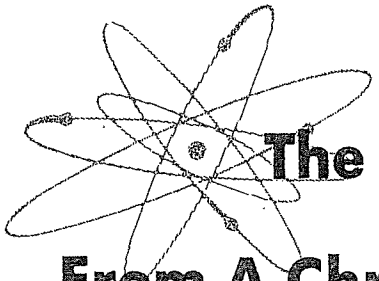

The Teaching Of Science From A Christian Viewpoint (II)

by Marjorie Martin

"Thine, O Lord, is the greatness, and the power, and the glory, and the victory and the majesty: for all that is in the heaven and earth is Thine; Thine is the kingdom, O Lord, and Thou art exalted as head above all." (I Chronicles 29:11) Such praise the Lord requires from His people, for He said, "This people have I formed for myself; they shall shew forth my praise" (Isaiah 43:21). Such praise must not only flow by word of mouth, but also from our walk of life, which should be glorifying of Him, and consecrated to His service.

The Christian education of the covenant seed has such for a goal. The study of Science can make an important contribution towards achieving such a goal, by token of its nature and content. For *Science education involves learning about God's creation—God's mighty works in creation and providence;* the created universe itself proclaiming the glory of God and praising His name, as a book; a revelation of Him; for, "All Thy works shall praise Thee, O Lord and Thy saints shall bless Thee" (Psalm 145:9).

In an article, in the fall edition of *Perspectives,* various issues concerned with Science education from a Christian viewpoint were treated; such topics as, the nature of Science, Science and Scripture, Science as opposed to Science falsely so called, scientific method and its limitations, a scriptural framework for a true interpretation of creation. In this article there will be further *treatment of goals, content of courses and methods of teaching Science in a Christian framework.*

As is necessary, for all our thinking and living, *we look to Scripture for our purposes or goals of education*, "for Scripture sets forth the end of man".[1] "Thou art worthy, O Lord, to receive glory and honour and power: for Thou has created all things, and for Thy pleasure they are and were created" Revelation 4:11. *The glorifying of God in his life and the honouring and praising of Him is the underlying goal of Christian education.* This goal implies others, as loving God with all his heart, soul and mind, fearing God, as this is "the beginning of wisdom" and the keeping His Commandments as this is His will.

Reverend David Engelsma gives a goal of Reformed covenantal education as "a mature man or woman of God, who lives in this world, in every area of his life, with all his powers, as God's friend-servant, loving God and serving God in all his earthly life, with all his abilities, and who lives in the world to come as king under Christ, ruling creation to the praise of God, His Maker and Redeemer".[2]

How can Science studies help to achieve such an overall goal. *One goal of Science education for a child of God is a growth in the knowledge of God.* "True Science is ultimately concerned with the knowledge of God".[3] Science, "includes not only the formal interpretation of certain data, but it includes the spiritual interpretation of it and the application of all the scientific data and conclusions with respect to the knowledge of God".[4] In a study of God's created universe, a Christian can see and learn more of God's wondrous attributes; His power and eternal Godhead, His majesty and infinite wisdom and providence, as manifested in the order and detail of creation. Such study also fosters the development of awe and wonder at His omnipotence and wisdom, when contemplating the marvels, the exquisite design and beauty and variety in His creation. In so doing *there may well follow, by the grace of God, an increase in reverence, holy fear and love of God, in the Christian student.*

Science studies may lead to a deep sense of humility before the Most High God, as he becomes more aware of His omnipotence, confessing as did Job, "I know that thou canst do everything, and no thought can be withholden from Thee." "I have heard Thee by the hearing of the ear; but now mine eye seeth Thee. Wherefore I abhor myself, and repent in dust and ashes." Job 42:2, 5, 6. Such humility is God-honouring and loving and *such love of God may be increased in the child of God,* when he is reminded, that this Almighty Jehovah, is the covenant Father of His people, loving them intimately and personally and

blessing them with His wondrous grace. He can see also, in his Science Studies, the loving-kindness and faithfulness of the Lord to His people, in His wonderful provision of their physical needs.

Following on an increase in the fear and love of God, another goal may be met, that of *increase in self-consecration to God, in obedience to His commands, and in holiness*. This is the spiritual mature man or woman of God, his mind captive to Christ, leading God-centred lives, obedient to His laws.

Again, recognition of the immutability of God's laws in creation, emphasizes his own necessity to obey, not only these physical laws regulating his life, but also God's moral laws, His Commandments. It can lead him to seek earnestly, God's enabling, so to obey. He also, can learn more of the justice and holiness of God, the awfulness of sin, and God's righteous judgments, when he sees the effects of the curse in creation, the Flood and temporal judgments. This can cause an increase in awe and reverent fear of God and thanksgiving for His redemption by Christ; this leading to further obedience.

The child of God is to live in this world, as a friend-servant of God, serving Him in every area of his life, using all his powers and abilities. "The believer must exercise his calling as king under Christ in using this creation and all its powers in the service of God."[5] A goal of Science *studies is the acquisition of a valuable body of knowledge and skills concerning creation, his physical environment which will enrich his life, and better equip him to use his talents in the service of God.* With the rapid advance in scientific knowledge and technology and their vital role in modern life, a Christian needs a good general scientific knowledge and to be reasonably scientifically literate.

There is an urgent need in this day, where increasing status is given to Science, to the extent of worship of Science and where there is much scientism, i.e. false Science; for the Christian student to rightly understand the nature of science, of scientific method, its scope and its limitations. Indeed *an important goal of Science is that the student learn to detect between true Science and false Science;* to be able to avoid "profane and vain babblings, and opposition of Science falsely so-called" I Timothy 6:20. We are constantly bombarded, for instance, by evolutionary propaganda, or evolutionary-based ideas and values, by the media, the press, science and other textbooks and such is widely taught in colleges. We need to help our young folk stand for the truth of Christ against encroaching influences of such blasphemous philosophies. *Also he needs to be able to discern*

what is error, superstition (e.g. astrology, charms) and other anti-biblical ideas and practices.

Ecological studies, scripturally based, can *encourage thankful and economic use of the natural gifts of God in creation.* A further goal of Science studies is to foster interest in the wonder and beauties of God's creation *leading* to fuller enjoyment and delight in the same; *and to present and life-long interests*, in so-called, "nature hobbies". A God-centred life will include wonder and joy in the works of His creation.

Also Spiritual *lessons can be learned from creation as directed by Scripture;* for we read, "Go to the ant, thou sluggard; consider her ways and be wise" Proverbs 6:6, compelling diligence, and, the Lord uses the "clothing" of the "grass of the field", to exhort His people to trust in Him for their material needs, Matthew 6:30.

It will be seen that the goals described for Science studies are *spiritual-ethical-practical* in nature, as is the essence of covenant education. [6]

Having outlined the excellent goals to which one may work in Science education, some consideration will now be given to *the content of Science courses.* Such treatment can be general and brief only. Remarks will apply, to some extent, to Science teaching from kindergarten to Senior High, with content and method appropriately selected for each age level. However, it is Science courses for Junior and Senior High which are chiefly in mind.

Firstly, we must emphasize *the absolute authority of Scripture*. This is our criterion for all we say and do. The Bible is God's revelation of truth to us. It tells us of creation, its origin, history and of providence. It speaks inerrantly and Science must bow to that speech of Scripture or it is not even true science. Science is to be judged by Scripture, never the reverse. "That fundamental principle may never be violated." [7] The status of the Bible is primary in Science, as in all subjects, and its teachings should pervade the whole atmosphere, with Scripture entering into the lesson quite often and often being the focal point.[8]

At the commencement of all Science courses, there should be explicit treatment of the events of history and the doctrines, which explain the nature of creation, as we see it now. In brief, these are; the creation of the universe and all therein, by the word of Almighty God and this in a period of six days; and all was very good; the fall of man into sin, bringing death and the curse

on mankind and the rest of creation; the world-destroying Flood in Noah's time; the redemption of His people and creation by Christ; God's covenant of grace in creation. These and other truths *constitute a foundation and framework* on which the student is to pursue his Science studies; for such is essential for the true interpretation of what is seen in creation. Therefore, though he studies these truths in Catechism and elsewhere and has heard them all his life, it is desirable that they be restated and emphasized, as the starting off point of his Science studies, and that there be continual reference to and illustration of them throughout his Science work at school.

This framework, would include further truths, such as; God is the Sustainer and Governor of Creation; He is the lawgiver in the Universe and ordains all the laws of His creatures [9] and sovereignly governs and preserves all according to His predetermined plan; He created plants and animals after their own kind and able to multiply after their kind only; God created man in His own image, to be a friend-servant of God and steward of creation; that this image was lost at the Fall; that man is distinct from animals and is a special creature of God in every respect; that the elect are redeemed because of the Covenant of grace which extends to the creation generally.

In this commencing unit, illustrations would be given from *the creation*, such as the creaturehood of all things and their dependence on God, e.g. reference might be made to the great variety of living creatures (an estimated 1½ million different kinds in the world) from tiny bacteria to huge trees; each creature wondrously designed by the Creator and sustained by Him as He purposes. There would be a restudy of the events of the six days of creation.

When dealing with *the Fall*, there would be illustrations of the effects of the curse in creation for, "the whole creation groaneth and travaileth in pain together until now" Romans 8:22. Reference may be made, not only to thorns and thistles and weeds, but to other creatures and events that cause incessant toil for men, suffering, decay and death. Pathogenic bacteria and viruses and other disease-causing organisms, insect pests as locust plagues, mutations (changes to genes, almost always harmful) could be mentioned but also natural disasters as storms, floods, earthquakes.

These judgments are widespread and frequent, showing the great evil of sin and the justice, holiness and wrath of God, and there is "an increase in the force and effects of the curse" and

"always new manifestations of it" [10] until the return of Christ.

Most of the present structure of the earth's crust and surface features, such as valleys, mountain ranges, stratified layers of sedimentary rocks, etc., were caused by *the Flood;* the great canyons being large "scars", that remind one of the penalty of sin; being caused by this universal Flood. The Flood was a miracle of God. It was a world-shattering deluge of immense proportions, which destroyed "every living substance"..."which was upon the face of the ground, both man and cattle and the creeping things and the fowl of heaven"..."and Noah only remained alive, and they that were with him in the Ark" (Genesis 7:23). The Flood lasted more than a year and it was universal, for we read that the "waters prevailed exceedingly upon the earth; and all the high hills, that were under the whole heaven, were covered" Genesis 7:19. It was accompanied by vast geological upheavals, "the fountains of the great deep" were "broken up" Genesis 7:11. There were vast earthquakes, huge volcanoes, great currents, tides and rampaging waters and "the world that then was being overflowed with water perished" 2 Peter 3:6. The Flood caused the formation of the great beds of sedimentary rocks and the huge numbers of fossils, these being from the vast numbers of animals and plants drowned and suddenly buried; and their positioning in different layers of rock being due to the sorting action of water and the order of burial. At this time, burial under pressure of thousands of tons of vegetation was the origin of fossil fuels, e.g. coal, petroleum.

The creation speaks also of the "wonder of grace, whereby this creation, and God's people with it at its head are redeemed and brought into the new creation of heaven"; e.g., the winter speaks of the curse, the new life in the spring speaks of regeneration of the brute creation. [11]

As well as in an introductory unit, *this Biblical framework will influence what is said and how topics are treated throughout the Science course;* there being quite often, illustration of and reference to the truths it contains. *There should be an emphasis on God as the Creator and sustainer of all His creatures and His laws; this often being explicit, and if not, implicit.* So we teach "Water" as one of the marvellous creations of God; that it was created on the first day; that all matter, all atoms that now exist were created on the first day of creation. Also that God maintains the spinning of electrons, at vast speeds, in their fixed positions within the atom, so preventing the coalescing of the electrons with the nucleus which would destroy the nature of matter. He

keeps the vast number of heavenly bodies moving at vast speeds in their fixed orbits and prevents their colliding. He maintains the nuclear disintegrations of the sun, which produce the vast amounts of energy which, of course, is the source of all our energy. He is "upholding all things by the word of His power" Hebrews 1:3. All is of God! He made everything! He preserves everything! It is His just curse and judgments, the signs of which are seen. It is His grace which supplies His people's needs and redeems them and creation.

Also at the commencement of Science courses, at secondary level, it is desirable, (and is usual), *that there be a direct study of the nature of science,* of scientific method, its scope and limitations and the nature of false science, or scientism. *Scientific knowledge is built upon observations, which must be reproducible.* Only observable, i.e. physical phenomena, can be studied by Science and Science can only deal with phenomena which are in existence now (events in recent history, for which there is data obtained, by scientific observations at the time, may be included as science).

True Science will never conflict with Scripture, as God is the author of Scripture and reality. Scientific method is a legitimate tool for investigating present physical phenomena. However it is limited to this field. It cannot speak on the origin of the universe, animals, man, etc. God alone can tell us of this. Nor can it deal with values or ethical and philosophical questions and spiritual realities. Scientific method is limited by the restricted abilities of man and his nature, which is depraved (unless he is redeemed by Christ). There are presuppositions in the scientific method. Sin distorts man's presuppositions and influences the inferences he draws. Its use involves the bias and prejudice of the scientist, though the unbelieving scientist claims objectivity. There is much false science or scientism, which is "a religion or set of beliefs," which stands opposed to God's word;[12] such as evolutionary-based science.

A direct study of Science and Scientific method at the start of his course, helps the student judge between true and false science in his readings as his course proceeds, which provides further training in the ability to make these judgments.

The bulk of Science courses are comprised of *formal or empirical knowledge*. This is facts or data, obtained by observation and principles or theories, which are patterns of relationships built on these observed data. This knowledge is seen in secular science textbooks. It is the whole of scientific

knowledge to the unbeliever. It is a large part of scientific knowledge (as far as it is in accord with Scripture) to the believer, but he learns more, the spiritual dimensions of phenomena (transcendent knowledge) as well.

In Science courses, desirably, there should be a good basic and general knowledge of facts, concepts and principles in the several natural sciences. So the student learns about the universe; the earth; the nature of matter, atoms, molecules, elements, compounds changes; about energy, electricity, light, sound, forces and other physical phenomena; about land forms and rocks; then also of life and living things, such as the structure and functions of parts of plants and animals and also of his own body; and other wonderful knowledge of God's creation. So he learns how God made and designed all His creatures to fulfil His purpose for them, and about His operations and laws by which He preserves His creation.

Once again the teacher is alerted to watch out for false science, as beliefs, such as evolution, are so deep-rooted, that, often, there are statements in text books based on these, and presented as facts. For example, statements that the world is billions of years old, of course, are false and unscientific, being un-Scriptural (from the Bible we can tell the age of the earth as around 6,000 years). It is of interest, to look briefly at a type of dating method used by evolutionists. Dating methods such as the potassium-argon method are not scientific and are based on beliefs and assumptions. It is asserted that processes such as the radioactive decay of potassium-40 to argon-40, have occurred at the same rate since the beginning of the earth (Uniformitarianism). This could never be shown to be so. Indeed, we know it is not, as the Flood would have altered the decay rate and the rocks and their contents. There would be no way of measuring the amounts of potassium and argon that may have been added or lost to the rocks. These dating methods are based on guesses as to what was in the rocks initially; it is just assumed, that there would be only potassium-40 and no breakdown products, such as argon-40. This could never be shown to be so. In fact creation, being complete, with an appearance of age and with all the processes of the earth functioning, chemical materials must have already been organized, it being most likely that some breakdown products, as well as the parent potassium were created simultaneously. Such dating methods do not give scientific findings and are false. Science cannot measure the age of the earth.

Children, first graders as well, should be made aware of the nature of evolution and that it is rooted in unbelief; is anti-Scriptural, evil and the "lie". Senior students should know the so-called "evidences" of evolution, so that they see further, its unscientific nature and are forewarned and forearmed against future subtle attacks and brainwashing by evolutionists. Moreover they should see that evolutionary thinking is destructive of society, causing despair and hopelessness to men and bringing violence and lawlessness. *They should at all times be made to feel confident and secure in their trust in the Word of God and be prepared to stand for Christ and His truth.*

The study of creation, for the believer, will include not only empirical knowledge of an object or event, but also the spiritual aspects, such as its relation to God, its creaturehood and dependence on God, its design and created purpose. This has been called *transcendent knowledge*. True knowledge includes this. However only the regenerated man can understand transcendent knowledge and see God's hand in creation and respond to this in praise. [13] In the study of a phenomenon, the Christian student should often see God's purpose behind it; and the aptness and fitness of its nature and design for its purpose or habit of life, should be often pointed out or discovered.

Some examples will now be given to illustrate the omnipotence and wisdom of God; and how the contemplation of His handiwork may increase the veneration and worship of Him. They will illustrate God-centred science teaching, including how the Bible can be incorporated.

The study of astronomy, as we learn of the stars, their vast numbers, the immensity of the universe and the illimitable tracts of space, astounds us and we are overwhelmed by the impression this gives us of the omnipotence and infinite glory of the Creator.

The stars are not scattered haphazardly in space, but are organized into systems (which we call galaxies) containing billions of stars (suns). The stars in our galaxy, the Milky Way, are exceedingly numerous, there being 10^{11} or 100,000 millions of them and these stars are separated by vast spaces. The distance across our galaxy, is such, that light travelling at the fantastic speed of 186,000 miles every second, would take 100,000 years to cross it. We say it is 100,000 light years across; one light year is 6×10^{12} miles. (When God created the stars on the fourth day, he also placed the light rays between them and the earth, so that they would have been visible from earth that fourth night.) It would take a space vehicle travelling at 25,000 miles an

hour, as they can now, more than 500 million years to go from the earth to the closest end of our galaxy! It is estimated that there are thousands of millions of other galaxies which are spread over immense distances of space. The closest galaxy to us, Andromeda, is more than a million light years away and the farthest detectable, by telescopes are said to be 5,000 million or more light years away. And each galaxy consists of billions of stars! How immense and wondrous is the created universe of Jehovah and how much mightier and glorious is He! Our hearts are bowed before Him in humility and then transported in praise! As Scripture tells us "as the host of heaven cannot be numbered neither the sand of the sea measured..." Jeremiah 33:22, "but Jehovah He telleth the number of the Stars, He called them all by their names" Psalm 147:4, for "He hath stretched out the heavens by His discretion" Jeremiah 10:22.

As for many topics, the Bible would be consulted, as to the stars and the heavens. There would be found, God's reasons for creating the stars (Genesis 1:14, 15, 16; Psalm 19:1) and also references, which are warnings, against worshipping the sun, moon and stars and other evils, as astrology (Deuteronomy 4:19). God asked Job questions about the stars; Job 31:33 to give him a lesson in humility. Surely, we must exclaim, "O Lord, our Lord, how excellent is Thy name in all the earth! who has set Thy glory above the heavens." "When I consider the heavens, the work of Thy fingers and the moon and the stars, which Thou has ordained; what is man, that Thou art mindful of him? and the son of man, that thou visitest him?" Psalm 8:1, 3, 4.

Everywhere we study in creation we find wonders of design and beauty. Myriads of examples can be given. Volumes could be written, every sentence declaring the omnipotence and wisdom of God.

Let us consider some aspects of that marvellous organ, the human eye. The eye is one of God's most precious gifts. "It is the light of the body; it is the open window to the whole world outside", it is the means by which we can see to carry on life's activities and enjoy the beauty around. [14] Learning the structure and function of the eye makes us marvel at its exquisite design.

The delicate, complicated apparatus of the eye is wonderfully adapted to light. Of course, without light, it could not function, and the property which all objects have of reflecting light is essential if they are to be seen. Also, if all wave lengths of light caused only one color, we could not distinguish objects from one another and beauty would disappear. Indeed, "light" itself is a

wonderful topic to study.

There is automatic adjustment of the amount of light which enters the eye through the pupil and automatic adjustment of the lens (which is towards the front of the eye) to accommodate to the distance of the object to be seen. This is a marvellous feature of the eye.

The reflected rays of light from objects pass through the lens and are focussed on the retina of the eye (the light-sensitive, inner layer at the back of the eyeball), where images are received. The retina changes the light energy into nerve impulses which are carried by the optic nerve to a particular region of the brain which interprets them and we see.

Let us imagine we are standing on a high hill overlooking an extensive scene of a city, river, boats, countryside and distant mountains. Amazing would be the vast numbers of light rays which are reflected from the great number of objects in the scene. The fact that we see the scene is remarkable! All these light rays from all these objects pass through the pupil and lens, in perfect order, without being blended, or confused with others. Millions of rays must be compressed into a space little more than 1/8th of an inch in diameter before they can enter the pupil and yet, exact, though inverted, images are formed. Also consider the distinct impression we have of the shape, color, motion and multiplicity of objects in the scene. How wonderful that all the rays from such an extensive scene, say, of about 500 square miles, can be accurately focussed on the back of the eye in a small area, of less than half an inch in diameter on the retina! How inconceivably fine and accurate must be the impressions which the light rays from the visible objects make on the retina! Wonderful also is the way the brain interprets the continual stream of nerve impulses from the retina, so that we see the scene in three dimensions, in color, brightness, shadow, nearness and farness, contour, etc. And all this without our wishing it or knowing anything about it except that we see. *Every moment we are so much indebted to the Creator for thousands of benefits and enjoyments that we seldom think of and for which we are not sufficiently grateful.*

Studies of eyes of animals show perfect provision for their needs. Fish, for example, have more rounded lenses than land animals, because light rays are refracted by water; deep sea fish have large eyes to catch as much light as possible. Anableps, a little fish, has its eye divided, as it sees above the water and underwater at the same time as it swims and it has an

egg-shaped bifocal lens for this. There is a salamander which has a transparent window in its eyelid, and so we could go on with thousands of examples of wondrous design in the structures of all God's creatures.

Surely we must use this wonderful gift of vision for the glory of God: being careful as to what we see, watch, read and what we do with our eyes, at all times using them and all our gifts in God-honouring ways.

When considering *methods of teaching Science from a Christian viewpoint,* we are concerned with the principles and techniques for efficient teaching generally. If goals are to be realized to a desirable degree, much skill and proficiency is required on the part of the teacher. This is a large field of study and mention will be made of only two or three aspects.

It is impossible to separate teaching from the teacher himself. He shapes the learning experiences. *A good teacher is able to communicate effectively with his students, thus stimulating an optimum response.* This involves, among other things, being *able to inspire his pupils,* so they are keen to learn. This is especially important for the Christian teacher, as he needs to inspire them to further reverence, love and service for their Maker. He must arouse not only the mind, but also the heart.

Above all, *his own spiritual maturity is important,* his own life, his walk, needs to be God-centred, with a deep faith in Christ and implicit trust in the Scriptures; and also a real interest in the field of Science. *Paramount is his own example.* He communicates directly by what he says, but indirectly, and, with as much, or more force, by his attitudes and his enthusiasm. His deep reverence for and love of God, and his love for the covenant seed, will be manifest to his pupils, in all he does and says; for example; his keenness to point out to them the might and glory of God as exhibited in creation and to share with them the joyous contemplation of these wonders. He will know and deeply appreciate the wonders, beauty and design in creation, for he cannot lead where he has not been himself. His being sensitive to the fact that the omnipresent God has created and is maintaining the objects and operations, he and the students are investigating, will show in his manner and what he says.

To communicate skilfully, his teaching *manner before the class needs to be forceful and enthusiastic* and sufficiently animated, to inject life and emphasis into his teaching, and arouse the interested participation of the students. Science studies should be interesting and meaningful; the topics being

interesting within themselves. A Christian Science teacher, however, is continually thoughtful as to *ways of arousing and keeping the pupils' interest.*

Another keynote of effective teaching is *clarity in presenting ideas, concepts, etc.,* requiring careful pre-thought as to ways of ensuring understanding. There are many concepts in Science, e.g. inertia, atom, gene, latent heat, resonance. Concepts are most important in organizing and attaching meaning to experience. Basic concepts must be clearly understood, before dealing with further concepts or principles dependent on them, e.g. pupils cannot understand why objects float, unless they understand the concepts of density and pressure. A few points to help teach concepts are: 1) provide a variety of experiences to illustrate the concept, in particular, concrete ones e.g. visual representations, as in demonstrations (varied experiences do more to promote understanding than the repetition of the same experience): 2) emphasize the characteristics of the concept: 3) give a clear, concise, meaningful verbal description (definition) of the concept: 4) compare and contrast the concept with others: 5) reinforce by repetition and emphasis: 6) test understanding by recall and application. Some pedagogical maxims of long-proved value are: proceed from (1) the known to the unknown (or familiar to unfamiliar in the students' experience), (2) the simple to the complex (3) the concrete to the abstract. Such, help develop understanding in simple, logical steps.

Of *especial importance, in Science courses, is the place of the practical demonstration by the teacher and practical activities by the pupils.* Science is based on the observation of the actual objects and events, and science work at school should involve a good amount of direct observation of objects and experiments. Nothing takes the place of actually examining an object itself; handling materials, using equipment, solving a physical problem by an experiment; using the scientific method to test an hypothesis, etc. Demonstrations by the teacher are very effective and useful learning procedures and are needed frequently. *Good demonstrations are essential for good science teaching.* However demonstration work requires a lot of preparation. Science teachers need help for laboratory work. e.g. part-time laboratory assistant, or extra free periods for adequate preparation and also access to the laboratory, to set up equipment, prepare reagents and materials, test experiments and other activities associated with practical demonstration.

The spiritual aspects (transcendent knowledge) are taught

concomitantly with formal knowledge, the former often being explicitly stated, but always implicit. As has been stated elsewhere, Science should be taught so that *the concept of creation and providential guidance are a necessary part of what we teach.* Therefore, the teacher's thought forms and speech patterns about creation are important, if he is to teach always in a Biblical perspective. [15] Since most of his Science studies are from secular textbooks, he will try to keep this Biblical perspective as an inseparable part of his thinking. This will ensure that *he will often make reference to these spiritual truths and his statements would never conflict with them.* He will make constant, but strategic, and not monotonous reference, to the omnipotence and wisdom and other attributes of the Creator, and to the creaturehood of all and God's providence in sustaining all. He will often *use the teleological approach; highlighting the created purpose of a phenomenon* e.g. he will make his pupils aware of the suitability to life, of the proportions of the gases in the air, and of the fact, that it is colorless and has pressure; he will draw their attention to structures and their perfect design for their purpose, as the feather of bird, its wings, hollow bones, etc., enabling flight.

He avoids the use of the term "nature", and its personification. One reads of "nature" in secular books, as though it were a power or entity that can do things, e.g. "nature never varies", but he will speak instead, of God's ways in sustaining creation, never varying [16] (except as God has chosen otherwise e.g. a miracle). He will always denounce evolution and the idea of "nature selecting". He knows there is no place for "chance" ("meaning a totally uncaused or unconditioned effect" [17]), in creation and God is in control of probability, as all else. He can recognize subtle statements that mechanise an event and remove it from God's control. No phenomena have independence or autonomy in themselves for God controls everything that occurs. "Autonomy and providence are mutually exclusive". [18]

It is better not to make statements like; an object floats because of Archimedes' Principle. The answer is better given in terms of weight of the object being counter-acted by the upthrust of the water displaced; Archimedes being the man who first noted and described this (this discovery also brought about by God).

God's name will be mentioned only with reverence, and on an appropriate number of occasions; the names Creator and

Maker also being used. However there must not be a continual reference to, say, "God's air pressure, God's temperature, God's humidity, etc., lest the name of God be profaned by over-usage. On the other hand, it is just as dangerous never to mention Him at all. It is a matter of balance, then, a matter that will reflect the balance evident in the teacher's own individual outlook". [19]

Biblical quotations and references should be read or stated, on an appropriate number of occasions, particularly where there are specific references to events such as the evaporation of water in the water cycle; "He causes the vapours to ascend", Psalm 135:7. A good project for pupils is the looking up of Bible references. Of course, it is only in the exalted language of Scripture, that the glory of the Lord and His works can be well described. "Thou, even Thou, are Lord alone; thou hast made heaven, the heaven of heavens, with all their host, the earth, and all therein, the seas and all therein and thou preservest them all; and the host of heaven worshippeth Thee" Nehemiah 9:6.

The task of the Science teacher is seen to be most demanding, with need for much knowledge and specialized skills in Science subjects, and also, much knowledge of the Scriptures. He needs much wisdom from God and, only with His enabling, can there be any measure of success in the achievement of the wonderful goals. *He is encouraged in his challenging work, for it can be so fruitful in the edifying of God's children.* Constant effort is involved and incessant prayer for the blessing of the Lord on his teaching, working in the minds and hearts of the students, further knowledge, wisdom and love for their Lord, to help them to live to His praise in this life and forever.

FOOTNOTES

1. Engelsma p. 79
2. Ibid p. 79
3. Hoeksema, H.C. p. 60
4. Ibid p. 60
5. Hanko, H. p. 22
6. Engelsma p. 65
7. Hoeksema, H.C. p. 69
8. Ream p. 8
9. Hanko p. 20
10. Hoeksema, H.C. p. 67 *
11. Hanko p. 19
12. Hoeksema, H.C. p. 55
13. Hanko p. 19

14. Rehwinkel p. 263
15. Ream p. 67
26. Ibid p. 67
17. Ibid p. 46
18. Ibid p. 45
19. Ibid p. 65

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1. Engelsma, David. **Reformed Education.** Federation of Protestant Reformed School Societies, 1977.
2. Hoeksema, Homer C. **In the Beginning God.** Reformed Free Publishing Association, 1974.
3. Hanko, Herman. **Principles of Education** of Hope Protestant Reformed Christian School, 1974.
4. Ream, Robert J. **Science Teaching, A Christian Approach,** Presbyterian and Reformed Publishing Co., 1972.
5. *Hoeksema, Homer C. **Older Testament History. Introduction. Creation to the Protevangel.** Theological School. Protestant Reformed Churches.
6. Rehwinkel, Alfred M. **The Wonders of Creation.** Baker Book House, 1974.

CORRECTIONS

In the previous article by Marjorie Martin on the same topic (cf. *Perspectives,* Fall, 1979, pages 32 and 33) the following errors appear.

A sentence appears as follows on page 32, paragraph 3.

"The earth is of enormous weight, estimated at about 6588 x 10 tons and it is whirling about its axis at the incredible speed of 1000 miles an hour and at the same time it travels in orbit about the sun at more than 1100 miles a minute."

The sentence would be correct if the weight of the earth were stated as follows:

"...estimated at about 6588 x 10 tons..."

2. On page 33, paragraph 3, a sentence appears as follows:

"The Christian sees creation 'as the science of the drama of sin and grace enacted according to God's eternal purpose and sovereignly controlled by Him.' "

The sentence should have been as follows:

"The Christian sees creation 'as the *scene* (not science) of the drama of sin and grace....' "