



CREATOR

VOLUME 26

NUMBER 4

I AM FEARFULLY AND
WONDERFULLY MADE

THE SWEETNESS OF CHRIST

A ONE-HUNDRED-YEAR CELEBRATION

Exactly 100 years ago, our sweet and merciful Creator gave the world a key to an incredible treasure. Few probably realize it, but this winter marks the centennial *discovery of insulin*. Since the beginning of time, a disease called *diabetes*—though rare in children—has caused untold horror, especially among the youngest of patients. Prior to insulin, medical treatment was relatively ineffective. Thanks be to God, all that changed in 1921-1922.

Insulin from
1923



A HISTORY OF SUFFERING

Their soul abhorred all kinds of food,
And they drew near to the gates of death.
Then they cried out to the LORD in their trouble;
He saved them out of their distresses. Psalm 107:18-19

The history of diabetes is a *chronicle of suffering*—one that has been sadly lost deep within the pages of time. It is also a tale of God's kindness and mercy. The thought of someone suffering is very painful to most. Yet if we possess redeemed souls, we are divinely suited to embrace tragedy—being blessed, not destroyed by it. And when we allow the suffering of those who have come before us to be etched upon our hearts and minds, we are then better equipped to come alongside others with “bowels of mercy.” Our “Lord is full of compassion and is merciful” (James 5:11). When Christ's Spirit guides us, we become living banners of His love.

In our lifetime, most of us will know someone touched by diabetes—possibly a classmate, relative, or friend. But what is this disease called “diabetes” (dy - uh - BEE - teeZ) and can it be cured? To answer these questions, we must again peer intently into our Lord's amazing creation of the impossibly complex thing we call the human body.

METABOLISM AND OUR PANCREAS

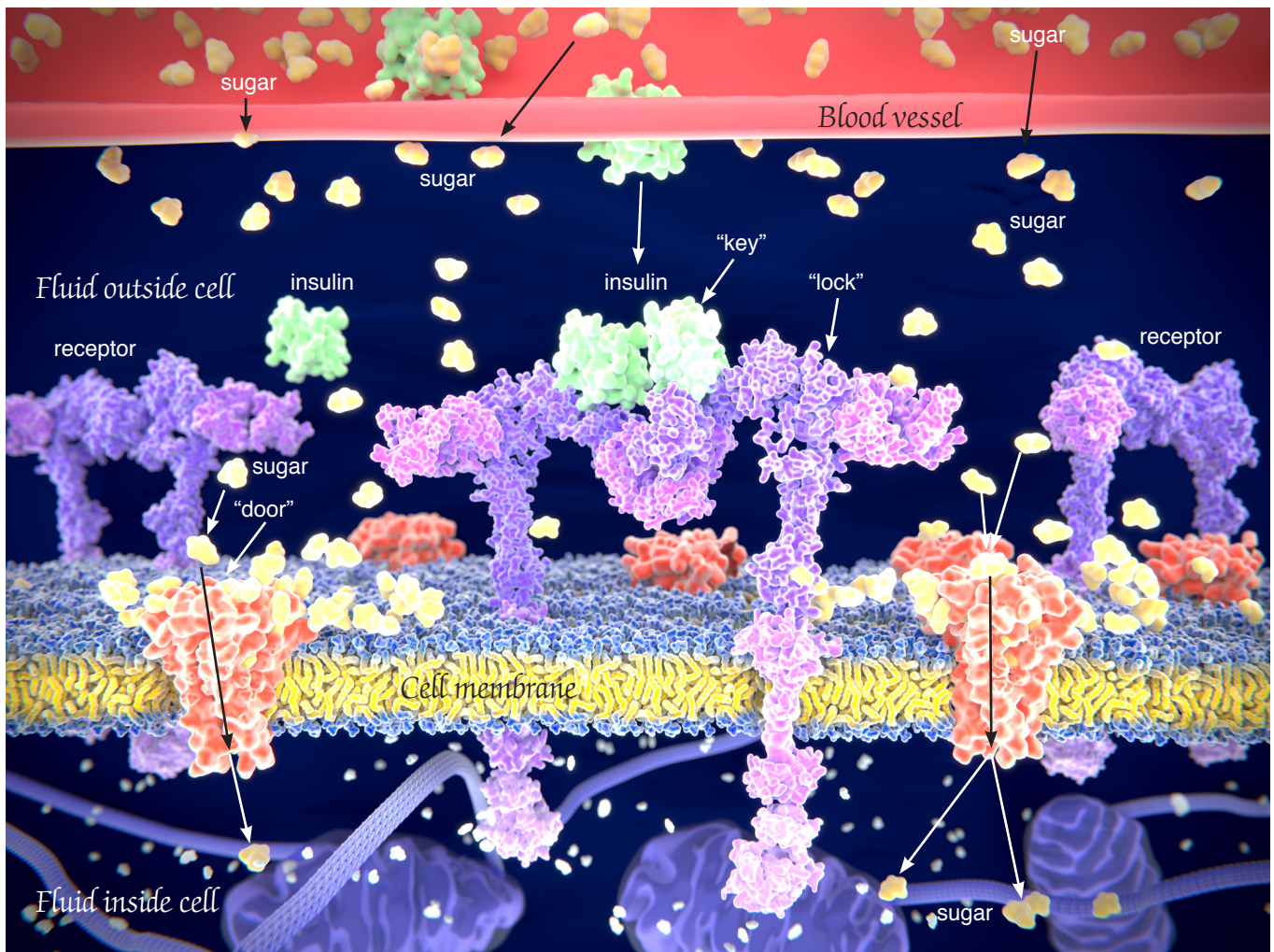
The earth is satisfied with the fruit of His works.
Psalm 104:13

All living things require energy to survive. God *alone* is self-sufficient. Our Lord Jesus created us with a need for daily food to prove our dependence on the Almighty. We have no better illustration of this than when He fed the five thousand. He provides for all of His creatures in this way revealing to us that He is a caring Creator!

Metabolism (muh - TAB - uh - liz - um) is the flow of energy through an organism and is the foundation of all biological life. It is the chemical process by which the Lord recharges the tiny “batteries” in our cells called *ATP* (please see **CREATOR** Volume 26 Number 1, page 4). God does this by converting the food we eat into simple fat molecules (fatty acids) and a sugar known as *glucose*. When these enter our cells, they are broken down and ATP is produced. Our body then has all the energy it needs to thrive.

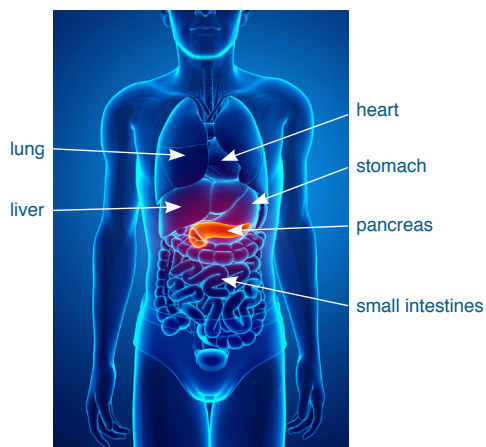
Christ's intimate care for us down to the realm of molecules

(An artist's drawing of a cell's surface—extreme magnification)



Insulin (green) moves out of blood vessels—along with sugar (yellow globs)—and attaches itself to the insulin receptors (purple) on the cell membrane. It acts like a “key” to unlock the “doors” (orange) in the cell membrane allowing sugar to freely enter the cell. Do you see God's incredible wisdom in this?!

The *pancreas* is vital to our metabolism. Positioned in the back of the abdomen just below the stomach, the pancreas helps



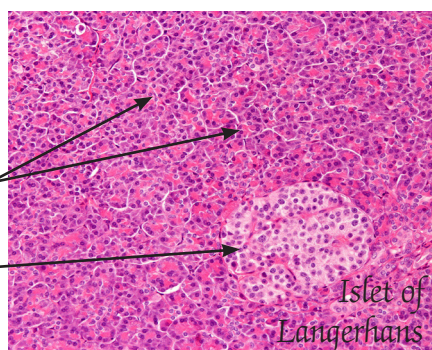
transform the food we eat into much-needed ATP energy. Our Lord fashioned the pancreas with the ability to release several complex chemicals called *enzymes* into the small intestine. It is in the intestine that these enzymes work to break down the starch, fats, and proteins of our food.¹

God also populated the pancreas with hundreds of thousands of microscopic cellular “islands” known as the *islets of Langerhans*. Special cells here function as “factories” that manufacture two hormones critical to our body’s metabolism—insulin² and glucagon. These hormones are then secreted directly into the blood, not the intestines. *Insulin* is a protein that attaches to special receptors on

Pancreas
greatly
magnified

Cells that
produce
enzymes

Cells that
produce
insulin



1 Pancreatic enzymes include amylase, lipase, and trypsin.
2 Insulin comes from the Latin word *insula* meaning “island.”

the surface of our cells. It acts as a “key” to unlock “doors” in the cell membrane allowing glucose to move easily into the cells (see the illustration on opposite page).

Our brain feeds almost exclusively on sugar (glucose). It consumes approximately two-thirds of the glucose in our body, which is equivalent to 250 pieces of M&M candies each day! Christ Jesus normally keeps the body fine-tuned and working within a very narrow range of glucose concentration. After a meal, blood sugar begins to rise and our pancreas quickly senses this increase. In response to elevated blood glucose levels, the islets of Langerhans in the pancreas secrete insulin. The concentration of blood sugar must stay within a very narrow range at all times because the brain does not function well if the level gets too low or too high. Too much sugar can damage our blood vessels; too little glucose can cause someone to get irritable and “hangry.”

Sugar has gotten bad press over the years. This is understandable because excess sugar and calories in a diet can lead to obesity and, in some cases, the development of Type 2 diabetes. Yet, sugar is as vital to our metabolism as gasoline is to a car.

Someone with diabetes either lacks insulin (Type 1 diabetes) or has cells that no longer respond to insulin present in their bloodstream (Type 2 diabetes). Before insulin therapy became available, the universal problem among children with Type 1 diabetes was their inability to metabolize sugar and gain weight—in fact, almost all lost weight rather quickly. Type 2 diabetes is frequently found in people who are obese. In both types of diabetes (Type 1 and Type 2), the cells of an untreated patient begin to starve because the cells cannot absorb the glucose they need.



THE HISTORY OF DIABETES

They quickly forgot His works. . . . So He . . . sent a
wasting disease among them. Psalm 106:15

The first historical record of diabetes is
found in an Egyptian papyrus dated to 1550
B.C. The name *diabetes* comes from the

Ebers Papyrus
—the oldest
known record
of diabetes



Greek word “to siphon” because diabetics
often drank a great deal of water that seemed
to pass right through them like a siphon.
As such, Araetus of Cappodocia (81-138
A.D.) offered a rather graphic description of
diabetes as “a melting down of the flesh and
limbs into urine.” Doctors in India (400–500
A.D.) recognized two kinds of sugar diabetes,
which they called *madhumela*. One type
turned out to be hereditary (Type 1); the
other was seen with obesity and a sedentary
lifestyle (what we now call Type 2 diabetes).

It wasn't until 1674 that Thomas Willis of
Great Britain introduced the term “mellitus”
to further describe the disease. (Mellitus is
derived from a Latin word meaning “honey
sweet.”) In 1776, Mathew Dobson, a Liverpool
physician, discovered that a diabetic's blood
and urine are sweet due to the *presence of*
sugar. And in 1889, German scientists Joseph
von Mering and Oskar Minkowski were the
first to link the *pancreas* to the disease. It
was soon realized that the pancreas produced
“a mysterious something” lacking in diabetics.

THE LORD'S GIFT OF INSULIN

“I will give you the treasures of darkness
And hidden wealth of secret places.”³
Isaiah 45:3

In the year 1920, a restless young surgeon
named Fred Banting became interested in
sugar metabolism. There were a number of
doctors before him who had unsuccessfully
tried to produce a pancreatic extract to treat
diabetes. (In the first two decades of the last
century, it was thought that the pancreas
produced some yet unknown *hormone* lacking
in diabetics.) Through the sweet providence of
our Lord Jesus, and over the course of several
months, Dr. Banting got permission to work
at the laboratory of Professor J.J.R. Macleod
at the University of Toronto. In the summer
of 1921, he teamed up with biochemistry
grad student Charlie Best to search for the
enigmatic secretion of the pancreas.



Charlie Best and Fred Banting at the University of Toronto

Their work involved diabetic dogs and
beef pancreas obtained from meat-packing
plants. (All vertebrates—mammals, birds,

³ Here, the Lord is speaking to King Cyrus. Yet this truth applies to rulers,
explorers, and scientists of all ages. *All discoveries are by His leading!*

reptiles, amphibians, and fish—have a pancreas.) The blistering summer heat did not thwart the undaunted efforts of Banting and Best, but the results of their early research were far from conclusive. In December of that same year, biochemist James B. Collip joined the efforts at the university. Up until then, the pancreatic extracts had shown promise, but it wasn't until Collip's addition to the team that real progress was made at isolating and refining the substance that came to be called Isletin (later insulin). A formal announcement of its discovery was made to the scientific community in May 1922.⁴ Soon after, the family-owned pharmaceutical company Eli Lilly began large-scale production of insulin. And they recognized, as few others did, that insulin was a sweet gift from our Creator revealing His great heart of mercy! We “have certainly entered the holy of holies, . . . and are sitting on the throne with the Elect.”—J.K. Lilly, son of Eli Lilly, writing to his head researcher in 1922.

The very next year, Drs. Banting and Macleod were awarded the 1923 Nobel Prize in Medicine for their discovery of insulin. The prize money was shared with Drs. Best and Collip.

THE VALLEY OF DRY BONES

May Your compassion come to me that I may live.
Psalm 119:77

Christ Jesus frequently blesses the medical field with extraordinary doctors to serve the public good. One such physician in the first half of the Twentieth Century was the devout Christian, Dr. Elliott Joslin of Boston, Massachusetts. He, along with Dr. Frederick M. Allen of Morristown, New Jersey, tirelessly invested themselves in the welfare of their diabetic patients. They both became interested in treating diabetes years

before insulin was available and when the tragedy of the disease was seen at its worst. Back then, diabetes took children in perfect health and rapidly caused them to lose weight. The more they ate, the greater was their thirst and their hunger. The youngest patients had a life expectancy of less than one year. This did not stop Drs. Allen and Joslin from passionately developing treatments that might lengthen and improve quality of life. The mainstay of the Allen-Joslin approach to diabetes was counterintuitive and became known as their “starvation diet.”

A diabetic loses his or her ability to move sugar from the bloodstream into the cells. Blood glucose (sugar) levels increase creating insatiable thirst. Patients often drink gallons of water in an attempt to wash the excess sugar from their bodies.

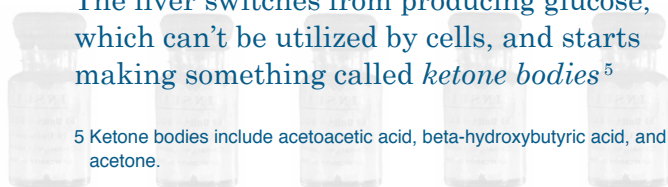
WHAT CAUSES TYPE 1 DIABETES?

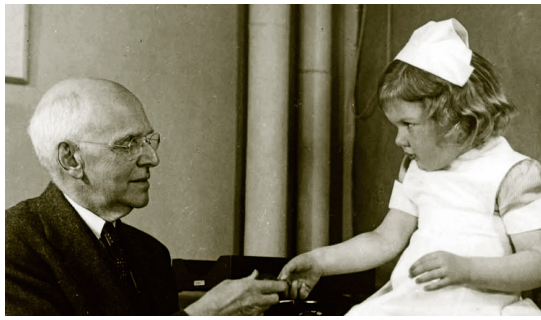
At some point in a diabetic child's life, their body's immune system starts to attack the insulin-producing cells of the pancreas. No one knows what triggers this process, but in a fairly short amount of time, the islets of Langerhans begin to disappear. Without insulin, the child's blood sugar levels steadily rise, creating the classic signs of diabetes—thirst, hunger, and excessive urination.

The severest forms of the disease caused a patient to starve to death in a matter of mere months. God has given the body other ways to obtain energy, but these are not meant to sustain someone long-term. The liver switches from producing glucose, which can't be utilized by cells, and starts making something called *ketone bodies*⁵

⁴ It's difficult to establish exactly when the team of Banting, Best, Collip, and Macleod discovered insulin, but we can safely place it in the winter of 1921-1922.

⁵ Ketone bodies include acetoacetic acid, beta-hydroxybutyric acid, and acetone.





Kindly Dr. Joslin with one of his patients successfully treated with insulin

instead. Ketone bodies normally show up in the bloodstream during prolonged fasting or starvation and can be used by the brain, heart, and muscles as a temporary energy source. This is probably what Jesus experienced toward the end of His 40-day fast. In severe diabetes, however, ketones—which are acids—reach dangerously high levels in the blood resulting in fatal ketoacidosis.

Instead of feeding diabetics a large number of calories to offset starvation, Dr. Joslin boldly did the opposite. By severely limiting a child's calorie intake, a patient was better able to burn food, and their medical condition stabilized for a time. This required unquestioned submission to the doctor. It is fascinating that the biblical principles of fasting, obedience, and self-control became the best treatments for diabetes prior to the discovery of insulin.

By the turn of the century (1900) it was believed that diabetes might be effectively treated if doctors could isolate the hidden hormone that the pancreas produced naturally. In the back of Dr. Joslin's mind was the hope that his patients would live long enough to see this "mysterious something" discovered.

One of Dr. Joslin's first patients to receive pancreatic extract was a very weak and severely emaciated 42-year-old nurse. He described her pathetic frame of 69 pounds (31 kg) as "just about the weight of her bones

and a human soul."⁶ After only six weeks of receiving regular insulin therapy she gained considerable weight and was walking four miles a day!

In the second half of 1922, insulin became more readily available. And thankfully there were a few physicians, like Dr. Joslin, who recognized it as a merciful gift from the Almighty: "By Christmas of 1922 I had witnessed so many near resurrections that I realized I was seeing enacted before my eyes Ezekiel's vision of the valley of dry bones. Ezekiel XXXVII, 2-10."—

He caused me to pass among them round about, and behold, there were very many on the surface of the valley; and lo, they were very dry. And He said to me, "Son of man, can these bones live?" And I answered, "O Lord GOD, You know." Again He said to me, "Prophecy over these bones, and say to them, 'O dry bones, hear the word of the LORD.' Thus says the Lord GOD to these bones, 'Behold, I will cause breath to enter you that you may come to life. I will put sinews on you, make flesh grow back on you, cover you with skin and put breath in you that you may come alive; and you will know that I am the LORD.'"

So I prophesied as I was commanded; and as I prophesied, there was a noise, and behold, a rattling; and the bones came together, bone to its bone. And I looked, and behold, sinews were on them, and flesh grew, and skin covered them; but there was no breath in them. Then He said to me, "Prophecy to the breath, prophecy, son of man, and say to the breath, 'Thus says the Lord GOD, "Come from the four winds, O breath, and breathe on these slain, that they come to life.'" So I prophesied as He commanded me, and the breath came into them, and they came to life and stood on their feet.

Ezekiel 37:2-10

⁶ As a Christian, Dr. Joslin was not suggesting that the human soul had physical substance. He used this figure of speech to illustrate the severity of her condition.

Dr. Joslin faithfully fought diabetes for nearly seven decades. He “saw 15 patients a day until a week before his death in 1962, at the age of 93.”⁷ On January 28 he felt ill, so he went to bed. Picking up his Bible, he read, *I will lift up mine eyes unto the hills, from whence cometh my help* (Psalm 121:1). And, *Unto thee lift I up mine eyes, O thou that dwellest in the heavens* (Psalm 123:1). He then closed his eyes and went home to be with the Lord—his work on Earth was done.

THE LORD’S GIFT OF FRENCH LILAC

Blessed be the God and Father of our Lord Jesus Christ, the Father of mercies and God of all comfort.
2 Corinthians 1:3

Over the centuries, doctors have treated various diseases using natural medicines. Diabetes is no exception. In the Middle Ages, the herb *Galega officinalis*, or French lilac—found in northern Africa, western Asia, and Europe—was administered to diabetics. It turns out that this legume contains several toxic chemicals, including guanidine, which can lower blood sugar. For decades, guanidine has been used to make the relatively safe medicine metformin, effective in the treatment of Type 2 diabetes. Diabetes knows no medical cure, but our compassionate God continues to give us effective treatments!⁸

LOVE THE LORD ... WITH ALL YOUR MIND!

“You shall love the Lord your God with all your heart, and with all your soul, and with all your mind.” Matthew 22:37

Our brief study of diabetes and the biochemistry of metabolism has only scratched the surface of Christ’s amazing creation of our “fearfully and wonderfully

made” bodies (Psalm 139:14). The scientific specialties of biochemistry and cellular biology continue to grow in leaps and bounds. Just when we think we truly comprehend some minute part of God’s microscopic world, we discover dozens of other details we had not realized before. And with them come countless unanswered questions. This may perplex many, but as Christians, it offers us an exciting opportunity to seek our Lord’s face (character) revealed in the smallest corners of the universe!



Galega officinalis or French lilac proclaiming the compassion of our Heavenly Father

Please allow us to humbly urge you to remain diligent in your exploration of His Creation. Like serious Bible study, God-honoring scientific investigation takes hard work and sustained concentration. The mind so engaged uses a lot of energy in the form of glucose; don’t be afraid to burn calories to exalt our Creator in this way—loving Him with all your heart, soul, and mind!

7 Quote taken from a MassMoments article titled, “August 2, 1893: Dr. Joslin Makes First Entry in Diabetic Ledger.”

8 Pancreatic transplantation (a surgery) can cure diabetes.

THE BREAD OF LIFE

"I am the Bread of Life; he who comes to Me will not hunger, and he who believes in Me will never thirst."

John 6:35

Food has always been vital to mankind. During celebrations and holidays, it seems to take on sublime meaning. We gather at special family meals to thank God for *His goodness* (such as Thanksgiving in the United States), *His love* seen in the incarnation of Jesus (Christmas), and *His gift of salvation* (Easter).

It is right that we give special honor to our Lord Jesus with our meals for He is "the Bread of Life" (John 6:35). Without Him, there can be no existence. His Spirit is the source of all life—both physical and spiritual. As Creator, Christ faithfully cares for each of His creatures. "They all wait for [Him] to give them their food in due season" (Psalm 104:27). As Savior, He is "the Way, and the Truth, and the Life" (John 14:6); "no one comes to the Father" apart from Him.

A FEAST FOR THE EYES

*"With a long life I will satisfy him
And let him see My salvation."* Psalm 91:16

The history of diabetes is a vivid reminder that our true joy and contentment are not in what we eat. Eating can glorify God if we do it with a right heart (1 Corinthians 10:31). But when our eyes are fixed on Jesus (Ephesians 1:18; Hebrews 12:2), He becomes our Feast and Satisfaction, whether we are well fed or not. So many in our world are starving spiritually for lack of knowledge and don't realize it. They imbibe large quantities of what society has to offer them but wither on the vine.

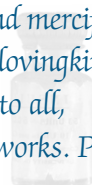
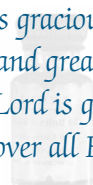


There may be no more gritty symbol of spiritual starvation than the dying diabetic of 1920. Worldly fare and food only sped up their demise. So, too, "There is a way which seems right to a man, but its end is the way of death" (Proverbs 14:12) "for the wages of sin is death" (Romans 6:23). Both poor and rich desperately need the Gospel cure. Like diabetes, the disease of sin is no respecter of persons. It destroys the high and low alike.

Sadly, so many Christians today are turning their hearts from sharing the truth about sin with the Lost to offering the sinner temporal solutions to his social problems. It's not wrong to help in this way as long as we recognize their true disease—"The heart is more deceitful than all else and is desperately sick" (Jeremiah 17:9). Offering someone temporary relief from daily burdens without presenting Christ's death on a cross for sin, is like giving a frail diabetic a piece of candy instead of insulin. To truly love nonbelievers, we must possess the same attitude as Paul: "For I determined to know *nothing* among you *except Jesus Christ, and Him crucified*" (1 Corinthians 2:2 emphasis ours). People need to repent of their sins and receive the Lord Jesus as the only hope of true life.

*The Lord is gracious and merciful;
Slow to anger and great in lovingkindness.*

*The Lord is good to all,
And His mercies are over all His works. Psalm 145:8-9*



TRUE SWEETNESS

God, who . . . manifests through us the sweet aroma
of the knowledge of Him in every place.
2 Corinthians 2:14

Do you know a sweet person, someone wise in the Lord, yet truly humble, always putting others first? Are they not a delight to be around?! The one filled with the sweetness of Jesus holds His Word close to his or her heart. I'm sure you might agree that feigned "sweetness" can be sickening, but true sweetness brings ineffable joy to our souls.



Grave site of Eli Lilly, owner of the company that made insulin widely available to the world. Inscription at base reads:

TO THE GLORY OF GOD - WITH THANKSGIVING
FOR THE WONDER OF LIFE

We have seen that insulin acts as a key, opening our cells to life-giving sugar. Jesus, who is the Way, and the Truth, and the Life (John 14:6), possesses *the Key of David* (Isaiah 22:22; Revelation 3:7). *Christ's Spirit*, like insulin, causes us to feast upon the Word of God, which is the sweetness of Truth. He then brings into our lives peace and order, calm and fatness. We soon become weighty with the delightful knowledge of Christ, equipped to herald His glory in all the Earth for the benefit of others (Ephesians 1:15, 17; 1 Peter 2:9). We, too, become a source of sweetness!

THE DISEASE OF DISCONTENTMENT

What is the source of quarrels and conflicts among you? Is [it] not . . . your pleasures that wage war in your members? James 4:1

Much of the social unrest, disorder, and ethnic hatred we see in the world today comes from the sin of discontentment. Puritan pastor Thomas Boston once preached in a sermon, "Discontent wages war with the Governor of the world and strives with Him."⁹ So many seem dissatisfied with the way God made them or how He has provided. They want something different . . . something more.

God ordains disease to caution us against taking His goodness for granted. The late J.C. Ryle¹⁰ lovingly reminds us that "Sickness is intended to be a blessing to us not a curse." He also writes, "Sickness helps men to think seriously of God, and their souls, and the world to come." We ought to recall to mind those diabetics of the last century who were not bitter about their condition but thankful for Christ's gift of insulin. This kind of humble contentment shines as a beautiful example of someone whose heart is hidden within the vestibule of Heaven—forever satisfied in Christ.

THE WAR MUST END

And He said to him, "Truly I say to you, today you shall be with Me in Paradise." Luke 23:43

Our spiritually-starved world is at war with God and itself, and in desperate need of Christ! He alone is the Prince of Peace (Isaiah 9:6). A society that rejects Christ and His Gospel is on a path of self-destruction. It consumes huge quantities of wickedness and grows weaker and weaker by the day.

There was a time when food shortages were thought to be the primary cause of famine.

9 Thomas Boston (1676-1732) Sermon: *The Hellish Sin of Discontent*
10 J.C. Ryle (1816 – 1900) was the first Anglican bishop of Liverpool. His writings are still in print and valuable to Christ's Church in our generation.

Truth is, famine is almost always *the result of war*. The personal “famine” that diabetics once commonly experienced was produced by the “biochemical war” within them. One hundred years ago, untreated diabetes often presented itself as “skin and bones”—as one who had experienced prolonged famine. Doctors brought “peace” to their starving diabetic patients—not by giving them more food but by supplying them with insulin that ended “the war within.”

Do you recognize the war within you? Each of your sins is a great offense against a thrice-holy God. Iniquity brings you no soundness of mind or spirit. Like an untreated diabetic striving to relieve a torrid thirst with sweet tea, “the lust of the flesh and the lust of the eyes and the boastful pride of life” (1 John 2:16) cannot satisfy a diseased heart (Jeremiah 17:9). No matter how much you feed on them you will never be content. They will eat at you from within and damn you for all eternity.

Please consider the example of the thief who was crucified next to Jesus. Though arrogant and self-willed, he watched Christ suffer and die on a cross for sins He had not committed. The thief’s conscience began to gnaw at him. He became aware of the disobedience that warred within his soul. Finding peace in nothing and no one else, he confessed his sins before Jesus and believed in Him. At that moment, the Lord became spiritual “insulin” to the thief’s sickly, shriveled heart. He received the life of Christ and was spiritually healed—fully and forever.

Mankind is guilty of sin and deserves to be plagued with all manner of diseases. The Lord did not spare His own people when they rebelled against Him: “They quickly forgot His works.” God, therefore, “sent a wasting disease among them” (Psalm 106:13a, 15b). Given our natural corruption, we might ask with trembling fear why we haven’t all succumbed to diabetes. Why did the Lord give us insulin?

Humanity is beset with forgetfulness, especially when it comes to the *sweetness of the Lord*. How quickly have His prior

mercies been forgotten in our hearts. So, as we celebrate the one-hundredth anniversary of insulin’s discovery, we have a wonderful opportunity to rejoice once again in our Creator’s goodness! It is our sincere prayer that we would remain *curious* about God’s sovereign work throughout history, and that we would be *captivated* by the sweetness of His daily love toward us, His children.

*“Awake, sleeper, and arise from the dead,
And Christ will shine on you.” Ephesians 5:14*



R.J. DESTREE, M.D.
Editor

JOSEPH ADRIAN
Theology Editor

TREY TIPPIE
Science Editor

DR. SEAN ALLISON
MAGGIE RICHARDSEN
Editorial Panel

KELLEY CARLSON
COLLEEN DESTREE
Art Directors

VISIT US AT OUR WEBSITE:
www.hiscreation.com

The **CREATOR** Journal is published quarterly by **HIS CREATION**, PO Box 1735, Blairsville, GA 30514. Copyright © 2021 by **HIS CREATION**. All rights reserved. Our publications are offered without charge, however donations are greatly appreciated!

Scripture references are from the New American Standard Bible, Copyright © 1960, 1962, 1963, 1968, 1971, 1972, 1973, 1975, 1977, 1995 by the Lockman Foundation.

PHOTO/ILLUSTRATION CREDITS

- 1 Insulin—University of Toronto
- 2 Cell membrane—© selvanegra / iStock
- 3 Organs—© Can Stock Photo/pixdesign123
- 3 Cells—© Jose Luis Calvo/ Shutterstock
- 4 Papyrus/Banting & Best—Public Domain
- 6 Dr. Joslin—Public Domain
- 7 French lilac—Epibase CC BY 3.0
- 8 Dinner—© Monkey Business Images/ Shutterstock
- 9 Lilly grave—Courtesy Visit Indiana
- 10 Crosses—© Can Stock Photo / beawolf