

Theology on the Web.org.uk

Making Biblical Scholarship Accessible

This document was supplied for free educational purposes. Unless it is in the public domain, it may not be sold for profit or hosted on a webserver without the permission of the copyright holder.

If you find it of help to you and would like to support the ministry of Theology on the Web, please consider using the links below:



Buy me a coffee

<https://www.buymeacoffee.com/theology>



PATREON

<https://patreon.com/theologyontheweb>

PayPal

<https://paypal.me/robbradshaw>

A table of contents for *Journal of the Transactions of the Victoria Institute* can be found here:

https://biblicalstudies.org.uk/articles_jtvi-01.php

JOURNAL OF
THE TRANSACTIONS
OF
The Victoria Institute,
OR,
Philosophical Society of Great Britain.

VOL. LX.



LONDON:

(Published by the Institute, 1, Central Buildings, Westminster, S.W.1.)

ALL RIGHTS RESERVED.

1928

704TH ORDINARY GENERAL MEETING,

HELD IN COMMITTEE ROOM B, THE CENTRAL HALL,
WESTMINSTER, S.W.1, ON MONDAY, DECEMBER 5TH, 1927,

AT 4.30 P.M.

DR. JAMES W. THIRTLE, M.R.A.S., IN THE CHAIR.

The Minutes of the previous Meeting were read, confirmed, and signed, and the HON. SECRETARY announced the following elections:—As a Member: Dr. W. H. Pettit; as a Life Associate: the Rev. Parke P. Flourney, D.D., Litt.D.; and as Associates: The Rev. A. J. Lundgren, Miss Agnes J. Grant, Charles E. Howkins, Esq., the Rev. Donald G. Barnhouse, Th.M., Frank H. Nutter, Esq., the Rev. Principal W. E. Boggs, B.Th., Professor Percy V. Roberts, Ph.D., the Rev. George Hanson, D.D., Mrs. Edith A. Powell, Dr. Don O. Shelton, and Miss R. M. Kemble.

The CHAIRMAN then introduced the President, Dr. J. A. Fleming, F.R.S., to read his paper on "Number in Nature and in the Biblical Literature indicating a Common Origin in a Supreme Intelligence."

NUMBER IN NATURE AND IN THE BIBLICAL LITERATURE INDICATING A COMMON ORIGIN IN A SUPREME INTELLIGENCE.

By DR. J. A. FLEMING, M.A., F.R.S. (*President*).

1.—NUMBER IN NATURE.

IN our scientific study of the physical universe we find everywhere numerical phenomena or effects which require number to describe them completely. In some cases this involves merely a pure number as in the statement of the number of days in a year or a month. In other instances it requires the use of a unit, as when we state the velocity of light to be 299,796 kilometres per second, or the distance of the earth from

the sun to be about 93 millions of miles. Here the kilometre, second, and mile are units of space and time.

The object of scientific investigation is to understand and predict phenomena, and this can only be done when we have precise numerical knowledge of them.

The growth of scientific information has convinced us that all phenomena in the material world manifest in some way exact measure, proportion, or amount, and that there is in truth nothing casual, disorderly, or indefinite. Hence scientific men are willing to spend the labour of a lifetime in ascertaining or improving our knowledge of the numerical constants of Nature.

Very often surprising discoveries have been made as a consequence. Fifty years ago every chemist would have asserted that the atmosphere of our earth comprised only the gases oxygen, nitrogen, carbon dioxide, and water vapour. The late Lord Rayleigh made some exact measurements of the density of nitrogen, and found that when obtained from air it was half of one per cent. greater than when the nitrogen was obtained from chemical substances. The result of this fact was to reveal the presence of a previously unsuspected gas called Argon in the air, and the late Sir William Ramsay later on discovered four more constituent gases, viz. Helium, Neon, Krypton, and Xenon, and so opened up an entirely new chapter in chemical science.

The progress of research continually provides fresh means of making exact measurements, not only of the extremely large things in Nature, but of the extraordinarily small ones. The broad result of all this quantitative or metrical work in the last three-quarters of a century has been to show us a marvellous unity combined with diversity in Nature, and that things most different in properties and powers are yet structures composed of elements identical or similar in character. Moreover, there is a certain common pattern pervading the whole which presents powerful indications of a single source or origin.

2.—NUMBER IN ASTRONOMY.

Beginning with the great things in the physical universe, we find that it is composed of discrete or separate masses of matter called stars or nebulae which, however vastly different in size and motion, are composed, as the spectroscope tells us, of some of the same constituent elements as those occurring in our earth.

The stars, though differing in bulk, have very roughly about the same mass. Up to quite recently we knew next to nothing about the actual sizes of the stars which appear as mere points of light in the most powerful telescopes. The invention of an instrument, called an Interferometer, by Michelson, enabled the first measurement to be made in 1920 of the true size of *Betelgeux*, one of the bright stars in the constellation of Orion, and it was found to be a mass of gas about 273 million miles in diameter, large enough to include not only our sun and the earth in its orbit, but even to overlap the orbit of the planet Mars. Further researches have shown that all visible stars may be broadly divided into two classes now called giants and dwarfs. The giants are enormous masses of incandescent but rarified gases, but the dwarfs are smaller and have greater density. Nevertheless, though stars differ from one another in glory and in the particular elements found in them, as well as in size and density, many are yet constructed on the same general plan as our sun and of much the same materials. The life-history of a star, from its genesis as a mass of rotating gas—at first getting hotter as it contracts and radiates, then cooling and returning to the state of a dark or invisible star—has generally been made out. But the life-history of our own sun and its attendant planets, as well as the earth-moon system, involves some difficulties, and has not been yet explained by the same general principles which seem adequate to account for the innumerable binary and multiple-star systems which fill our galaxy. The giant and dwarf states represent probably the initial and final stages of an evolution through which many stars pass.

The observations on the so-called parallax of the stars, that is the apparent shift in position of the star as seen from opposite sides of our earth's orbit, have given us some idea of the immensity of stellar distances. The mile, or even a million miles, is far too small a unit to employ in dimensioning the appalling abysses of space. Astronomers employ a measuring line called a *Light-year*, equal to the distance travelled by a ray of light in one year. It is approximately six million million miles. Yet even this far-reaching line is too short for some soundings, and a unit called a *par-sec* is employed equal to $3\frac{1}{4}$ light-years in magnitude. The nearest star to our solar system is *Alpha Centauri*, which has a distance of $4\frac{1}{4}$ light-years from our earth. It appears clear that our own sun is a dwarf star rather past middle age, and is a member of a group of stellar bodies of very similar constitution

called Solar stars. These are distributed, it may be, in a globular cluster or ring, at 5 to 50 light-years distance from our sun. Outside and far beyond are the giant and dwarf stars of other clusters comprised in the so-called Milky Way. The stars composing this galaxy are distributed over a space of a lens shape, according to a recent estimate 40,000 light-years in thickness and 300,000 light-years in diameter, hence it extends farther in a lateral than in a vertical direction. Outside and mostly in the direction of the short axis of the galaxy lie the spiral nebulae which are probably "island universes" or systems of stars in process of creation.

There are strong arguments in favour of the view that the total mass of all the stars is not infinite, and that the space itself in which they are distributed, though unbounded, is not unlimited in amount. This can only be the case if our four-dimensional space-continuum is curved in a fifth dimension. This notion, however, introduces us to some very recondite ideas in connection with the theory of Relativity.

3.—NUMBER IN ATOMIC STRUCTURE.

Passing then to the opposite end of the scale of magnitudes, we notice the great progress made in the last few years, or since 1896, in exploring the structure and sizes of atoms. Not only is the visible universe composed of discrete masses of matter we call stars, but all matter is built up of discrete or separate units called chemical atoms. We have discovered about 88 or 89 different kinds of atoms, and there are some reasons for thinking not more than 92 or perhaps 100 different kinds of atoms do exist.

These atoms are built up of two discrete or separate kinds of smaller particles called electrons and protons, and are constructed on the same general plan as the Solar system, with its central controlling body or sun and attendant planetary electrons rotating round it. Every atom, in short, is a microcosm. The electrons taken collectively form what we call negative electricity and the protons the positive electricity. The protons are probably much smaller in size than the electrons but vastly more dense. A proton has about 1,800 times the mass or weight of an electron; they are analogous to the dwarf stars. The central part or nucleus of the atom contains all the protons held together by a certain number of electrons into a small, very compact mass;

around this in various orbits the planetary electrons revolve. The total number of these planetary electrons in an atom is called the *Atomic Number*, and it is a very important quantity, as on it the chemical properties of the atom depend.

These planetary electrons are arranged in certain numbers in their various orbits, which are called the K, L, M, etc., orbits. It seems that there are always 2 electrons in the innermost or K orbit, and in the outer orbits various numbers up to 18 or more. The electrons in the outermost orbit are, however, generally fewer than 8, but it is a curious fact that most atoms seem to desire to make up the number to 8 in the outermost orbit, and when they can satisfy this octet appetite they become neutral or indifferent to combination with other atoms.

Thus, for instance, one of the most important elements is Oxygen which forms one-fifth part of the air we breathe. It is the life-giving element, and unless oxygenated blood is continually supplied to the brain, we become unconscious in a few minutes and death supervenes shortly after. The Oxygen atom has 8 planetary electrons, 2 in the K ring and 6 in the L ring, and it is very desirous to possess 2 more to make up its outer orbit to 8 electrons. The atoms of the metallic elements have few electrons in their outer orbits, and these they seem rather anxious to get rid of than retain. Thus an atom of Calcium has two such loosely attached outer electrons, but if it comes across an atom of Oxygen desirous to take up two they come to some kind of bargain to transfer them.

The loss of 2 electrons by the Calcium atom upsets its electrical neutrality and it becomes positively charged. The gain of 2 electrons by the Oxygen atom gives it an equal negative charge, and the mutual attraction of these two opposite charges holds the atoms together and, combined, they form a molecule of Calcium Oxide or quicklime.

We find then that the total number of planetary electrons in these atoms of various kinds increases by 1 as we proceed up the series, from 1 in the case of the lightest atom of Hydrogen to 92 in the case of the heaviest, viz. Uranium.

We can arrange all these known kinds of atoms in a table called the Periodic Series (*see* p. 17), having 9 columns and 12 rows. Each column contains two series of elements of similar chemical and physical powers. The zero column is peculiar; it contains all the rare atmospheric gases—Helium, Neon, Argon, Krypton, and Xenon. The ninth column, or

Group VIII, contains all the elements of marked magnetic power such as Iron, Cobalt, Nickel, and two other groups of three metals. Everywhere in this Periodic Series the digits 8, 10, and 12 are remarkably conspicuous.

On examining the table it will be seen that certain places in it are unoccupied; these belong to a few missing elements which may some day be found. We can tell even now to some extent what the properties of these missing elements will be. There are, therefore, nearly 90 known or possible substances called Elements, because they are not made up of anything simpler nor can be resolved at present into other substances. There is, however, some proof that the nucleus of each atom is made up of the nuclei of Helium and of Hydrogen. The number against each element is its Atomic Number or total number of its planetary electrons. The group in which it stands—I to VIII—tells us the number, actual or possible, of the electrons in its outer orbit. The row, 1 to 12, in which it is placed determines in a more specific manner its chemical and physical properties.

It will be seen that, excluding Hydrogen, there are 11 actually known elements in nearly every column. This table, however, should be written on a cylinder and not on a plane sheet, so that the zero column and the VIIIth are identical.

Anyone who looks at this table with even a small knowledge of Chemistry, will see the wonderful symmetry of it in the changes in atomic properties as we pass from column to column or row to row.

Passing along any row, we see in each successive column a single planetary electron is added with marked change in properties. As we proceed downwards in any column, the planetary electrons are added in groups of 8, 10, or 18, but the addition of the 8 does not change essentially the properties. There is a marked similarity of character which is preserved all down the column. Can all this be possibly the result merely of an unconscious physical agency called Evolution? Is it not evidence of some marvellous mathematical design in the building of the atom which makes it, as Sir John Herschel said long ago, clearly "a manufactured article." Some great Enumerator evidently here exhibits His profound Thought as well as Creative power.

We see then here a marvellous symmetry and unity of idea. The atom itself composed of two kinds of smaller particles, protons and electrons, is the pattern on which the Solar system and possibly also other systems of stars are built. Our sun has

THE PERIODIC TABLE OF THE ELEMENTS.

| Group 0. | Group I. | Group II. | Group III. | Group IV. | Group V. | Group VI. | Group VII. | Group VIII. | | |
|---------------|-----------------|-----------------|------------------|-----------------|------------------|------------------|-----------------|-----------------|---------------|-----------------|
| | | | | | | | 1 Hydrogen | | | |
| 2 Helium | 3 Lithium | 4 Beryllium | 5 Boron | 6 Carbon | 7 Nitrogen | 8 Oxygen | 9 Fluorine | | | |
| 10 Neon | 11 Sodium | 12 Magnesium | 13 Aluminium | 14 Silicon | 15 Phosphorus | 16 Sulphur | 17 Chlorine | | | |
| 18 Argon | 19 Potassium | 20 Calcium | 21 Scandium | 22 Titanium | 23 Vanadium | 24 Chromium | 25 Manganese | 26 Iron | 27 Cobalt | 28 Nickel |
| — | 29 Copper | 30 Zinc | 31 Gallium | 32 Germanium | 33 Arsenic | 34 Selenium | 35 Bromine | | | |
| 36 Krypton | 37 Rubidium | 38 Strontium | 39 Yttrium | 40 Zirconium | 41 Columbium | 42 Molybdenum | 43 Massium | 44 Ruthenium | 45 Rhodium | 46 Palladium |
| — | 47 Silver | 48 Cadmium | 49 Indium | 50 Tin | 51 Antimony | 52 Tellurium | 53 Iodine | | | |
| 54 Xenon | 55 Cæsium | 56 Barium | 57 Lanthanium | 58 Cerium | — | — | — | | | |
| — | — | — | — | 72 Hafnium | 73 Tantalum | 74 Tungsten | 75 Rhenium | 76 Osmium | 77 Iridium | 78 Platinum |
| — | 79 Gold | 80 Mercury | 81 Thallium | 82 Lead | 83 Bismuth | 84 Polonium | 85 — | | | |
| 86 Radon | 87 — | 88 Radium | 89 Actinium | 90 Thorium | 91 Brevium | 92 Uranium | 93 — | | | |

A COMMON ORIGIN IN A SUPREME INTELLIGENCE.

The elements whose Atomic Numbers lie between 59 and 71 inclusive lie in Group III under Lanthanium. There are 2 known and 1 missing.

The number written over each element is the Atomic Number.

circulating round it eight major planets and a host of smaller ones called asteroids. These rotate in the same direction, and their motions are conditioned by the law of gravitation, which, as far as we know, holds throughout the universe. Our own Solar system comprises, as it were, 8 planetary electrons in the form of the major planets and some hundreds of smaller asteroids.

Moreover, each of these Solar planets is built on the same general plan, and 6 out of the 8 major planets have satellites or moons revolving round them. The Earth has 1 moon, Mars has 2, Jupiter 9, Saturn 10, Uranus 4, and Neptune 1, as far as is known. The wonderful rings of Saturn are (as Clerk Maxwell first showed) only a vast number of small satellites, meteoric dust or stones circulating in close array round the planet. Indeed, the same kind of ring seems to exist on a larger scale in the cloud of asteroids which revolve round our sun in the space between the orbits of Mars and Jupiter.

All these stars are in motion, and the astronomer Kapteyn proved as the result of his investigations that the nearer stars form themselves into two great groups moving in opposite directions through space. These stars, as far as visible to us in our great telescopes, number upwards of 10,000 million, and they are scattered over a space the radius of which is perhaps about a million light-years. Our imagination fails us in the effort to grasp the meaning of these stupendous numbers, but we can at least obtain some faint conception of the magnitude and majesty of the physical universe in which we live.

At the opposite end of the scale our measurements bring us in contact with dimensions of inconceivable minuteness. A usual scale for atomic measurements is the Ångström Unit, which is a hundred-millionth of a centimetre. The majority of atoms have a diameter of 2 to 3 Ångström units. At this rate it would require about 200 million atoms placed in a row in contact to make up a length of a single inch.

But all our measurements show that an electron is vastly smaller, probably a hundred-thousandth time less. On this scale it would be as much smaller than an atom of Hydrogen as a mote of dust in the air floating in a sunbeam is smaller than the dome of St. Paul's Cathedral.

But the study of late years of the minute astronomy of the atom has revealed extraordinary numerical relations between its parts. It has been found that a planetary electron cannot revolve round its atomic nucleus at any distance, but only in certain

orbits which are called quantum orbits. In these orbits the energy of the revolving electron diminishes as the size of the orbit increases by regular and fixed steps or decrements, so that these energies are in the ratio of the reciprocal squares of the natural numbers, viz. 1, $\frac{1}{4}$, $\frac{1}{9}$, $\frac{1}{16}$, etc.

An electron cannot revolve in any intermediate orbit but can jump from one orbit to another, and when it does so it either absorbs energy or else gives it out in the form of light or radiant heat.

There is a technical term used in mechanics called *Action*, which must be explained. When a material body, whether electron, atom, or planet, is in motion, it possesses what is called kinetic energy. If its kinetic energy is changing, and if we multiply together the number representing it by the length of the short interval of time during which it may be considered as unaltered, and sum up these products—viz. time, multiplied by energy—we obtain what is called the Action during that whole period of time. In cases in which the body is moving freely under the action of forces depending only on the distance, the Action is less than it would be if the body were constrained to move along any other path. This principle of “Least Action” seems only to be one aspect of a more general principle of Economy in Nature. Thus a ray of light always travels from one point to another, no matter how much it may be reflected or refracted, in the least possible time.

The study of the laws of radiation has led to the remarkable conclusion that Action must exist only in exact multiples of a very small unit of Action. There are therefore no vague or indeterminate quantities in Nature. For everything that can be measured there appears to be some natural unit in multiples of which we must describe any other quantity of it. Every created thing or process is subject to number, magnitude, and measure.

Another field in which a striking order and numerical order is found is in the arrangement of atoms in solid bodies into lattices and the lattices into crystals. The employment of the X, or Röntgen, rays has enabled us, as it were, to look inside metals and other materials and find out the emplacement of the atoms in them. Thus, in diamond, the carbon atoms are arranged at the corners of a four-sided figure called a tetrahedron, and in many metals at the 8 corners of a cube. These lattices are packed together into larger aggregations called crystals, and a very common type of crystal is the octohedron with 8 faces formed of

8 similar triangles. Another is the cube, with 8 corners, 6 faces, and 12 edges. Even metals which apparently are uniform in structure may, in fact, be made up of multitudes of minute crystals compacted irregularly together.

4.—NUMBER IN LIVING ORGANISMS.

Passing then from the non-living to living matter, we find in the same manner that there is a unit, so to speak, which forms the atom of organic life. In this region of fact Number is again predominant.

The physical basis of life is a material called protoplasm, but this exists, not in unbroken masses, but in small discrete particles called cells. All vegetable and animal organisms are built up of cells, and each cell comprises in general a little particle of protoplasm round which there may be formed non-living material. The living cell contains a body called the nucleus, which plays a very important part in its growth and activities. The growth consists in the gradual multiplication of cells by a process in which each cell divides into two, and each of these again into two, and so on. This growth is conditioned by the cell having certain nourishment supplied to it from some surrounding medium, and also having a certain environment as regards temperature, moisture, and absence of other disturbing causes.

One chief characteristic of living organism, as we ascend the scale of life, is the gradually increasing complexity of structure. The mass of cells produced by the process of subdivision and growth is not disorderly, but in each case built up according to a certain plan in which cells in different parts take on special functions and continue to produce similar cells. Moreover, it does not continue indefinitely. The process proceeds until a certain individual or specimen, vegetable or animal, is produced, and then stops and fails, and finally disintegration or death takes place.

The second great characteristic of living organisms is their power to reproduce their kind, and pass on to another generation, whether plants or animals, that power of body-building according to a certain type they themselves possess.

Modern researches have then made it clear that there are two kinds of cells in all living organisms, viz. those concerned with the growth and development of the body or individual, called body-building cells, and those concerned with the reproduction of

the individual, called genetic or generative cells. The controlling agency in both of these classes is the nucleus of the cell. The nucleus contains a material called chromatin, because it can be stained by certain coloured dyes, and this chromatin is arranged, at a certain stage of growth, in rod-like bodies called chromosomes. The remarkable thing is that the number of these chromosomes determines, or is determined by, the nature of the individual. There is one number, 48, characteristic of the cells of a human being; another number, 38, of an ox; another, 12, of a house-fly; and another, 24, of a lily. Thus an ox-cell can never produce a man or a fly-cell a lily.

When a body-cell divides into two, the first step is that all the chromosomes divide lengthways into two and the two parts move to opposite sides of the cell, so that, when the latter divides, each daughter-cell has its own proper number of chromosomes, and this process continues at each fission.

The reproductive cells behave differently. In nearly all cases reproduction involves the union of two cells, one from each sex. Hence, in order that the proper chromosome number may be kept up, the generative cells must first reduce their proper chromosome number to half, and then when the union of the two cells from the two different sex-individuals takes place, the proper chromosome number is restored. In all parts of this wonderful process of cell-growth and cell-reproduction in living organism we see the domination of Number as a factor.

5.—NUMBER IN HOLY SCRIPTURE.

Let us, in the next place, consider some of the numerical facts which present themselves, in Holy Scripture. It is generally recognized that the various digits, 1, 2, 3, etc., have each a certain spiritual suggestiveness in the Bible. The number *Seven* carries with it the idea of perfection. We are told that the work of Creation occupied six great periods of Divine operation, and was followed by a Seventh day of Divine rest. Under the Theocratic Dispensation of Israel the appointed system of worship was septenary in character. There were Seven Feasts of the Lord at intervals during a sacred year of Seven Months. The Seventh year was to be Sabbatic, and the Seven-times seventh year a Jubilee. The Desolations of Israel covered a period of Seventy years, and the Coming of the Messiah was foretold to Daniel in the great prophecy of the "Seventy Weeks."

The completeness and perfection of the Divine Government is everywhere associated with the numbers *Seven* and *Ten*. The Seven seals, Seven trumpets, and Seven vials, of the Apocalypse, the Lamb having Seven horns and Seven eyes. The 119th Psalm has as its keynote the perfection of the Divine Law: "O how I love Thy law! It is my meditation all the day." Seven words especially characterize this Psalm, viz. Law, Testimonies, Judgments, Statutes, Precepts, Commandments, and Word. Also the number 119 is Seven times seventeen, and these are the only two numerical factors of 119.

It is remarkable how closely the number 17, or 7 plus 10, is associated with important Biblical events.

We are told that the Flood began on the 17th day of the second month and ended on the 17th day of the seventh month (Nisan), when the Ark rested on the mountains of Ararat (Gen. viii, 4). On the 17th day of Nisan the Israelites crossed the Red Sea at the Exodus and commenced their national life; and on the 17th day of Nisan the Lord Jesus Christ rose from the dead, having completed his work of redemption for humanity. The last miracle recorded in St. John's Gospel is the miraculous draft of 153 fishes. Now 153 is the sum of the first 17 numbers, 1 to 17, and 153 is also the product of 17 and 9. Those 153 fishes evidently symbolized the completed number of the redeemed, for the fish (*ichthus*) was an early well-recognized symbol of the Christian believer.

The digit *Six*, which is one less than Seven, connotes imperfection, and is associated therefore with the government of Man by himself. The image which Nebuchadnezzar set up for worship on the plain of Dura symbolical of himself was 60 cubits high and 6 cubits broad.

The human military empires of this world are termed "Beasts" in prophetic scriptures. The "number of the Beast" is given as 666, which is the sum of the first 36 ($= 6 \times 6$) numbers. The duration of these "Beast" empires is given as 1,260 "days," and 1,260 is $6 \times 6 \times 6 \times 6 - 6 \times 6$.

Then the digit *Eight*, which is one more than Seven, is connected with the idea of a new covenant or creation or restored life. At the Flood there were only Eight people saved in the Ark, when a new covenant was made with mankind. Only Eight persons are mentioned by name in the Bible as restored to life after bodily death, and our Lord was the Eighth. There

are only Eight writers of books in the New Testament or New Covenant mentioned by name.

Every male Hebrew child entered into a special covenant relation with God on the Eighth day of his life, "circumcised the Eighth day." The Resurrection took place on what might be called the Eighth day of the week. The Crucifixion for the Sin of Man was on the Sixth day of the week, the Rest in the Grave on the Seventh, and the Resurrection on the Eighth day, or First day of a new week.

In the number *Nine* we have a suggestion of finality. It is the last digit. Our Lord breathed out His Spirit at the Ninth hour on the Cross, and cried, "It is finished!"

We shall see presently that the word "Amen," the final word of prayer, has associated with it the number 99.

It can also be shown that the digit *Five* is united closely to the ideas of Grace and Redemption. It makes its appearance in all parts of the dimensions and furniture of the Tabernacle in the wilderness as well as in the sacred wounds of our Lord's Body.

There were Five significant articles in that Tabernacle in the part accessible to the public and the priests, viz. the Altar of Burnt Offering, the Laver, the Table of Shewbread, the Seven-branched Candlestick, and the Altar of Incense, all of which had typical reference to the stages of justification and sanctification in the redemption of humanity.

6.—GEMATRIA OF NEW TESTAMENT WORDS.

We may in the next place note that in the Greek and Hebrew alphabets every letter had its numerical value, and therefore every word its *gematria*, or sum total of these numbers. Our digits of to-day, universal in use with Western nations, were introduced from Arabia in the eighth century, and the Arabs probably derived them from India.

Although the classical nations had words for numbers such as 10, 50, 100, etc., they signified them also by letters of the alphabet, as may be seen by consulting any Greek lexicon in which the numerical value of each letter is given.

Thus, for the Greek Alphabet we have the following numerical values for each letter :

| Greek Letter. | | | | Numerical Value. | English Equivalent. |
|---------------|----|---------------------|-------|------------------|---------------------|
| Alpha | .. | α | .. .. | 1 | a |
| Beta | .. | β | .. .. | 2 | b |
| Gamma | .. | γ | .. .. | 3 | g |
| Delta | .. | δ | .. .. | 4 | d |
| Epsilon | .. | ϵ | .. .. | 5 | e (short) |
| Zeta | .. | ζ | .. .. | 7 | z |
| Eta | .. | η | .. .. | 8 | e (long) |
| Theta | .. | θ | .. .. | 9 | th |
| Iota | .. | ι | .. .. | 10 | i |
| Kappa | .. | κ | .. .. | 20 | k |
| Lambda | .. | λ | .. .. | 30 | l |
| Mu | .. | μ | .. .. | 40 | m |
| Nu | .. | ν | .. .. | 50 | n |
| Xi | .. | ξ | .. .. | 60 | x |
| Omicron | .. | \omicron | .. .. | 70 | o (short) |
| Pi | .. | π | .. .. | 80 | p |
| Rho | .. | ρ | .. .. | 100 | r |
| Sigma | .. | σ, ς | .. .. | 200 | s |
| Tau | .. | τ | .. .. | 300 | t |
| Upsilon | .. | υ | .. .. | 400 | u |
| Phi | .. | ϕ | .. .. | 500 | ph |
| Chi | .. | χ | .. .. | 600 | ch |
| Psi | .. | ψ | .. .. | 700 | ps |
| Omega | .. | ω | .. .. | 800 | o (long) |

Thus, for instance, the Greek word *Logos* signifying "Word," and applied to the Second Person of the Trinity, has a *gematria* of $30 + 70 + 3 + 70 + 200$ signified by the letters, *l, o, g, o, s*. The sum of these numbers is 373. The 3 is spiritually significant of the Triune Deity and 7 of Perfection, which conveys the idea of the Perfect Deity of the *Logos* or *Word of God*.

The same is true of the Hebrew. The letters of that alphabet had each a numerical value.

In the case of Latin, only six or seven of the letters, viz. I, V, X, L, C, D, and M, had numerical values, and other numbers were made up by placing these in juxtaposition and by the ingenious device that relative position should mean addition or subtraction. Thus, XI = 11, but IX = 9; XC = 90, CX = 110, etc.

Confining ourselves to the Greek of the New Testament, we may notice that the *gematria* of certain Names, Titles and words or phrases have factors which are significant with respect to them. Thus a large number of the Names and Titles of the Saviour of Mankind have *gematria* which contain the factor 8. For example, take the Supreme Title, *Lord Jesus Christ*. The Greek words are *Kurios Iēsous Christos*. Translating these letters into numerical values, we have :

| | | |
|---------------------------|--------------------------|--------------------------|
| <i>K</i> = 20 | <i>I</i> = 10 | <i>Ch</i> = 600 |
| <i>u</i> = 400 | <i>ē</i> = 8 | <i>r</i> = 100 |
| <i>r</i> = 100 | <i>s</i> = 200 | <i>i</i> = 10 |
| <i>i</i> = 10 | <i>o</i> = 70 | <i>s</i> = 200 |
| <i>o</i> = 70 | <i>u</i> = 400 | <i>t</i> = 300 |
| <i>s</i> = 200 | <i>s</i> = 200 | <i>o</i> = 70 |
| | | <i>s</i> = 200 |
| — | — | — |
| = 800 | = 888 | = 1480 |
| = $8 \times 10 \times 10$ | = $8 \times 3 \times 37$ | = $8 \times 5 \times 37$ |

If we add all the *gematria* we have 3,168, which is $8 \times 99 \times 4$.

It may be noted in passing that the word *Amen* has a *gematria* of 99. It is significant that this factor 99 then occurs in the Name of Him who speaks of Himself as "The Amen" (Rev. iii, 14).

Then, again, numerous other titles which our Lord gives to Himself, or is given, have in Greek a factor of 8 in their *gematria*. Thus :

Saviour = *Sotēr* = 1408 = $8 \times 8 \times 2 \times 11$.

Messiah = *Messias* = 656 = $8 \times 2 \times 41$.

King = *Basileus* = 848 = $8 \times 2 \times 53$.

There was no Title our Lord applied more often to Himself than "Son of Man" = *huios tou anthropou*. The gematria of this is $680 + 770 + 1510 = 2960 = 8 \times 10 \times 37$. Note here the recurrence of the numbers 8 and 37 as in the factors of *Jesus* and *Christ*.

Also the following self-applied Titles have gematria having a factor of 8 in the gematria of the Greek words :—

"I am the Good Shepherd" = $1592 = 8 \times 199$.

"I am the Door of the Sheep" = $3944 = 8 \times 493$.

"The Bread of Life" = $2264 = 8 \times 283$.

"I am the Way, the Truth, and the Life; no man cometh unto the Father, but by Me" (John xiv, 6). The total gematria of all this sentence is $6192 = 8 \times 4 \times 193$.

"I am Alpha and Omega, the first and the last, the beginning and the end" (Rev. xxii, 13). The gematria is $7200 = 8 \times 9 \times 10 \times 10$.

Nearly all the long-sentence Titles our Lord gives to Himself in the messages to the Seven Churches of Asia, to Thyatira, to Sardis, to Philadelphia, and to Laodicea are the same, viz. $13352 = 8 \times 1669$; $6920 = 8 \times 865$ $6808 = 8 \times 851$; and $7216 = 8 \times 902$.

There is an important New Testament word, *Theotēs*, which means Deity or Godhead (see Col. ii, 9). The gematria of this is $592 = 8 \times 2 \times 37$. Notice again the 8 and the 37 numbers. We have seen that the gematria of *Iēsous* is $8 \times 3 \times 37$, of *Christos* is $8 \times 5 \times 37$, and of *huios tou anthropou* is $8 \times 10 \times 37$. We then notice that the last is equal to the sum of the gematria of Jesus Christ and Deity. When our Lord put the important question to his disciples at Cæsarea Philippi: "Whom say ye that I the Son of Man am?" Peter earned his benediction by the reply, "Thou art the Christ, the Son of the Living God."

We have in the above fact, with regard to the gematria of these words, an arithmetic endorsement of this cardinal truth.

These instances are capable of many extensions, but at this stage we may pause to express the opinion that these gematria properties cannot be merely an accident. It cannot be merely the "long arm of coincidence."

We can write down twenty Names and Titles of our Lord, the gematria of which all have as a factor that number 8 which we have seen is connected with the idea of a New Covenant or life-giving Power. We have seen that 8 is the Atomic Number

of the life-giving element Oxygen. There are 8 major planets revolving round the life-giving agent, our Sun, and it can hardly be a mere coincidence that this digit 8 is also a fundamental factor in the gematria of Him who is the Source and Author of Eternal Life. It could easily be shown, if time permitted, the laws of the mathematical Theory of Probability are against it being the result of chance.*

7.—NUMBER IN SOLI-LUNAR CYCLES AND IN PROPHETIC PERIODS.

There are other departments of numerical fact in Nature and in the Scriptures between which there is a close relation, viz. in astronomical Soli-Lunar cycles and the Prophetic Periods or Times.

The Moon and the Sun appear to move over the celestial vault like the "hands" of a vast clock. Apart from the diurnal motion of the Earth which causes them both to rise and set, the Moon moves from West to East over the stars and goes through its phase in 29·5306 days, and the Sun completes a similar apparent motion over the stars in 365·2422 days. The first is called a Lunation and the second a Solar year.

It is clear that 12 Lunations (called a Lunar year) are less than a Solar year by 10 days 21 hours nearly. This difference is called the Lunar Epect. The question then arises, In what periods of time do the Epects add up to an exact or integral number of Lunations, days, or solar years? These periods of time are called Soli-Lunar Cycles.

The first of these, discovered by Meton a Greek, in 432 B.C., is the 19-year cycle called after him the Metonic cycle. Meton discovered that 235 Lunations occur in nearly 19 Solar years. In that time the Epects add up to nearly 7 Lunar months, since $19 \times 10 \cdot 875 = 7 \times 29 \cdot 5306 =$ nearly 206·65 days.

A more exact Soli-Lunar cycle was discovered in the eighteenth century by M. de Cheseaux, a Swiss astronomer, and it is 315 Solar years. In 315 Solar years the Lunar Epects add up to almost exactly $116 = 4 \times 29$ Lunations, and this last cycle is more exact than the Metonic, for in the de Cheseaux cycle the sun

* Those who wish to follow up this subject of the Scripture gematria will find assistance in two little books published by C. J. Thyne, of 28, Whitefriars Street, London, E.C.4, viz. *Spiritual Arithmetic*, by Reginald T. Naish, and *Verbal Inspiration Demonstrated*, by Ivan Panin.

and moon come round into the same relative position to each other within 1 hour and 48 minutes. In 315 Solar years there are almost exactly 3,896 Lunations or synodic months. M. de Cheseaux then noticed that this cycle of 315 years is one quarter of a period of 1,260 years.

Now, reckoned on the year-day theory, that is a year for a day, this 1,260 years is identical with a prophetic period mentioned 7 times in the apocalyptic books of Daniel and Revelation under the titles "A thousand two hundred and threescore days" (Rev. xi, 3; xii, 6), "Forty and two months" (Rev. xi, 2; xiii, 5), and "A time, and times, and half a time" (Dan. vii, 25; xii, 7; Rev. xii, 14).

The Lunar Epacts add up in this time to 37·511 Solar years, or to 7×66 Lunar months and 60 days, or to 66 Metonic cycles of 19 years and 6 years over. There is, in fact, a peculiar sextuary character about this Soli-Lunar cycle. We have already seen that as a number it is remarkable in that respect, since $1260 = 6 \times 6 \times 6 \times 6 - 6 \times 6$.

The number 2520, which is double 1260, is equal to 7×360 , and is also the least common multiple of all the nine digits. In the period of 2,520 Solar years the Lunar Epacts add up to almost exactly 75 Solar years, so that 2,520 Solar years contain 2,520 Lunar years and 75 Solar years over. It is therefore also a Soli-Lunar cycle. This cycle is nowhere directly mentioned in Scripture, but it is suggested by the use of the phrase "seven times." M. de Cheseaux was then led to examine another prophetic period mentioned in Dan. viii, 14, viz. "Two thousand three hundred days." He found that the Epacts in 2,300 Solar years add up to 25,012·5 days, or almost exactly to 847 Lunations, or $12 \times 7 + 7$ Lunations, or 121×7 Lunar months. Bearing in mind that under the Mosaic Law the Sacred year was a period of 7 Lunations, which period we may call a *Festal*, it is seen that the total Epacts in the Metonic cycle of 19 years is 1 *Festal*, whilst in the prophetic period of 2,300 years it is 121 *Festals*, or 11×11 *Festals*.

M. de Cheseaux made the further discovery that the difference between 2,300 and 1,260 Solar years, viz. 1,040 Solar years, is the most exact Soli-Lunar cycle known. The Epacts in this time add up exactly to 11,310 days, or to 383 Lunations.

As Dr. H. Grattan Guinness showed long ago, this cycle is so exact that it can be employed to predict astronomical events over long periods. Mr. Walter Maunder, in his book *The Astronomy*

of the Bible, pointed out that 2,300 Solar years not only contains an exact number of Lunations, but also an exact number of anomalistic months, each of the latter being the time the moon takes to pass from the perigee in its orbit round again to the perigee.

The difference between 2,300 and 315, or 1,985 Solar years, is also an exact Soli-Lunar cycle, as in this period the Epacts add up exactly to 731 Lunations. The 2,300-year cycle has also a relation to a period called the "life" of a Solar eclipse.

It was known, even to the Babylonian observers, that eclipses of the Sun of the same type repeat themselves at intervals of about 18 years, or more exactly 18 years and $11\frac{1}{3}$ days. This period is called the *Saros*. At each recurring *Saros* the eclipse in question happens at a slightly different latitude on the earth as well as longitude. The whole time in which the complete set of 65 eclipses of one group happen so as to be visible somewhere on the earth covers a period of about 1,150 years; which is half of 2,300, and this is called the life of a total eclipse.

It is clear, therefore, that these prophetic times mentioned in the apocalyptic books of the Bible have a close relation to important astronomical periods. At the date when these books were written, the length of the Solar year and of the Lunation were not known with sufficient exactness to bring these Soli-Lunar cycles within the range of the then human knowledge. How then did such periods become incorporated in the prophetic books? How also were the remarkable arithmetic properties of the gematria, to which attention has been directed, in New Testament words and phrases brought about? It is beyond question that it was not due to the skill or ingenuity of the authors of those books, and is indeed quite beyond human powers in any age. Here then is a question for our Modernist advocates of the theory of a purely human origin of the Biblical literature to consider carefully.

The only answer that can be given is that they were not solely the product of human intelligence, but that "holy men of God spake as they were moved by the Holy Ghost."

8.—THE UNITY OF DESIGN IN CREATION.

A broad survey of the structure of the physical universe in the light of modern scientific research reveals then a general unity of design and pervading idea extending over things great

and small. It is impossible to admit that this can be the result merely of chance or of an impersonal, unconscious, self-acting agency called Evolution, rather than that it is the product of the Thought and Will of a single Almighty Mind. We find that same organic unity of idea, although with progressive development, in the Biblical literature. The rationalist view, that this literature is solely the result of human thought and compilation by various editors, is inconsistent with the harmony and close inter-connection of writings and events separated by time-intervals extending over a thousand years or more.

We find in all parts of this literature references to future events, that is future to the time when they were predicted, and mention of time intervals which have a correspondence with periods marked out by astronomical phenomena.

The Bible is not, however, a scientific treatise on astronomy, physiology, or psychology. Each part of this literature has the "colouring" of the age in which it was produced. Its inspiration is not of a mechanical kind which made use of the human authors simply as pens with which a superior power could write. Its writers were ambassadors sent to convey a message couched in the language of the day, not always fully intelligible to the messengers themselves, but nevertheless *God-breathed*, in that it was the vehicle of information quite beyond the power of the unassisted human mind to ascertain, yet in closest contact with absolute truth and reality.

In all parts of it, both in the Old and New Testaments, there are numerical characteristics which could not possibly have been due to the human writers, but give significant suggestion that its inspiration proceeds from the same Source as that of the universe of material things. Its primary purpose is not, however, to convey information, but to impart life, and to restore to humanity the lost image of Him who is "the image of the invisible God." He is known by many Names and Titles. There is one Title, however, which seems to have special reference to the subject here considered. In a vision granted to Daniel, described in the eighth chapter of his book, the prediction of the 2,300 days, or "evening-mornings," which were to elapse before the cleansing of the sanctuary is pronounced by a Speaker who is called in the Authorised Version a "certain saint which spake." The marginal reference, however, gives the words "Palmoni," or the "Wonderful Numberer," as an equivalent (*see* Dan. viii, 13). In the vision granted to Daniel described in the tenth, eleventh, and

twelfth chapters of his book, the Holy Speaker who announces future events and prophetic Times is described as regards His appearance (*see* Dan. x, 5, 6) in terms which are identical with those in the description given in the Book of Revelation (i, 13, 14, 15) of the Glorified Son of God who appeared to John in Patmos.

Hence there seems to be some ground for the view that this "Wonderful Numberer" in the Book of Daniel was the Second Person of the Trinity; in other words, He was one of the Theophanies or manifestations of God, under the Old Testament dispensation. He alone is able to predict future events. He alone knows the Times and Seasons which have been appointed for the probationary periods of mankind and their relation to the great astronomical periods approximately marked out by the Sun and Moon, owing to the incommensurable ratio of the length of the month and year.

When Belshazzar made his impious feast, and employed the sacred vessels of the Temple for it, we are told the fingers of a man's hand appeared and wrote on the palace wall the words *Mene, Tekel, Peres*, which Daniel interpreted as *Numbered, Weighed, and Divided*. But the same words are in a sense written across the pages of Nature and the story of the human race. They are the sign-manual of Him who "telleteth the number of the stars and calleth them all by their names" (Ps. cxlvii, 4), and has taught us "so to number our days that we may apply our hearts unto wisdom" (Ps. xc, 12). That wisdom is partly derived from scientific investigations of the physical universe, but still more in the serious study of the Word of God which alone is able to make us wise unto salvation through faith which is in Jesus Christ.

DISCUSSION.

The CHAIRMAN: Once again it has been our pleasure to listen to a lecture by Professor Fleming—this time as President of the Victoria Institute. Again he opens a new session; and whereas last year he dealt with "Evolution and Revelation"—thus bringing the fact of GOD into the scheme of the Universe—now he follows on to indicate traces of the majestic movements of the ETERNAL, first in connection with Nature, and then in connection with the Biblical literature. It is after the manner of a man of science that he treats of Number in Nature; and it is from a point of view that is equally exacting that he examines Number in Scripture; and in the result he

maintains that the things observed conspire to indicate a common origin for Nature and Revelation, with a supreme intelligence presiding over all.

Dr. Fleming has unfolded before us marvellous things, as observed in Nature, both among the great and the small ; and whether in the field of Astronomy or the recesses of Atomic Structure, he finds numerical harmony and symmetry—a truly marvellous mathematical design, exhibiting One whose profound thought and creative power spell the short word GOD. Who can fail to have been impressed by the deliberate statement of our distinguished lecturer, that “There are no vague or indeterminate quantities in Nature For everything that can be measured there appears to be some natural unit in multiples of which we must describe any other quantity of it. Every created thing or process is subject to number, magnitude, or measure ” (p. 19). Passing from non-living things to those that are living, the lecturer impresses us with the corresponding truth that “In all parts of the wonderful process of cell-growth and cell-reproduction in living organism we see the domination of Number as a factor ” (p. 21). Marvellous as are the constituent details, the facts in their volume and as a whole are significant in a high degree, and should call forth gratitude from the thoughtful Christian, that in this, as in other ways, God has not left Himself without witness.

Proceeding to deal with Number in Scripture, the lecturer has shown himself content with the larger and more evident observations of research in this regard. While thanking him for the striking summary he has given us of the significant digits that lie embedded in Bible story, we recognize the cautious man of science in the acceptance of certain words only in the body of gematria applied by some to the New Testament Writings. Some have carried gematria to a length that divests it of any definite value, and makes it to yield results that are more fanciful than convincing. But not so our honoured President ; and we thank him for the manner in which he confined himself to Names and Titles of our Lord, the gematria of which may rightly command the sober attention of Christian people.

The subject of Number in Soli-Lunar Cycles, and in Prophetic Periods, as treated in the lecture, sets forth in few words investigations of real value, as students of prophecy for two generations or more

have not failed to recognize. The bearing of this section upon the Book of Daniel and the Apocalypse of John is of deep importance. At the time when these books were written the length of the Solar year and of the Lunation were not known with sufficient exactness to bring the Soli-Lunar Cycles (therein recognized) within the range of the then human knowledge. How then did such periods become incorporated in the prophetic books? The New Testament definition of inspired prophecy furnishes the explanation—"Holy men of God spake as they were moved by the Holy Ghost."

From time to time great and valuable utterances have been given forth from the Presidential Chair of the Victoria Institute; but it would not be easy to recall an occasion on which so commanding a deliverance has been made as that to which we have listened to-day. From first to last the treatment has been in confirmation of the Faith which we have received to hold, which we hold to defend, which we defend to promulgate in the world; and we are grateful for the words, in the last section, in which, while lifting divine inspiration free from the confusing misrepresentations of unbelievers, the lecturer says of the Bible writers: "They were ambassadors sent to convey a message couched in the language of the day, not always fully intelligible to the messengers themselves, but nevertheless *God-breathed*, in that it was the vehicle of information quite beyond the power of the unassisted mind to ascertain, yet in close contact with absolute truth and reality" (p. 30).

From what we have heard this afternoon there will emerge, for some at least, a new note of confidence in regard to the Holy Bible, as to some parts, some features. The time has assuredly arrived when doubters should shake themselves from all manner of questioning in regard to Daniel and the Apocalypse. Unbelievers have said their worst; but they cannot gainsay the fact that these Books are, in the nature of things, invested with marvellous features such as belong to stars, atoms, cells, and the rest, all of them wonderful, and not one of them without its definite witness to God and relation to Christ who revealed Him among men. And in regard to the solemn story, the majestic record, as it has been unfolded before us this afternoon—in an address that has been equally cogent, versatile, and brilliant—we may, with adoring praise, use the words of Job of ancient days: "Lo, these are but the outskirts of His ways;

and how small a whisper do we hear of Him! But the thunder of His power who can understand?" (Job xxvi, 14, R.V.).

In conclusion, the Chairman moved a vote of thanks to the lecturer, and the same was accorded with acclamation.

Lieut.-Col. A. H. C. KENNEY-HERBERT: We may congratulate ourselves on the relative simplicity of a paper which has introduced to our notice a subject of vital importance in these days. I can only hope that it will act as an inducement to those who have the leisure to pursue the subject further, in order that their researches may add to the common stock of knowledge.

Perhaps one of the best books to begin with would be Bullinger's *Number in Scripture*. It is one of the pioneer works, presenting much accumulated research from which the student can strike out his own line. *The Greek Cabala*, by Messrs. Bond and Lea, shows how gematria was once used to express geometry, and contains many suggestions of interest.

The time-limits imposed by our rules will only permit of a few statements which may add to the interest created by the paper, while contributing to the probability of its conclusions; even though the time-limit prevents any proof in support of these statements.

Let us apply number in proof of the plan which can be detected underlying the true Bible Chronology.

I think that it can be shown that the visible new moon which marked the New Year Day of 2008 (Adamic reckoning) was Abram's official birthday, and divides the period from Adam to the Conception of the Lord into two parts, in the ratio of mean solar and prophetic years, the first part being 2,008 mean solar years, the second 2,008 prophetic years. From Conception to the Birth was 37 weeks; note that the paper suggests, and I believe rightly, that 37 is the Lord's number.

Again, from the Covenant with Abram (Gen. xv) to the actual birth is four exact periods of 69 sevens of prophetic years. In comparing this with the flood date, 1656—which was four periods of 69 sixes of ordinary years—we note that the sevens and the sixes, as well as the ordinary and the prophetic years, indicate different scales on which similar numeric periods of four sixty-nines are marked.

True Bible Chronology is stamped with numeric design, a collateral proof of accuracy.

Let us apply number to the text of the New Testament. The 1st Epistle of St. Peter is contained in $69 \times 5 \times 5$ words; the 2nd Epistle is $69 \times 4 \times 4$ words; the two in 69×41 words. Note the recurrence of 69 in text and Chronology.

The Second and Third Chapters of The Revelation contain 5,238 letters, which are grouped into 1,162 words. The sum of these numbers is 6,400. Here the 7 overcomers, the Lord being an 8th, find $8 \times 8 \times 10 \times 10$ to be the expression of a most glorious resurrection. Both of these examples have been taken from Mill's text, just as it stands, published many years ago. Many similar facts could be quoted, tending to prove that God has safeguarded the text, independently of the confusion created by the textual critic.

Lastly, we might apply this language of number to the solution of the problem of the Great Pyramid. If we do, I think we shall find that the true solution is very different from that recently suggested in the columns of the *Morning Post*, which created so much interest in the public mind. It can be shown that the Core Masonry covered a base which suggests the first thought of the Bible—"in the beginning GOD—" This was hidden by a casing extension, suggestive of the last word of the Bible, in Greek, AMEN—99. This base was modified by the Fall, and the basic numbers of Gen. iii are factors in the measurements. These things were recorded in stone some four or five hundred years before Moses was born. As a monument the Great Pyramid certainly indicates the same main dates as those of the chronology already referred to.

It is interesting to note that these base dimensions can be obtained in quite another way, the factors of which are 6,660 lunar years reduced to mean solar years—the whole modified by the factor found in the story of the Fall. For this calculation, the mean lunation and the mean solar year as determined by Grattan Guinness (*see* p. 28) are necessary.

Mr. W. E. LESLIE: Dr. Fleming invites us to draw teleological inferences from the numerical characteristics of the Universe as distinct from its forms, but his paper blends them. Are they finally separable? Some structures are necessary, and from these no argument for design can be drawn. For example, any three given points

will be found to be at the angles of a triangle, and, at the same time, to lie in the circumference of a circle. No teleological inference can, however, be drawn, because any three points (not in the same straight line) must necessarily be so arranged. This is a very simple case, but, if the time factor be added, and the points are in mutual translation, we could probably get more complicated cases.

The Doctor then refers to gematria. This system was developed with immense ingenuity by the Rabbis, but their labours led nowhere, because they were not based on sound inductive methods. Dr. Fleming states that twenty of our Lord's titles are characterized by the factor 8; but he does not tell us how many of the titles have not this characteristic, nor does he tell us how the percentage of titles containing this factor compares with the percentage of words containing it in the rest of the New Testament. We are consequently left without sufficient data to formulate a judgment.

With regard to the Soli-Lunar phenomena, would Dr. Fleming state whether there are any exact equations? All those he gives appear to be approximations. Johannes Lepsius stated, in the *Expositor* in 1912, that the difference between 480 Julian and Apocalyptic years amounted to 2,520 days, while the difference between 500 Julian and Apocalyptic years amounted to the sum of 1,290 and 1,335 days. Are these figures exact?

Mr. PERCY O. RUOFF: We shall all be in agreement that this lecture is learned, unique and remarkable. Professor Fleming has placed Bible students under a debt of obligation by the many facts he has adduced. The arguments, moreover, in their sum, mark a decided step forward in framing a powerful case to exhibit the operations of one great and mighty Designer of Nature and the Bible.

With regard to the section of the paper which deals with the phenomenon of the gematria, it seems that this matter is susceptible of wide extensions. But it is of the utmost importance that a study of this kind should be pursued with thoroughness, patience, and scientific accuracy. If a vast number of instances can be cited in support of the unvarying evidence of gematria, pointing with mathematical precision to concurrence in certain numerical powers and co-related truths, this will afford valuable supplemental evidence of the Divine and plenary inspiration of the Bible. But it is essential

that the evidence should be uniform and not casual, based not on a few but on many instances.

The statement on p. 22 that "only eight persons are mentioned by name in the Bible as restored to life after bodily death, and our Lord was the eighth," does not appear to be supported by facts. There are nine recorded individual cases, viz. : (1) The Widow's son (1 Kings xvii) ; (2) the Shunamite's son (2 Kings iv) ; (3) a man in Elisha's sepulchre (2 Kings xiii) ; (4) Jairus' daughter (Mark v) ; (5) the widow of Nain's son (Luke vii) ; (6) Lazarus (John xi) ; (7) Tabitha (Acts ix) ; (8) Eutychus (Acts xx) ; and (9) the Lord Jesus Christ. There is also in Matt. xxvii, 52, the mention of "many bodies of the saints which slept arose." I understand the Professor to cite the fact of eight named persons restored to life in support of the view that 8 points to a New Covenant. Now if the digit 8 is employed in connection with restored life, then it is necessary to take into account every record of restored life. The case is neither strengthened nor weakened by the fact that the restored person is named or unnamed ; the essential fact is, was the person under consideration restored to life ?

On p. 13, Professor Fleming refers to *Betelgeux* as having been "found to be a mass of gas about 273 million miles in diameter." In a recent remarkable book by Professor A. S. Eddington, entitled *Stars and Atoms*, the author says, referring to *Betelgeux* : "The diameter is about 300 million miles. *Betelgeux* is large enough to contain the whole orbit of the earth inside it, perhaps even the orbit of Mars. Its volume is about 50 million times the volume of the Sun." Perhaps the lecturer will kindly explain whether the figures he gives are approximate, round figures, or whether the difference is accounted for by recent research.

Mr. R. DUNCAN : Perhaps the following may serve as further illustrations of the statement in the paper that the number *Six* connotes imperfection :—

- (1) *Six* is the atomic number of Carbon, the central element in the structure of the organic world, over all the glory and beauty of which, as we know only too well, the signature of death is written.
- (2) The joyful procession homewards of the returned Ark was tragically interrupted by the death of Uzzah.

On resumption of the journey three months later we are told that, when they had gone *six* paces, seven bullocks and seven rams were sacrificed. The procession moved on then in gladness and rejoicing. Was there not in all this some intuitive recognition of man's essential imperfection as a follower of the law of God, and of the perfect sacrifice through which he is brought into joyful reconciliation with the law-giver?

- (3) The gematria of the name "Jesus," and the number of the Beast, or the man of sin, have the factors 3 and 37 in common. But in the former the additional factor is the extra-perfect number *Eight*, and in the latter (not without significance surely) the imperfect number *Six*.

I would hazard the suggestion that Number has its place and use in the spiritual world as well as the physical. Are not faith, hope, and love forms of spiritual energy capable, as experience shows, of varying in their amount or intensity? Why should they not be measurable therefore in terms respectively of some unit, and is there not a hint of this in Our Lord's words, "If ye had faith as a grain of mustard seed"?

The designation "Wonderful Numberer," taken from the margin in Daniel, is applied in the paper to the Second Person of the Trinity. Is there not some witness to the truth of this identification in Our Lord's own words, "Even the very hairs of your head are all numbered"? His disposition to think in tens may also be noted. Of this many illustrations will occur—ten talents, ten pounds, ten pieces of silver, an hundred sheep, and so on.

Mr. C. F. HOGG: If the Scriptures are indeed "inspired of God" (and how else can they be accounted for?) there is every reason to expect to discover in them the characteristic marks of divine workmanship. Whether the paper demonstrates that Number is such a characteristic is another matter, but in any case it makes a not inconsiderable contribution to the material on which a judgment may be formed.

I desire to put a few questions to the author of the paper, in hope of eliciting information on some points that seem to me to be important.

(1) On p. 21 it is stated that there is a characteristic number of chromosomes in the body-cells of different animals. Illustrations are given, but the characteristic number of chromosomes in the body-cells of the anthropoids is omitted. Will Dr. Fleming be kind enough to supply this to enable a comparison to be made with those of man ?

(2) On p. 22, the Psalms have from time to time been numbered differently. It is at least precarious to attempt to find a gematria in the number of the 119th, which is the 120th in the LXX. In a series of 150, seven, or any other primary number, is bound to have repeated influence. For example, we might be attracted by 147 with its factors $7 \times 7 \times 3$. But what conclusion could be drawn therefrom germane to the subject of the paper ? Then Dr. Fleming finds seven words for God's law. But usually ten are identified, as by the Massorah which associates them with the Ten Commandments. The Massorah adds to Dr. Fleming's list, "Word" (which translates two Hebrew words, and therefore is to be counted as two) and "righteousness," while other writers make a different list. Plainly there is nothing here to support the argument of the paper.

(3) On p. 22: "The fish was an early well-recognized symbol of the Christian believer." Not Christians, but CHRIST, was symbolized by the fish ; hence it is not immediately evident on this ground that the number 153 suggests "the completed number of the redeemed." Moreover, the factor 8 is absent from 153, while the gematria of *ichthus* is 1219, an awkward number to reduce to factors ; it yields neither 3, 7, 9, nor even 17 or 37.

(4) On p. 26, the description the Lord so frequently used of Himself as represented in the Gospels is *ho huios tou anthrōpou*, the gematria of which is 3030, not 2960. Dr. Fleming secures his result by omitting the article which, however, is an integral element in the title. Then why should "I am" be omitted before "The Bread of Life," but included with each of the other items in the list in which it appears ?

In view of these discrepancies it is well that we are able to dispense with "the arithmetical endorsement of" the New Testament doctrine of the Deity and Humanity of the Lord. Moreover, the Lord frequently spoke of Himself as "The Son"; here the gematria is 750, in which 8 is not a factor, nor is it in *logos* = 373, nor in "the Son

of God" = 2004. *Monogenēs theos* = 780, in which 8 is not a factor, *monogenēs huios* = 1176 (8×148), may comfort adherents of the *Textus Receptus*! But the statement that "twenty names and titles of our Lord, the gematria of which all have (8) as a factor" requires examination; these instances do not seem to warrant it.

WRITTEN COMMUNICATIONS.

Dr. A. T. SCHOFIELD: I have read with much pleasure Dr. Fleming's remarkable paper, which, after many years at the Victoria Institute, I consider to be one of the best papers ever read.

I am much struck with the constant number of the rods in germinating cells, but most of all with the accuracy with which he exposes the now "fatal fault of current evolution, that it eliminates 'Mind.'" He shows that no fortuitous combination of mechanical forces could produce the constant numbers that rule the universe—that the postulation of an Almighty mind is a necessity. This leads on to Theism and God. But the Professor goes a step further, and does not conclude his wonderful paper till he leads us on to Christ and Christianity in a way not common among scientists.

Mr. MARTIN H. F. SUTTON: I have read with great satisfaction and deep interest the wonderful paper prepared by Dr. Fleming, each section of which is absorbingly interesting. I wonder if Dr. Fleming holds the view, which has been expressed on several occasions, that the Pleiades are, as it were, the *Axis* of all the universes, and the Seat of God's Authority.

Lieut.-Col. G. MACKINLAY: I rejoice that a lecturer has arisen who is able to meet scientific men on their own ground, and who is also, like so many of the men of a former age, a simple believer.

Our President has proved his point of harmonious design in the things of Nature, and has given us much food for serious thought. I observe that he has quoted Ivan Panin, and should be glad to know if he thinks that—in case of doubt regarding the form of any passage of Scripture—it would be possible to test the same by the principle of gematria. Panin does this to prove the authenticity of the last verses of Mark xvi.

Mr. R. McCORMACK: Dr. Fleming is deserving of grateful thanks for his illuminating and instructive paper, and for calling attention to

a subject which has not received the consideration its importance merits. Among every ancient people, especially in the East, importance was attached to numbers, Greek philosophy laying it down that "the elements of numbers are the elements of all things"; and the study of numbers, whether in Nature and Natural Science, or in the Bible, will be found both interesting and fascinating, and will well repay the student.

Dr. Fleming points out that certain numbers have a spiritual suggestiveness, and this symbolical meaning is true both in Nature and in the Bible. My own studies have been mainly in the number *Seven*, but I found that it was practically impossible to deal with *Seven* in Nature without taking in also the number *Four*, so interwoven were they together, more so indeed than any other two numbers. For it is generally agreed that, symbolically, *Four* is the number of Nature, of the World. Thus there are four seasons, four quarters of the earth, four phases of the moon, and so on. *Four* follows three and proceeds from it, and *Three* is the numerical symbol of the Triune God. Now three and four make *Seven*, so that *Seven* is the number used by God in His dealings with the world.

In none of the Natural Sciences does Number play a more important part than in chemistry. Everything is governed by laws, and these laws are chiefly numerical. Dr. Fleming has dealt with the Periodic Law of the Elements, a remarkable discovery, which excited ridicule when first propounded. Then the Law of Multiple Proportions is based upon numbers, and so important is it that it has been said that "the study of chemical composition would be unmanageable without it." Crystals, again, so far from being shapeless masses, consist of well-defined geometrical forms, and have been divided into 7 systems and into 32 (4×8) symmetry classes. There are 7 colours in the rainbow (3 and 4), 7 notes in music (also 3 and 4), 7 parts in the human body (head, neck, trunk and four limbs), and so on throughout Nature.

When we come to the Bible, Numbers are equally prominent, *Seven* taking easily the first place. The signs of the four Covenants were (1) with Noah, the 7-hued rainbow; (2) with Abraham, circumcision, which took place on the eighth day, *i.e.* when the child was 7 days old; (3) with Moses, the seventh day Sabbath (Exod. xxxi, 13, 17); and (4) of the Christian Covenant, Christ Himself, whose titles Christ

and Messiah both contain (in the Greek) 7 letters, the human name Jesus having only 6 (man's number). But just as the 7 Words from the Cross are not found in any one Gospel, but must be searched for, so we must search for the number 7. Thus the word "Covenant" occurs 7 times in Gen. ix (of Noah's covenant), and 14 times in Gen. xv, xvii (of Abraham's).

As minerals are sometimes found outcropping on the earth's surface, but for the most part have to be searched for underground, so, both in Nature and in the Bible, the number 7 and other numbers have to be searched for under the surface. It has only recently been discovered that the sentences, words, and letters in the true original text of Scripture are exact multiples of 7. Full particulars are given in my book "*The Heptadic Structure of Scripture, with a chapter on Seven and Four in Nature.*" Thus the words of the eminent geologist, Hugh Miller, are fully justified, that "it was He who created the worlds, that dictated the Scriptures," both indicating, as Dr. Fleming says, "a common origin in a Supreme Intelligence."

THE LECTURER'S REPLY.

Dr. J. A. FLEMING wrote: In making a short reply to some of the remarks and criticisms on my paper which have appeared in the discussion, one or two preliminary suggestions may be perhaps permitted which apply especially to objections raised to certain points by Mr. Leslie, Mr. Ruoff, and Mr. Hogg. One of these is that the doctrines and latent truths in Scripture are not given to us with such complete, unexceptionable proof as to compel intellectual assent without possibility of refutation.

All that we are afforded are powerful indications or converging lines of argument which give influential suggestions and provide an opportunity for the exercise of faith. In the next place we do not find either in Nature or in the Scriptures that absolute uniformity of events or statement which leave no room for difference of opinion. Hence to demand the complete demonstration without exception of uniformity in any of these gematria phenomena is to ask what is not possible, or at any rate not granted.

It is, of course, essential to ascertain that we are not "following cunningly devised fables" or pretending to detect an order which

we ourselves have created. All that is essential is to try to discover whether that order or numerical phenomena are of human or super-human creation.

Coming then to the particular objections: Mr. Leslie has asked the pertinent question, how many of the titles of our Lord have gematria which have not a factor of 8? It is impossible to answer this question definitely, because the appellations themselves refer to different attributes and powers. The digit 8 has reference to a new creation and new Covenant, and it should therefore not be expected as a factor in every title. I confess I have been surprised not to find it in certain very characteristic titles such as "The Lamb" (to *arnion*), or in "The Lamb of God," or in any equivalent words.

Mr. Hogg asks why the definite article (*ho*) is omitted before *huios tou anthropolou*, and why the "I am" is omitted before "Bread of Life"? These are perfectly fair criticisms, and I cannot say that I am prepared with any conclusive argument in reply. Everyone, however, must judge for themselves how far the instances quoted justify any attention being paid to these gematria properties or how far they are really due to chance. Anyone who will carefully read the books which have been published on the subject, such as Mr. Naish's *Spiritual Arithmetic*, or Mr. McCormack's *Heptadic Structure of Scripture*, or the books mentioned by Lieut.-Col. Kenney-Herbert, such as Bullinger's *Number in Scripture*, will find it very difficult to agree with the opinion that it is a mere accidental effect.

I disagree with Mr. Hogg's suggestion that the word *ichthus* applies to our Lord. The fish was an undoubtedly early symbol for the Christian believer, and the plural *ichthues* (= fishes) for believers in general under covenant. This last word has a gematria of $1224 = 8 \times 153$. With respect to Mr. Hogg's question about chromosome numbers, the books on Cytology state that any particular characteristic number of one species is not exclusive. Thus the monkey of South America has 54, but the Asiatic or African has 48. But no valid conclusions can be drawn from the identity of this last number 48 with that of man, for the chromosome number of the ox and the mouse is the same, viz., 38, and that of the opossum and female grasshopper of North America is 24.

Mr. Ruoff questions a statement in my paper that only 8 persons are mentioned by name in Scripture as having been restored to life.

He instances the man in Elisha's grave, and those who came out of their graves at the Crucifixion. We are not told that these last-named persons came back to ordinary bodily life for any time, as we have reason to believe was the case for the 7 others named. In reply to Mr. Ruoff's question about the size of *Betelgeux*, the diameters given in different books vary. The measurement is very difficult, and there may be unavoidable discrepancies.

Mr. Leslie refers to the question of the exactness of Soli-Lunar cycles. In the paper I have stated that the difference between 2,300 and $1,260 = 1,040$ Solar years is the most exact cycle known. Since the reading of my paper I have had my attention drawn to a very important pamphlet by Mr. W. Bell Dawson, M.A., D.Sc., published in *The Transactions of the Royal Society of Canada*, Vol. XI, § III, 1905, in which he proves that the mean of 2,300 and $1,260 = 1,780$ Lunar years $= 1,727$ Solar years, is even more exact than de Cheseaux's cycle of 1,040 Solar years. Its error is only 1 day in 16,920 years.

I think this must be sufficient by way of answer to criticisms as far as space permits. Let me in conclusion thank very heartily our Chairman (Dr. Thirtle) and other speakers for their kind remarks, and also express to the audience generally my grateful acknowledgments for their appreciation of my effort to render interesting the subject of "Number in Nature and Scripture."