

**58:2 (“The Urantia Atmosphere”), 58:3 (“Spatial Environment),
and 58:5 (“The Continental Drift”)**

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Sources for 58:2, 58:3 and 58:5

- (1) Dr. Harlan True **Stetson**, “Solar Radiation and the State of the Atmosphere,” *The Scientific Monthly*, Vol. 54, No. 6 (June 1942)
- (2) Charles **Schuchert**, *A Text-book of Geology, Part II: Historical Geology, Second, Revised Edition* (New York: John Wiley & Sons, Inc., 1924)
- (3) Robert Andrews **Millikan**, *Electrons (+ and -), Protons, Photons, Neutrons, and Cosmic Rays* (Chicago, Illinois: The University of Chicago Press, 1935)
- (4) Reginald Aldworth **Daly**, *Our Mobile Earth* (New York: Charles Scribner’s Sons, 1926)
- (5) Thomas C. **Chamberlin** and Rollin D. **Salisbury**, *A College Text-book of Geology* (New York: Henry Holt and Company, 1909)

Key

- (a) **Green** indicates where a source author first appears, or where he/she reappears.
- (b) **Yellow** highlights most parallelisms.
- (c) **Tan** highlights parallelisms not occurring on the same row, or parallelisms separated by yellowed parallelisms.
- (d) An underlined word or words indicates where the source and the UB writer pointedly differ from each other.
- (e) **Blue** indicates original (or “revealed”) information, or UB-specific terminology and concepts. (What to highlight in this regard is debatable; the highlights are tentative.)

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PAPER 58 — LIFE ESTABLISHMENT ON URANTIA

2. THE URANTIA ATMOSPHERE

“SOLAR RADIATION AND THE
 STATE OF THE ATMOSPHERE”
 (Stetson 513)

Because of the relatively insignificant size of the earth, and also the great distance that separates us from the sun a distance of 93 million miles, our planet can intercept but

about one two billionths of the total solar output (S 514).

At a price of $1\frac{3}{4}$ cents per kilowatt hour, the annual budget that would have to be allowed for sunshine for the continental United States alone

would represent an expenditure of 327 quadrillion dollars (S 514).

If we change our picture to a more restricted one, we can say that the cost of sunshine for Greater New York at the above figure would amount to approximately 100 million dollars for the average day (S 514).

58:2.1 The planetary atmosphere filters through to the earth

about one two-billionths of the sun's total light emanation.

If the light falling upon North America were paid for at the rate of two cents per kilowatt-hour, the annual light bill

would be upward of 800 quadrillion dollars.

Chicago's bill for sunshine would amount to considerably over 100 million dollars a day.

If we analyze the radiation from the sun we discover that it covers a wide range of wave-lengths. Certain of these wave-lengths or frequencies produce their own special effects upon the earth and its atmosphere (S 514).

[Outside the] so-called **visible range** to which the eye responds there is a **vast** scale of radiations both beyond the red end of the spectrum, which we call the infrared, and far down below the violet, which we call the ultra-violet (S 514).

Observations with the spectroscope indicate that there is much radiation **at the extreme ultra-violet end of the spectrum** to which the earth's atmosphere is completely opaque.

A great deal of the absorption of this region of the solar spectrum of very short wave-lengths is caused by

a layer of ozone which exists at an average height of about 22 kilometers [*13.67 miles*],

but which probably occupies a region extending from 15 to 35 kilometers [*9.321 miles to 21.749 miles*].

If all the ozone in this region were to be brought to the standard conditions of temperature and pressure of our atmosphere at the earth's surface,

it **would represent a layer of only 2 to 3 millimeters in thickness.** [*0.0788 to 0.1182 inches*]

And it should be remembered that you receive from the sun other forms of energy—

light is not the only solar contribution reaching your atmosphere.

Vast solar energies pour in upon Urantia embracing wave lengths ranging both above and below the recognition range of human vision.

58:2.2 The earth's atmosphere is all but opaque to much of the solar radiation **at the extreme ultraviolet end of the spectrum.**

Most of these short wave lengths are absorbed by

a layer of ozone which exists throughout a level about ten miles above the surface of the earth,

and which extends spaceward for another ten miles.

The ozone permeating this region, at conditions prevailing on the earth's surface,

would make a layer only one tenth of an inch thick;

Yet **this small amount of ozone**

is the defense between us and extremely dangerous radiations in the ultra-violet region of the sun's light (S 516).

Were this absorption, however, of this region of the solar spectrum even a little greater than it is,

we should be deprived of that small amount of ultra-violet light filtering through our atmosphere that is so **essential for health**

and the production of our sunshine vitamin D (S 516).

We can be confident, however, that it is a **fortunate** combination of the sun and our atmosphere that makes **life on the earth** possible. The sun not only radiates its health-giving sunshine, but it also emits literally **death-dealing rays** (S 516).

nevertheless, **this relatively small** and apparently insignificant **amount of ozone**

protects Urantia inhabitants from the excess of these dangerous and destructive ultraviolet radiations present in sunlight.

But were this ozone layer just a trifle thicker,

you would be deprived of the highly important and **health-giving** ultraviolet rays which now reach the earth's surface,

and which are ancestral to one of the most essential of your vitamins.

58:2.3 And yet some of the less imaginative of your mortal mechanists insist on viewing material creation and human evolution as an accident. **The Urantia midwayers have assembled over fifty thousand facts of physics and chemistry which they deem to be incompatible with the laws of accidental chance, and which they contend unmistakably demonstrate the presence of intelligent purpose in the material creation. And all of this takes no account of their catalogue of more than one hundred thousand findings outside the domain of physics and chemistry which they maintain prove the presence of mind in the planning, creation, and maintenance of the material cosmos.**

58:2.4 Your sun pours forth a veritable flood of **death-dealing rays,**

and your pleasant life on Urantia is due to the “fortuitous” influence of more than two-score apparently accidental protective operations similar to the action of this unique ozone layer.

[The atmosphere] is a sort of buffer state, the very top of which receives a violent bombardment of high frequency radiations from the sun, and the lower layers of which form a blanket that enables the earth to retain during the night much of the warmth generated by the sunshine that has penetrated through it, thus mitigating the extremes of temperature between night and day to which the earth would otherwise be subjected (S 516-17).

58:2.5 Were it not for the “blanketing” effect of the atmosphere at night, heat would be lost by radiation

so rapidly that life would be impossible of maintenance except by artificial provision.

[contd] If we look at a cross-section of the earth’s atmosphere, it may for convenience be divided into three zones or layers in which the stratosphere occupies the middle ground. The region below the stratosphere is that which contacts our immediate surroundings and provides the winds and atmospheric currents, giving rise to all our weather. We call this lower region comprising perhaps the first 5 or 6 miles the troposphere.

58:2.6 The lower five or six miles of the earth’s atmosphere is the troposphere; this is the region of winds and air currents which provide weather phenomena.

The region above the stratosphere is the ionosphere.

Above this region is the inner ionosphere_

and next above is the stratosphere.

If we send a recording thermometer aloft, we find that while passing through the troposphere the temperature steadily falls until a height of 10 or 12 kilometers [6.214 to 7.4568 miles] is reached,

when the temperature reaches the extremely low value of -55° C., or some 68° below zero Fahrenheit.

Strangely enough, for the next 30 miles or so there appears to be little change in temperature.

This is the region of the stratosphere (S 517).

At a height of 60 kilometers or some 40 miles, the temperature would begin to rise again.

Recent investigations give some evidence that at extreme heights, up where the auroral fires play, temperatures of $1,000^{\circ}$ C. [1832° F.] have to be postulated

to account for the presence of the ionized oxygen that is there.

The extremely rarefied condition of this upper atmosphere, however, calls for perhaps a quite different interpretation of temperature than that to which we are ordinary accustomed when determining temperatures by the thermometer at the earth's surface (S 517).

Ascending from the surface of the earth, the temperature steadily falls for six or eight miles,

at which height it registers around 70 degrees below zero F.

This temperature range of from 65 to 70 degrees below zero F. is unchanged in the further ascent for forty miles;

this realm of constant temperature is the stratosphere.

At a height of forty-five or fifty miles, the temperature begins to rise,

and this increase continues until,

at the level of the auroral displays, a temperature of 1200° F. is attained,

and it is this intense heat that ionizes the oxygen.

But temperature in such a rarefied atmosphere is hardly comparable with heat reckoning at the surface of the earth.

Bear in mind that

[contd] Ascending through the cross-sections of the atmosphere, we find there is a rapid decrease in the amount of atmospheric pressure. Within the **first 3 miles** from the earth's surface, **half** the total amount of oxygen and nitrogen, the principal atmospheric ingredients, are included.

The limiting **height** to which the thinning atmosphere extends is somewhat difficult to fix. Perhaps we should place it at 200 to 300 miles, although recently Dr. Carl Störmer has observed **auroral streamers** reaching to heights of 600 kilometers [**372.84 miles**] or more. Where the auroral streamers go, some of the thin atmosphere must extend (S 517).

[contd] If we make a chart of the numbers and occurrences of aurorae we find there seems to be a curious connection between the frequency and brightness of auroral displays and the state of the sun as marked by the appearance of **sunspots** (S 517).

It was in 1908 that the late Dr. George Ellery Hale, the founder and director of the Mount Wilson Observatory, first observed that sunspots were giant **cyclones** in the sun's atmosphere (S 518).

To carry the analogy still further, spots north of the sun's equator are in general whirling in one direction while corresponding spots south of the equator **whirl in the opposite direction**. If the rotation of the one is clockwise, that of the other is counter-clockwise.

one **half** of all your atmosphere is to be found in the **first three miles**.

The **height** of the earth's atmosphere is indicated by the highest **auroral streamers**—**about four hundred miles**.

58:2.7 Auroral phenomena are directly related to **sunspots**,

those solar **cyclones**

which **whirl in opposite directions** above and below the solar equator,

This again is characteristic of the differences of rotation of tropical hurricanes on the earth originating in the northern and southern hemispheres, respectively (S 518).

even as do the terrestrial tropical hurricanes.

Such atmospheric disturbances whirl in opposite directions when occurring above or below the equator.

When the Mount Wilson observers first examined and actually measured the frequency of light coming from the centers of sunspots, it was found to have changed frequency in exactly the way that light waves are distorted in the laboratory when a powerful electromagnet is placed around the source of light being examined (S 519).

58:2.8 The power of sunspots to alter light frequencies

Thus came the startling revelation that sunspots were not only terrific hurricanes but every center was in itself a powerful magnet (S 519).

shows that these solar storm centers function as enormous magnets.

Since a magnetic field may exert a repulsing effect upon swiftly moving electrons, we see some reason that charged electric particles can be actually hurled from sunspot centers at velocities which may carry them through space into the earth's atmosphere,

Such magnetic fields are able to hurl charged particles from the sunspot craters out through space to the earth's outer atmosphere,

thus ionizing the upper regions of the air in a way that would produce auroral displays.

where their ionizing influence produces such spectacular auroral displays.

In the light of such a mechanism, therefore, we see a possible reason why aurorae occur in greater numbers and at greater brilliance at times when these solar storms occur most frequently (S 519-20).

Therefore do you have the greatest auroral phenomena when sunspots are at their height—

There is, I believe, a good reason for the fact that the maximum in the auroral displays occurs a year or two after the year of most sunspots.

As sunspots begin to wane in numbers, they are nevertheless occurring in regions progressively nearer the solar equator, and as the sun's equator is inclined but slightly to the plane of the earth's orbit, we may draw the inference that sunspots are most effectively associated with the aurorae when, other things being equal, they are most nearly in the geometrical plane that the earth travels in its journey around the sun (S 517-18).

When the sun rises in the east, the north end of the compass needle turns slightly toward that direction (S 520-21).

Then in the afternoon as the sun wanders and sets in the west, the compass needle wanders likewise to the west,

coming back again to its normal position about midnight when the sun is below the northern horizon.

This goes on day after day, month after month—

but during the years when sunspots are most numerous these daily excursions of the compass needle will on the average be twice as great as during the years when the sunspots are lacking.

or soon thereafter—

at which time the spots are more generally equatorially situated.

58:2.9 Even the compass needle is responsive to this solar influence

since it turns slightly to the east as the sun rises

and slightly to the west as the sun nears setting.

This happens every day,

but during the height of sunspot cycles this variation of the compass is twice as great.

These diurnal wanderings of the compass needle can now be roughly explained as due to the effects of ionization of the upper atmosphere

by sunlight (S 521).

[The lower electrified conducting region, *i.e.* the Kennelly-Heaviside layer, also designated as the E layer] lies far above the stratosphere and generally above the region that is usually regarded as that where ozone is manufactured.

This E layer is particularly favorable for reflecting or turning back radio waves of the frequencies which are most generally used for commercial broadcasting in connection with our entertainment programs [*i.e.* medium wave]. Radio waves of much shorter wave-lengths or of higher frequencies penetrate and actually traverse through this region until they reach what appears to be another ionized region called the F layer, originally postulated by Professor Appleton in England (S 522).

During the last few years of sunspot activity, there have been occasions when remarkable fadeouts have occurred in radio communication (S 523).

Could we visualize the ethereal substance of the ionosphere as we visualize the surface of the ocean, we should find times when terrific storms were raging in this ionosphere (S 524).

These diurnal wanderings of the compass are in response to the increased ionization of the upper atmosphere,

which is produced by the sunlight.

58:2.10 It is the presence of two different levels of electrified conducting regions

in the superstratosphere

that accounts for the long-distance transmission of

your long- and short-wave radio-broadcasts.

Your broadcasting is sometimes disturbed

by the terrific storms which occasionally rage in the realms of these outer ionospheres.

3. SPATIAL ENVIRONMENT

XIII: THE DISCOVERY OF THE COSMIC RAYS (Millikan 301)

III. HYPOTHESES AS TO THE MODE OF ORIGIN OF THE COSMIC RAYS (Millikan 312)

58:3.1 During the earlier times of universe materialization

My own tentative hypothesis has been that under the exceedingly low temperatures existing in interstellar space there are formed aggregates or clusters of hydrogen atoms, just as clouds consisting of aggregates of water molecules are formed at ordinary temperatures in our atmosphere....

the space regions are interspersed with vast hydrogen clouds,

If we may assume, then, the existence of vast quantities of "hydrogen dust" scattered throughout the universe,

just such astronomic dust clusters as now characterize many regions throughout remote space.

it is then to be expected that in accord with the postulates of the modern quantum theory a time will come sooner or later when some such cluster of hydrogen atoms finds itself in just the right condition to jump over the "potential wall" ... and to clamp itself together into the nucleus of a helium atom, or perchance an oxygen atom or one of iron (M 314-15).

Much of the organized matter which the blazing suns break down and disperse as radiant energy was originally built up in these early appearing hydrogen clouds of space.

But again, we may also assume that in rare instances

one of these clusters, having got started on the road to ruin, instead of stopping at the stage of the partial annihilation of its mass required to produce say an atom of helium or of oxygen, completes the catastrophe and transforms its whole mass into radiant energy (M 315).

A slight modification of this hypothesis is suggested by Baade and Zwicky, who instead of letting these clustering and subsequent partial or complete annihilation processes take place under the influence of the intense cold of interstellar space, have assumed that the catastrophic processes which result in the sudden flashing-up of temporary stars, called "novae," may create another type of extreme conditions that facilitate these atom-building and atom-annihilating processes. If novae are assumed to be uniformly distributed throughout space the uniformity of distribution of the cosmic rays would thus be accounted for (M 315-16).

[*Note:* Is 'highly heated nebulae' the UB writer's synonym for 'novae'??]

Under certain unusual conditions

atom disruption also occurs at the nucleus of the larger hydrogen masses.

And all of these phenomena of atom building and atom dissolution,

as in the highly heated nebulae,

are attended by the emergence of flood tides of short space rays of radiant energy.

Accompanying these diverse radiations is a form of space-energy unknown on Urantia.

I. THE DISCOVERY OF THE COSMIC RAYS
(Millikan 301)

From the astronomical estimates of the distribution of the nebulae we conclude that the total radiant energy in the universe existing in the form of cosmic rays is from 30 to 300 times greater than that existing in all other forms of radiant energy combined (M 309).

III. HYPOTHESES AS TO THE MODE OF
ORIGIN OF THE COSMIC RAYS (Millikan 312)

The only other source than matter-annihilation that has been suggested for these observed cosmic-ray bullets is a cosmic electric field, essentially symmetrical with respect to the earth ... The difficulties with such a hypothesis of this latter kind are so great that I have, for the present, discarded it altogether as completely untenable (M 312-13).

[[A]lthough there are penetrating rays that do originate in the earth and are indeed abundantly given off from practically all kinds of rocks and soils in the earth's crust, ... yet there must be other rays abundant at high altitudes that come in from above originating either (2) in the remoter regions of the atmosphere or else (3) coming in from outer space (M 303-04).]

[?]

58:3.2 This short-ray energy charge of universe space is four hundred times greater than all other forms of radiant energy existing in the organized space domains.

The output of short space rays,

whether coming from the blazing nebulae,

tense electric fields,

outer space,

or the vast hydrogen dust clouds,

is modified qualitatively and quantitatively by fluctuations of, and sudden tension changes in, temperature, gravity, and electronic pressures.

58:3.3 These eventualities in the origin of the space rays are determined by many cosmic occurrences

XII: THE SPINNING ELECTRON
(Millikan 270)

[See Exhibit A: Fig. 27, p. 219.]

as well as by the orbits of circulating matter, which vary from modified circles to extreme ellipses.

V. THE NEW SPECTROSCOPIC RULES
(Millikan 293)

The new physical conception introduced by Uhlenbeck and Goudsmith is that every electron within an atom is not merely revolving in an orbit, but at the same time rotating, just as does a planet, on its own axis....

4. ... As stated above, there are supposed to be in each atom but two possible directions of spin, 180° apart ...

Further, because of the opposite directions of spin of the two electrons of a K shell

Physical conditions may also be greatly altered because

the electron spin is sometimes in the opposite direction from that of the grosser matter behavior, even in the same physical zone.

their joint or resultant moment of momentum and also their total magnetic moment must be zero, which in turn requires that helium be diamagnetic as it is found in common with all the noble gases actually to be (M 292, 295-96).

58:3.4 The vast hydrogen clouds are veritable cosmic chemical laboratories, harboring all phases of evolving energy and metamorphosing matter.

[?]

Great energy actions also occur in the marginal gases of the great binary stars which so frequently overlap and hence extensively commingle.

[*Compare*: The amount of the radiation is very great.... It must break up millions of atoms in each of our bodies every second and we do not know what its physiological effects may be (Sir James Jeans, *The Universe Around Us* [1929], p. 136).]

But none of these tremendous and far-flung energy activities of space exerts the least influence upon the phenomena of organized life—the germ plasm of living things and beings.

[!]

[*Note*: Cosmic-ray exposure is known to damage DNA. Google ‘evidence cosmic rays damage dna’ for information.]

These energy conditions of space are germane to the essential environment of life establishment, but they are not effective in the subsequent modification of the inheritance factors of the germ plasm as are some of the longer rays of radiant energy.

The implanted life of the Life Carriers is fully resistant to all of this amazing flood of the short space rays of universe energy.

58:3.5 All of these essential cosmic conditions had to evolve to a favorable status before the Life Carriers could actually begin the establishment of life on Urantia.

5. THE CONTINENTAL DRIFT

58:5.1 The continental land drift continued.

IX: THE EARTH BEFORE GEOLOGIC TIME (Schuchert 127)

[Preamble] (Schuchert 127)

The earth as a whole is very rigid, as dense and rigid as is armor steel, or glass (S 129).

III: THE EARTH'S INTERIOR (Daly 90)

The pressure increases with depth, so that at the earth's center it amounts to the inconceivable 45,000,000 pounds, or about 22,000 tons, to the square inch (D 104).

We have reviewed new data showing the rate at which the temperature increases with depth below the surface.

The temperatures of the deep interior probably surpass the surface temperature of the sun, about 6,000 degrees, or four times the temperature of vivid white-heat (D 126).

2. An outer shell, about 1,000 miles thick, and occupying nearly six tenths of the whole volume, is essentially composed of silicate material, the substance of ordinary rocks (D 107).

The earth's core had become as dense and rigid as steel,

being subjected to a pressure of almost 25,000 tons to the square inch,

and owing to the enormous gravity pressure, it was and still is very hot in the deep interior.

The temperature increases from the surface downward

until at the center it is slightly above the surface temperature of the sun.

58:5.2 The outer one thousand miles of the earth's mass consists principally of different kinds of rock.

1. The earth's core, in volume about one-sixth of the whole planet, is composed of **metallic** iron, alloyed with a small portion of nickel and other metals, which appear in iron meteorites (D 107).

According to [the tidal-disruption theory, first announced by Chamberlin] thus modified [by Jeans and Jeffreys], the earth was once **fluid**.

When fluid, much of its denser material must have **sunk toward the center**; much of the less dense material must have risen toward the surface (D 104).

[T]he crust is **about 40 miles thick** (D 91).

[See Fig. 56. DIAGRAMMATIC SECTION SHOWING DISTRIBUTION OF DENSITIES IN THE EARTH'S CRUST AND BELOW IT. (D 100)]

[Compare: The substratum is white-hot. Nevertheless, it is not highly **mobile**, ... for the great **pressure** makes it rigid—even more rigid than plate glass at the temperature of a room (D 114).]

Now, it is found that, under ... differential stresses, the subcrustal material has **flowed** so as very nearly to restore the original state of internal pressure (D 114-15).

Underneath are the denser and heavier **metallic** elements.

Throughout the early and preatmospheric ages the world was so nearly **fluid** in its molten and highly heated state

that the heavier metals **sank deep into the interior**.

Those found near the surface today represent the exudate of ancient volcanoes, later and extensive lava flows, and the more recent meteoric deposits.

58:5.3 The outer crust was **about forty miles thick**.

This outer shell was supported by, and rested directly upon, a molten sea of basalt of varying thickness,

a **mobile** layer of molten lava held under **high pressure**

but always tending to **flow** hither and yon in equalization of shifting planetary pressures,

thereby tending to stabilize the earth's crust.

[T]he crystallized, basaltic earth shell below each ocean basin and, as well, each of the high-floating **continents** are underlain by a deep, continuous layer of **non-crystallized**, glassy, eruptible **basalt** (D 100).

[?]

[But the ordinary earthquake is **not the effect of volcanic action**. Both quake and volcano are effects of a common cause, the sudden fracture of a strained crust (D 78-79).]

[See D 95.]

The best value [of the earth's mean density] is **5.52**, water having the density of 1.0 (D 103).

The average density of [the rocks constituting the continents] is close to 2.70; that is, on the average, they weigh **2.70 times as much as an equal volume of water**. This is nearly the **density of typical granite**, and in fact the principal continental rock *is* granite (D 94).

At the center the density approaches **11.6**, or one and one half times that of iron at zero pressure (D 107).

[The **continents**] project above the ocean floor because they are made of rocks lighter than the rocks beneath the deep sea (D 91).

58:5.4 Even today the **continents** continue to float upon this **noncrystallized** cushiony sea of molten **basalt**.

Were it not for this protective condition, the more severe earthquakes would literally shake the world to pieces.

Earthquakes are caused by sliding and shifting of the solid outer crust and **not by volcanoes**.

58:5.5 The lava layers of the earth's crust, when cooled, form granite.

The average density of Urantia is a little **more than five and one-half** times that of water;

the **density of granite** is **less than three times** that of water.

The earth's core is **twelve times** as dense as water.

58:5.6 The sea bottoms are more dense than the land masses,

and this is what keeps the **continents** above water.

The deep-sea islands are chiefly made of basalt, a rock with the density of about 3.0,

and therefore heavier than granite (D 97).

If the density of the rocks beneath the oceans, from the sea bottom down and level for level, were identical with the density of the rocks beneath the continental surface,

then the continents would represent excess of matter at the earth's surface. The gravitational attraction of each of these great masses of excess matter would pull up the sea water on the continents (D 99).

But geodetic and other methods show that the sea-level is not so distorted by anything like the amount expected on the hypothesis (D 99).

At the depth of 40 miles, or one per cent of the earth's radius, the combined weight of the ocean and the suboceanic rock

is almost exactly equal to the weight of the continental rock at the same level. The continents are thus kept essentially in flotation and tend to be stable (D 99).

When the sea bottoms are extruded above the sea level,

they are found to consist largely of basalt,

a form of lava considerably heavier than the granite of the land masses.

Again, if the continents were not lighter than the ocean beds,

gravity would draw the edges of the oceans up onto the land,

but such phenomena are not observable.

58:5.7 The weight of the oceans is also a factor in the increase of pressure on the sea beds.

The lower but comparatively heavier ocean beds, plus the weight of the overlying water,

approximate the weight of the higher but much lighter continents.

XVI: THE CAMBRIAN PERIOD
(Chamberlin & Salisbury 476)

FORMATIONS AND PHYSICAL HISTORY
(Chamberlin & Salisbury 476)

The Subdivisions of the Cambrian and their Distribution (Chamberlin & Salisbury 476)

1. Lateral spread or continental creep.
(Chamberlin & Salisbury 480)

[contd] The continents stand about 15,000 feet above the ocean bottom. Their weight causes a pressure of 15,000 to 20,000 pounds to the square inch on their bases (C&S 480).

Spreading is opposed by the hydrostatic pressure of the oceans against the sides of the continental platforms. This is some 5,000 pounds per square inch at the bottom, so that there remains an unbalanced pressure of 10,000 to 15,000 pounds per square inch, tending to cause creep (C&S 480).

This pressure tends to cause the continents to spread by creep into the ocean basins, on the same principle that a great body of ice, such as an ice-sheet, spreads (C&S 480).

But all continents tend to creep into the oceans.

The continental pressure at ocean-bottom levels is about 20,000 pounds to the square inch.

That is, this would be the pressure of a continental mass standing 15,000 feet above the ocean floor.

The ocean-floor water pressure is only about 5,000 pounds to the square inch.

These differential pressures tend to cause the continents to slide toward the ocean beds.

[See 57:8.5 and compare D 310.]

58:5.8 Depression of the ocean bottom during the prelife ages had upthrust a solitary continental land mass

[?]

to such a height that its lateral pressure tended to cause the eastern, western, and southern fringes to slide downhill, over the underlying semiviscous lava beds, into the waters of the surrounding Pacific Ocean. This so fully compensated the continental pressure that a wide break did not occur on the eastern shore of this ancient Asiatic continent, but ever since has that eastern coast line hovered over the precipice of its adjoining oceanic depths, threatening to slide into a watery grave.