, good teachers in Reformed Christian schools need to make *intersections* daily between the Word and the world. Sometimes it needs to be learning directly from the Word the psalmist's description of the order God put in creation (Psalm 104); sometimes it needs to be direct counsel such as "Let no unwholesome talk come out of your mouth" (Eph. 4:29). But other times students need to see the principles of stewardship of God's creation applied to time, materials, and one's own skills and abilities. It is a Reformed Christian worldview applied to art, music, science, health, technology, and more.

It is the Reformed Christian schools where students learn to *interpret* the world. A rabbi says, "Now we help them know what they see rather than see what they know." Students will see anything without teachers. Christian school teachers need to help their students understand to "know what they see." What is dark about certain song lyrics? What is the difference between "private" and "alone"? How does calling the substance of a womb "tissue" or "child" form our view of God's people? How is "If it feels good, do it" a poor way to make decisions?

Testing is another way to reach the end of Christian education. We often think of testing as the *result* of learning, but it can be used to reach the purpose *during the test.* First, most students believe that what is on the test is what the teacher values the most. If true, teachers ought to put on the test what is most important in achieving the purpose of Christian education. Second, if teachers ask students to write the intersection of faith and life on a simple subject, students are forming that connection in their minds *while* writing it, e.g., "How does this character's views of God's creation differ from what the Bible tells us?" A third kind of test is asking students in their last year in a Reformed Christian school to give a senior presentation to an audience of parents, extended family, and friends. Each student essentially answers this question, with illustrations, "What is your worldview and how does that apply to what you have learned in the past and will likely do in the future?"

The time is short. The times tempt us to apathy. History shows how gradually Christian schools lose their life. Reformed Christian schools have a vital role in teaching our children to live well within the Kingdom of God. Shakespeare says, "All's well that ends well." Reaching the right end well means teaching toward it intentionally. . . until He comes again.

Discovering My Inner Dutchman

In The School Computer Lab

by James Dykstra

Let me just say that I have the greatest respect for the Dutch. I have been steeped in Dutch Canadian culture since I was young enough to crunch a King peppermint so I know about the Dutch reputation for being thrifty. Some would uncharitably say that a Dutch Canadian could grasp a penny so firmly as to leave it gasping for air. The truth is only that we folks of Dutch extraction have been brought up to appreciate the value of a dime, let alone a dollar.

In contrast with that, I'm a computer teacher. Everything in the world of computers is fabulously expensive. You need newer and newer computers, faster and faster software, and all sorts of cool devices to plug into your computer if you're going to make it all work well. This all costs money, and, well. . . my inner Dutchman rebels at the idea.

So what do I do? How do I get my students doing fabulously cool things with less and less money? How do I resolve that ongoing war between my thrifty Dutch character and my computer geek nature?

It can be done. . . if you're careful.

Make old things last longer

Most schools that are older than five years have several (and often dozens of) old computers stored in a backroom somewhere. They're there because they're too slow for the computer lab and nobody wants that old junk in their classroom. What if you could do something useful with those old machines? It's possible.

Now here's a crazy idea. Disconnect the hard drives in those computers, Take out those noisy cooling fans. Download some software from www.publicwebstations.com and burn it to a CD. That CD will replace your computer's operating system; everything your computer needs to know will be on that CD. Now pop that CD into your computer's CD drive, connect your computer to your school's Internet connection and suddenly your old, useless computer is a sparkling new Internet

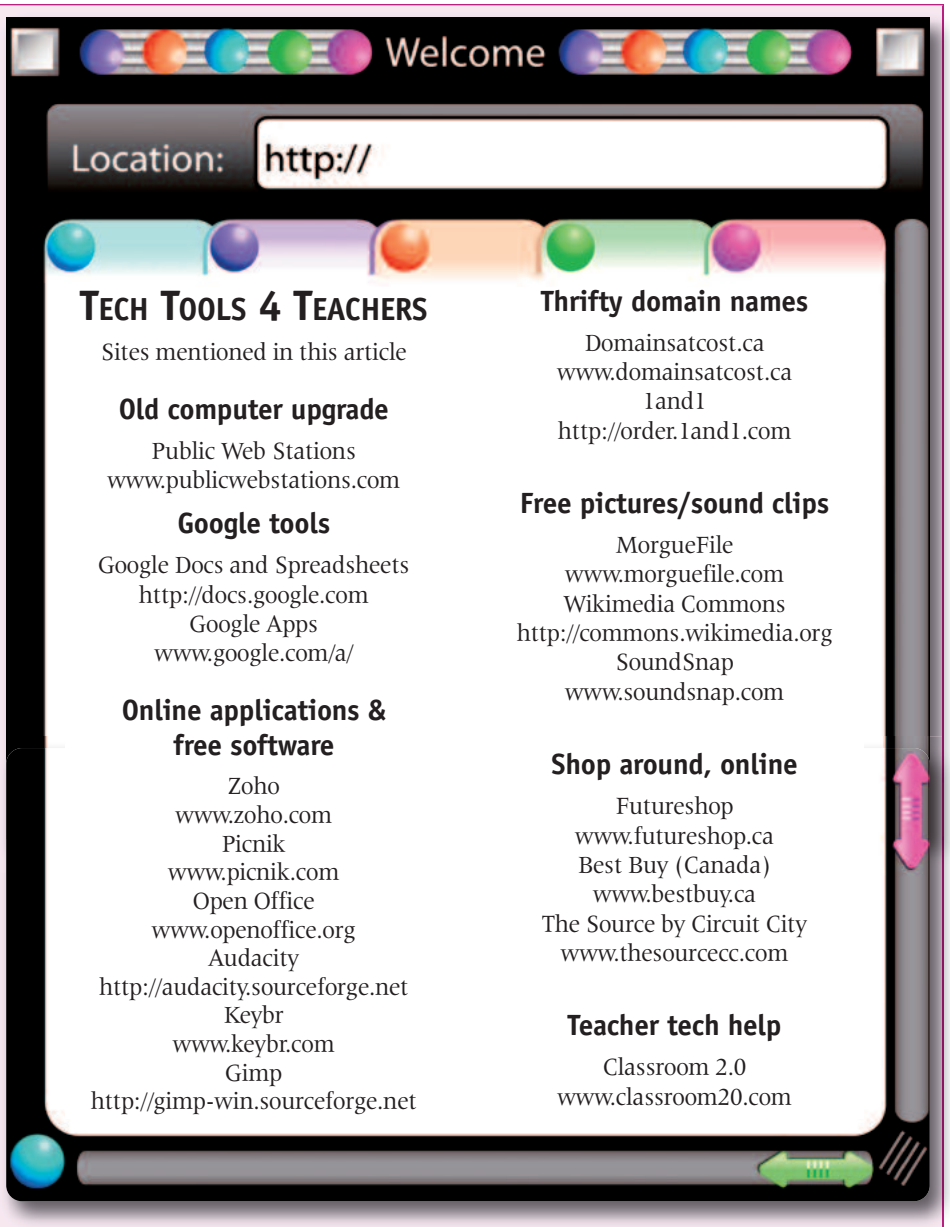
station. Since your computer doesn't have a hard drive, there's no place for viruses to be saved. Since it has no fan there's nothing to make noise. Sure, this new Internet computer may not be fast enough for your computer lab, but you could put a few of these in a classroom and run a mini-lab. These are remarkably stable and quiet. Some computers set up this way have been known to run continuously for two years without any crashes.

But, wait, I can hear your objection: "I need to do more in my class than just surf the Internet." I know. Read on.

The Internet has unexpected value to replace your software

If you need to create a document, build a spreadsheet, make a PowerPoint style presentation, or even work with a database and all you have is an Internet connection, have I got good news for you. You need to visit docs.google.com, and www.zoho.com. These two sites have decent online word processors, spreadsheets, and capable imitations of PowerPoint. Zoho's database functions are really remarkable. These sites may not be good for a full-length essay with footnotes, but they're great for shorter and less formal work. Because they're online, work done on these sites is accessible at school and at home which means students won't be able to use the excuse that they forgot to bring their homework. It's even possible to share a document so two students can work on a project together.

If you need photo editing, try Picnik.com. It does all the basics of cropping, resizing, and rebalancing your color photos for free. If you need to practice typing skills, you could experiment with www.Keybr.com. The list could easily go on. Odds are good that whatever you want is out there somewhere.



Use free software

Free or open source software can often be incredibly good. Some good-hearted souls have designed some remarkable products and then simply given them away. These pieces of software are easily commercial quality, but they're yours for free provided. . . Well, actually there's no strings attached. Just give credit if you change the product, and don't try to make money off a product someone else is giving away. I'm currently typing this article using Open Office, a free office suite given away by Sun Microsystems. I'm using the word processor, but I could also be using a spreadsheet, database, or even a PowerPoint style application. All of it is free.

If that's not enough, edit your pictures using the always free Gimp which some claim is every bit as good as the very expensive Photoshop. Record and edit audio presentations with Audactiy. It's not quite as nice a sound editor as Garageband which comes packaged with Macintosh computers, but it's free and it's really very good.

Don't pay for the fancy add-ons

If you're creating documents like reports, or audio or video presentations, you need to throw in pictures or sound effects. If you buy these, they're extremely

expensive. However, there are great places to find all kinds of pictures you can use for free such as those at Wikimedia Commons or Morguefile.com. If you need sound effects for something, there can be no finer place to look than soundsnap.com. This site has thousands of sound effects and music clips that are all free to use for whatever purpose you want. None of this will cost you a penny.

Maintain control

If you have your students working online, at some point they're going to need e-mail. A lot of parents are very nervous about their children having e-mail at school. They're scared their kids will do something stupid, or come in touch with someone they shouldn't. If your students are using e-mail, as their teacher, you need to be in control of it. To be in control, you need to be in charge of your students' e-mail accounts.

If your school can't afford to give the students official school mail, there is another way. Visit Google Apps. Google, everyone's favorite search engine, will set you up with their e-mail, G-Mail, plus their online word processor, and spreadsheet. Using Google Apps, you get to assign the students their accounts, login names, and passwords. Since you've given out the accounts, if anything goes wrong, you can also shut them down. You can keep your students safe and out of trouble.

As a really neat bonus of Google Apps, the students are all automatically part of each others' contact list making collaboration very easy. If you need to suspend someone's e-mail for any reason, as the administrator, you can. What does all this cost? Well, Google charges you nothing, but they do require you to have a domain name to use for this and that can be had for as low as seven dollars per year from a registrar like 1and1.com or www.domainsatcost.ca.

Buy what you need, not what they say you need

With two of my classes we tried recording sound clips to a particular website. Before we could do that, we needed microphones. If you believe a lot of the salesmen we needed $20 or $30 mikes in order to get decent recordings. The thing is, we didn't want "decent" recordings, only ones that were good enough to be clearly understood over the Internet. We weren't recording a CD, we were adding comments on a website. Cheaper equipment was a much better choice. Some of that equipment even came from dollar stores. That leads to the next suggestion.

Shop around. Shop online

Once you know approximately what you want to buy, watch the websites of the big stores. In Canada, places like FutureShop, BestBuy, and The Source all have their store stock listed online. You can tell the current price and even if a particular location has what you want in stock. You want to watch the websites of the major electronics retailers because you need to find out what a fair price is, and also because the price of electronics varies wildly from week to week. I have seen a flash drive cost $70 one week, $25 the next, and $60 the week after. There's no rhyme or reason to the prices, so take your time and shop around.

Get help

Believe it or not, you're not alone. There may not be anybody else in your school who wants to do more with your computers, but there are thousands of teachers around the world who want to do just that. Go online and find them. The social network site Ning.com has a discussion area called Classroom 2.0. Currently over 4,000 teachers and other people connected with education are members of this group. If you have a question about how to get students in your class using computers, someone in that group has the answer and is willing to share it.

Using computers in your class can be done well, and can be done fairly inexpensively. You need to be creative. You might need some help with the technical geek end of things, but if you're not afraid to ask, and eager to learn, there's always someone willing to help out. Do it well and do it for less. Why not make your inner Dutchman happy, too?

James Dysktra is a Social Studies and Computer teacher. He blogs on technology in the classroom at www.befuddled.info.
Links from this article can be found at del.icio.us/mrpuffin/innerdutchman

A Christian Perspective on Math

Sound like an odd premise?

READ ON. . .

by John Byl

What does math have to do with God? Many people see no connection. Aren't logic, numbers and geometry the same for Christians and atheists? Math is thought to be the hardest subject to integrate with Christianity. Yet, there are very close links between math and God.

Mathematical realism

The key question concerns truth. Most mathematicians believe that mathematical truths such as "6+1=7" are universally and eternally true, independent of human minds. They believed that they are *discovering* properties of, say, numbers, rather than merely *inventing* them.

This view of math dates back to Pythagoras (582-507 BC) and Plato (427-347 BC). They held that mathematical concepts apply best to ideal objects. For example, geometry deals with exact circles, but no physical object is exactly circular – perfect circles don't actually exist. Furthermore, such things as the number "7" seem to exist at all times or, even, beyond time. This led to the notion that math exists in an ideal world of eternal truth. This is called *mathematical realism.*

Where do such eternal mathematical truths exist? Augustine (354-430) placed the ideal world of eternal truths in the mind of God. He argued that eternal truths could not arise from material things or finite human minds. Rather, mathematical truths must depend on a universal and unchanging Mind that embraces all truth. Only God can have such a mind.

Thus math was held to be true because of its supposed divine origin. It was held, moreover, that God created the universe according to a rational plan that used math. Since man's was created in the image of God, it was thought that man should be able to discern the mathematical structure of creation. Indeed, since man was God's steward over creation, man had the duty to study nature and to apply the results towards the glory of God and the benefit of man. Such theological considerations were key factors motivating the scientific revolution. Most founders of modern science, such Kepler, Galileo and Newton, were all driven by their Biblical worldview.

Naturalist math

Ironically, the very success of mathematical science led to the demise of the Christian view. The universe seemed to be so well controlled by mathematically formulated laws that God was no longer deemed necessary. Such over-confidence in scientific laws led to a denial of biblical miracles. This undermined biblical authority. Consequently, many scientists banished God and embraced *naturalism*, the notion that nothing exists beyond nature.

The loss of certainty

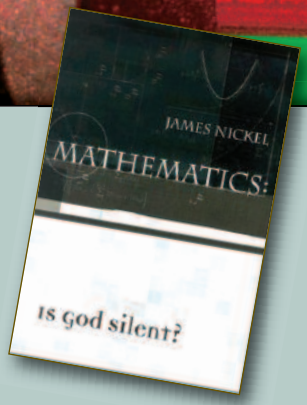
With the rejection of a divine Mind, there was no longer any place for eternal truth. This, in turn, led to the collapse of mathematical realism. Naturalists came to consider math as just a human invention. But if math is just a human invention, why should it be true?

Mathematicians tried to prove the truth of math using the *axiomatic* method. Math was to be grounded on a set of undoubtedly true, self-evident principles, called *axioms*, from which everything else could be derived. The axiomatic method had been used with great success by the Greek mathematician Euclid (circa 300 BC). He derived all the truths about normal (or *Euclidean*) geometry from only 10 axioms.

This became the model for the rest of math. Towards the end of the 19th century the search was on for a set of self-evident axioms upon which all of math could be based. Any system that yields a contradiction is, of course, false. A system of axioms that will never yield a contradiction is said to be *consistent*. A system is said to be *complete* if all true theorems (and no false ones) can be derived from the axioms. The goal, then, was to find a set of axioms that could be proven to be consistent and complete for all of math.

Initially, there was some success. Simple logic and Euclidean geometry were

Not just for math-lovers



Mathematics: Is God Silent?

by James Nickel
Ross House Books, 2001
408 pp: Paperback; $22 US

reviewed by Arthur deLeeuw

I first read this book more than ten years ago, and a recent second read through it caused me to again reflect on the Christian approach to mathematical instruction. The author, James Nickel, throughout his book brings the reader back to his thesis captured in the title, introduction and conclusion of the book. Nickel wants to make it clear God is *not* silent in Mathematics. . . nor anywhere else. So he hopes his book will be followed by others, tackling every subject under the sun:

> "As we look at the place of mathematics in the future of biblical Christian education, let us envision an army of effective and motivated teachers using a whole series of refined textbooks that thoroughly and completely exposes the student to the wonders of God's creation. . . ."

A first glance at the title and the book would suggest that this volume is one to be read by only those involved with mathematical thought or instruction. Nothing is further from the truth. This book will pique the interest and intrigue of those involved in history, philosophy, and science as well as mathematics. A statement like "when a culture rejects basic biblical truths, fragmentation tends to manifest itself in every area of life" will cause every reader to ponder, examine and respond constructively.

This book examines mathematical investigations and developments from the beginning of creation till present day. The author makes strong connections between a mathematician's worldview and how that impacts their mathematical inquiries and thought. For example concerning Plato he states, "Since Plato did not want to bow before the infinite, personal Creator, the God of Scripture, he was left to his own devices and developed an autonomous philosophy." He concludes this section with sound argument that the "sandy foundation of Greek mathematics is the denial of the autonomy of the biblical God."

Throughout the book the author challenges the reader to examine the worldviews that drive our mathematical and thinking processes. He exposes the conflict; the antithesis that continues to exist throughout time where man either relies on the self-sufficiency of his own mind or on the reliance of the truth found in God's Word. He applies this thought to present day by stating, "we have been brainwashed by modernity into believing a lie, a lie that boldly states that the scientist is a man of reason and certainty and the person who believes in the Bible is a man of faith and uncertainty.

James Nickel then addresses all those who teach (this includes many more than just those whose occupation it is to teach). Some try to teach math within a "neutral" framework – this method of instruction is void of any acknowledgement of the Creator. Others try to "tack on" a Biblical worldview. But the approach that the author uses is to encourage the students to see mathematics as a language that allows us to "read" and explore creation. It is incumbent on those who teach mathematics to try and show students they should take math not just "because they have to," or because mathematics "teaches logic and is practical" but rather "because a study of God's creation is the most fertile source of mathematical discoveries." "True motivation and inspiration for mathematics lies in the observance of God's created order."

Mathematics: Is God Silent? is an excellent resource for everyone who wishes to examine and study his or her discipline or profession from a biblical perspective. It is a very readable volume that will encourage teachers in their biblical approach to teaching. It points out with clear argumentation, that truth and knowledge do not come from man's own understanding, but are revealed in God's divine Word and creation. Although not everyone will be able to follow each and every mathematical or scientific example, this book does assist the educator in their role of exposing the students to the wonders of God's creation.

proven to be both consistent and complete. Unfortunately, in 1931 the Austrian logician Kurt Gödel proved that the program was doomed. He proved that any large system of axioms (i.e., large enough for arithmetic with addition and multiplication) will always be incomplete. There will always be theorems that can be neither proven nor disproven by the system. Thus *all* of math can never be based on a finite set of axioms. Math will always be larger than our human attempts to capture it within a system of axioms.

Moreover, Gödel proved also that we can never mathematically prove the consistency of any system large enough for arithmetic. Hence we cannot be sure of the validity of arithmetic, even though we use it all the time! The soundness of math now had to be accepted largely on faith.

The limits of invention

Rejecting theism affected not only the *soundness* of math but also its content. Classical math was based on the concept of an all-knowing, all-powerful, and infinite Ideal Mathematician. The operations and proofs allowed in classical math were those that could in principle be done by God.

It was thought that, if math is just a *human* invention, its methods should be adjusted accordingly. Only those mathematical concepts and proofs were to be considered valid that could be mentally constructed in a finite number of explicit steps. The "there exists" of classical math was to be replaced by "we can construct."

This came to be known as *constructive* math. It entailed a new approach to both logic and proofs. Classical math is based on what is called *two-valued* logic. Any mathematical proposition is either true or false. Take, for example, Goldbach's Conjecture concerning primes. A prime is a number that is divisible only by itself and 1 (e.g., 2,3,5,7 & 11 are the first five primes). Goldbach's Conjecture asserts that any even number can be written as the sum of two primes (e.g., 10=3+7; 20=13+7). No one has ever found a number for which it did not hold. But no one has as yet been able to prove it. Classically, this conjecture is either

true or false, even though we do not yet know which it is. Constructionists, however insist that there is a third possibility: a proposition is neither true nor false until we can construct an actual, finite proof.

The rejection of two-valued logic restricts one's ability to prove theorems. Classical math often uses an indirect method of proof called *Proof by Contradiction*. To proof a theorem, one first assumes the theorem to be false and shows that this leads to a contradiction; hence the initial assumption is false, which means that the theorem is true. Since such proofs rely on two-valued logic, constructionists reject them. They accept only those theorems that can be directly derived from the axioms. Unhappily, this means rejecting so many results of classical math that one lacks the sophisticated math needed in modern physics.

Evolutionary conjectures

If math is just a human invention how did it ever get started? Naturalists propose that evolution has hard-wired our brains to contain small numbers (e.g., 1,2,3…) as well as a basic ability to add and subtract. They conjecture that all our mathematical thoughts come from purely *physical* connections between neurons.

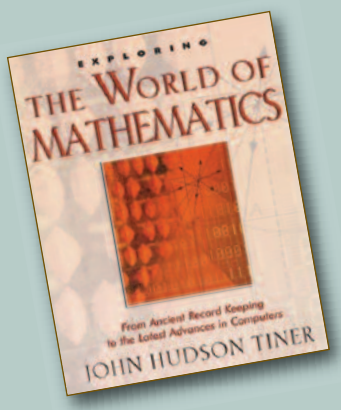
Even if an evolutionary struggle for survival could account for an innate ability for simple arithmetic, it is hard to see where more advanced math comes from. Our ability for advanced math is well in advance of mere survival skills. The evolutionary approach fails to explain also the amazing mathematical intuition of leading mathematicians.

Further, if our mathematical ideas are just the result of the physics of neural connections, why should they be true? Such accounts of math cannot distinguish true results from false ones. Indeed, if all knowledge is based on neural connections, so is the idea that all knowledge is based on neural connections. Hence, if true, we have no basis for believing it to be true.

In spite of naturalist objections, most mathematicians remain realists. They view new theorems as discoveries rather than inventions. The excitement of exploring an objective mathematical universe is a powerful incentive for research. Realism explains why mathematicians widely separated in space, time, and culture end up with the same mathematical results. Moreover, if math is just a human invention, why is it so applicable to the physical world? Math is indispensable for science. Further, if math is a human invention, one might ask: how did math exist before Adam? Are we to believe that "2+2=4" did not hold, so that two pairs of apples did not add up to four?

Christianity and math

How does math fit within a Christian worldview? The Bible tells us that man was created in the image of God (Gen. 1:26-30). The divine image included not only righteousness but also rationality and creativ-



A great teaching tool

Exploring the World of Mathematics

by John Hudson Tiner
Master Books, 2004
160 pp; Paperback; $14 US

reviewed by Arthur deLeeuw

For some the teaching of mathematics presents challenges, just like instruction in the humanities does for others. When we face such a challenge we can treat the anxiety first of all by imploring our Heavenly Father for strength in the task of teaching, (which involves everyone to one degree or another). Reading a book like *Exploring the World of Mathematics*, exposes the reader to a vast array of mathematical and scientific examples to also aid and assist those involved with mathematical instruction. The targeted audience for this book is anyone involved in teaching or learning mathematics at the upper elementary level. It can be read and used at a high school level to help expose and remind students of the wonders found in the areas of counting, measurement, number patterns and modern technology. After reading this book, the educator, whether at home or school, is armed with a vast array of examples which help students in exploring the many wonders of God's creation. The author of this volume sets out to meet the challenge the author in the previous review (James Nickel – *Mathematics: Is God Silent?*) put forward. It is not a textbook that will take a student and teacher through a developed curriculum, rather it will broaden the student's view of mathematics in terms of revealing some of its profound, yet simple concepts. Reading this volume will acquaint and familiarize the teacher with many different mathematical and scientific examples, which they in turn can pass on with interest to their students. Questions at the end of each of the fourteen chapters help the student and reader to internalize what they have read. Having this volume in the home or classroom will spark student interest in the beauty and wonder of mathematics, encouraging motivated learning of the subject.

Arthur deLeeuw is a math teacher at Credo Christian High School in Langley, BC.

ity. This involves the capacity for abstract thought, as well as the ability to reason, to discern and to symbolize. Man was created with the innate potential to do math, to help fulfill his role as God's steward (Gen. 1:28). Adam could have confidence in his mental abilities because God created these to function properly. He was the result of God's purposeful plan rather than an evolutionary accident.

With Adam's fall into sin, man lost much of his original image. Yet, man's mathematical ability is still largely functional. It seems that we are born with various basic, innate mathematical abilities such as those of logic, counting and distinguishing shapes.

Justifying math

How can we justify human math from this basis? One could try to ground the soundness of math on the Bible. After all, the Bible frequently uses logical arguments (e.g., I Cor. 15:12-50 or Matt. 12:25-29) and arithmetic operations (e.g., Luke 12:52). Gordon Clark claimed that all the laws of logic could be deduced from the Bible. Similarly, J.C. Keister asserted that all the axioms of arithmetic are illustrated in Scripture.

Although such biblical examples may confirm our rules of arithmetic and logic, they fall short of rigorous proof. One must be careful in drawing general conclusions from a limited number of specific cases. Moreover, this method gives no basis for the vast bulk of math that extends beyond basic arithmetic and logic.

A better approach might be to ground the truth of math on the attributes of the biblical God. For example, God's character has a *logical* aspect. God's word is truth (John 17:17); God never lies (Titus 1:2) and is always faithful (Ps. 117:2). God means what he says, not the opposite; hence the law of non-contradiction holds. God's identity is eternally the same; hence the logical law of identity must be eternally valid. Thus the very nature of God implies the eternal and universal validity of the laws of logic. Logic is not above God, but derives from God's constant and non-contradictory nature.

Some Guidelines in Teaching Math

The goal of Reformed education is to prepare students to serve the Lord (I Cor. 10:3). This entails teaching them to think and function within a Christian worldview. In any discipline one must teach not only the subject matter but how this coheres with other disciplines and finds meaning within the Christian worldview. God's truth functions as a comprehensive unity.

Math should thus be taught in terms of various contexts.

1. *Mathematical Context*

   In addition to mathematical knowledge we should instill insight into why math works, an appreciation of its beauty and a love for math.

2. *Theological Context*

   Math must be connected to the Christian worldview. We should show how Christianity explains mathematical truth, the rational structure of the universe, and our ability to do math. Studying math should be motivated by the love of God and directed to His glory. Studying math tells us something about God (e.g., His wisdom, coherence, boundlessness, consistency, dependability, righteousness).

3. *Applied Context*

   We should illustrate how math is an important tool for other disciplines, such as science. Math helps us to fulfill the cultural mandate and to more deeply appreciate God's wonderful world. We should stress both the strengths and limits of mathematical models: these have to be applied and interpreted in ways that are consistent with Scripture. More generally, math helps to develop logical thinking and analytical problem-solving abilities, skills that are useful in all facets of life.

4. *Social context*

   Math teaching can be enriched by linking topics to their historical cultural context. One could tell interesting anecdotes about pertinent mathematicians, touching also upon their religious motivation. This will bolster also the theological context since Christianity played a large role in the scientific revolution and since most leading mathematicians (e.g., Descartes, Pascal, Newton, Euler, Cantor, Gödel) were theists.

God's character also has a *numerical* aspect: the Biblical God is *tri-une*, consisting of *three* distinct persons. Since the three persons of the Godhead – Father, Son, and Holy Spirit – are eternal, so are numbers.

Consider further God's infinite power and knowledge. God knows all things. This includes not just all facts about the physical world but also all necessary truths and even all possibilities. As such, God's knowledge surely embraces all possible mathematical truths. Thus math exists independent of human minds. God surely knows whether any proposition is true or false. Hence the usage of two-valued logic in math is justified.

God is the source of all being, upholding everything. He even establishes necessary truths and contingent possibilities. God upholds all truths, including truths about math. God surely knows whether any mathematical proposition is true or false.

God's knowledge includes that of the actual infinite. The concept of *infinity* is crucial to the philosophy of math. We can distinguish between *potential* infinity and *actual* infinity. *Potential* infinity is the notion of endlessness that arises from counting. Given any large number, we can always obtain a yet larger one by adding 1 to it. There seems to be no largest number. Potentially we could go on forever. *Actual* infinity, on the other hand, is the notion that the set of numbers exists as a completed set. Augustine, however, considered actual infinity to be one of the mathematical entities that existed in God's mind. He wrote, "Every number is known to him 'whose understanding cannot be numbered' (Ps. 147:5)." Since God knows all things possible, this must surely encompass also the totality of all possible numbers.

A basis for math

Modern math is based on *set theory.* A *set* is a collection of objects. We can consider the set of all dogs, or the set of all even numbers, and so on. We use brackets {} to denote a set. Thus, for example, the set of even numbers is written {2,4,6...}. Treating each set as an entity in its own right, we can then do various operations on

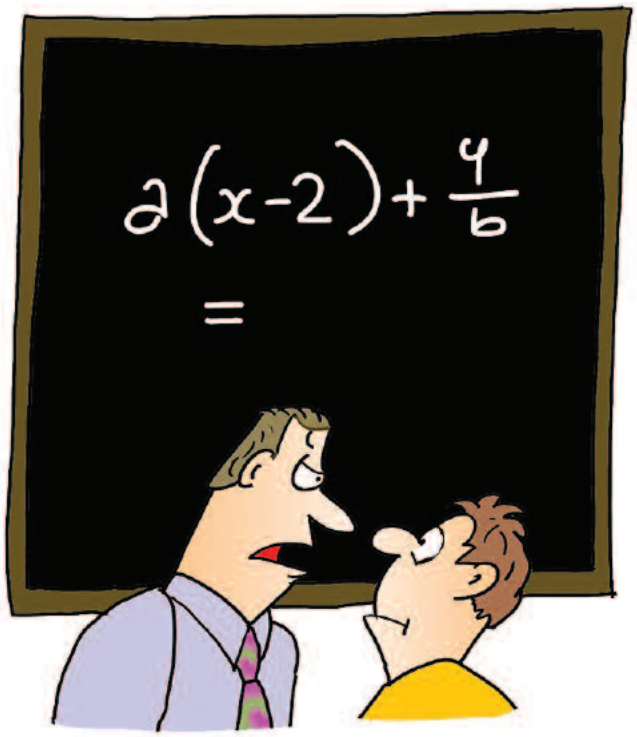
these sets, such as adding sets, comparing their sizes, etc.

Remarkably, almost all advanced math can be derived from the nine axioms of modern set theory. Not all math, since Gödel proved that all of math can never be derived from a limited number of axioms. Yet, it does cover all of the math that most mathematicians ever use in practice.

So far no contradictions have been found. Can we be sure, however, that no contradictions will ever be found in this system? Gödel, you will recall, proved that it cannot be proven mathematically that the system is consistent. The best we can do is to appeal to the plausibility of the individual axioms. Everyone agrees that the axioms all seem to be self-evidently true when applied to *finite* sets.

Several of these axioms, however, deal with *infinite* sets. They postulate that certain operations on finite sets apply also to infinite sets. Infinite sets are needed to get beyond number theory (which just concerns whole numbers) to real numbers (such as $\sqrt{2} = 1.414213\ldots$, which requires an infinite number of decimals to write out fully). Real numbers are needed for *calculus*, upon which physics heavily relies.

The axioms concerning infinite sets are rejected by constructionists since infinite sets cannot be humanly constructed in a finite number of steps. However, these axioms are very plausible given an infinite, omniscient and omnipotent being. Georg Cantor (1845-1918), the founder of modern set theory, justified his belief in infinite sets by his belief in an infinite God. He thought of sets in terms of what God could do with them. Cantor believed that God's infinite knowledge implies an actual infinity of thoughts. It included, at the very least, the infinite set of natural numbers {1,2,3...}. Actual infinity could thus be considered to exist objectively as an actual, complete set in God's mind. Cantor believed that even larger infinite numbers existed in God's mind.



"YES, THIS **IS** A CHRISTIAN MATH CLASS, BUT NO, 'BY FAITH ALONE' IS NOT THE RIGHT ANSWER"

Even today, almost every attempt to justify the principles of set theory relies on some notion of idealized abilities of the Omnipotent Mathematician. The existence of sets depends upon a certain sort of intellectual activity – a collecting or "thinking together." According to Alvin Plantinga,

> "If the collecting or thinking together had to be done by human thinkers there wouldn't be nearly enough sets – not nearly as many as we think in fact there are. From a theistic point of view, sets owe their existence to God's thinking things together."

Plantinga grounds set theory on God's infinite power and knowledge. He concludes that theists thus have a distinct advantage in justifying set theory. A detailed theistic justification of modern set theory has been developed by Christopher Menzel (2001).

Ultimately, the consistency and certainty of math can be grounded upon the multi-faceted nature of God Himself. Trust in God generates confidence in math.

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Dr. John Byl is Head of the Department of Mathematical Sciences at Trinity Western University, Langley, BC and author of God and Cosmos: A Christian View of Time, Space, and the Universe *and* The Divine Challenge: On Matter, Mind, Math & Meaning.

'round and 'round

The *in*side of the school bus ride

by Ginny VanderHorst

"The wheels on the bus go 'round and 'round!" At least, that's what we expect them to do, every morning and every afternoon of the school week. The big yellow school bus pulls up to the stop, the door opens, it gobbles up your children and disgorges them at school, only to reverse the process later in the afternoon. You hand your youngsters over to the driver behind the wheel of the bus, giving all the transporting responsibility over to that one person and you hope and pray that they will arrive safely at school and return home again at the appointed time.

But what actually happens in that big yellow rectangle on wheels? How does it function? How does everyone interact? How does the driver stay sane?

The school bus experience

Growing up in Edmonton and living close to the schools I attended, I never rode the school bus, instead walking to school, uphill both ways, barefoot through the snow, etc. etc. (you know the story). And raising our children in Langley, BC in the Fraser Valley, we lived close enough for our children to ride their bikes to school. So, I did not experience the world of the school bus until I sat behind the wheel as driver and boss of my own school bus numerous years ago, serving two Christian school communities.

I know I speak for my fellow bus drivers when I share with you that I start every day praying that the Lord will guide my driving and bring me and my riders safely to and fro, that my bus run will be protected because I know, *we* know, that we carry a precious cargo. We feel a burden of responsibility that is indeed awesome, as your children are your treasure that you have placed in our hands, to handle with care. Yes indeed, a precious cargo, but some days we would like to grab them by their precious little ears or leave their precious little backsides at the side of the road somewhere, as not every day or every run goes as we would like it to.

More than one job to do

"How do you drive the bus, *and* dish out discipline, *and* handle crowd control at the same time?" is a question that I'm asked routinely. Well, driving comes first, of course, but handling rider behavior is part of the job too. I can whistle well, and can usually get the misbehavers' attention, and use hand signals such as shaking my finger, or slashing across my throat or zipping across my lips. These mean, (and the kids know it) "I'm upset with you!" or "Stop doing that!" or "Pipe down!" This generally works, though some kids are just as good at innocently ignoring these key signals. If necessary, I pull the bus over, and walk down the aisle, which means to the whole bus that someone is in *big* trouble!

The kids have a way of keeping each other in check as well. One young lad, in grade 2 was being harassed by a boy some two grades his senior. Finally in exasperation he shouted, "Oh yeah!? Oh yeah!? Well, when I grow up. . . and I get married. . . and I buy a car. . . I'm gonna come and run you over!" So there! No need to get his bus driver involved in this squabble. In another conflict, needing some driver intervention, a rider came to complain that the guy he was sitting with was bugging him. "Don't sit with him then," I countered. Well, he looked pretty perplexed at me, as if that was a silly solution I had come up with, since it meant that he couldn't sit with his bugging buddy anymore.

I have certain rules on my bus, (since I am the boss), and some are quite foreign to some of the kids. For instance, I don't approve of "passing gas" in public, which in some households seems to be entertainment, or a cultivated talent. And of course, while profanity is absolutely forbidden, barnyard language is also a strict no-no, which is a strange thought to some kids as well, showing again what is and what is not allowed at home.

Growing affection

My riders and I get to know each other quite well over the course of the year, and years. Unlike teachers who pass their students over to the next classroom after a year is completed, or down the hall, or even to a different school, we bus drivers see these kids from kindergarten through grade twelve, and watch them grow up from gap-toothed little tykes to young men and women, ready to take on the world. And attachments do develop, between the children, and between them and the driver. They celebrate each other's joys, announcing birthdays, new babies in the family and the like. They also feel sad together when someone's Oma or Opa has died, or when someone is really sick. My riders were discussing the plague of chicken pox that had gone like a rash (pun intended) through their elementary school. "This many gone in this grade, so many missing in that grade." One young fellow was excited to report that, "he hadn't missed a day in his whole, entire life!" His cohorts were impressed, were proud of him, and happy for him! (He is in Kindergarten!)

Family secrets get shared. One girl was bemoaning the fact that a baby had just been born in a friend's family. "I wish *we* would have another baby!" But her brother exclaimed from five rows back, loud enough for all to hear, "Nope, Mom said no more babies! Two boys, two girls; that's enough!"

Yes, relationships develop. It's special for a school bus driver to be shopping somewhere, and to have a primary student see her, tug on her mother's jacket and shyly exclaim, "Mommy, there's my school bus driver!" And just as special to meet up with a young lady who has already graduated, and she introduces you to her new boyfriend as "the best bus driver ever!" And I go to a charity run that our school participates in, not because I have *my* children running anymore, or *my* grandchildren running in it yet, but to cheer on *my* Bus #37 children! And when there's graduation or another special school event, someone always asks if I'm coming.

Encouraging one another

It's also nice for a school bus driver to notice her riders express their faith. While driving for Stepping Stones Summer Camp – a children's bible camp here in BC – it's wonderful to hear the campers and their leaders sing the Christian songs that they have learned at camp. And on the way to school, it's wonderful to hear kids practicing the psalms they had to learn for memory work. Or reciting the books of the Bible one last time before they have to say them for their teacher. However, practicing the recorder on my school bus is something that strictly falls under the realm of "Things to do at Home."

My riders get a kick out of it when I put a big red bow on the front grill of my bus during the weeks before Christmas. And I attach Vancouver Canuck flags to my outside mirrors while our favorite hockey team is making a playoff run, (which is usually too short a time for us fans). Little things to make the time we spend together just a little nicer.

Is my job that important in the faith life of my riders? As we drivers see your children, and interact with them each and every day, I know that we can have some influence and impact. We are part of the educational process, even if just in a small way. So then, it is very important that the drivers are reflective of the supporting community and share the same Christian principles and values that the parents, families and students have. I try hard to get the children to respect each other, and each other's property, and I expect them to show respect to me as well. I'm just a little disappointed by the ones that never say boo, bah or good morning when they get on the bus, but I'm always heartened by the ones that wish me a good weekend, or give that extra wave as they head off for home.

We all are role models

School bus driver – an easy job? Not always. Do I like it? Usually. Can I set a Christian example for my riders? For sure! Can I let my light shine when I do my job? Certainly! Do I do that? I try, and I'd *better* try very hard – from being a responsible driver who obeys the laws of the road, to being a courteous driver who respects the rights of other vehicles, to being a role model for the children that are entrusted to my care. May God strengthen me and my fellow school bus drivers in all these things. And may God give his guardian angels charge over our bus runs, both *out*side and *in*side the big yellow school bus.

IT'S HARD TO CATCH WAVES

A new source of power is on the horizon

by Margaret Helder

I well remember standing on the coast near Albany, South Western Australia, as truly dramatic waves from the Southern Ocean smashed against the rocky shore. Crashing waves assaulted my senses with the sound, sight, spray and the scent of salt water. Who could fail to be moved by the beauty or harsh grandeur of this scene? It was the sort of moment any observer would pause at and commit to memory, or try to capture in several dozen digital images. A more artistic sort might paint a picture, while a poet might well immortalize the scene in verse.

Modern technological man, however, might do none of those things. This is an age in which we think that, time is money, living creatures represent information (in their DNA) and energy means profit. For technological man, the motion of ocean waves no longer represents aesthetic grandeur; rather it suggests a new way to generate electricity. There is a big gulf between Tennyson's "Break, break, break, on thy cold grey stones, O Sea!" and questions about energy capacity per meter of breaking waves. We have obviously moved from aesthetics to practical application. That brings us to the topic of wave energy. Welcome to the brave new world of renewable energy.

Potential

While petroleum-based energy generation is easy, renewable energy is much more difficult to tap. Not all locations are suitable for exploiting any given type of renewable energy. Obviously then, a number of different technologies are required, and the choice of which to use, depends upon the renewable energy which is available.

Many of these technologies require the use of huge areas of land. For example, the tapping of hydropower may require an enormous dam and a reservoir that will flood a large territory. Windmills and solar collectors could potentially cover much larger areas than a reservoir, if comparable power were to be generated. Since many governments are now demanding that a significant proportion of their energy generation come from renewable sources, they are very interested in any natural phenomenon that appears to represent a potential source of renewable energy. The crashing sea, therefore, appears more attractive every day, but this time it is not the artists who think so.

The energy content is 10,000 times the energy of sunlight

Problems

When we think about renewable energy, our minds first turn to solar energy and wind energy. However, these forms of energy are difficult to utilize as major sources of electrical power. For a start, the sun shines only part of each day and very little on cloudy days. In some parts of the world, there is actually more cloud than sun. Any system that generates electricity from the sun's light therefore, has to make ample provision for storage of some of that generated power in batteries. Otherwise electricity would only be available on sunny days and never at night (if one relied completely on solar generated electricity).

Similarly winds suitable for generating electricity blow only some of the time and only consistently in certain locations. Again, suitable powerful batteries are needed to store power for calm days. It is plain that no nation is going to generate most of their electricity from either solar and/or wind power.

Punch!

Wave energy for its part, offers a number of advantages over solar and wind power. Moving water, for a start, actually provides a lot more impact because water is eight hundred times denser than air. Thus it takes a lot more energy to move water than it does to move air. It is this energy that the technologists seek to exploit.

Indeed wave energy is actually a concentrated form of solar energy. Sunlight heats some areas of the globe more than others. Winds are generated as cooler and warmer air masses swirl around. As these winds pass over open bodies of water, some of this energy is transferred to the

water in the form of waves. The water however moves only with consistent blowing of the wind.

While the average power level of sunlight is about 100W/m^2 (100 watt per square meter), the power level of an average wave in the ocean is 70 *kilowatts* (1 kW = 1000 watts) per meter of crest length. Thus one meter of wave carries *7,000 times* the energy of sunlight arriving at any given moment on 1 square meter of the earth. Moreover in the winter, the energy content of an average wave rises to 170 kW/meter of crest length, and during storms the energy punch may rise to 1MW (megawatt = 1 million watts), so that the energy content is 10,000 times the energy of sunlight falling on one square meter of earth.

Pretty near perpetual

Waves, like solar and wind energy, are not consistently available at any given site, but they are much more reliable than wind and solar energy. Obviously only countries with a seacoast, can consider wave energy as a potential source of power for the generation of electricity. Moreover only certain coasts enjoy really good waves: the west coast of continents in mid-latitudes of the Northern Hemisphere or on east coasts in the Southern Hemisphere. Scotland, Norway and Portugal and the west coast of North America, all have particularly good waves.

Some experts estimate that the total worldwide energy content of the waves lies between 1-10 terawatts (1 terawatt = 1 trillion watts). Apparently the world currently produces about 13 terawatts of electricity when all sources of generating capacity are taken into account. Others place the potential energy of waves much lower, at around 0.2 terawatts. This is still about three times the current installed capacity for wind power worldwide. Evidently the waves have energy potential we can ill afford to overlook.

Plenty of plans

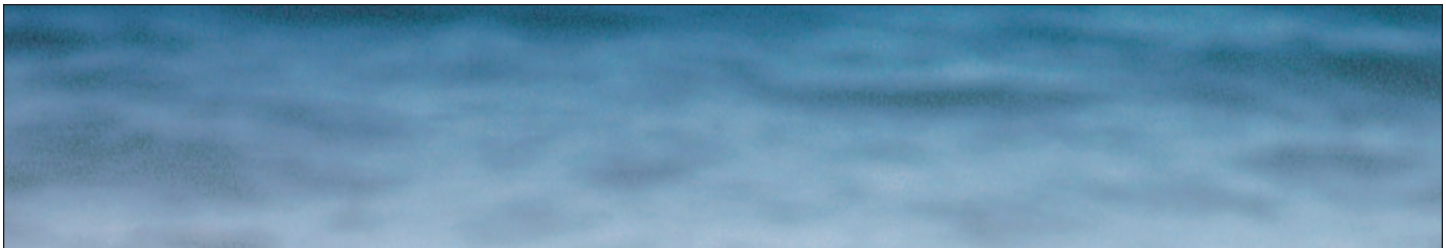
It is not for lack of ideas that wave energy is still not commercially available. As far back as 1799, French engineer Pierre Girard patented a device to harness power from the waves. It was never constructed. A similar fate met other plans through the years. It was not until the 1970s, after the 1973 crisis with oil supply from mid-eastern countries, that more serious money was devoted to this project. It soon became apparent that technology devoted to wave energy had two major problems to overcome: cost and storms.

One early concept was the Dam-Atoll, designed by the Lockheed California Company. This device, patented in 1979, was the culmination of six years of research. Two hundred fifty feet in diameter (80 m), and made of concrete, the device was meant to be anchored offshore in at least 30 m of water. Only a relatively small knob would project above the water surface. The rest would lurk beneath the waves like an atoll (submerged coral). Guide vanes projecting from the knob, would cause the waves to spiral through an opening in the top of the unit. The design called for the water to swirl downward through a 20 m long tube in the centre of the dome. The swirling water was meant to turn a turbine wheel, the only moving part in the system. Lockheed company built a small model (about 1 m in diameter) to demonstrate that the mechanism would work as imagined. Beyond that, Lockheed did nothing else and the patent has reverted to the public domain. During the early 1980s however, the design received a lot of publicity.

Prototypes

In the mid 1980s the government of Norway undertook to support industry in the development of wave energy. Kvaener Brug, a subsidiary of Norway's largest engineering firm, began to study wave power as early as 1973, the time of the crisis in petroleum supplies. After a decade of research, this company, with the support of the Norwegian government, set out to build a prototype 600kW pilot plant on the shore of the island of Bergen, off the west coast of Norway. The design, chosen to capture energy from the waves, is called an oscillating water column (OWC). The device, built into the shore, funnels waves up into a

The Pelamis "snake"
(photo courtesy of Pelamis Wave Power www.pelamiswave.com)



tube whose opening is submerged beneath the surface of the water. The motion of the waves pushes water up and down in the tube. This motion pushes the air in the chamber up past a turbine, and then back down, as the wave retreats. The moving air causes the turbine to move. By 1985, the OWC had been installed and the experiment was set to run.

Kvaener Brug believed that they had overcome the obstacle of prohibitive cost. Now all they had to do was wait until 1990, when the experimental run had been completed. Then they would market the system locally. Already, however, they began to market the system to island nations in the South Pacific. Unfortunately reality, in the form of a severe storm in 1988, caused the firm to abandon any interest in wave energy. Others have tried the OWC system in other places. One installation on the Isle of Islay, Scotland, has been functioning since 2000. This particular system, called LIMPET, employs two turbines, each of which drive 250 kW generators. The electricity thus generated is used to power an electric bus, probably the only bus in the world to use wave generated electricity for its energy supply.

Another wave harvesting design is called Pelamis, after a surface swimming sea snake. The massive steel tubes, joined end to end by flexible joints, indeed move like a slithering snake. The box car sized tubes are linked into a system 140 m (460 ft) long. Four such snakes are yoked side by side. They point into the oncoming waves. As the waves proceed through each tube, the water motion causes the tube to writhe energetically. This motion pushes hydraulic fluid through a hydraulic motor which drives a generator.

The first Pelamis prototype, installed near Orkney Island, Scotland, was officially opened September 28, 2007. This full scale prototype is designed to generate 750 kW of energy. The Scottish manufacturer of Pelamis has also signed a contract with a Portuguese consortium to build and install the world's first commercial wave farm. The plan is to install three Pelamis machines, 5 km off the Portuguese coast near Povoa de Varim. The 2.5 MW (megawatt = 1 million watts) is designed to generate enough electricity for 1500 households. The total cost of the equipment and installation is expected to be about 8 million Euros. If the system, expected to come on stream soon, is deemed satisfactory, 30 more machines may be installed for a 20 MW capacity. To this point however, it is all hopes and dreams.

Their prototype operated only two months before it sank

Other engineers have turned their attention to ocean buoys which so conspicuously bob up and down on the sea surface. In 2001, a company working for the American navy, designed a buoy that turns wave action into power. A piston inside the buoy rides up and down, thereby turning a generator which stores power in a battery. This company has installed 4 large machines, each capable of generating 20 kW, off the Victoria coast of Australia. The company also hopes soon to develop a 100 kW buoy. If enough of these were strung together, substantial electrical energy might be generated. Enough buoys could be located in 4 acres of ocean surface to generate 10 MW of power. This is a very small area in which to generate so much electricity from renewable energy.

Recent events however provide a reality check on such dreams. For example, the recent experience of Finavera Renewables of Vancouver is interesting. Their prototype Aqua Buoy, positioned off the Oregon coast, operated only two months before it sank in October 2007. That indeed seems to be the story of wave energy inventions, designed with high hopes, only to be smashed or sunk in a storm. No doubt some designs will eventually prove more durable than others. Time will tell also how enthusiastic the public will be for wave energy installations in the open ocean and/or on the coast, in addition to wind farms and perhaps solar energy farms too. It will certainly be a brave new world, but not necessarily a beautiful one, when large areas of nature are cluttered with electrical generating machines. To this point renewable energy devices are popular with environmentalists, but that will certainly change as the equipment becomes more widespread.

IN A NUTSHELL

Tidbits relevant, and not so, to Christian life

by Jon Dykstra

Evolution takes a hit on the big screen

The movie *Expelled: No Intelligence Allowed* hits theatres in February, and promises to knock Evolution down a peg or two. The trailer (www.expelledthemovie.com) shows Ben Stein, former speechwriter for Nixon, and current political commentator, game show host, actor and comedian touring the country asking the powers that be why high school teachers, university professors and scientists are being "ridiculed, denied tenure and even fired – for the 'crime' of merely believing that there might be evidence of 'design' in nature, and that perhaps life is not just the result of accidental, random chance."

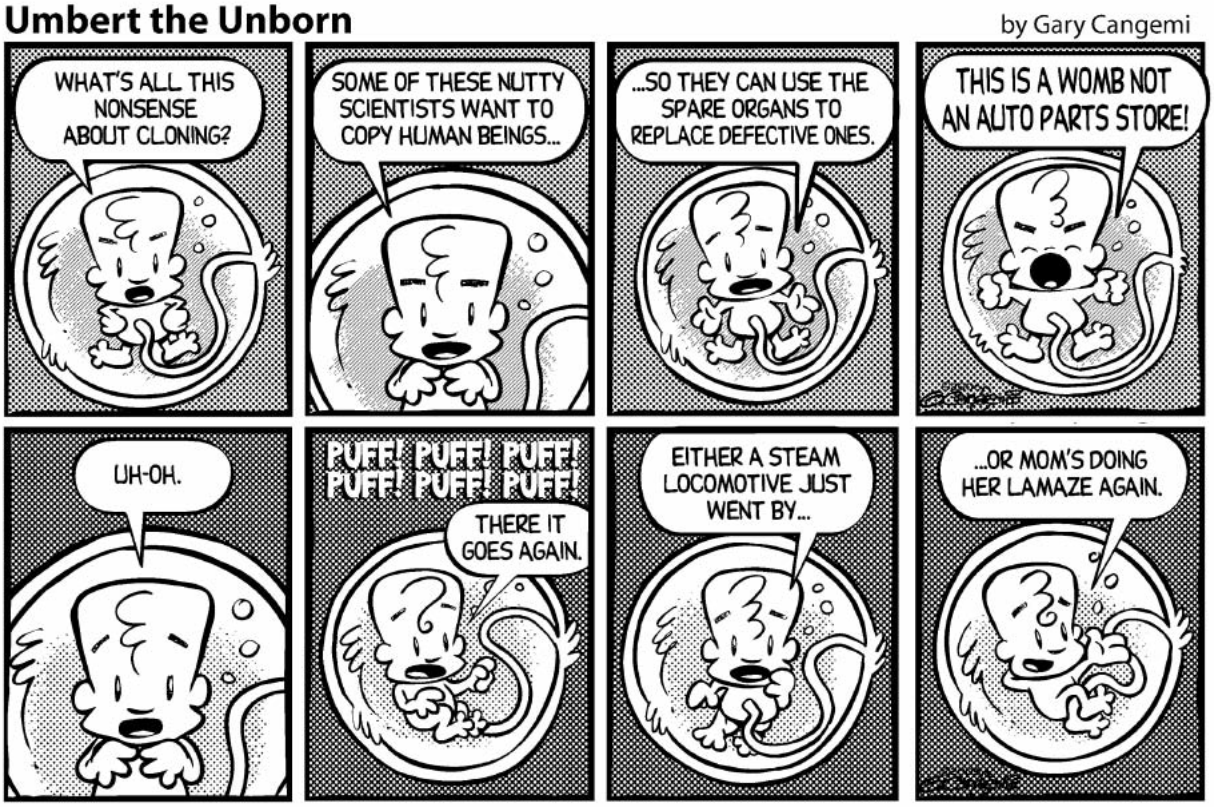
Mixing it up

The American Reformed Church of Lynden, Washington has figured out a better way to do Bible studies. Their Sunday night study is large, comprising about 60 people and too big to meet all together. So they've split into six smaller ten-person groups and added a twist. Every time they meet, the groups pair off in sets of two groups. The pairings change each time, so Group 1, through the course of the year, will eventually be paired off with all five of the other groups. This ensures both stability – your group of ten remains the same throughout the year – and also a good exchange of insights as different people will be at every study night.

Quote of the month

"A worn out and tattered bible is owned by someone who isn't"

– seen on a church sign



Soup & Buns

Are you gaining, or losing?

by Sharon L. Bratcher

The Smiths were excited when their kids wanted to join a soccer team. The fresh air, exercise and teamwork would all be beneficial. Johnny did extremely well, so it seemed right to sign him up for a second league that included only the best in the community. It was pretty amazing to watch him score a goal against a tough opponent. Of course, this meant 2-3 practices a week now, and at least two games to attend.

Sally Jones plugged in the video game and instantly all her children and their friends were on the floor in front of it, cheering. There! At last she would have peace and quiet for a few hours, knowing that they would be entertained and busy.

Grandma Mills was astounded to see the price on the latest electronic games for toddlers! But they advertised that little Ben would be able to gain reading skills using it all by himself since it talked and explained everything to him. It seemed like a good idea to buy a couple of them.

Karly Jackson hated to wake up little Stan when they arrived at church. So, she clicked the tabs on the infant seat/car seat, popped up the handle, and carried the sleeping infant in his "bucket" into the building.

It's easy to see the benefits that will come from particular items or activities. These items provide happiness, excitement, fulfillment, convenience, free time, temporary peace, and even fitness and strength. Why wouldn't we like to buy them if they fit into our budgets? No doubt the ads and the comments from others encourage our desires even more.

Another side

But while we see the gains, we are often blind to the losses that we may incur.

Soccer is great, as are hockey, drama, music, etc., but do they make us lose the benefits of family dinnertime conversations, Bible reading and prayer? Do Mom and Dad become irritable, constantly running from one activity to another? Does schoolwork suffer? How about church activities? Does everyone get enough sleep?

Video games, (and TV/movies) are fun, but when they become the babysitter, do the kids lose interaction with the adults and peers around them? Do they become so used to "canned entertainment" that they no longer enjoy reading or know how to occupy themselves in quiet times? Do they become addicted to movement and excitement so that they always desire "something" to be happening?

Everything that electronic games can do could be accomplished better by an adult with a piece of paper and a pen and some time.

Car seats are wonderful and pop-outs are convenient. But the babies (and parents) lose out on some wonderful close feelings when they are not being held nearly as much. And many mothers and fathers ruin their backs by carrying these heavy items in one hand.

Time savers are great but. . .

If we are using all these activities/devices to provide convenience for ourselves so that we will have more free time that's great, but what "more important" activity are we going to engage in during all that free time? Is it more important than sitting with your toddler and showing him how to make a B that says "Buh"? Is it more important than hearing about your child's school day at dinner, and sharing a joke you heard from his Grandpa? And there's nothing quite like holding a baby, and there are usually plenty of people around that would love to have a turn at it when the parents' arms get tired.

Many parents are stressed from running here and there. They believe that they are doing it for the sake of their children. But perhaps they should ascertain what they are losing, as well as what they are gaining. That will help to bring balance to the situation.

Consider the Amish: they don't use modern conveniences in their daily lives because they would lose the exercise and the connections that the "old ways" give to them. They find strength in their tightly woven communities that we have somewhat lost by moving further apart and not relying on one another for entertainment. Why do we need to get together with Joe and Sarah when we can be easily entertained by pushing a button at home?

Jesus said in Matthew 16:26: "What shall it profit a man if he gain the whole world and lose his own soul?" Here is the ultimate case where a man sought after pleasures that he thought would bring him happiness. But in the end it was just empty and useless.

We should analyze what we are doing and see whether or not the "new modern approaches" always help us to lead our families closer to God and to one another.

Don't just think about what you would gain; realize what you would lose.

PUZZLE PAGE ENTICING ENIGMAS AND CEREBRAL CHALLENGES

Send Puzzles, Solutions, Ideas to PUZZLE PAGE, 43 Summerhill Place, Winnipeg, MB R2C 4V4 **OR** **robgleach@gmail.com**

NEW PUZZLES

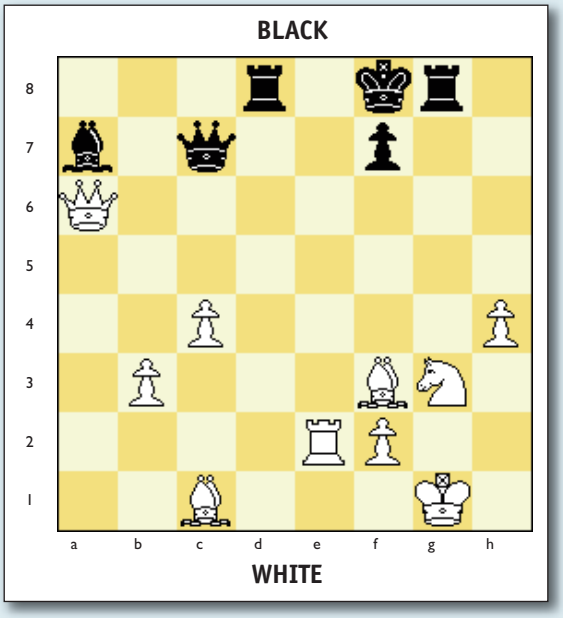
Riddles for Punsters #141

Why did the vegetable farmer not like to watch comedy shows on daytime television? He found them too _ _ _ _ _ and figured that he should have _ _ _ _ working in the fields instead.

Problem to Ponder #141

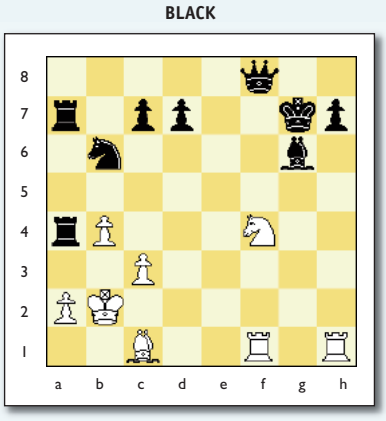
Mrs. Van der Thrifty goes to the market on Mondays when the vegetables are on sale. Carrots cost $0.85 per bag, beans $1.25 per bag, cucumbers $0.65 each and green peppers $0.99 per bag. If Mrs. Van der Thrifty has a ten dollar bill how can she spend as much of it as possible on vegetables (and so have a minimum of change left over) if she buys at most three of any particular vegetable (so no more than three bags of carrots, etc.)?

Chess Puzzle # 141



WHITE to Mate in 3
Or, If it is BLACK's Move, **BLACK to Mate in 2**

SOLUTION TO CHESS PUZZLE # 140



WHITE to Mate in 3
Descriptive Notation

1.	N-K6 ch	PxN
2.	B-R6 ch	K-R1/N1
3.	RxQ mate	

IF

1.	N-K6 ch	K-N1
2.	RxQ mate	(mates sooner)

Algebraic Notation

1.	Nf4-e6 +	d7xe6
2.	Bc1-h6 +	Kg7-h8/h7
3.	Rf1xf8 ++	

IF

1.	Nf4-e6 +	Kg7-g8
2.	Rf1xf8 ++	(mates sooner)

BLACK to Mate in 2
Descriptive Notation

1.	———	RxRP ch
2.	K-N3	B-B7 mate

Algebraic Notation

1.	——-	Ra4xa2 +
2.	Kb2-b3	Bg6-c2 ++

NOTE: BLACK can also Mate in 3
Descriptive Notation

1.	———	RxNP ch
2.	PxR	QxP ch
3.	K-R1	Q-N8 mate

Algebraic Notation

1.	———	Ra4xb4 +
2.	c3xb4	Qf8xb4 +
3.	Kb2-a1	Qb4-b1 ++

SOLUTIONS TO THE PREVIOUS (JANUARY) PUZZLE PAGE

Answer to Riddles for Punsters #140 – "Two pair for the price of one?"

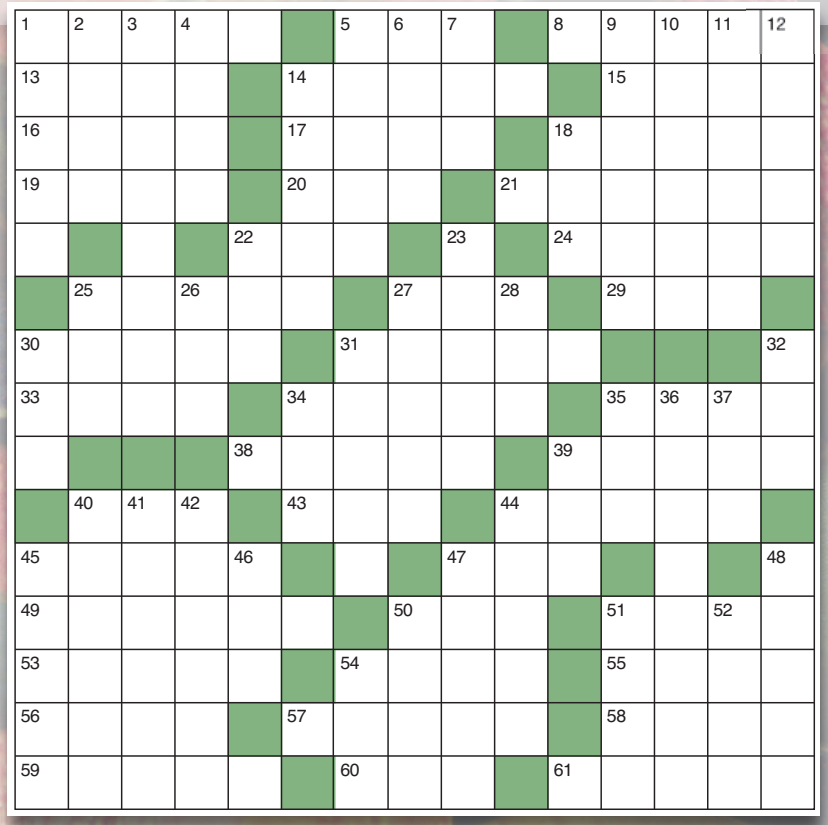
Fabian, in d e s pair since his old jeans were beyond r e pair (they had shrunk and i m pair e d his walking), had been p r e pared to pay a lot for a new p a i r, but he c o m pared prices at different stores and found some jeans a p par e n t l y at half price.

Answer to Problem to Ponder #140 – *"Birth of Christ Words"*

Fill in the missing letters of these words related to the birth of Jesus Christ.
For example, _ o _ e _ h would be J o s e p h.

a) n a t i v i t y
b) m a n g e r
c) s h e p h e r d s
d) a n g e l s
e) I m m a n u e l
f) m i r a c l e
g) H e r o d
h) B e t h l e h e m
i) M a g i
j) f r a n k i n c e n s e
k) M a r y
l) v i r g i n
m) w o r s h i p
n) k i n g
o) s a v i o u r (OR s a v i o r)

Crossword Puzzle



Series 15 No 4

Last month's solution
Series 15 No 3

1 P	2 A	3 L		4 R	5 E	6 C	7 I	8 T	9 A	L		10 P	11 N	12 G
13 I	P	O	14 D		15 E	R	R	O	L		16 F	A	I	R
17 A	S	I	S		18 L	E	O	N	E		19 O	L	L	A
20 N	O	S	E	21 S		22 S	N	Y		23 G	R	E	E	N
O				24 P	25 S	T		26 S	27 E	E				D
	28 A	29 S	30 S	E	T		31 S		32 V	E	33 I	34 N	35 S	
36 E		37 C	H	E	Y	38 E	N	39 N	E		40 S	O	U	41 R
42 S	43 H	A	R	D		44 D	A	A		45 A	M	O	R	E
46 T	I	L	E		47 S	H	I	H	48 T	Z	U	S		D
	49 S	E	W	50 E	R		L		51 R	U	S	E	S	
52 C				53 M	I	54 O		55 S	I	R				56 C
57 A	58 Y	59 E	60 R	S		61 R	62 A	T		63 E	64 D	65 G	66 A	R
67 D	U	D	E		68 E	G	R	E	69 T		70 A	L	M	A
71 E	L	I	M		72 P	A	I	N	S		73 D	U	E	T
74 T	E	T		75 L	I	N	D	S	E	Y		76 M	N	E

ACROSS:

1. Tall, slender building
5. Large North American deer
8. A government territory, possibly
13. Norse god
14. Universally accepted rule
15. American publisher, at one point of New York Times
16. Something forbidden
17. Plant branches, plural of ramus
18. Musical instruments
19. Sea eagles
20. In my experience (chat room abbr.)
21. Red colour or french fruit
22. Donkey
24. Number
25. Express an opinion
27. Took a seat
29. _____ Moines
30. Fad
31. Useful piece of furniture
33. Limbs
34. Showing keen interest
35. Imitator
38. Object and distance detector
39. Change for the better
40. Atomic mass unit (abbr.)
43. Three times, in prescriptions
44. A book's back
45. Steeple topper
47. Expression of discovery
49. Blow-up furniture
50. Three (pref.)
51. Walk
53. Wild, like an animal
54. Evening in Paris
55. Eye fringe
56. Acad. course
57. Type of beer
58. Person opposed to something
59. One of the sons of Zebulun (Gen. 46:14)
60. Friend
61. Threw eggs at

DOWN:

1. Music notes
2. Scent
3. Prairie city in Canada
4. Son of Seth
5. Students' tests
6. Sour fruit
7. Japanese carp
9. Visited as a tourist
10. Not a couch potato
11. Dissertations
12. German city
14. Get up
18. ____ Miserables
22. Also
23. Provide food to a party
25. Mineral
26. Computer key, for short
27. Sweet stuff
28. Rocky peak
30. Mother's love perhaps?
31. Worn out
32. Grandson of Benjamin (Num. 26:38-40)
34. Have dinner
35. French friend
36. Georgian Bay town with a large jail
37. Direction
39. Tropical tree
40. Each
41. Reflector
42. Smooth and sophisticated
44. Bake in a shallow dish
45. Burglar-resistant boxes
46. Slippery fish
47. Mountain gazelle of Arabia
48. Small plant-sucking insect
50. Roman robe
51. Volcanic cinder
52. City in Italy; medieval fortress
54. Tree liquid

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