

1 Cor. XV
A7H
R.V.

The first man is of the earth, earthy: the second man is of
the ~~first~~ ^{heavenly} ~~heaven~~ ^{heavens}. As is the earthy, such are they
also that are earthy: and as is the heavenly, such are they
also that are heavenly. And so we have borne the image of
the earthy, we shall also bear the image of the heavenly.
not till the fin is dying in the grate,
Look us for any kinship with the stars.
Meredith: Modern Love, II.

Rund. Howl 212

This All that has emerged into life is an
amorphous structure — like those lesser
forms that are born within it which are
born night & day out of the luminousness of
its vitality — the Universe is a life organism,
affective, complex, all-comprehensive,
displaying an unfathomable wisdom.
Plotinus: Treatise on the Good, II, 9, 8.

It is the stars.
The stars above us govern our conditions.
King Lear, Act II, Sc. 2.

From the little cell in which he finds himself lodged, I mean the universe, let
him estimate at their true value the earth, Kingdoms, cities, & himself. What
is a man in the Infinite?
Pascal: Pensées, 70.

The stars... by moving in a procession & a dance the most beautiful of all &
impressive of all dances, ministers to the needs of all things.
Plato: Epinomis, 982.

'Tis the sublime of men,
Our nomadic Maflets, to know ourselves
Parts & proportions of one wondrous whole!
Coleridge: Religious Musings.

The stars are dead. The angels will not look.
We are left alone with our day, with time
to rot, and

O the joy of my spirit — it is uncaged — it darts like lightning!
It is not enough to have this globe or a certain time,
I will have thousands of globes & all the time.
O to nation space!
The plentifulness of all, that there are no bounds,
To emerge & be of the sky, of the sun & moon & flying clouds, as one of them.

unshaped universes
With manes of fire & a raging sun for head
Pestation, generation & duration —
The cycles of all lives upon the earth —
Plants, beasts & men, must follow
Edith Sitwell, 'An Old Woman I'
(in Street Songs)

Walt Whitman: A Song of Jove.

You never enjoy the world aright, till the sea itself flourish in you... you are clothed
with the heavens, & covered with the stars.... & are more present in the hemisphere, considering
the glories & the beauties there, than in your own house...

Trakema: Centuries of Meditation

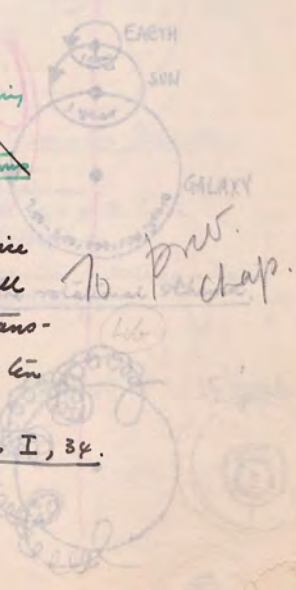
Would one think it possible for a man to delight in gaudy clouds like a butterfly, &
neglect the Heavens? Did we not daily see it, it would be incredible. They rejoice
in a piece of gold more than in the Sun; & get a few little glistening stones & call
them jewels. And admire them because they are resplendent like the stars, & trans-
parent like the air, & pellucid like the sea. But the stars themselves which are ten
thousand times more useful, great, & glorious they disregard.

Trakema: Centuries of Meditation I, 34.

Let the constellations
look at me before I disappear!

Rilke: 'To the Angel' (Later Poems, trans. J.B. Leishman)

The never to be ended given & -take is set up between the individual & the Absolute. The Spirit of the
has been born... It knows itself a member of that mighty family in which the stars are numbered: the
family of the sons of God, who, free & creative, share the rapture of a living, stirring Cosmos, "about for day" E.V. 19



We live in the company of men, ~~and of stars~~ ^{and of stars} ~~but how little attention~~
~~not pay to~~ ^{our} ~~sublimest companions~~ ^{the stars} ~~It the stars should appear one night in~~
 a thousand years, how would men believe & adore; & preserve for many gen-
 erations the remembrance of the city of ~~God~~ ^{which} ~~which has been shown!~~ "x Reveal
 to me nightly this Heavenly Jerusalem & the vision is unutterably loving - & would
 be so if I took the trouble to ~~notice~~ ^{see} it. ~~Then am I, mind being~~ ^{undreamed-of}
~~magical, & conducted more magically than Cinderella, into the beautiful society of~~
~~spirits, & I am too selfish to~~ ^{realize that is happening} ~~be content, as the insane are, to live wrapped-up in my own mean~~
~~of his stage.~~ ^{At this high level} ~~But I am capable of raising myself to comparative wakefulness & sanity.~~
 When I do so, what, briefly do I find?

x Emerson: *Nature* [1836]
 "Ray itself the unprophetic."
 Hugo & the others. They
 illumine the impossible.... they
 are terrible of showing. They
 are faint lights scattered
 through the unknown. We
 call them stars. The knowledge
 of all this passes the bounds of
 Chimeras & is overwhelming in
 its reality. A madman could
 not have dreamed it, a
 genius would not have seen
 it."
 Hugo: *Intellectual Evolution*
 (Portraiture de ma Vie) "Hugo
 or the Infinite".

Every ~~night~~ ^{clear night!} ~~night~~, every ~~good~~ ^{goodly} night, as Mendeth calls it,
 "...is a night to make the heavens our home."
 "More than the next where's apace we strive." x
~~for it is literally~~ We live in heaven, ~~all the while without~~
 noticing it. We are princes ~~under the illusion that our palace~~
 - the most splendid conceivable - is a hovel.

x Mendeth: 'Wint. Heavens'
 Truvelyn 138

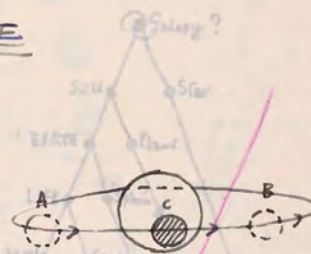
CHAPTER X

THE DISTANT VIEW: GALAXY UNIVERSE

1. The Galaxy

The SUN ^{is one of} ~~is in a world inhabited by~~ thousands of millions of ~~Suns~~ ^{of Stars.} essentially like himself. These ~~Suns or Stars~~ are not solitary dwellers in space, but are grouped in a number of ways: ~~they are~~ ^{relatively close} so to speak, sociable. The simplest association is the Binary, made up of two Stars which, on account of their mutual gravitational pull, go round a ^{common} center of gravity that lies ~~between them~~. Sometimes there are three, four, or even more Stars in such a group. On a much larger scale are the Star Clusters, consisting of hundreds or thousands of members travelling along together much as a flock of birds travels: Sometimes some Clusters are 'open' or of loose structure, others are compact & more or less globular. Still larger groups, ^{containing} millions of Stars, are called Star Clouds. Finally there is the Galaxy (or Spiral Nebulae or Island Universe*) a lens-shaped system of ~~many thousands~~ ^{at least tens of} millions of Stars (organised into Star Clouds, Clusters, & so on), rotating about a common centre of gravity much as the Planets rotate about the Sun. The diameter of the Galaxy is ~~reckoned in~~ ^{reckoned in} ~~billions of~~ ^{hundreds of thousands of} light-years, * which is roughly ~~six~~ ^{hundred thousand} million miles. Here indeed, as Victor Hugo says, 'geometry has become frightful.' X

It is estimated that about three Stars in four are single, while the remainder are ^{double} (Binaries), ^{triple or quadruple} (Multiple Stars). The SUN, lacking any near companions, belongs to the single category, but he is a member of the Local Star Cloud ~~to which~~ ^a to which belong most of the Stars that are visible to the naked eye. This Star Cloud is ~~perhaps 7,000 light-years deep~~ ^a ~~to 20,000 light-years across~~ ^{lens-shaped object whose} & its members are in motion with respect to one another: the SUN, for instance, is travelling at twelve miles a second in the direction of Hercules. The motion within the Cloud is rather like the motion of gnats in a railway carriage - the whole ^{the motion of} swarm is being carried along ~~as~~ ^{as} a body, & much faster than any member of it with respect to ~~the~~ ^{his} companions. The whole Cloud is, in fact, rotating about the centre of the Galaxy - ~~a spot some 30,000 light-years from the Sun~~ ^{at a distance of} ~~Our position is about a two-thirds of the~~ ^{variously estimated at one-third to} distance from this centre to the circumference & (at our speed of ~~200 miles~~ ^{200 to 300} a second) we should take about 220 million years to complete the circuit. (For us there are, so to speak, three 'days' - the terrestrial, of twenty-four hours, the Solar, of one year, & the ^{Galactic} ~~Universal~~, of 220 million years. These are the principal rhythms of our life.)



A variable Binary star model of a Binary Star, based on the variations in its luminosity, for positions A & B its luminosity is greater than in position C. Though the light from the star is seen directly, the variation in the luminosity of the whole system is due to the change in the angle of the plane of the orbits.

* In this chapter our own Island Universe is called the Galaxy, & other Island Universes are called Galaxies & Nebulae. All these expressions apply to the same class of things.

+ This & most of the other figures in this chapter are provisional, for because the authorities differ widely, large ~~leaves~~ ^{leaves} figures are 100,000 million, ~~Extending to~~ ^{Extending to} & sometimes quickly become out of date. The purpose of the figures I mention is simply to give a general impression of the ~~order of~~ ^{order of} numbers & dimensions involved.

* A light-year = the distance light travels in one year = 5.88×10^{12} miles. ~~= nearly~~ ^{= nearly} six million million miles.

X Intellectual Biography (Porto-Optim de ma Vie): 'Things of the Infinite'.



The rotational schema.



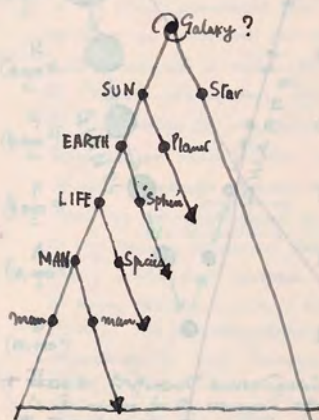
Here are, then, several types of stellar organization, but the only type which is sufficiently definite in structure to qualify for a place in the hierarchy of individuals is, apparently, the Universe or Galaxy: the Clouds & Clusters, intermediate in rank between ^{Galaxy} ~~Universe~~ & Stars, seem to be Galactic 'organs' rather than true individuals.

If the ^{Galaxy} ~~Universe~~ is in truth an individual creature, is it alive & intelligent in much the same way as one, at least, of its 30,000 million members, is alive & intelligent? Or is it, perhaps, more alive, & more intelligent, & in all respects at a higher level, than ^{the SUN or} any of its members? The question is of much more than academic interest because, according to my observer, this is a region where I am this ^{Galaxy} ~~Universe~~, & because (if the argument so far is right in the main) there is an element in my own experience which belongs at the level of the ^{Galaxy} ~~Universe~~. The nature of the ^{Galaxy} ~~Universe~~ is a personal problem. Am I, besides being that solid & spherical angel 'EARTH', & that rarefied & disc-shaped angel the SUN, an ~~spiritual angel as well?~~ even more tenuous spiritual angel as well, or gaseous vertebrate?

2. The community of Stars

Common sense has, of course, a number of ~~defections to miss~~ ^{queries}. The first is that Stars are ^{not} altogether too similar in their constitution & behaviour to make up a true individual: ~~the resemblance~~ ^{which} ~~feature~~ ^{is} of the higher individuals ~~being~~ ^{which} ~~that~~ ^{is} ~~to~~ ^{be} ~~lacking~~ ⁱⁿ ~~structure & function~~ ^{structure & function} are both diverse & complementary. ~~The stars are~~ ^{the stars are} ~~differentiated or specialized~~ ^{differentiated or specialized}, but are they mutually dependent? & do they need one another? That is to say: is the Universe a thoroughly integralist whole, or a loosely organized, low-grade whole, or little more than an aggregation of Stars?

It is true that Stars have much in common. They are seldom ^{ten times more massive or} ~~more than~~ ^{five times less massive than} the SUN; ~~as~~ ^{they} are spherical, ^{self-luminous}, hot, & gaseous; they do not move erratically. Something of this sort, however, ~~cannot be~~ ^{is} looked for amongst any expected units of the same level or order. Thus there are limits to the ~~significance~~ ^{significance} of the atoms, the molecules, & the cells, & the similarities between units of the same ~~are~~ ^{are} more marked than their differences; on the other hand, their differences are of the greatest importance. So it is with Stars. ^{Though in mass they are very similar,} ~~their~~ ^{size, in magnitude (that is, luminosity), in temperatures (of which} ~~colour is the sign), & in density, they vary~~ ^{greatly}. The ~~current~~ ^{present} classification into ^{Spectral} ~~classes~~ ^{classes} B, A, F, G, K, & M, is ~~based~~ ^{related} ~~on~~ ^{to} differences of temperature, ranging from $15,000^{\circ}\text{C}$. on the surface of the B class ~~blue~~ ^{white} Stars, to 3000°C . on the red M class. ^{above} Of the first importance is the fact that temperature



A new apex for the pyramid of individuals?

X The words are Fechner's (*Lehrbuch der Psychologie* ii): "It is true, that solid & physical angels are not to our thinking, but to us this is inconceivable only because we have been caught in the school-room & think of the Earth as a paper model of the globe."

+ Karl du Prel (*Der Kampf ums Dasein am Himmel*) extends Darwinism to the heavenly bodies: - there are (as to say) competing organisms; space is the means of existence for which they struggle; ~~the~~ the fitness of their motions in relation to other heavenly bodies is their organic efficiency. Survival is the reward of such fitness; discomputation or fusion with other bodies is the penalty for unfitness. ^{Ende Brühl 'Evolution'} VIII p 76g

o The + however the expression from Aldous Huxley's novel is actually Haeckel's, & he applies it to ~~the~~ (previously of course) to God. *Reader of the Universe* Ch. IV p 235



Comparative Star-sizes.

- 1 = the Sun
- 2 = Aldebaran
- 3 = the orbit of the Earth
- 4 = Betelgeuse

The diameter of Antares is twice that of Betelgeuse

See UAU 1961 etc.

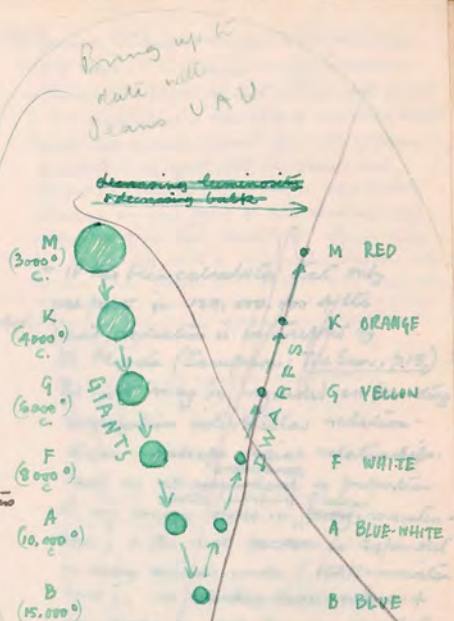
and atomic composition go together: - the spectra of the hottest stars give no evidence of the lighter (i.e. the heavier, more complex) atoms; in the cooler stars, hydrogen, iron, & other metallic elements are present; in the coolest classes, there are not only heavy atoms but a few kinds of molecules - such as titanium oxide & certain carbon compounds - that are capable of existing.

What is the explanation of this diversity among stars? Much depends upon age. Stars have a 'life-history'. There is some evidence that they are born as large luminous red giants of low temperature, and becoming smaller & hotter as they grow up, ~~till they turn first yellow & then blue~~. The blue or blue-white stage is the prime, after which they gradually cool & lose magnitude till they are our red stars of the M class once more. ^{Through this time dwarfs instead of giants.} Actually this life-story is ^{not known for certain} speculative - whether they it is in middle life that the temperature-peak is reached, & whether a long second childhood ^{also in fact} repeats the first childhood in reverse, whether there are not several types of life-stories, are still matters of conjecture. What is reasonably ^{clear} is that the differences between stars in the ^{Galaxy} (like the differences between men in MAN) are, ^{to a large degree}, differences of age. The universe is a society of individuals in all stages of development.

3 The isolation of the SUN, & the wholeness of the ~~universe~~ GALAXY

It is not enough, says common sense, ^{is it} that the members of a group shall be differentiated. If there is to be real organic unity, they must be mutually dependent; each must need & be needed by the others. Without question this universe is a kind of whole - a mechanical unit. But would the amputation of a ~~star~~ star cluster make any difference to it, comparable with the difference which the amputation of a leg makes to a man? In particular, is it not plain that the SUN is a self-supporting individual, independent of other stars & of the Gal. ^{or what} universe as a whole? All he needs is to be left alone, & given room to be himself.

Whether the SUN is self-contained or not, he certainly is isolated. ⁺ If he (i.e. the whole Solar System) is represented as a football, the nearest star - Alpha Centauri - is a mile off, & many other stars in our Universe are thousands of miles away. Whereas the light of the Sun takes four hours to reach the limits of the Solar System, it takes four years to reach Alpha Centauri. These great distances do not, however, prevent each star from being 'in touch with' every other star: every ^{star in} motion in the ^{Galaxy} ^{local} takes full account of the position & the mass of every ^{other} star. In truth, all motions in the ^{local} universe



+ There is different investigation given different temperatures for the various spectral types.
 * This is the theory advanced by H. N. Russell. See Russell, Dugan & Stewart: Astrophysics Vol. II: Astrophysics & Stellar Astronomy, & Smart: Astrophysics, p. 70 ff. for a brief account.

Victor Hugo is the poet who, perhaps more than any other, lived amongst the stars, was really alive to them. Consider this description: "There exist double stars, triple stars, quadruple stars, three suns, one green, one yellow & one red, revolving around one another in full pursuit at a speed of eighty million leagues a second - such is Aldebaran. How do these animal globes of varying speed contrive to subsist? ... Very little light has been thrown on these terrible passions." Intellectual Biography (Porto Rico de ma Vie): "Things of the Infinite."

(The Sun)
 + "The threat attaching it to the rest of the universe is doubtless very tenuous. Nevertheless it is along this thread that is transmitted down to the smallest particle of the world in which we live the operation immanent to the whole of the universe."
 Bergson: Creative Evolution, p. 10.
 Cf. Albert Einstein's line: "And I thought of the umbilical cords that bind us to strange suns in 'The Two Loves' (The Song of the Cold)"

Besides these differences among stars, there are individual peculiarities: - Cepheids are stars whose luminosity varies rhythmically - they are ^{perhaps} swelling & shrinking; Novae ^{or stars that} blaze up suddenly then slowly revert to their old appearance; Planetary Nebulae are stars that have a ring of gaseous material about them.

are but fragments of one Motion.

Next, there is the light of the Stars. While the effects of starlight are small in a solitary Sun in an idiot Sun. ^{but it can no more grow to the point on its own than a baby can walk.} ^{It makes all the difference that, at that level, I am not lonely.} one respect, they are great in another. If the Stars were hidden from us, astronomy, & with astronomy, solar self-consciousness, would be impossible. And, since in many ways astronomy has led science, it is a question how far science could have progressed ^{while} in ignorance of the heavens. If common sense objects that these considerations are 'psychological', & what we are looking for are the effects of Stars upon the Earth's physical development, I ^{ask} ~~reply~~: what has changed ^{the physical condition of} EARTH (& so the SUN) more than science - the science whose history is inseparable from starlight? The Plough & Orion have played their part in the invention of my fountain-pen, & in the devising of this sentence.

Other kinds of commerce between SUN & UNIVERSE are not lacking. Not all comets ^{on} necessarily solar: some ^{in space} may have been picked up & incorporated, or others are, perhaps, just visitors. So with meteors: there is nothing to show that a proportion of them is not ~~picked~~ acquired by the SUN in his journeying through space. What is certain is that the Universe contains ^{presumably} a vast ^{which} ~~layer~~ of extremely rarefied gas: upon ^{which} ~~this~~ ^{stars} ~~layer~~ ^{feed}. Cosmic rays are thought by some to originate in Stars, by others to originate in interstellar space. Little is known about them, but it has been suggested that they ^{may} be responsible for ~~the~~ ^{or cause} ~~some of the~~ changes in the Earth's genes, ^{that is} thus giving rise to mutations. If this is the case, LIFE may owe ^{its} ~~its~~ ^{origins} ~~to~~ ^{to} mutations. ^{It may well be we are ignorant} (or even have existence) to Galactic influences. ^{This is no more than guess-work, but at least it is conceivable that the whole course of evolution in} EARTH & SUN is really a fragment of a much more extensive process, of which cosmic rays, & other types of radiation known & yet to be discovered, are the coordinating medium.

Common sense rightly points out that I am in some difficulties, & am obliged to make a little evidence go a long way. The effects of any Star, or group of Stars, upon the SUN, are slight. There is no sign of that intimate interweaving of needs & services which is found amongst men, & cells, & animals. ^{Can it be said} (common sense inquires) of any Star whatever that the SUN has need of it, as the astronomer himself has need of his glasses or his tailor?

The answer is that the astronomer can, & does. He says - this time it is with reasonable assurance - that there is a Star in this Universe to which the SUN owes his form, his life, his intelligence; ~~lacking~~ without this beneficent

The ~~isolation~~ relative isolation & self-dependence of the SUN is the greatest ~~mark~~ ^{mark} of evidence of its superiority as a living creation. To be ^{self-sufficient} ~~self-sufficient~~ ^{independent}, yet internally of extreme complexity - what are these but ^{marks} of a being immensely higher in the scale than any animal organism? ~~The stars~~ ^{The stars} ~~Plankton~~ ^{Plankton} & the space that divides planet from planet, & star from star, & galaxy from galaxy, is ^{the} measure of their status: ~~loneliness~~ ^{loneliness}. Quality means loneliness, to develop from within instead of being moulded by outside forces

+ It has been calculated that only one part in 120,000,000 of the Sun's radiation is intercepted by the Planets. (Sampson: The Sun, p.18.) The rest may be regarded as providing ~~energy~~ ^{energy} in interstellar relations - ships - ~~perhaps~~ ^{perhaps} social relationships. Just as ^{at} ~~an~~ ^{an} ~~unconscious~~ ^{unconscious} ^{level} ^{of} ^{my} ^{energy} ^{goes} ⁱⁿ ^{my} ^{own} ^{maintenance} (ance) & the rest ~~is~~ ^{is} expended in doing external work (MAN-maintenance), so ~~at~~ ^{at} ~~this~~ ^{this} ~~level~~ ^{level} ~~a~~ ^a ~~part~~ ^{part} of ~~my~~ ^{my} ~~energy~~ ^{energy} ~~is~~ ^{is} ~~divided~~ ^{divided} between SUN-level & universe-level. So far from the Stars being isolated, in ~~the~~ ^{the} ~~sun~~ ^{sun} ~~of~~ ^{of} ~~keeping~~ ^{keeping} ~~the~~ ^{the} ~~universe~~ ^{universe} ~~to~~ ^{to} ~~themselves~~ ^{themselves}, their enormous energies are poured out upon one another.

"Why should I feel lonely?" asks Thoreau, "is not our planet in the Milky Way?" (Walden: Solitude)

+ See W.M. Smart: Astrophysics, p.65ff

+ See, e.g. Louis Leprince-Ringuet: Les Rayons Cosmiques (1945).



+ See J.E. Bondi's Cosmic Evolution, for a statement of this thesis.

A comet that is part of the Solar System travels in an elliptical orbit such as (a). A comet that travels in a hyperbolic orbit (b) will not return, & is a mere visitor. The view that apparent parabolic or hyperbolic orbits are really very large ellipses is increasing, & it is doubtful whether we are ever visited by extra-solar comets.

+ The ~~isolation~~ ^{isolation} of the ~~star~~ ^{star} ~~consciousness~~ ^{consciousness} of this Star is inextricably bound up with its consciousness of the ~~its~~ ^{its} ~~yellow~~ ^{yellow} ~~stars~~ ^{stars}. To take one example: "The Pythagoreans were wont betimes in the morning the first thing they did, to look up into the heavens to put themselves in mind of them who constantly & invariably did perform their tasks: as also to put themselves in mind of orderliness, & of good order, & of purity, & of naked simplicity. For no Star or planet hath any cover before it." (Marcus Aurelius: Meditations XI, XXV.)

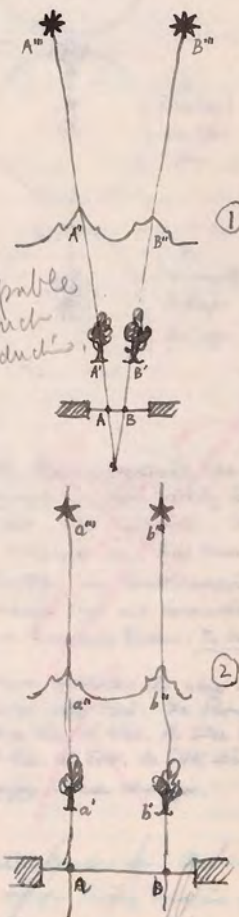
Organic units diff. as we climb the tree.

⑥ Benians, the French socialist writer, who was half mad, & entertained many fantastic notions (he predicts that the sea will turn to lemonade, that a new race of animals, called 'anti-leopards', 'anti-horses' etc will appear on earth) taught that the lion eat, drink & make love. He was more wisdom in this part of his madness than ~~is~~ we give him credit for. Lions live a social life, & it is likely that they can only become more alive (i.e. become manifest now systems) by near approach or contact. I see no reason why this approach should not be deliberate.

fellow-Star he would still be a Planet-less Ball of hot gas. The astronomer can truly say that there is, among the Stars he studies, one which ^{under} makes that study possible, one which has gone to the making of the astronomer, his instruments, & his world. I refer to the Star which (according to the generally accepted hypothesis) ⁺passed so close to the SUN that the planetary material was pulled out & set in motion about the parent body. This Star, who is in some sense our father, having endowed us with a great deal of his energy*, joined the others. One day, perhaps, the SUN will recognise him. Meantime, when I look up at the night sky, there is always a chance I am seeing gazing upon ~~the~~ an ancestor whose own energy is (at some remove) the cause of my gazing. 

* Most of the rotational momentum of the SUN belongs to the Planets, & the presumption is that this was conferred by the visiting Star. ^{If this is so,} ~~then it is so,~~ there is a sense in which the SUN's development ~~means~~ ^{is} also the development of the system. To ~~recognise~~ ^{recognise} ~~only~~ ^{only} the SUN's side is ~~rather~~ ^{rather} ~~certain~~ ^{certain} ~~primitive~~ ^{primitive}, to have ~~us~~ ^{us} to resemble those primitives who ~~do not~~ ^{do not} ~~recognise~~ ^{recognise} ~~fatherhood.~~ ^{fatherhood.} It is sometimes held that a ~~man~~ ^{man}

Common sense tries to think of the Universe in terms appropriate to another world, ~~in which the units which~~ ^{employing units of measure that} the Borough Surveyor & the City Chronicle ~~are~~ ^{plan-less} ~~are~~ ^{disappointed,} ~~are~~ ^{who knows} meaningless find satisfactory. No wonder the ~~universe~~ ^{Galaxy} seems ~~a mere jumble of isolated parts.~~ ^{a mere jumble of isolated parts.} As the electron microscope misses the ~~entity~~ ^{entity} of the man, so common sense misses the ~~entity~~ ^{wholeness} of the ~~universe~~ ^{Society of the Stars}. Here is an individual billions of miles from end to end & billions of years old. How can a mere man take in such a creature? He cannot. ^{inspect:} Knows & known must belong to the same level. To be aware of the ~~universe~~ ^{Galaxy} as a true whole is to ~~conceive~~ ^{understand} the ~~universe's~~ ^{Galaxy's} space & time to manageable proportions, thus the astronomer talks of light-years & parsecs, ^{calls a Star that is 'only'} ^{& speaks of 'dwarf' and 'giant' Stars & 'late-type' Stars} ^{Transcending} ten light-years away 'near', ~~a red star~~ ^{late type}. Dealing with his merely local self, he naturally thinks in units suited to his object. Dealing with Stars, he thinks Star-fashion; dealing with ~~universe~~ ^{Island} Universes, he thinks Universe-fashion. A moment later - so swift ^{or} ~~so~~ ^{is} descent & ascent - he may be talking of his lens as a 100 inch lens. To recognise & control these metamorphoses is most important, otherwise thinking inappropriate to the level under consideration is bound to happen. In particular, higher levels ~~become~~ ^{become} diluted out of existence. Actually, Stars & Universes are no bigger than cells & men, & their tempo is no slower: to fail to recognise this is to take all the unity out of them. The SON is a creature, neither big nor small, wakened to life by another Star not very long ago. Much - almost everything, perhaps, - remains to be discovered concerning the relations between Stars & Stars in the Universe; but, as I do not have to wait till I am ^{just} expert in anatomy before I recognise men,



Through my window pane I see, coinciding with two spots $A \times B$ on the pane, a pair of trees, a pair of mountains, ^{a pair} of stars. This I interpret only in terms of design (1), losing sight of the fact that diagram (2) is equally true to the facts. In terms of D I say that the Stars are very distant (in terms of the space of my window pane) (in (3) I say they are very close (in terms of their space)).

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so I do not have to wait till I know all that goes on between stars & star-groups before I recognise the wholeness of the ^{Galaxy} ~~universe~~. If it is ~~unreasonable~~ irrational to take myself on trust at ~~this~~ ^{universe} level, then, for the same reasons, it is irrational to take myself on trust at man-level, or ^{at} any other ~~level~~.

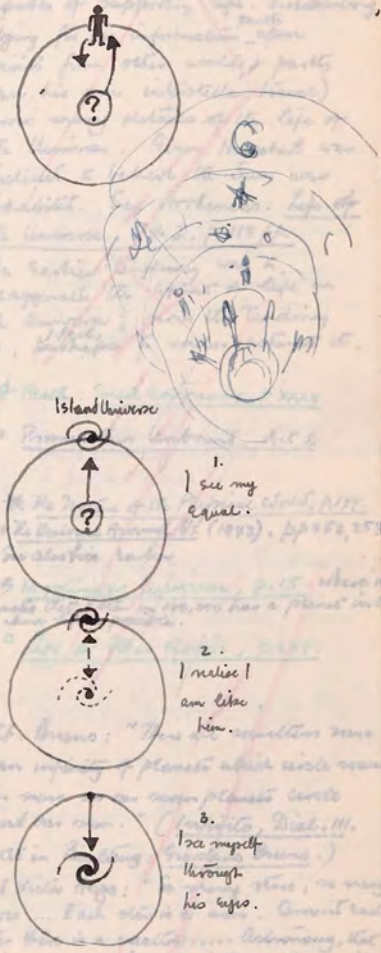
At man-level, common sense ~~allows~~ ^{shows} me, I have my mirror, & I have my fellow men, the guides to what I am. These I take on trust, no doubt; but they are trustworthy. At universe-level I am not ~~so~~ ^{simply} ~~equipped~~ ^{equipped}: ~~from the difficulty of rationality.~~

Common sense is wrong: ~~but~~ even at ~~universe~~ ^{Galaxy}-level I ~~look~~ ^{see} at myself in my looking-glass. Scattered in the sky are millions of ^{Galaxies or Islands} ~~universes~~ - spiral, lens-shaped, globular. These do for me at ~~universe~~ ^{Galaxy}-level what men do for me at man-level - show me myself. At no level am I in a position to grasp my own unity without help from outside. Without this external aid I am a headless body, an affair of arms & legs. And (I repeat) the three stages of the discovery of my unity are: first, I see my equals; second, I realise I am ^{somehow} like them; third, I see myself from their viewpoint. This is so at man-level, & it is so at ~~universe~~ ^{Galaxy}-level. I look outwards & find, not a close-knit, well-organised, human body, but a trunk that lacks a head; I look further out & find, not a close-knit, well-organised ^{Galactic} ~~universe~~-body, but a ~~chaotic~~ ^{starry} ~~chaos~~ ^{Chaos}. To leave it at that would be silly. I look outwards again & see complete, well-organised ^{Island} ~~universes~~, & further afield, complete, well-organised ~~universes~~. And I say to myself: that is what I must look like from over there. I am not this headless body I seem to be, but a whole, both a whole man & a whole ~~Island~~ ^{Island} ~~universe~~. And I have no more reason for doubting the unity of the second than I have for doubting the unity of the first.

4 The living Universe: Solar systems in the ^{Galaxy} ~~universe~~, & their life.

Common sense allows the unity, but not the life. Granted the SUN lives & is a member of a ^{genius} ~~great~~ whole, it is really asking too much of him to expect ~~one tiny insignificant~~ ^{such an infinitesimal} part of that whole to vivify all the rest. The life of the SUN has been ~~stretched~~ ^{stretched} to the limit in the effort to cover the whole Solar System; that it should do duty for myriads of other Suns is pure belief. ^X If the ~~universe~~ ^{Galaxy} is alive as a whole, it will take more than the SUN to make it so. And, common sense asks, what wonder is there of life among the stars? None at all. When Mendelith calls them 'the brain of heaven' he is talking beautiful nonsense. Nor may Milton's ~~more cautious lines~~ ^{more cautious lines} be taken seriously, does science bear out Milton's more cautious lines, about the ^{stars} ~~stars~~ numerous, and every star perhaps a world of destined habitation.

+ Mendelith, at any rate, is the stiller influence. In his sonnet 'Star Sirius' he addresses the star as: -
"And thy quick beams whose jets of life inspire life to the spirit, passion for the light, Dark Earth since first she lost her light from Hae viewed & felt them sweep her as a Gyre."



"The meaning systems being in the heavens... have nothing but their beliefs, their hypotheses, with which to astonish us. They have neither theology nor mathematics. They neither feel nor understand."
W. Macquarrie Dixon: The Human Situation, p.158.

X Common sense overlooks the way in which 'texture' varies with level. The flower is not more complex than the tree, the tree than the EARTH, the EARTH than the SUN, the SUN than the GALAXY: it is the scale which changes.

+ Plato speaks of 'this universe, a single living creature containing within itself all living creatures, mortal & immortal.' (Timaeus 69C) ^{to}

o In that magnificent sonnet: "Lucifer in Starlight." Two pages
o Pardus Lost Bl VII, 620 620

In this, common sense is right — there is no evidence of life among the Stars. How could there be? ^{in the first place} Life is planetary, & even the nearest Star is ^{much} too far away for any planets ^{it may have} to be visible. I am in the region where these Stars are Stars & nothing less than Stars (they likewise are where I do not exist ~~for~~ ^{for me they live} as a Planet, but only as a Star); if they live at all ~~it is~~ ^{as} Stars. But — here lies the difficulty — the behaviour of a 'dead' Star, ^{among} ~~if~~ these are not, is not outwardly ^{(if the SUN is a good guide) or} ~~so far as I know~~ different from the behaviour of a live one. I have, then, no direct way of telling whether the Stars are alive or not.

When, at night, I look skywards, we may be exchanging glances, or we
was Anaxagoras right when he taught the plurality of inhabited worlds? & was Shelley's view,
may not ~~that~~ ^{that} ~~are the~~ ^{are the} ~~probabilities~~ ^{probabilities} must be dismissed as
fantastic belief, that 'those million worlds which burn & roll around us' are inhabited, = be dismissed as
for mere poetic imagination? H

Expert opinion is divided. Eddington's ^{negation} ~~was~~ ^{less} ~~not more~~ than one in a hundred million stars ^{have?} has been disrupted ~~(that is his work)~~ into planets.

He adds that, while it would be characteristic of Nature to use a million times what we would do, it seems unlikely that ours is the only consciousness

* ~~assertion~~ "that the number of planetary systems in the whole of space must be almost infinitely great. Millions of millions of these must be almost exact replicas of our solar system, & millions of their planets must be almost exact replicas of our earth." †

H. Spencer Jones thinks ^{it is likely that} the number of planetary systems is 'very large'. On the whole, the weight of opinion seems to be in favour

of ~~a~~ ^{numerous} solar systems, some of which include the conditions of life. If I take Eddington's estimate of one Star in 100 million, & the number of Stars in this ^{island} Universe as ~~20,000~~ ^{1,000} million (some put the figure ~~as high as~~ ^{much higher} 30,000 million) the number of planetary systems works out at ~~two hundred~~ ^{ten}.

A that in the dark, common sense ~~is~~ ~~does not~~ ^{come to} ~~mean~~ ^{life}; and, in any event,
do planets necessarily ^{have} life?

Given a solar system not too unlike our own, is the ground to emerge, at some time in its career, the conditions of life? And if these conditions do emerge, is ^{the} life ~~to~~ also bound to emerge? Henderson says 'yes' to both these questions. He considers that, given a ^{world} Planet massive enough to retain an atmosphere, & sufficiently near the Sun, then an atmosphere with water vapour & carbon dioxide must ~~appear~~ develop. There will follow, ^{more or less} as a matter of course, the differentiation of land from sea, denudation, & the formation of soil. "In short, a possible abode of life not unlike the earth apparently must be a frequent occurrence in space." ⁺ And where the conditions of life are, there, presumably, life is. ~~therefore~~ This opinion is strongly held by Benjamin Moore* who (^{in view of} ~~the~~ ^{the} fact that the chemical composition of Planets anywhere is unlikely to be very different from EARTH'S) makes temperature the governing factor. As the Planet cools, more complex

Initially,
① The recently ~~published~~ theory of Dr. Weizsäcker is that development into a planetary system is part of the life-history of the normal stars. +

The acceptance of the Copernican System brought with it the belief that other worlds were proper like ours. Bruno particularly preached this doctrine, & it was often assumed that all heavenly bodies were capable of supporting life. Swedenborg, (relying for his information upon spirits from other worlds & partly upon his own interstellar travel) gave many details of the life of the Universe. Even Herschel was inclined to believe the Sun was inhabited. See Archæmius: Life of the Universe, Vol. I, p 118 ff.

The earlier tendency was to exaggerate the extent of life in the University; now the tendency is, ^{if I feel,} ~~perhaps~~ to under-estimate it.

♂ Health: Snake Astronomy, p xxxv

- Prometheus Unbound, Act I

* The Nature of the Physical World, p.177.

+ The Universe Around Us (1943), pp 252, 253.

See also this earlier

3 Mysterious Universe, p. 15. where it estimates that 1 star in 100,000 has a planet in the zone where life is possible.

- Life on Other Worlds, p 247.

+ Cf. Bruno: "There are countless suns
 & an infinity of planets which circle round
 their suns as our seven planets circle
 round our sun." (Infinite, Dial. III.
 quoted in Boullée: Giordano Bruno.)

And Victor Hugo: "So many stars, so many
loves Each star is a sun. Around each
star there is a creation Astronomy, that
micrography of heaven, is the most magnificent
of the sciences because it is mingled with a
certain amount of divination." Intellectual
Autobiography (Participation de Ma Vie):
'Things of the Infinite'.

+ The Fitness of the Environment, p 60.

* "Life is at present originating in
 another ~~other worlds~~ ~~medium~~....
 or it is originating upon our own
 & given a certain stage in evolution
 when matter has reached a
 certain complexity in structure,
 & become limited by certain types
 of energy, life must come, &
 having done must evolve into higher
 & higher forms." (The Origin & Nature
 of Life, p. 73.)

[illegible]

② Double stars are stars in love, who in due season merge in a blaze of joy & pain: the resultant new star, after a period of unconsciousness, generates new living worlds & takes its place ^{proper} again in the angelic host. Our own solar system was born of a more transient love. As for psychic characters, the planets used in astrology, the stars retain the complete angelic wisdom of the golden age, while the nebulae are great religious hosts, ^{longing} desiring for union with one another & with their cosmic Source.^x To ear^{long} accustomed to ~~the~~ science's funeral oration over the corpse of the universe, all this has a very queer sound: it is almost indecent, as if some monstrous, practical jokes were, in the middle of a funeral service, to galvanize the corpse into knocking off the coffin-lid. But, after all, ~~the~~ when the ancients & our modern poets speak of the life of the stars, they mean such a life as Stapledon describes, rather than such a life as I caricature the her. "With joy the stars perform their thing," says Matthew Arnold, & adds no qualifications about planetary rings & the possibility of humans in them. And certainly Dante makes no provision when he ~~write~~ describes the stars proceeding "In circling motion, rapid more or less, As their eternal vision each impels" -

x See Matter p. 246 ff.

1(A) finds identity with B in b, with C in c, & with D in d, because in the last resort the entire triangle is A, B, C, & D.

- What matter to me if their star is a world
mine has opened to soul to me;
therefore I took it.

Browning: My Star

8) In all this there is nothing ^{essentially} ~~new~~ new. According to tradition the Psychogonans ^{not all} ~~populations~~ all the stars, but believed that souls could ~~can~~ slip from ^{a planet} ~~the earth~~ on to the earth, & from the earth on to ~~the stars~~ ^{other} stars. The ~~new~~ ^{most} latter meets the horizon.

(Euler 69)

* To achieve the ^{grandest} ~~the~~ ~~most~~ view
of fantastic & absurd dogma. See, e.g.
Walter Rauschenb.: Religion & a Scientist, p. 147.

Chalk ~~_____~~ (550-550 BC), the father
of philosophy, taught that all men
are equal, ^{especially} held to be
honest gods. was merely false
of his.

to wisdom still, but amongst the educated the
~~fallacy~~ antipathetic fallacy is universal.
° See Denis Sautet: The Gods of the People.

o The poet-philosopher Santayana describes the universe as an 'immense engine', 'an organism of mind & fire' that we should not blame for what, doubtless, it makes ^{from} that it did. (Little Essays) So much depends on the observer: a poetic nation can be first the poet's imagination may be more fired by a dead world than an actual one.

similar view: ~~the celestial bodies are~~ ^{are} ~~not~~ ^{not} ~~divine,~~ ^{cannot} ~~they~~ ^{will} ~~not~~ ^{not} ~~be~~ ^{be} ~~their~~ ^{be} ~~own~~ ^{be} ~~souls,~~ ^{be} ~~the~~ ^{be} ~~souls~~ ^{be} ~~of~~ ^{be} ~~the~~ ^{be} ~~least~~ ^{be} ~~of~~ ^{be} ~~man~~ ^{be} ~~kind,~~ ^{be} ~~they~~ ^{be} ~~declare~~ ^{be} ~~deathless~~ ^{be} ~~&~~ ^{be} ~~divine,~~ ^{be} ~~but~~ ^{be} ~~the~~ ^{be} ~~entire~~ ^{be} ~~heavens~~ ^{be} ~~&~~ ^{be} ~~the~~ ^{be} ~~stars~~ ^{be} ~~within~~ ^{be} ~~the~~ ^{be} ~~heavens~~ ^{be} ~~have~~ ^{be} ~~had~~ ^{be} ~~no~~ ^{be} ~~communication~~ ^{be} ~~with~~ ^{be} ~~the~~ ^{be} ~~Immortal~~ ^{be} ~~Principle,~~ ^{be} ~~through~~ ^{be} ~~these~~ ^{be} ~~are~~ ^{be} ~~far~~ ^{be} ~~purer~~ ^{be} ~~&~~ ^{be} ~~lovelier~~ ^{be} ~~than~~ ^{be} ~~their~~ ^{be} ~~own~~ ^{be} ~~souls."~~ ^{be} ~~To Plotinus~~ ^{be} ~~(Enneads~~ ^{be} ~~II, 9, 5)~~ ^{be} ~~such~~ ^{be} ~~an~~ ^{be} ~~opinion~~ ^{be} ~~is~~ ^{be} ~~abundant.~~ ^{be}

5. The living Universe: from ~~Stars to~~ ^{SUN & GALAXY} ~~Galaxy~~

'I believe' — so runs the Credo of our time — 'in a dead World, & in a materialism which finds the source of life (such ^{microscopic cases of} life as a dead World can harbour) in atoms & electrons.' But these two articles cancel one another. If life proceeds automatically from electrons & atoms, & these are the stuff of warm Stars, then, potentially, the World is alive through & through. Each Star has it in itself to live ^{to think} & awaits only the right temperature — which comes anyway as the Star cools — & the accident of 'fertilisation' by another Star.

And there (common sense points out) is the snag: the fertilisation is so rare. I reply: the difference between a really live Universe ^{on the one hand, + a Universe ~~that is~~ that is alive} ^{though in principle + there actually + through + through potentially, ~~on the other hand,~~} ^{great is in principle very small.} But for a technical hitch, ^{or conception.} so to say, the Universe is ^{according} (materialism) everywhere alive. ^{it follows that life which} ~~that life that~~ does emerge cannot be looked on as a stranger or freak in the Universe: it is the flower that

But if it is true that the more so-called individuals are content to contemplate rather than to act, then we ~~are~~ are no doubt mistaken to expect the Blacks any notable business. They observe, & enjoy. But do they? common sense inquires: 'He don't look down' - it is poetic metaphor. But indeed they do look down. And what is more, they see me - yes me, this man who looks up.

degrees,
{coursing

* It may be expected that the life of the U. is not nec. to its beauty. I believe, however, that only the beauty of the living life is in the end essential. Thus what for Woodworth really matters (as to the U. is not the mere beauty, but rather the irregular life of Nature: his universe is animated throughout).

entitled to ^{assume} ~~suppose~~ have got beyond the stage of ~~vague discussion~~ ^{actual} performed what we have only dreamed of? Even if living Suns are ~~not so plentiful~~ ^{are} somewhat rare objects in the Galaxy, some of them may, be so abundantly alive that they are able, by means of space-ships & artificial planets, to colonize the ~~whole~~ ^{themselves} dead stars of their neighbourhood & so bring them to life. Who can be quite sure that our Sun does not contain ~~so~~ ^{intensely alive, but too small to attract attention?} such a Columbus-planet? Then may, after all, be something in the suggestion of Goethe & Arcturus that life comes to us ~~from outside~~ ^{from within} the solar system. ~~But again, I doubt~~

x In Die Drei Motive, I add to his theoretical arguments, the historical (man has always believed in the living stars), & the practical (man believes in the living stars). He then mentions the fact that these motives mutually support one another, & to why one of them is like balancing a tripod on a single leg. Then he mentions the fact that the pragmatism of Wm. James who, in A Pluralistic Universe, (1918) acknowledges the debt of the conclusion of James' V.R.E.

Theoretically, ~~then~~ ^{a great deal} there is much to be said for a Galaxy that is the scene of widespread & varied life. But there is also a practical side to the question. * Is not such an ~~island universe~~ ^{a Galaxy} more beautiful, better worth living in, & nearer to our hearts' desire, than the defunct & inane ~~conglomeration~~ ^{conglomeration} which common sense ~~imagines to be our home?~~ ^{imagines to be our home?} Do we not, in ~~our~~ ^{those} those moments when we feel most alive & at our best, reject the dead world & assert the living? And, if this is so, is it not unobjectionable & unscientific to ignore what we & who are ~~the~~ ^{our own} samples of the universe ~~which~~ ^{which} feel in this matter? Our ~~altruistic~~ ^{altruistic} ~~is~~ ^{is} ~~the~~ ^{the} ~~preferences~~ ^{preferences} are ~~not~~ ^{not} ~~irrelevant~~ ^{irrelevant} to the nature of the universe. Human nature & human ideas are ~~not~~ ^{not} ~~at least~~ ^{at least} ~~as relevant~~ ^{as relevant} to the nature of the universe as ~~the~~ ^{the} ~~universe~~ ^{universe} is. And the verdict of ~~human nature~~ ^{our} ~~is~~ ^{is} ~~unmistakable~~ ^{unmistakable}. "In how different a light", exclaims Fechner, "the whole earth appears to us now when it is awakened & kindly living! In how different a light ---"

It is symptomatic of our age that the rhyme about the twinkling stars becomes the rhyme about the but: we no longer wonder what a star is, for we know it is blindest & stupidest than any but --- & we ~~Part Lost~~ ^{Part Lost} ~~die a~~ ^{die a} ~~Y. hand and star!~~ ^{Y. hand and star!} (Booth P. 13 Job)

But the question (C.S. points out) is not what ~~we~~ ^{we} think should be, but what is; and ~~countless~~ ^{countless} ~~lower~~ ^{lower} ~~from the occasions when~~ ^{from the occasions when} ~~man's desires have been mistaken~~ ^{man's desires have been mistaken} for ~~fact~~ ^{fact} ~~their desire for fact.~~ ^{their desire for fact.} True enough, but the now opposite error is just as fatal. ~~Our best~~ ^{Our best} ~~is~~ ^{is} ~~even now~~ ^{even now} ~~disastrous.~~ ^{disastrous.} We ~~do not~~ ^{do not} ~~get~~ ^{get} ~~what we want of the universe, but~~ ^{what we want of the universe, but} if we did we should perhaps find that ~~they~~ ^{they} ~~these two~~ ^{these two} ~~coincided.~~ ^{coincided.} ~~At least it is pre-~~ ^{At least it is pre-} ~~ferred~~ ^{preferred} ~~to declare that the truth about the universe is neither good nor beautiful, and, since we must have by~~ ^{to declare that the truth about the universe is neither good nor beautiful, and, since we must have by} ~~faith, let it be that faith which is at once~~ ^{faith, let it be that faith which is at once} ~~most~~ ^{most} ~~satisfactory~~ ^{satisfactory} ~~to head & heart.~~ ^{to head & heart.} ~~Why prefer the Over-belief~~ ^{Why prefer the Over-belief} (as James called them) are practically indispensable, why ~~not~~ ^{not} ~~cleave to the optimistic~~ ^{cleave to the optimistic} ~~sunnier side,~~ ^{sunnier side,} especially when that side in it is the side of prefer the life-denying alternative? or Surely it is more often ~~the~~ ^{the} ~~path~~ ^{path} ~~lead's~~ ^{lead's} ~~away from light & life.~~ ^{away from light & life.} ~~The truth is that a man who lives in a dead Earth,~~ ^{The truth is that a man who lives in a dead Earth,} ~~the path lead's away from light & life.~~ ^{the path lead's away from light & life.} ~~And our advice to the would-be suicidist is: suicide is intellectually, or~~ ^{And our advice to the would-be suicidist is: suicide is intellectually, or} ~~morally, aesthetically, & definitely~~ ^{morally, aesthetically, & definitely}

10
5

5. The living universe: from Sun to galaxy. "I believe" — so runs the Credo of our time — "in a dead world, & in ~~atoms~~ ^{atoms} (and other ultimate particles) which are the source of such life, as this dead world ~~can~~ ^{can} ~~transiently~~ ^{transiently} ~~achieves.~~ ^{achieves.} But then two articles ~~cancel out.~~ ^{cancel out.} If life arises as a matter of course, from ~~electrons & atoms~~ ^{electrons & atoms}, & these are the stuff of every galaxy & every star, then potentially the universe is alive through & through. Every star has it in itself to live & to think, & awaits only certain ~~other~~ ^{other} ~~circumstances~~ ^{circumstances} (which, it seems, are not rare) for these potentialities to become actual. It follows that the life & thought ~~which~~ ^{which} ~~emerge~~ ^{emerge} ~~are not freaks in~~ ^{are not freaks in} the universe, ~~no~~ ^{no} ~~stranger~~ ^{stranger} ~~but~~ ^{but} ~~thoroughly at home,~~ ^{thoroughly at home,} & implicit from the beginning & everywhere. ~~The universe~~ ^{The universe} ~~is, in effect, nothing but~~ ^{is, in effect, nothing but} ~~what we call~~ ^{what we call} ~~inanimate~~ ^{inanimate} ~~nature is, in effect, the seed & promise of life.~~ ^{nature is, in effect, the seed & promise of life.} Nor is it needful that every seed, or that more than a few seeds, should germinate: the life of the few is ~~enough~~ ^{enough} ~~for the life of all.~~ ^{for the life of all.} Our thinking about mind in the universe is irritated by a crude & age-old materialism, which still pictures 'consciousness' as something simply located in space, as a 'mind-stuff' analogous to subtle matter. But mind is not like light that dims as it advances; it suffers no wastage, no delutions, as it 'spreads' from planet to star, & from star to galaxy, from galaxy to cosmos. Based on an infinitesimal subject-matter, or nucleus, it is more than equal to its universal sweep. What seems to be its abiding handicap, or ~~limitations~~ ^{limitations} of position & movement, ~~is~~ ^{is} ~~more likely~~ ^{more likely} ~~to be its~~ ^{to be its} strong point. How ~~should~~ ^{should} ~~the spectroscopist~~ ^{the spectroscopist} ~~study the~~ ^{study the} ~~atoms~~ ^{atoms} ~~in the~~ ^{in the} ~~sun's~~ ^{sun's} ~~center,~~ ^{center,} if not at a safe distance, when their radiation not only presents itself for study, but also endows the student with the means of life itself? Is this an untoward arrangement, or, on the contrary, a singularly neat one? Or again, when should a galaxy be observed if not

④

(i) He ~~is~~ in the Army. 17

being, in time, by a process of differentiation, the Galaxy ^{later, the form of myself writing this sentence about the} shows itself to be ~~several~~ ^{as the} myself ^{describes the Galaxy} writing this sentence about that process. ^{To say that this} is patently absurd. ^{is} ^{of the nature of} ^{the} ^{development} ^{no indication of} ^{that} the Galaxy ^{is}.

inquiring so far, ~~perhaps~~ I am justified in extrapolating the curves which this inquiry has so far estab-
lished.

it in others over this) they possess the qualities these qualities. The qualities of life & mind that I
own belong to any fellow here in me (who am nothing in myself) ^{True!} (and from them), & to any those same equals over
claim to have an inevitably shared, since ^(A) they belong to ^(B) my equals here in me (who am not in

self) + ~~is~~ (b) ~~they belong~~ to ^{ours} ~~us~~ ~~them~~ in ~~my~~ equals (who again are nothing in themselves). "EMERSON"
10a

* In other words, I have
no more reason to be
solipsist at the solar
galactic level, than
at the human.

For example, Stromberg has measured the Sun - ring of Galaxy by studying spectra of the nearest nebulae, deducing from the speed of the Sun's orbital motion, which in turn gives the due to the radius of the Sun's orbit. (UAV p66) In other words, this Galaxy deceives itself in its fellows.

Hegel 19

x Cf. St John of the
Cross: "He would live
by that which it loves
rather than in the
body which it animates.
For it has not its
life in the body, but
rather gives it to the
body & lives in that
which it loves."

Nothing is contained where it seems to be contained, & it is of the very essence of ~~no~~ ^{a not} consciousness that it ^{becomes} ~~contains~~ the rest. [Plotinus] (10a p.). A star, in fact, is not a star in one place but in at least two: it is a star ~~for an observer on the star's surface~~ ^{here - from here & here from there.}, & for half as it identifies itself ^{with} that observer. That is to say, any adequate definition of the term "star" is a definition of a pair of stars. [Frederick] 10. Modern physical science is nothing if it is not built upon a framework of

widely scattered intercommunicating observers. I say that these observers must be taken seriously: (no less than the data they supply). They ~~also~~ are scientific data, that cannot be ignored. ^{Each whole} Science cannot weigh & measure the ^{yet leave no trace of life that is} data, & make themselves free of the Galaxy, without changing it to life. D.H.L. 1144.

(v) The argument from the traveling observer. ^{three} ~~four~~ things I am fairly sure; ^{sure} I am a living self-conscious creature, ^{then discovers that} that when I am kept under observation by a seeing observer & become a planet, a star, a galaxy, ^{then his observation does not deprive me of life & self-consciousness.} there is a prima facie presumption, ^{then} that I should, in these phases, retain my qualities of life & self-consciousness.

1844 *

(11) The argument from first-hand experience. And my travelling observer's report would, by itself, be of little value. But its force is derived from the fact that it agrees so well with my report. Thus, as he recedes from me, the direction of his gaze is slightly modified from time to time: he shifts centre - from Earth to the Earth's centre to the Sun, ^{from} & the Sun's to the Galaxy's. And this shifting agrees perfectly with mine. It is a part of my intellectual growth ^{to maturity} that I ~~shift~~ ^{shall} become first geocentric, then heliocentric, then galactocentric: these Copernican revolutions are the condition of my hierarchical advance, whether it is a question of my own view out, or of my observer's view in. In other words, ~~as I increase my grasp of time, & so fill out, & solidify the earth's ^{present moment} ~~space~~~~ ^{any eccentricity, so (i.e. no present moment) r of space} ~~the little patch of country I call "her" becomes first an Earth-ringing some 36,000 miles or thereabouts & 24 hours about place & time~~ ^{where point is ch. / who's point is 24} ~~the little patch of country I call "her" becomes first an Earth-ringing some 36,000 miles or thereabouts & 24 hours about place & time~~ ^{where point is ch. / who's point is 24} ~~then a Sun ring 186,000,000 miles, & whose point is a star, whose radius is 36,000 light years. Thus here~~ ^{where point is ch. / who's point is 24} ~~moving an inch I can not foot leave Earth & set foot upon the Sun & the Galaxy.~~ ^{where point is ch. / who's point is 24} "This is not a

[Faint handwritten text, possibly "No. 10"]

we are looking for a ^{to find that} ~~the~~ Galaxy ^{that} is indeed a living, self-conscious ~~entity~~, ^{then we must expect an experience of} ~~it is~~ other galaxies: and it is just such an experience ^{as we find, & know by direct} ~~that we find, & know by direct~~ the most direct & certain means possible. In we have the power (more literally than Christian realized) - "the power at some moments to outgrow the galaxies that are here enough to know that one for" (*)

⑤ Edding - p 19

Ramsay 700

Trabeme 20¹⁰

UAV 73

* Fehner: p 18.

focal length
 Jones General
 Adair
 Mass of Gulf
 UAU 66
 Halden + Harg
 276

the universe, which the
200 "Palovan
reflected reveals has
light into the volume
of revealed by the
200 "reflected. Being
to the understanding of
its atmosphere, however
the 200 "instrument has
in advantage does the
200 "only on some 15
days in a year.
to put the matter
more accurately,
I know more about
the solar & galactic
systems than I do
about the human &
infrahuman part.

- Haldane (21)

HWK
1000-
Lester
DNE

A further extension
laziness: distant soft
misty. And this
too has its celestial
counterpart. V.A.U.
58.
Smart Act. 27

did not
then
clo

swallows up the stars. ~~As we become more aware of our condition we discover that the galaxies are here, & in particular, & to elude to galaxies, is to elude the life & the future~~ ^{become more alive, ~~or~~} ^{need as further} And if C.S. should ~~require~~ ^{guarantee} ~~us~~ ^{us} ~~have~~ ^{have} that we have genuinely transcended the human order, it is only necessary to point to the ~~fact that~~ ^{the dimensions of} our Godlike ability to compress in one field of vision, not merely a star & a star cluster but a spiral nebula & a group of nebulae. ~~Who but only C.S. could create with in a galaxy & scale~~ ^{who but see the world thus?} ~~comparing billions of miles into a hair's breadth?~~ ^{comparing billions of miles into a hair's breadth?} So also with time. ~~There a nebula at a glance - a glance which~~

By means of the blink microscope, we see as we
of years & the incoming light-stimulus originated say 500,000,000 years ago, & the outgoing response will
arrive in after a minutes interval in the future: that is to say, our 'present moment' ^{indeed} embraces,
in respect of these nebulae, swells like a thousand million years. It is ~~naïve~~ ^{ridiculous} to suppose that man
is capable of ^{this} ~~such~~ ^{so} transcending his temporal ^{present} ~~limitations~~. "For 99.9 per cent. or more of its long

Journey, the light by which we see the faintest of visible nebulae travelled towards an earth uninhabited by man. Just as it was about to arrive, man came into being on earth, & built telescopes to receive it. "• But this is ^{Plaints} incredible. It is the Galaxy who sees ^{not man} his fellow the galaxies, ^{no human evels} ~~no~~ when my eye sweeps across the heavens from one nebula to another, covering untold millions of light years in a second. ^{as mine does} ~~it is as my does mine does~~ P12*

The argument from galactic micro-organs. And if c.s. demands, besides galactic & pyramineer, galactic
 micro-organs, they are ~~not~~ ^{not} fit to seek. There is, for instance, the blink microscope, by means of
 which ^{1 (i.e. the Sun)} we see as one swift motion (lasts a fraction of a second) the ^{very small} motion of a star over a period of
 say 20 years. There is the sidereal spectroscopic, in which ^{of a star cluster,} two photographs ^{are} taken at ^{some years} different ^{times} ~~times~~
 years later than the other, are placed: the cluster ~~is then seen~~ ^{may then be viewed} in three dimensions. The ~~measured~~ distance
 between ~~the~~ ^{the} ~~two~~ ^{two} ~~eyes~~ ^{eyes} is the distance that the Sun has travelled, relative to the cluster, between the taking of the
 two photographs. ~~Here is the~~ ^{It is no matter of speculation} ~~we want to know~~ ^{an eye a} what kind of eyes ~~a creature~~ ^{who is} giant, billions of
 times bigger than any earthly creature, would have: its light-gathering power is equal to that of a
 million human eyes, its range is of the order of 1000 million light years, & ~~the universe it~~

^{unimaginable}
 of human eyes than ^{about} a star's, or a galaxy's: ~~the mystery is not~~ the unfortunate result of
 this knowledge is that we ~~imagine~~ look upon the telescopes & cameras & spectroscopes, into which the sense
 organs of the Sun & the Galaxy may be analysed, as ^{orthopaedic devices, ~~entirely~~ ^{the genuine natural}} ~~so much a kind of~~ ^{that we look.} ~~in place of~~ ^{Key help us out, supplement our poor sense.} ~~instruments~~
^{But we have this is there is no justification for such a view.} ~~But we have this is there is no justification~~ ^{for such a view.} ~~How at long last, the answer for my~~
^{study of (in Chapter VI) of tools & instruments, begins to show itself.} ~~study of (in Chapter VI) of tools & instruments, begins to show itself.~~ ^{He ~~look~~ ^{extends} the man, not but}
 it extends him beyond manhood: his ^{expansion is} ~~extension is~~ vertical rather than horizontal, ~~raise~~ — he cannot
 grow far on the human plane. ~~But the growth~~ The ~~real~~ ^{Galactic} body is the human, extended; &
 in particular, the Galactic eye is the human eye extended. • "Art quickens nature", as Heracle says, ^{in this modern} ~~but in this modern~~

(The common method of judging the distance of the ~~Cygnus~~^{the nearest} nebulae is to observe the luminosity of certain variable stars that they contain - stars whose intrinsic luminosity is known: it is an easy matter to find the distance necessary to produce the dimming. This is, in principle, one of the principal methods by which we judge of the distance of such objects as trees & houses. We know the actual dimensions of the door & windows with their known dimensions, & allow a distance sufficient to allow for the diminution.) Again, the haziness of the distant object, & its dimming of its colour, provide a clue to its distance.) while it is not as men that we perceive galaxies, it is as we see men, we perceive them as we see men. And this is our chief aspect of the universe.

The increase in the case. What seems to be limitations are more likely to prove insurmountable advantages. How should the spectroscopist ^{investigate} ~~study~~ the particles of the sun's interior if not at a safe distance*, where their radiation

(ix) He argues from history. Then is the fact that we have generally believed that heavenly bodies are alive, & indeed divine.^x Now this ~~belief~~^{conviction} would be of little or no ^{significance} consequence if it were merely a ^{belief} ~~human~~^{as such} — men are plainly not fitted to pronounce upon ^{such a} the question. But ~~unless this opinion is~~ if there is ^{I do not see how} ~~any~~ in the fact, ^{at all, unless} the belief ^{helps by} ~~only~~ makes sense of it is the belief of a heavenly body. But in that case it cannot be ignored. Here is a ~~conviction~~^{conviction} (for ~~it~~ ^{is} ~~apart from~~ ^{it is possible for him to} ~~but~~ ^{relatively brief & never unequalled} ~~smooths of scepticism~~) that he is surrounded by ^{innumerable living organisms} ~~things~~ ^{which} ~~are~~ ^{are} ~~heavenly~~ ^{material} bodies. ~~He may be wrong, of course,~~ ^{is it probable} but his ~~belief~~^{conviction} must be taken into account: it is ~~undeniable~~ ^{undeniable} a part of the evidence. Now ~~and it be~~ argued that ^{this opinion is} ~~the belief is perhaps~~ a flippant & perverse one, a preposterous, or a scarcely known over-belief. ^{Burns did for it.} Campanella not only wrote (10a) but he is said to have suffered the severest tortures on account of his beliefs about the stars, during his 27 years' imprisonment. Was not his ~~conviction~~ ^{conviction} ~~and even his pain~~ ⁱⁿ ~~interest in the heavens itself heavenly, & his~~ ^{visions} ~~visions~~ ^{visions} ~~at the very least~~ ^{visions} ~~no less than~~ ^{visions} ~~human?~~ ^{visions}

(X) ^{religion} ~~We dying to live~~ argument — dying to live. I pass through the same three stages in my assessment of my fellow galaxies, & fellow stars, & fellow planets, as in my assessment of my fellow men. First, the stage of ^{primitive} animism, when I treat my companions as ~~things~~ ^{living creatures} ~~animate~~ ^{animate} & externally related to me; Second, the stage of mechanism, when I treat them ~~rather~~ ^{unselfishly} as ~~things~~ ^{things} to be used or avoided; Third, the stage of ~~non-animism~~ ^{intellect} when I treat them as ~~relates~~ ^{respects}. In the second stage I ~~lose~~ ^{respect} the stars as ~~dead~~ ^{for the one reason that I treat} men as chattels & instruments — economic classes, labour, ^{consumers} manpower, personnel, & so on. Now is this ^{divid of life} merely lack of imagination, & ^{angelic} ~~stupid~~ egotism? To it is an essential ^{moment in} part of the universal process whereby life overcomes death. Without it, science ~~could~~ ^{at worst never learn} never ^{advance beyond} get to grips with its material; ~~or the entire~~ ^{at worst never learn} objectivity & innocence of eye; ~~or religion would~~ ^{advance beyond} be crude polytheism. ^{The universe has to die before it can give life to it} At every level, the condition of life is ~~that~~ ^{the} the sacrifice of life; & the higher the level, the greater the sacrifice. ^{the angels have to die} in order to live ~~again~~ ^{more angelically} more angelically. It ~~was~~ ^{is} necessary to kill the stars & the galaxies in order that they should rise again to a new & ~~altogether~~ ^{higher} finer life. Now is this an ^{sacrifice} ~~extensive~~ ^{thinkers as scientists, artists, & worshippers as mystics} alone. It is ~~man himself~~ ^{ourself} ourselves who must, ~~at~~ ^{on} every hierarchical plane, give up our life. And most of all ^{it is} the mystic ^{who} (as I have already urged at length) ^{must} ~~also~~ ^{realize} live

[illegible]

of very unequal weights, & they are, of course, not
 Here eleven 'arguments' are ^{not} of course independent of one another, ^{undoubtedly they do, I think} together
^{I cannot} ~~prove~~ ^{show} that this Galaxy ^{body} is not a ^{dead body} machine, ^{any more than I can prove that}
^{ingenious} ~~with~~ ^{conduct} robot.
 The human body is not a ^{robot} machine. ^{But} Nevertheless, it seems to me that the grounds for ~~the~~ accept-
 ing the life & mind of the Galaxy as a working ^{hypothesis} are as good as ^{the} we have any name to expect,
 & a good deal better than ^{those which upon which we accept many other widely held hypotheses}
 the grounds upon which we base many of our cherished beliefs. ^{Conceivably} Nevertheless their combined force is considerable.



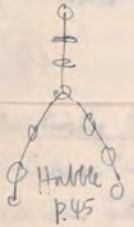
Clouds, water, stars,
are more than a few.
Plaque: 'To Thomas
Butler'
"All as Mien
in Unity. Rivers,
Mountains, Cities,
Valleys,
All as Mien.
Jewelry
P 19a

Let me put the matter in an unusual, but not altogether
new, a travelling observer, who contemplating a single
common-sense story 'many objects presented to one mind', ~~it is~~ ^{my} one Object presented to ^{my} many minds;
In other words, what I make of that one Object depends upon how far I have travelled from it
or rather, one Object presented to ~~one mind~~ ^{at many distances}. And my speed of travel is phenomenal.
When I look away from a star to a man, I approach my Object at the rate of billions of miles a second;
when I look away from a man to a galaxy, I recede from him even faster. Galaxies are ones who
spiral nebula is a man who has overstepped the seen from afar; a man is a spiral nebula or closer
inspection. Indeed there is a place where distance lends more than enchantment, where my Object reaches
the limit - "For all there is heaven; earth is heaven + sea heaven, + animal + plant + man; all
there is heavenly." Plo
Viewed from without, I am ~~a unitary organism~~; ~~a simple organism~~. But but, viewed from within, I am
But the truth is that I am ~~sheltered at the galactic~~ ^{in a vast river it is not plural, but only multifarious}.
for my objects, it is that ~~Object not many~~ ^{plurality}. In this river, am I not ~~plurality~~ ^{plurality} with plurality?
which are of many grades.

Mathematical account.

The Sun contemplates himself as first falling to the Galactic center, giving his own path a wavy character. He falls to the Galactic center, but then moves (which, so far from being pictorial, is the mathematical basis of his self knowledge of his behaviour), becoming successively each other at no moment that his path is a compromise between them - namely a curve. But the astronomer not only sees the Sun from the boundary of necessity, but the other stars of the Galaxy also.

Aristotle. Taylor 120. Aristotle draws this fundamental distinction between 'celestial' & 'terrestrial' matter; that the former, left to itself, travels in a straight line upwards or downwards.



consists in the realization (1) of what he does, (2) that he could do but does not do, (3) of why he does what he does. And if, for finite creatures, there is any other sort of freedom, I do not know what it can be. Man's freedom is of this sort, but for man, he is, by his very nature, free. For (1) he does not know his own behaviour (past, present, & future) as exactly as perfectly at the human level as at the cellular level; (2) he is not so clearly aware of his own unalloyed tendencies; (3) now of why they are unalloyed, & he behaves as he does. Now what I have just stated, Earth's free conscious movements about the Sun, applies also to the Sun's movements about the Galactic center. For, to put the matter another way, it is true that man is free, but my freedom belongs chiefly to the higher levels of my personality: as men man I have little freedom. At the cellular level, & at the Galactic level, for example, I am so organized that the three conditions of freedom are to a large degree ~~met~~ met. The body of a creature is a self-directing creation is ~~as~~ of this sort - a system of units revolving, at varying distances, about a common centre, at speeds which decrease with their distance from the centre.

(VI) The Galaxy & metabolism

The dimensions of the Sun's orbit (i.e. a radius of 50,000 light years) is a ~~disproportionate~~ disproportionate distance, the local conditions ~~are~~ are such that it makes of the Galaxy - it is ~~from~~ from astronomical can, weight ~~of~~ the ~~mass~~ mass (acting ~~on~~ on the system's c. of g.) the ~~stars~~ stars within that orbit; by ~~calculating~~ calculating that is to say, the ~~gravitational~~ gravitational force ~~the~~ must exert upon the Sun to keep him ~~moving~~ moving as he does. When he is, in other words, the Sun's path, his position with regard to the Galactic centre of gravity, is a demonstration of what he makes of the Galaxy. (It goes to say that the ~~stars~~ stars ~~mean~~ mean the centre, the ~~affection~~ affection, mass of the Galaxy for its own stars is the mass of the stars contained within that star's orbit) ~~acting~~ acting ~~at~~ from the Galaxy's centre of gravity? in that case the Sun's path (prior to, as in the case of Earth) is compounded of his tendency to make more of the Galaxy by retreating from its centre, & of his opposite tendency to make less of the Galaxy by falling ~~into~~ into that centre. In other words, his path is 'metabolic': a union of 'anabolic' (or upward & outward) movement whereby the higher levels are built, & of the 'katabolic' (or downward & inward) movement whereby they are destroyed. The metabolism which at the biological levels is ~~inextricably~~ inextricably involved, ~~is~~ here becomes beautifully evident, & capable of ~~expression~~ expression being expressed in lucid mathematical language. Again, the celestial body is not so much another body ~~than~~ than the human body, as that body ~~perpetual~~ perpetuated.

(VII) The spiral form of the nebulae

Why the spiral form of the typical galaxies, on its later stages? The astronomer attempts to explain ~~how~~ how a rotating assemblage of stars ~~has~~ has ~~come to take this form~~ come to take this form: but the question here is whether such a this curious shape befits us at our best. First, note that it is by virtue of the fact that nebulae ~~evolve~~ evolve in their forms ~~their~~ as of ~~several~~ several forms, according to their age, that we are enabled to reconstruct their life-history to our own. ~~It is~~ It is believed that the sequence of nebulae types, ranging from a globular ~~to~~ to a ~~linear~~ linear mass ~~connected~~ connected into stars, to the relatively large, ~~spiral~~ spiral whose matter has been largely resolved into stars, represents the stages through which most nebulae pass. ~~Second~~ Next, note how appropriate this form ~~both~~ both ~~structurally~~ structurally, & in its development ~~actually~~ actually, is.

The size increases: that is to say, the members make more of this ~~whole~~ whole society. But (it seems) the outer members And this does not simply mean that ~~a~~ a ~~large~~ large globe ~~or~~ or ~~disc~~ disc becomes ~~a~~ a ~~larger~~ larger; ~~mutable~~ mutable & ~~unpredictable~~ unpredictable. ~~What~~ What could be more appropriate than the growth comes in time to express itself in the most vivid & unmistakable ~~form~~ form, & the spiral ~~is~~ is which ~~is~~ is combining the ~~unbroken~~ unbroken ~~curves~~ curves of the ~~circle~~ circle with ~~an~~ an ~~expansion~~ expansion radial expansion; which ~~is~~ is (making the monotonous & self-satisfying self-sufficiency of the single circle, & overcoming the ~~disunity~~ disunity ~~plurality~~ plurality of a number of concentric circles? Here is, in ~~visible~~ visible ~~form~~ form, which visibly shows forth the oneness of its members & at the same time their inequality; & which, as it grows to maturity, demonstrates more clearly its own incompleteness, what is a spiral but a pointer the beginning of an infinite expansion, or a pointer signpost to the whole? Not here, but still further on' as the words it seems to say to the celestial traveller.

(VIII) The recession of the Nebulae

To c. s. this is, ~~fantastic~~ fantastic. And so, indeed, it would be if there were no other evidence, if it were not part of a more general trend. What we find in the individual galaxy, we find, in a still more marked fashion, in the community of galaxies. ~~They~~ They are ~~receding~~ receding from one another receding from the centre of the galaxies at speeds that are proportional to their distance from us: that is to say, the ~~universe~~ universe is

I go through the same three stages in my assessment of my fellow-stars (& fellow-planets & fellow-galaxies) as in my assessment of my fellow-men: (1) the stage of 'animism', when I treat them as plural minds relationally related to mine, (2) the stage of 'mechanism', when I treat them as plural things for use, & (3) the stage of 'the realized self', when I treat them as relatives. ~~plural not plural~~ ^{relatives} (mutually supported by our commonness at the last concern) & as such, uniting with my self: Really to appreciate another's self is to make it one's own — that is to say, there is no room in the world for more than one self. If this is true, then I treat the stars as dead for the same reason that I treat men as men instruments & chattels — as ^{economic classes} 'labour', 'manpower', 'personnel', & so on, instead of as relatives. * My selfishness, my imaginings, etc., are much the same at every level of my life. Cf. Ch I § 2 (Intro. of P) & Ch XVIII § 3 (LIFE) foll. of P.

Having gained a level, my tendency is always to deny equal status to my colleagues of that level, & in so doing, to deny the greater part of my self.

* Cf. Ch III see Martin Butler's I - There.

Our thinking about ^{mind} in the universe is vitiated by a crude, & age-old materialism, which still pictures consciousness as an aura of particularly refined matter. But mind is not like light that dims as it advances; it suffers no wastage, no delution, as it 'spreads' from planet to star, from star to galaxy, from galaxy to world. Based on an infinitesimal nucleus, it is nevertheless more than equal to its universal sweep. Its arbitrary handicaps, its seeming limitations, are likely to turn out to be its strong points. How else should the physicist study the particles at the sun's centre ^{unless} at a safe distance, such that their radiation submerges their study, & the thing studied ^{observes & responds} imbues the student? Is this an unobvious arrangement or, on the contrary, a irregularly neat one? Or again, when should a galaxy be observed if not when it is a galaxy, & where the necessary optical instruments can be formed? But the problem of life in the universe will always baffle, until the law of absence/whence is thoroughly understood. Science, failing to grasp the law, tells me I live in a dead world; grasping the law, it tells me that the world lives in me & that I am dead apart from ^{the} ~~the~~ ^{its} ~~indwelling~~. * These Excluding in pictures a universal mind-stuff means, how differentiated into parts & rising here & there to consciousness. (Nature of the Physical World, P. 277.)

'Each of them' — ^{at the same time} ~~at the same time~~ ^{as the same time} contains all within itself & sees all in every other, so that everywhere there is all, & each is all, & infinite the glory! Each of them is great: the small is great; the sun There is all the stars; & every star, again, is all the stars & sun; each is mirror in every other. Ennads (trans. Turnbull)

Tractate on Intellectual Beauty V, 8.

Russell HWP 319

There is something social & intrusive in the nature of all things; they seek to fascinate & overpower, each the nature of every other creature, & itself alone in all modes & throughout space & spirit & power & process. Every star in heaven is discomfited & insatiable. Gravitation & chemistry cannot content them. Even they woo & court the eye of every beholder. Every man who comes into the world they seek to fascinate & possess, to pass into his mind, for they desire to republish themselves in a more delicate world than they occupy. It is not enough that they are Jove, Mars, Brim, & the North Star, in the grandstanding firmament: they would have such poets as Newton, Herschel, & Laplace, that they may exist & happen in the finer world of natural soul, & fill that realm with their fame. So it is with all ~~imaginative~~ ^{imaginative} objects. . . . These beautiful basilisks set their brute, glorious eyes on the eyes of every child, & if they can, cause their nature to pass through his wondering eyes into him, & all things are mixed. * These profound and eloquent words are — they are Emerson's — come, nearer to the liberal truth than their casual reader has any idea of; they are no more (& no less) fanciful than the astronomer's mathematics. Again & again the poet's intuition turns out to be, grass or centaur's hair, silver sun. At any rate I can say, with F. H. Bradley, that what in ^{earlier} ~~earlier~~ years seemed to be poetically true, ^{as satisfying} ~~increasingly~~ ^{appears} demands intellectual assent.

+ The Method of Nature.

- See G. J. Whitson's article "Natural Philosophy" in Philosophy, April 1946, pp 20, 21.

See last
pg of Ch. X

- ~~Find the person~~ Star Teachers

* Кратко опис:

Point me out its way
To any one, particular traitorous slave,
And I will flit into it with my legs,
And make its silver splendour past all time.

(Hyperion Bk I, 99)

This is more than a poet's fancy.
Keats is where the 'Beallieous
Star' is a Star. In this region
of itself it really ~~is~~ does
while Keats' most 'beats', 'poet
bath bliss'.

See Ch III § 6

And it was St John of the Cross who said: ~~that~~ "The soul lives by that which it loves rather than in the body which it animates. For it does not its life in the body, but rather gives it to the body & lives in that which it loves."

The Works of St John of the Cross,
trans. Allison Peers, p)

• B Where is Star B

Av A, But for whom?

For an observer at A

Who is himself a star
at B. But for whom?

For an observer at B:
i.e. A putting himself
in B's place.

Thanks to A. then,
B is true for it

observed to be, a
Stars.

— As from after
Stair calls to stop—

One calls & the,
Demanding who you are,
And your degree....

James Stephens: 'Kings & Tanists'
in Kings & the Moon.

in any place. $\frac{1}{10} \times 1 = \frac{1}{10}$

as. Key Ex. 16
Four expanding, 1
* * * * *

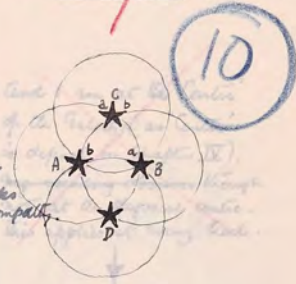
moment, believe it was all his doing) there can be no doubt about the social relationships, the exchanges. The Stars are exchanging views. Amongst negligible creatures, 2000 Menus Aurelio, then spring up comparatively, friendships, families.... "Now among them that were not of a more excellent nature, as the stars and planets, though by their nature far distant from one another, yet even among out intelligences, then began some mutual correspondence & unity. So proper is it to excellency on a high degree to affect unity, as that even in things so far distant, it could operate unto a mutual sympathy." And Menus Aurelio speaks with inside, first-hand knowledge of that sympathy.

To argue from this exchange to the wholeness, & livingness, & consciousness of the Society in which it occurs, is, according to common sense, unjustified. The ~~universe~~ may well enclose such living relationships without itself achieving any high degree of awareness, or any awareness at all. If there is no other & no better reason for believing in a self-conscious ^{Island} Universe, common sense prefers to disbelieve.

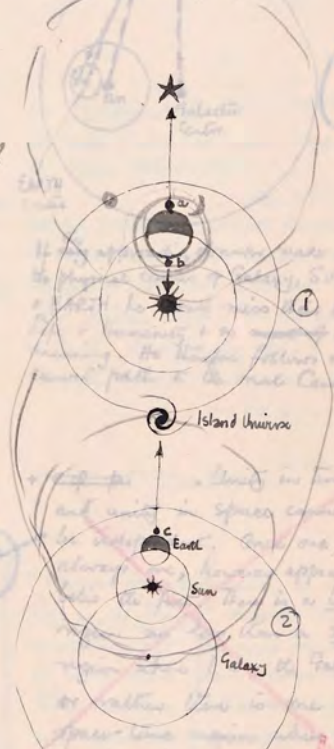
There is another & a better reason. It is this: Common sense discusses (in order to reject) the notion of a self-conscious ^{Galaxy} Universe. To do so, common sense must first entertain the notion, grasping its meaning. Now what is this common sense but an aspect of the ^{Galaxy} Universe? Is a ^{Galaxy} Universe that first entertains the notion of its own self-consciousness, & goes on to reject it, self-conscious? Obviously it is, & in a peculiarly subtle way. Common sense retorts that what the aspect or part thinks is not necessarily what the whole thinks. Agreed, but ^(though momentarily & abjectly) there is plenty of evidence that the part, ^{is here} taking up the point of view of the whole, & in so doing, is no longer a part.

For example, when I turn from the Stars ^{contemplating} of this ^{Island} Universe to contemplate ^{the latter} the stars & devices of the other Universes, & I realize that, ^{from} for them, these Stars must merge into a small & compact unit very similar to those the ^{Galaxy} I am observing — then I have left behind Stars — but taken on ^{Galaxy} — hood. I am living at the level where there are no longer any Stars, but only Island Universes. I am thinking for & observing for this Galaxy, ~~seeing~~ all of whose Stars I have effectively ones. I have put them behind me, incorporated them without noticing it, endowed them all with life & mind without the slightest difficulty. Here, if common sense is still doubtful, is notable evidence of the life & the mind of this Universe. I am truly in a position to speak for this Island Universe, & I say that it feels like a Universe & looks like a Universe, & knows that it feels thus & looks ~~that~~ thus. Only ^{Galaxies} can ^{see} another, & recognize one another as ^{Galaxies}, & put themselves in each others' places to observe themselves. Our ^{Island} Universe leads this sort of existence, & it is no mean achievement. Certainly it is not the achievement of one who ^{is all but} ~~is~~ dead, weighted down with encumbrances, empty of content, unorganized, a mere jumble.

And what more cogent evidence could common sense want than this? After



A not only comes to realize the existence at A of Stars b & c, & the existence at B of star a, but the existence at C of both ~~a & b~~ a & b. C is the third party.



① During the day I am at b: the Sun is visible but not the Stars. It is as Earth that I see the Sun. — the ~~Earth~~ is behind me, seeing, backing me. During the night I am at a; & the Stars are visible. The SUN (including ~~Earth~~ & Sun) is now behind me, & it is as the SUN that I see the Stars.

② When ^{at c} I observe an Island Universe, I have the backing of the Galaxy, & am the Galaxy. But in all cases I look through a part of the ^{& part} a part of what I am. Not all EARTH, SUN, & Galaxy are back of me.

3

being taken in: it may be a wonderfully-contrived automaton. But if I can only for a moment get inside this creature, at its very centre, & can look out on ~~the~~ its world through its eyes, then, because I have reached identity with it, I can no longer be in doubt. The life & mind of the most unlikely-looking ~~creature~~ ^{being} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ ^{creature} ~~is~~ ^{is} ~~the~~ ^{the} ~~same~~ ^{same} ~~as~~ ^{as} ~~the~~ ^{the} ~~life~~ ^{life} ~~of~~ ^{of} ~~the~~ ^{the} ~~most~~ ^{most} ~~likely~~ ^{likely} ~~creature~~ <

as I have of the mind of ^{this} man, because it rests upon the same ^{wide information.}
Bruno (~~that still-neglected genius~~) who wholly right when he spoke of the World-Soul as "the all-mother
of worlds which are souls & contain souls, some of which are higher, some lower than we..... We can
attribute life to worlds with better reason than we can to our own earth."

° Infinite, Dial. III, IV. Quoted by Boulling:
Giordano Bruno, p. 144.

What has science to say? Does the SUN, with all he is, derive from the ~~universe~~ Galaxy? According to the generally-accepted theory he does. The Galaxy ~~universe~~ was once a nebulous throughout, one vast cloud. Out of this cloud, by a sort of condensation, the Stars were born. The one differentiated itself into the many, but the many are still one ^{planet} ~~universe~~. Like the SUN, the ~~universe~~ Galaxy only seems to have been disrupted by the appearance within it of smaller units — by 'letting out rings'. In fact, its unity is enriched with new content — a unity embracing diverse parts is 'higher' than unity embracing similar parts. But the new content of the many proceeds from the primal one: it is the unfolding of what ~~it~~ ^{the one} had in itself to be.

And yet, says common sense, the actual intellectual commerce, & the commerce between Universe & each ^{& its} States, escapes ^{detection}. If the whole maintains the part continually, dividing itself to become the part, this process is

Observer's deflected path.

Sun

Galactic Centre

Earth Centre

See Ch I

+ ~~c.f.p.~~ . Unity in time
and unity in space cannot
be independent. Once one,
always one, however appearance
belies the fact. There is a time
region no less than a space region
where I am the Galaxy,
or rather there is one
space-time region where that
is what I am.

⑥ The phrase is from the book Herai
Nam Heng, Richs, III. "Before the settling
down of the heavens had produced
their form, there was a state of
mounting like the beating of wings,
of rising & cutting into rings.....
The emptiness produced the space-time
(nexus) & the space-time (nexus) the
vital energy, & the vital energy had
layers to it. The power to move dispa-
-rse layers forced themselves out &
made the heavens. The heavier &
more turbid ones solidified & made
the earth." (Chinese Philosophy, in
Classical Times (Ed. & Trans. E.R.
Hughes) pp 291, 292.)

well - hidden.

I would live in a meagre world indeed if I could only enjoy what I understood. What do I know about the exchanges ~~between~~^{between} that are now in progress between the atoms in my hand, or about how I, the man, am getting at those exchanges so as to move the hand? Yet I do not for a moment doubt the reality of the two levels or of the commerce between them. I am not prepared to wait till I know ^{precisely} how the trick is done before I accept the results. I think the matter out as far as ^{my} time + intelligence allows (in other words, I hardly scratch the problem) + take the rest on trust, as I always have done & will do. So it is at ^{Island} Universe-level. Just how the ~~Universe~~^{Universe} gets at me, in physical or outward detail, I do not know.

Then are, of course, ^{the} different sorts of radiation that fill the interstellar space. It is probable there is more to these waves than we have any idea of. They may well be to us what our radio waves ^{surely be} to Scientists on some other Planet — just radiation, without trace of ~~thought or feeling~~ ^{meaning, & all for lack of sensitivity perception.} I cannot help feeling that, among the waves we receive on EARTH, there are some which, if only we had the right receiving-apparatus, would bear exciting ^{The "arrest influences of the Pleiades" have not ~~yet~~ been for ever debunked. ☺} news for us. ☺ Conceivably, many stars, immeasurably more advanced than this SUN of ours, are now watching over us, & using either radiation or means still more subtle, are influencing our destinies. The SUN may be the baby of a great, & accomplished, family & perhaps anxious, family. *

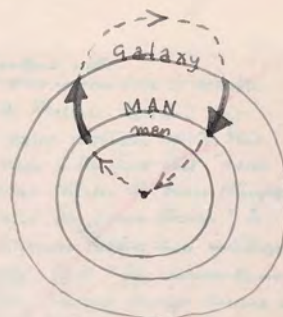
At least it is just as necessary to entertain such possibilities as to
^{final} ~~have~~ ^{know} ~~action~~ ^{think} ~~believe~~ ^{perhaps} ~~believe~~ ^{island} ~~the~~ ^{the} ~~universe~~ ^{universe} as a living
 individual of surpassing vitality & intelligence, an individual in whose
 sublime experience all men could share & ~~the~~ ^{some men do} ~~myself~~ ^{do} ~~share~~ ^{share}.

7 Rotation and Gravity

The Stars rotate about the centre of gravity of the Galaxy. Why should exhalations as giffed as Stars be fated to lead this treadmill existence?

I have already, while discussing EARTH, considered the question of the regular motion of heavenly bodies, & whether it is inferior to erratic motion. ^(but complex) ~~Here I~~ ^{will only suggest some additional points.} And I have already, in an early chapter,

④ J.E. Broadin ^{regards} ~~attributes~~ terrestrial evolution to a creative response to 'the energy structure of the Cosmos'. The part ^{also} develops under the influence of the whole: the impetus comes from the environment, & to us it appears under the guise of rays or waves. It is a well-known speculation that Cosmic Rays cause mutations of species by modifying the genes of the germ cell.



In Paradise Lost Adam explains to Eve (who has asked why the stars shine) that:

Not only enlighten, but with kindly heat
Of various influence foment & warm,
Temper or nourish, or in part shut down
Their stellar virtue on all kinds that grow
On Earth, made ready apt. to receive
Perfection from the Sun's more potent ray.
(BK IV, 657)

© Job xxxviii, 31.

+ General Jungheutland, in his Life in the Stars, records his conviction that 'on some planets of some stars exist beings higher than ourselves, who are influencing our spiritual development'. On one particular star, he speculates, live beings of 'archangelic' status. 'The stars, ^{excluding} ~~except~~ therefore, are the apexes of what wonderful triangles! What distant & different beings in the various mansions of the universe are contemplating the same me at the same moment!'

Walden: 'Economy'.

⑥ It is not possible that the earth & the heavens & the stars if they have no soul attached to each body & dwelling in each body, should nevertheless accurately describe their orbits as they do, day by day, month by month, & year by year, & that we all should receive all the benefits that actually come to us.

Plato: Epinomis, 983.

Heath / GK Cost 59

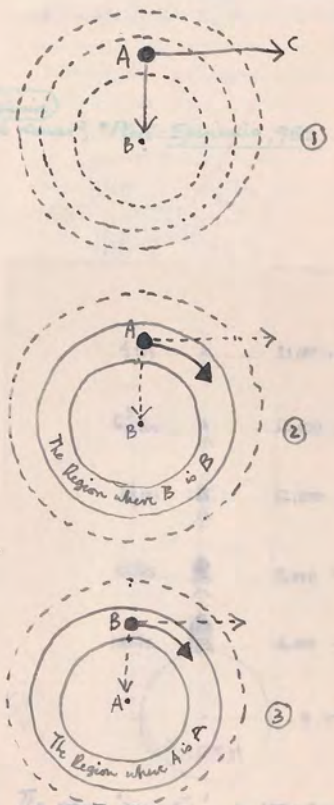
suggested that the behaviour of circulating electrons in an atom may be interpreted as an expression of what the electrons make of the nucleus. Then I will only bring together then two sections of the book & ^{write} make one or two ~~last~~ additional points. First, take this problem: - A has a certain estimate of B & is moving with respect to B: how can he go on moving yet keep the same estimate of B? If he gets any closer or any further away from B, B ceases to be itself. The only course A can take is a circular one about B as a centre. This behaviour alone ensures that he does not change his views about B. His movements are confined to the region where B keeps its B-hood. He has come under the spell of B's centre; fascinated by the B-aspect of the centre, he is entrapped. And, of course, the relation is two-sided. By behaving in this way, A preserves his own status as registered by B. Circulation is keeping distance; keeping distance is making sure of stable surroundings; making sure of stable surroundings is giving oneself a certain stability. At low & high levels in the hierarchy this circulation is very evident; in the middle it is ~~assured~~ mixed with erratic motions. But it is there all the same, for without a degree of 'horizontal' permanence & continuity, all would vanish in the 'vertical' flux. For practical reasons I find it necessary, at man-level, to introduce into my circumambulations a good deal of radial motion. At atom-level & star-level I do not find the same necessity. ^{The essential thing is that} ~~but at every level there must be~~ besides motion ^{cutting} through the region to superior & inferior regions, motion ^{within} the region. That motion ^{tends to be} circular, more or less.

This brings me to my second point: the circular motion which furnishes the milestones for the radial centrifugal-centripetal process, is the product of that ^{dual} process. Thus the EARTH takes a curved path about the Sun because she begins to fall away from the Sun, pursuing her own path ^{inwards} towards distant regions where the Sun is more than the Sun, & because at the same time she begins to fall ^{herself} into the Sun, or rather into regions where the Sun becomes less than ~~itself~~. The curved path is, so to speak, the path of no not as simple as it looks; it is not the easy, automatic way, but the product of never-ending conflict. The world in which things remain themselves is the delicate offspring of two worlds, in one of which things become more than themselves, & in the other of which things become less than themselves. Gravity is one aspect of the latter. It is an abstraction from the Katabolism or centripetal movement; it is part of the universal tendency (in its current jargon) to take 'a poor view' of things. Counterbalancing this tendency is the equally universal inclination to value, centrifugally, to the objects ⁱⁿ other regions, & so place a higher value upon ~~them~~ it. These two movements would

14
Aristotle draws this fundamental distinction between 'celestial' & 'terrestrial' matter, that the former rotates, while the latter, left to itself, travels in a straight line upwards or downwards.

+p. (Close View § 10)

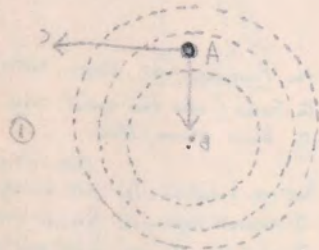
Compare with
The view taken here is similar to the Platonic doctrine that the axial rotation of the stars is due to the fact that "each always thinks the same thoughts about the same things." It is because ~~that~~ ^{that} less intelligent souls that "the unwandering stars having beings above & revolving... abide for ever revolving uniformly upon themselves." (Timaeus, 40.)



- 1 Pursuing its own course to C, A moves into regions where B is more than B; falling towards B, A moves into regions where B is less than B.
- 2 These two tendencies result in an orbital motion in which A remains in one region of B.
- 3 The story can be retold from B's point of view, where B keeps the same opinion of A by circulating in one of A's regions. Which is still a matter of point of view.

① The physicist says the same thing in different terms when ^{he} speaks of the ~~presence~~ matter producing a curvature in the surrounding space, causing bodies moving in it to follow curved paths. There is no force of gravitation. I have (in fact, I am) a field that does not stop short of the Cosmos, & everything in it is modified by me; as a characteristic of the space where ^{the object} it is, I enter into ~~the~~ ^{the object's} nature, so that it is 'myself' in the object which curves its path towards my Centre. And the 'myself' that I am reinforced, otherwise I should become quite ineffective. Thus this work grows as the field advances: Near the field's Centre the 'myself' is a proton; much further out it is a Planet & a Star. In ~~either~~ ^{both} cases what I do to the field's inhabitants is ~~obvious~~ ^{seen in} from their circular motions with respect to me.

As a-a I cross ~~A~~ the space where A is, as b-b the space where B is, & so on.



① Pressing is not done to
A across the vagina where
B across the B; falling between
B. A across the vagina where
B is too thin B

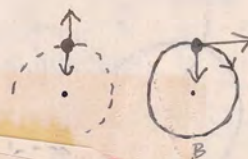
② There are two passages inside
in an external section
where A remains in the vagina
of B.

③ The vagina can be divided from
B's point of view, where B
keeps the same position
of A by contracting in one of
A's vagina. which is with
which contracting is voluntary
a small amount of view

[illegible]

② Aristotle shows the fundamental distinction between 'substantial' and 'accidental' qualities. The

cancel one another, if it were not for the fact that ^{they do not work} ~~instead of working~~ in opposition, but at right-angles. They are not utterly incompatible, ^{partly against & partly with} ~~the way of~~ circular motion. Over-estimation pulling ^{more or less} ~~against~~ under-estimation results in a fixed estimate.



A is the sort of opposition that makes either for a stagnation or a flux in which nothing remains itself. B avoids both these results.

What is true of EARTH's orbit round the SUN's centre of gravity is true of the SUN's orbit round the Galactic centre, except that, in the latter ^{instance}, there may be no actual heavenly body enclosing or marking the centre. The centre of gravity of the Galaxy is that point from which the whole collection of stars may be supposed to act. It represents them, & the SUN, in ^{holding to} ~~maintaining~~ a certain distance from that point, is ^{holding to} ~~maintaining~~ a certain estimate of what his companions amount to. Some stars - binaries & multiple stars - hold more or less fixed views about their immediate colleagues by circulating about them; all the stars of the Galaxy keep more or less fixed views about ^{all} their colleagues by circulating about a common centre of gravity. This does not mean, of course, that ^{it} ~~individual~~ stars ^{in this procession and dance the most beautiful of all dances} ~~present~~ uniform distances, but it does mean that, normally, they remain in each other's star-regions instead of scattering or coalescing, & so destroying their mutual star-herd.

+ It is sometimes supposed that this is, at the centre of the Galaxy, a Super-Sun hidden by a cloud of matter. Head S. 1. 1. 1.

The Galaxy is not unlike a game of Snakes-and-Ladders. ^{to the best} ~~there is~~ an organisation of space into regions ^{carrying different values,} ~~of different qualities,~~ and a movement, according to certain rules, of counters. What the counters do depends, not on ^{what} they are, ~~but~~ ^{on} where they are. The board on which the Galaxy-game is played is marked with a series of concentric grooves, & a counter finding itself in one of these grooves is obliged to ^{behave according to the instructions} ~~conform to the speed which is~~ ^{marked on the groove - the size & colour & weight of the counter has} ~~marked on the groove~~ - ^{for instance,} the period of EARTH's rotation about the Sun - one year - ^{is determined by} ~~follows from~~ her distance from the centre, & the period of the SUN's rotation about the Galactic centre - ^{some tens or three hundred} ~~million years~~ - ^{is determined by} ~~follows from~~ his distance from the Galactic centre. The more remote the groove the ^{longer} ~~longer~~ shows the counter's motion in it, irrespective of the counter's ^{own} ~~own~~ peculiarities. Again, when ^a counter, instead of moving circumferentially, moves or tends to move radially towards the centre, its acceleration depends not at all upon itself, but only upon the peculiarities of the space it happens to be in. In other words, the acceleration of ^{the EARTH's} ~~the EARTH's~~ 'fall' towards ^{the Sun, & of the SUN's & the Galactic centre,} ~~another~~ is governed by their distance alone: the more remote the region the less the acceleration.



The same 'counter', a 100-pounder shell, would ^{amount to} ~~be~~ a 4-pounder if it were first to a height of 16,000 miles. (This is because gravitation decreases as the square of the distance from the centre increases). The observer on Earth, who is watching the shell shrink as it rises, sees truly: it really is shrinking, so far as Earth is concerned, because it is moving into regions of space which carry ~~new~~ ^{new} values.

4
CELL

5
CENTRE

6
EXT.

8

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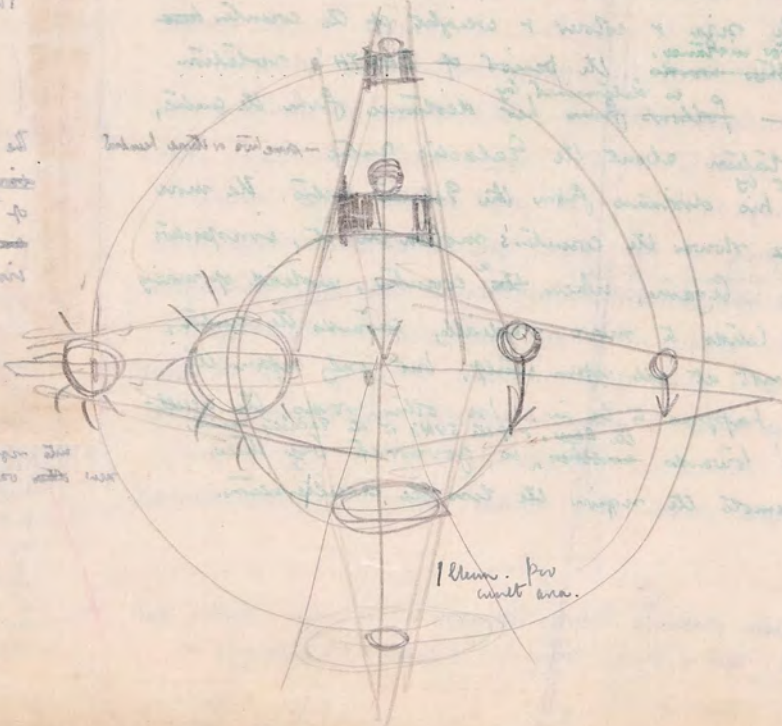
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11

☐ Gravitation may be looked on as a special instance of the perspective effects which are present to all observers. That this ^{view} is justifiable is suggested by the fact that the law of inverse squares may be used to describe (1) gravitation, (2) planetary acceleration, (3) ^{illumination} apparent luminosity, & (4) apparent ^{size} magnitude. For illustration, consider EARTH as observer of the Sun. (1) Her 'weight' with respect to the Sun, (2) her acceleration along the radius of her orbit round the Sun, (3) her illumination by the Sun, & (4) her ^{estimate} ~~appreciation~~ of the ^{to her} size of the Sun's disc:— all four are inversely proportional to the square of her distance from the Sun, & all four are items in the ^{same} ~~same~~ ^{argument} of the Sun which fit the ^{view} ~~view~~ ^{view} to explain her station.



The same law of perspective applies to the view of the Sun from the Earth's surface, & to the view of the Sun from a point of view.



1 Illum. per unit area.

The image contains two Venn diagrams, each with three overlapping circles labeled A, B, and C. The regions are labeled with letters and symbols.

Top Diagram: The intersection of all three circles (A, B, and C) is labeled 'X' and is shaded with a black square. Other regions are labeled with letters: 'A' is in the part of circle A not overlapping with B or C; 'B' is in the part of circle B not overlapping with A or C; 'C' is in the part of circle C not overlapping with A or B; 'D' is in the intersection of A and B only; 'E' is in the intersection of A and C only; and 'F' is in the intersection of B and C only.

Bottom Diagram: The intersection of all three circles (A, B, and C) is labeled 'Y' and is shaded with a black square. Other regions are labeled with letters: 'A' is in the part of circle A not overlapping with B or C; 'B' is in the part of circle B not overlapping with A or C; 'C' is in the part of circle C not overlapping with A or B; 'D' is in the intersection of A and B only; 'E' is in the intersection of A and C only; and 'F' is in the intersection of B and C only.

The counter shifts from X to Y & in so doing changes its value with respect to A, B, C, D & E .

* 4th Plate (Symposium, 190) suggests
~~that~~ (not altogether correctly, no doubt) that
the original hemaphysoid men, before
the gods split them into the two sexes,
"when they broke into a run etc... simply
thrust their legs straight out & went
whirling round & round like a clown
bearing cartwheels. And since they had
eight legs, if you count their arms as
well, you can imaginatively watch bowling
along at a pretty good speed." - So I imagined
~~and the goddess of wisdom said that this~~

+ "The eye," says Bergson, "was only meant to reveal to us objects on which we can act"; but.... nature could only obtain the requisite degree of vision with an apparatus whose effect goes beyond the object (since we can see the stars, while we have no control over them)." (*Morality & Religion*, p. 144). What Bergson does not realize is that the eye is a Star-organ.

- Creative Evolution pt. 145 ft.

I have said enough to show that the ^{detailed} structure of high-grade individuals, like the structure of low-grade ones, conforms in notable ways to the scheme of regions. ^{On the other hand,} The transition from molecule to cell, from cell to man, from man to MAN, & from MAN to LIFE, does not proceed through well-marked concentric regions (for instance, my cells do not describe orbits about ~~the common~~ ^{my} ~~center of gravity~~ ^{focus}, nor do men ~~ordinarily~~ ^{about the rest of the government}). In these ~~stages~~ ^{middle regions} of the pyramid, the building up from one stage to the next is via confused intermediate aggregations & pseudo-individuals, whereas ^{the higher & lower regions} ~~near the base & the apex of the pyramid~~ each level contains ~~sub-~~ ^{sub-} ~~stages~~ that reflect the organization of the main stage. ^{What this comes to is that} ~~that this comes to is that~~ my observer himself behaves uniformly when he is very close to me (e.g. when he is an electron & I am a Proton) and when he is very distant (e.g. when he is a Star & I am the SUN), but when he is neither very close nor very distant (e.g. when he is a man & I am a man) he behaves ^{non-uniformly} ~~irregularly~~. This is not an accident, & not a defect in my observer: it is the right way and the only way to see a man. To observe me as a man is to work under such limitations. ~~He does so~~ ^{direct} He perceives must resemble the perceived: in the last resort it is himself the perceiver.

8 Can I have insight into the nature of the GALAXY?

The mind of man has grown up amongst familiar terrestrial objects - men, wild animals, trees, mountains, rivers, the sea. There have been ^{what would it} ~~its fathers & mothers~~ - or, rather, they are ^{books} ~~its~~ ~~ancestors~~. How can it, then, transfer almost overnight to stars & ^{island} universes & the Cosmos itself, & stay on the same limbs with its material? ^{And} ~~Am I~~ ^{qualified} If there is some doubt whether I am qualified to think of the Galaxy, ~~is not my claim to think for it doubly questionable?~~ ~~is there not much more doubt whether I am qualified to think for it?~~ The instrument ~~accepts~~ has reason to be sceptical of its powers. Intellect, according to Bergson, is originally the faculty of making & using tools, & can never shake itself free from its origins. It remains practical, analytic, external to its object, relative to human needs.

In every way, so it seems, I am circumscribed by my own nature.

+ "the age," says Ferguson, "we are
 inclined to measure in terms of what
 we know and feel... but... what
 we do obtain is the opportunity to
 of vision with an experience that
 often goes beyond the visible.
 (what we can see is not what we
 "feel")
Chomsky's definition, p. 141 is that
 Ferguson does not realize in that the
 age is a given - again.
 o Chomsky's definition is: 142-43

4
CELL

5
CHURCH

6
EXT.

8

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Handwritten notes on the left page, mostly illegible due to bleed-through and fading.

Handwritten notes on the right page, mostly illegible due to bleed-through and fading.

his mission a whim:
Nor is ~~this~~ ^{the} result of any whim of his - he is forced to take in more & more of me, in order that the picture shall make sense. (For example, he discovers that a great deal of my behaviour cannot be attributed to a man, & he is forced to take account of humanity; LIFE has the bodily equipment to live - nothing less is alive; he discovers I have weight & other physical properties which ~~nothing~~ ^{no machine} that is not also a Planet can possess; he discovers I have eyes, & ~~no~~ ^{or rather} which are because they are solar eyes; he discovers that I have notions which are those of a man, & of a Planet, & of a Star, & of a Galaxy. In other words, his attitude from me is an essential constituent of his discovery of me, in order to discover me.

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It would be a mistake to put up this argument, like a mine-pipe, only for the purpose of knocking it down the next minute. Human capacity for self-deception is boundless. We all want to ~~draw~~ ^{draw} flattering portraits of our ~~own~~ ^{own} cook the evidence. in our favour. On the other hand, because the evidence points the way of our desires, it is not therefore less reliable. (Nowadays people talk about 'wishful thinking' as if the True & the Bad, & the False & the Good, were synonymous: ~~as if this were not done~~ ^{as if this were not done} ~~not realising that this is only another, inverted, kind of wishful thinking.~~ as if ~~deducting~~ ^{deducting} ~~was~~ ^{was} ~~never~~ ^{never} ~~realisations~~ ^{realisations} of unconscious ~~feelings~~ ^{feelings} ~~could~~ ^{could} ~~never~~ ^{never} ~~be~~ ^{be} ~~traced~~ ^{traced} ~~to~~ ^{to} ~~deep~~ ^{deep} ~~irrational~~ ^{irrational} ~~impulses.~~ ^{impulses.})

But reconsider, for a moment, the main outline of the evidence. Externally, my observer sees me become the SUN & then the Galaxy. Internally, I go to the greatest pains to discount every lesson outlook upon the world, & to achieve their outlook. The instruments, the calculations, the mood, are the exhibits in the case. Poets, no less than astronomers & philosophers, bear witness. In any event, if I am not a vent out, a view in, & a system of regions, then what am I? Until I can get a better insight into what I am, this scheme will have to do. I am essentially regional.

And — this is the ^{significant} surprising fact — the remotest regions are ~~not~~ ^{not} inaccessible, mysterious, alien. To find, spectroscopically, what ~~is~~ ^{is} ~~there~~ ^{there} ~~is~~ ^{is} in the outer layers of a Star is not more difficult — it may be easier — than to analyse a mixture of gases in the laboratory. The Stars are ~~laboratory~~ ^{laboratory} ~~factories~~ ^{factories} ~~where~~ ^{where} ~~temperatures~~ ^{temperatures} ~~unattainable~~ ^{unattainable} ~~on~~ ^{on} ~~Earth~~ ^{Earth} ~~are~~ ^{are} ~~maintained,~~ ^{maintained,} ~~and~~ ^{and} ~~to~~ ^{to} ~~say~~ ^{say} ~~that~~ ^{that} ~~a~~ ^a ~~scientist~~ ^{scientist} ~~is~~ ^{is} ~~getting~~ ^{getting} ~~over~~ ^{over} ~~the~~ ^{the} ~~difficulty~~ ^{difficulty} ~~of~~ ^{of} ~~their~~ ^{their} ~~remoteness~~ ^{remoteness} ~~by~~ ^{by} ~~is~~ ^{is} ~~misleading;~~ ^{misleading;} ~~when~~ ^{when} ~~should~~ ^{should} ~~such~~ ^{such} ~~factories~~ ^{factories} ~~be~~ ^{be} ~~kept~~ ^{kept} ~~but~~ ^{but} ~~at~~ ^{at} ~~such~~ ^{such} ~~a~~ ^a ~~distance?~~ ^{distance?} Science has a way of standing in the outer regions & working inwards to EARTH: astronomy (as I have already mentioned) has led the way in many spheres. Helium was discovered in the Sun before it was discovered on Earth, before we details; the main point is that nothing is ~~unnecessarily~~ ^{unnecessarily} ~~removed~~ ^{removed} ~~from~~ ^{from} ~~me.~~ ^{me.} Such distance & inaccessibility, as ~~it~~ ^{it} ~~has~~ ^{has} ~~is~~ ^{is} ~~not~~ ^{not} ~~a~~ ^a ~~barrier,~~ ^{barrier,} ~~or~~ ^{or} ~~a~~ ^a ~~kind~~ ^{kind} ~~of~~ ^{of} ~~haze,~~ ^{haze,} ~~or~~ ^{or} ~~even~~ ^{even} ~~an~~ ^{an} ~~empty~~ ^{empty} ~~gulf,~~ ^{gulf,} ~~between~~ ^{between} ~~myself~~ ^{myself} ~~&~~ [&] ~~it.~~ ^{it.} The distance is organic, the very framework bones of its body. Truly speaking, the Star is only a Star because it stretches right up to me ~~and~~ ^{and} ~~achieving~~ ^{achieving} ~~Star-hood~~ ^{Star-hood} ~~where~~ ^{where} ~~I~~ ^I ~~am.~~ ^{am.} And it has no other kinds of Star-hood. ~~It is~~ ^{It is} ~~no~~ ^{no} ~~doubt~~ ^{doubt} ~~I~~ ^I ~~feel~~ ^{feel} ~~to~~ ^{to} ~~take~~ ^{take} ~~in~~ ⁱⁿ ~~all~~ ^{all} ~~the~~ ^{the} ~~Star-like~~ ^{Star-like} ~~character~~ ^{character} ~~of~~ ^{of} ~~this~~ ^{this} ~~place,~~ ^{place,} ~~but~~ ^{but} ~~they~~ ^{they} ~~are~~ ^{are} ~~here~~ ^{here} ~~for~~ ^{for} ~~my~~ ^{my} ~~inspection.~~ ^{inspection.} ~~It is~~ ^{It is} ~~the~~ ^{the} ~~very~~ ^{very} ~~spot~~ ^{spot} ~~where~~ ^{where} ~~the~~ ^{the} ~~full~~ ^{full} ~~nature~~ ^{nature} ~~of~~ ^{of} ~~Star-hood~~ ^{Star-hood} ~~&~~ [&] ~~of~~ ^{of} ~~Galaxy-hood~~ ^{Galaxy-hood}

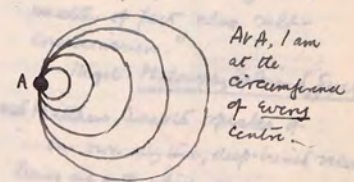
It is here that I part from Fichner, who ~~admits that~~ ^{admits that} ~~after~~ ^{after} ~~admitting~~ ^{admitting} ~~that~~ ^{that} ~~(while~~ ^{(while} ~~the~~ ^{the} ~~soul~~ ^{soul} ~~of~~ ^{of} ~~the~~ ^{the} ~~plant~~ ^{plant} ~~can~~ ^{can} ~~only~~ ^{only} ~~be~~ ^{be} ~~inferred~~ ^{inferred} ~~by~~ ^{by} ~~analogy)~~ ^{analogy)} ~~we~~ ^{we} ~~have~~ ^{have} ~~inside~~ ^{inside} ~~knowledge~~ ^{knowledge} ~~of~~ ^{of} ~~the~~ ^{the} ~~Earth's~~ ^{Earth's} ~~soul,~~ ^{soul,} ~~and~~ ^{and} ~~goes~~ ^{goes} ~~on~~ ^{on} ~~to~~ ^{to} ~~say~~ ^{say} ~~that~~ ^{that} ~~we~~ ^{we} ~~cannot~~ ^{cannot} ~~imagine~~ ^{imagine} ~~to~~ ^{to} ~~rise~~ ^{rise} ~~to~~ ^{to} ~~the~~ ^{the} ~~unity~~ ^{unity} ~~of~~ ^{of} ~~that~~ ^{that} ~~soul.~~ ^{soul.} "This experience we cannot have, nor ought we to inquire it, for this conclusion is away above ours; its whole soul of the earth must be ours if in us we were to have its unified conclusion, whereas in fact, like a small circle within a greater, we comprise only a part of its content."

Louise: Religion of a Scientist, p 156.

"To deeper than this ball of night
Appeal the lusty people of the night"
And the depth is physical as well as spiritual
— a man is as deep as the thing he contemplates
is high: when it is a Galaxy, my center is my Galaxy-center.

6
e.g. Meredith,
+ Meredith, I think, most of all, & particularly in his 'Mediation under Stars' (Posthumous Works, ed. Constance, 1912, p. 365.) In this splendid poem he finds the Stars 'not distant aliens, nor mindless Powers', & 'doubts not in them is he the binder of his heavens'. Not only do the Stars live, but their life is continuous with human life — 'then with toil life climbs its self-same Tree' — and the same issues come nearer solution. In all ages & in all parts of the world, men have seen the souls of dead men in the Stars; Hadrian rediscovered his drowned Antoninus as a new star, & many primitive peoples believe that all the stars were men. See Robert Graves: The Royal Art of Astrology, p 55 ff.

5
+ An extraordinarily interesting account is J.B.S. Haldane's essay 'What Place is Astronomy?' in Possible Worlds.



5
"And Jacob awaked out of his sleep, & he said, Surely the Lord is in this place; & I knew it not. And he was afraid, & said, How dreadful is this place! This is none other but the house of God, & this is the gate of heaven."
Genesis XXVIII, 16.

© Indeed, spectroscopy astronomical spectroscopy has, in general, preceded terrestrial.

The new 200 inch telescope — an instrument for discovering, not what is up in the sky, but in the laboratory — will bring out & prove more of the astronomical character of this place.

© The number of rays comes from five upwards: the number we actually see is six & is determined by the thickness of the eye-lens.

Cush 219 check



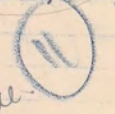
My object is presented at all ranges: where very distant, I call it a Galaxy or a Star; where near, I call it a man; where near still, a cell. It would be a ~~very~~ ^{old} (but ~~the~~ ^{old} way of putting the facts to say that the Galaxy is I see as ~~distinct~~ men, & the men I see as who have overstepped the mark, & the men I see as Galaxies who have failed to keep their distance. ~~What I see~~ ^{what I am} depend primarily upon the range at which I am standing. There is a place - it is a place where a man may occasionally dwell - where distance lends more than enchantment. "For all there is heaven; earth is heaven & sea heaven, & animal & plant & man; all there is heavenly. And the gods traverse that region & all space in peace." That is one side of the picture; the

• Plotinus, Enneads, (trans. Turnbull.)

Other has been drawn by Blake: - Testament of Man
 "All are Men in Eternity, Rivers, Mountains, Cities, Villages,
 All are Human" + Jerusalem



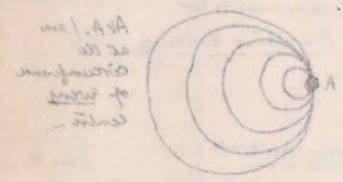
Blake
 preface



to be a part of the whole
 to be a part of the whole
 to be a part of the whole

to be a part of the whole
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To sum up, there has been nothing less than a Copernican Revolution. Instead of multiple objects presented to my one (human) mind read one Object presented to my multiple (all-level) mind. What I make of this Object depends, not so much upon the Object itself, as upon the level of mind I bring to bear upon it. When I function at Galaxy level I find myself surrounded by the Galaxy. Common sense is like a man who, while inspecting an object, keeps on using microscope & telescope & all powers indiscriminately, & then accounts for the results by saying he is looking at many objects.

the old familiar common-sense story

3 11

are waiting for realization. After all, Regis is no more remote than my hand, or the Magellanic Clouds than my pen. I ^{disparaged} ~~disparaged~~ all these objects to where they belong, but to do so I must first have them here. And it is here, not over there, where they ^{attain their astronomical} ~~achieve their~~ status. Regis is Regis here. The Magellanic Clouds are Island Universes here. I am here too, but as nothing in myself, as a mere capacity for them. Therefore, because of my nothingness & their everything-ness here, I may claim true insight. I claim that, in so far as Regis is here I am the Magellanic Clouds. I am ^{inattentive} ~~unobtrusive~~, but I am not parted from my object. In discovering them I am unveiling myself. If I could make the instrument perfectly sensitive (that is, entirely self-effacing & entirely other-regarding); if I could make the mirror perfectly flawless (that is, revealing its presence in no way whatsoever), then I would find that here, where I am nothing, everything is itself without diminution or obscuring.

§9. The manner of my functioning at Galaxy level.

Granted the insight, or the possibility of insight, into what is here - is this insight necessarily important for me? Most men get along very well without knowing that there are ^{hundreds of} ~~hundreds of~~ millions of Island Universes.

I am ^{accommodated} ~~accommodated~~, room for something. My existence depends upon filling the vacancy, & the fullness of my existence depends upon filling the vacancy well. Or I should say, realizing how well the vacancy is, in actual fact, already filled. All other things being equal, it is better that I should get to know my contents. I can get along without discovering Stars & Universes in myself, but my life is correspondingly impoverished. I lack self-consciousness. To be alive & more is to be more alive, & ultimately, to be more self-conscious. My problem is to live up to what I am.

But minding my own business at the 'lower' levels may surely be as enriching & as meritorious as occupying myself with 'higher' levels. There is nothing especially elevated about astronomy & astronomers. The same kind of thrill of discovery is experienced, the same intellectual discipline is required, in all fields of research.

Again common sense is right. In fact, I would go further, & say that in a real sense the middle levels are of supreme importance. More of this later; meantime certain distinctions must be made. My powers, & on governed by the level at which I happen to be operating. The higher

* Eddington has pointed out that "There are no purely observational facts about the heavenly bodies. Astronomical measurements are, without exception, measurements of phenomena occurring in a terrestrial observational or station; it is only by theory that they are translated into knowledge of a universe outside." (The Expanding Universe, p. 25.) Eddington gives the impression, however, that this is an ~~unpleasant~~ ^{unpleasant} a disability under which astronomers labour. I say it is the reason for their successes. They study what is here.

"This is not a journey for the feet.... Call up all your confidence, strike a forward step - you need a guide no longer - strain & see." So speaks Plotinus of "the eye that adventures the vision. This is the only eye that sees the mighty Beauty. If the eye that adventures the vision be dimmed by vice, impure, or weak, ... then it sees nothing even though another point to what lies plain to sight." Plotinus: Enneads (trans. Hornsby).

* He Napoleon of North Hill, Plk V. Ch. 3.

+ "Self-consciousness is the fruit of consciousness: the latter is a consequence of the former, all consciousness of an other object being as a matter of fact also self-consciousness." Hegel: Philosophy of Mind, §24.

Matthew Arnold makes of "our own only true, deep-buried self, Being one with which we are one with the whole world" (Empedocles on Actina).

Browning: Truth is within ourselves; it takes no rise From outward things.... To KNOW, Rather caries in opening out a way whence the imprisoned splendour may escape. Then in affecting entry for a light Supposed to be without. (Paracelsus)

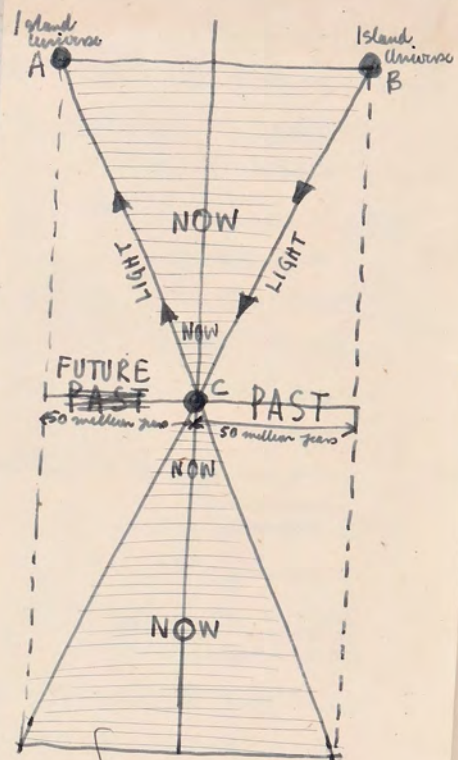
We can make the self self-conscious by an act of will. This is the nature of the mind. Thus Regis

49

[illegible]

• The importance of the

This is a manuscript of
 the constitution of
 the United States
 of America
 - 1787 -
 "manuscript"
 4548 and 4549: 1787

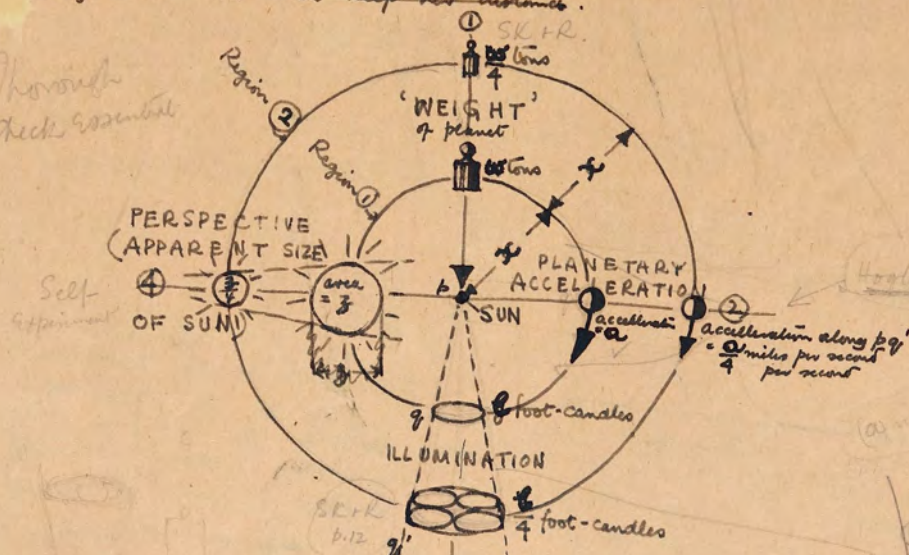
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My NOW at C is instantaneous.
At AB it is still instantaneous,
yet ⁺100 million years' duration.
This paradox will be more fully
discussed in Part III.

* How does ^{the Galaxy use its organs to} ~~the Universe~~ judge the distance of other ^{1st rank} Universes? Briefly, by observing in the near ^{Island Universes} ~~universe~~ certain variable Stars of types that are also found in the Galactic System. The intrinsic luminosity of such Stars is known, & when this is compared with their apparent luminosity, the distance necessary to produce the dimming may easily be calculated. Once the distances of some of the near ^{Island Universes} ~~universe~~ have been discovered by these means, we can work out their ^{average} intrinsic luminosity, & use the result to judge the distance of ^{Island Universes} ~~remote~~ ^{average} ~~universe~~ simply by interpolating their decreasing apparent luminosity in terms of increasing remoteness. This method does not work, of course, for individuals (in which unusual ~~dimness~~ intrinsic dimness may be mutation for distance, & unusual intrinsic brightness for nearness) but only for groups, on the assumption that ^{Island Universes} ~~universe~~ are ^{on the average} ~~all~~ much the same ^{in different parts of the UNIVERSE.} There are other methods of checking these results, & it may ~~confidently~~ be said that the distances of thousands of ^{Island Universes} ~~universe~~ are now known, ^{with fair certainty.} ~~with only a 15% margin of error.~~

This sounds rather technical; but what, in the end, does it amount to? How ^{can I tell} ~~do I know~~ that the house ^{roughly a quarter of} ~~is~~ over there is ^{roughly} a mile away? Because I can see its windows & door & chimneys, & I know how big then things must 'actually' be, I can arrive at their distance by (more or less unconsciously) allowing enough ^{fit} ~~to~~ produce the observed reduction in size. How do I know that ^{a house} ~~the~~ house is ^{roughly} a mile away? Because, although I cannot see its ~~distance~~ ^{distance}, it is preserved. The essential thing is that the ~~house~~ ^{house} keep her distance.

Thorough check essential



The effect of a ^{planet} ~~planet~~ doubling ~~its~~ the radius of its orbit, & entering a new region of its Sun.

* The intrinsic luminosity of a Star can be deduced from its distance & the distance calculated. This is in principle the same as judging the hills ~~to~~ (known to given 'intensity' of hand) to be distant. (Smart, Ap 27)

Common sense doubts whether this travel is real travel. But what are
! to expect of Galaxies? Should they pay social calls upon one another?
Where is the necessity, since they are already in ~~one~~ each other's province?
What is more, approach would mean suicide. Galaxies must keep
their distance.

Finally, there is the bodily equipment. This too belongs at Star-level or at Universe-level. When our Universe studies another, it does not use telescopes, cameras, & spectroscopes, in place of worthless organs, in place of eyes that really beset a celestial observer of the highest rank. When Universes observe Universes ^{the astronomer's instruments are precisely} ~~there are~~ the sort of organs it needs. The astronomer's telescope is as proper to the Galaxy as ^{an} ~~his~~ eyeball is to a man, & every bit as natural. The designers of the ~~200-~~ 200-inch telescope ^{were no men, & at long last} performed no mean task - they were a Universe bent on sharpening its senses. Now the reason for my study (in Chapter VI) of tools & instruments, begins to show itself. Man is not the only tool user. Every grade above him, including planets, stars, & galaxies, increasingly design & make & employ 'artificial' instruments, which are more other than their own 'natural' organs. Fittingly, the more advanced the creature, the more he becomes responsible for his bodily equipment. Man takes his eyes as he finds them: galaxies make theirs.

10. The type of Galaxy
THE UNIVERSE of Universes

10. The types of Galaxy evaluation takes 1
The UNIVERSE of Universe

It is time to consider, very briefly, the characteristics of these other ^{Island} Universities which are the Galaxy's field of study, & what sort of community they build.

¹ Island
Our own Universe, the Galaxy, is a system of stars & thousands of millions of stars.
~~(which is a system of stars & thousands of millions of stars)~~
~~more than at least a hundred million islands.~~ ~~100,000,000,~~
is one of a ~~series of such islands.~~ +
Universe or Nebulae
of the same order of magnitude as theirs average size
diameter is of the order of such that light takes ~~several~~ ^{lines of} thousands
light years to cross from rim to rim, + their average spacing is
such that light takes two million years to pass from one Universe
to another. (This means that when I ~~take~~ ^{embrace} two adjacent Nebulae
in one glance I am, in some sense, comprehending 60,000 times my human
life-span into the moment of that glance.) The Nebulae are scattered
rather uniformly throughout space ^{empty} to the limit of telescopic vision.
+ This
Edd
Univ
100,0
Nebu
like
* Or rather

The appearance of a Nebula depends partly upon the angle at which it is seen. It is usually a flattened object, & it may appear spindle-shaped, elliptical, or roughly circular. Often it takes the form of a two-armed spiral. Hubble has classified Nebulae into a series showing increasing flatness (Elliptical Nebulae), branching into Normal Spirals of increasing openness on the one hand, & Barred Spirals on the

In Possible Worlds, (p 281 ff), J.B.S.

Haldane describes the innovations of
a ^{synthetic} ~~synthetic~~ machine number to the whole
range of work. I say that such
being is not ^{synthetic} ~~synthetic~~,
a machine does not, & his sense
organs are perfectly well-known, to
us, & it is a mistake to suppose
these organs to be artificial, unnatural,
or a makeshift. They are to me
as ~~MAN, LIFE, EARTH, SUN,~~ ^{MAN, LIFE, EARTH, SUN,} &
thence (as the case may be) what
my unaided eye is to me as man.
Entia non sunt multiplicanda praeter
necessitatem.

→ necessitation.

+ This is Eddington's guess,
(Expanding Universe, p12)

+ The number depends on the what model of the UNIVERSE is adopted. Eddington's theory (in expanding universe) requires something like 100,000,000,000 Nebulae, & a Nebula ~~that~~ develops into something like the same number of Stars.

* Or rather, nearly empty.
There is ~~not~~ extremely diffuse
matter between the Nebulae,
as well as somewhat less
diffuse matter inside them.

EAU 70

3 The Migration of Symbols,
P. 69:

Is it a coincidence that all primitive symbols of the spine (in its various forms, including the vertebrae) is the most prominent ~~part~~ ^{part} playing a prominent & even fundamental part in certain ancient religious systems? The spine was a life-giver, & was ~~the~~ associated with the Great Bear constellation both in the Old World & N. Am.

~~See Donald A. Mackenzie~~
~~The Emigration of Sephardic~~

pp xii ff. There are, of course, many spiral forms in nature to copy from, but this does not explain why, in Mr Mackenzie's words, man should "remain content ~~to~~ to draw constant refreshment from an exceedingly limited stock of shells & other arbitrary designs." It is not inevitable that since man is never ^{nearly} without access to books full of such illustrations Galathea, like continuity should find approximations first in his symbols. In the typical. How we must have something like a Jungian "archetype"? See also Elliot Smith: Evolution of the Dragon pp 173 ff. + Elephanta & Ethnologists, pp 83, ff.



One of the four wheels of
the four Beasts of in
a 12th Century MS.
(Brit. Mus. Add. 11, 695).

The drawing (Pallas
Blackwelder) shows a
swastika among the
symbols. The Parol
of the Apocalypse, it
is understood as the
Cratific intelligences
round about the throne
of God. See Revelation,
4: 6.)

11 The recession of the galaxies

At any rate, here
Here, then, is a community — ^{more numerous, probably, than the human race —} ~~at least as populous as a great modern~~
~~nation~~ ^{of spiral angle,} — of strange creatures, whose patterned beauty* is reminiscent of the
whorls of certain flowers, ^{+ shells,} & of Foraminifera found on the deep-sea bed.
Every one of these Nebulae is potentially alive; perhaps all ^{those} whose material
has, for the most part, condensed into Stars (that is, all the Late-type
Spirals) ^{have actually come to life, & are} ~~are also actually~~ ^{enjoying} social intercourse of the highest
order. ^{this would mean} ~~that the lives of Nebulae are complementary, so that each is a specialist~~
~~reliant upon & relying upon the other.~~ None lives in its own right; their life is one, & their
experience is ultimately indivisible.

If this is so, it is, at first sight, odd that they should all be in the act of parting company as fast as they can. To all appearances, Universes do not 'think a lot' of one another: literally & figuratively they seem to think less of one another every moment. Possibly, however, as is the way with receding observers they are only doing this to think ^{"Relieve from them"} says Frahm, speaking of St. Augustine, "that you may be the more precious". ~~more~~ ^{Is the} ~~of one another in the end.~~ ^{Cosmic Island} ~~a kind of~~ progressive 'non-attachment'; a necessity which Universes experience (not because they are ^{Island} Universes) to take the ever-widening, remotest view, till they see their fellows engulfed by the whole? * The poet (or the saint, or the mystic) who at the sees his fellow man as a theophany, is, in effect, despatching him to so great a distance that he becomes or merges with the whole. At the moment of his vision, the poet is in the region where ^{his object} ~~the man~~ is the whole. My ^{tentative} suggestion is that these ^{our Island Universe} ~~disconnected~~ ^{also} experiences of the poet & of the Universe are not two ^{events}, but parts of one movement. Man & the Galaxy are continuous: the Galaxy is the poet, operating at a high level. At this level, the man whose recession the poet observes has got as far as being an ^{Island} Universe, & is ~~thus receding~~ ^{with the other receding further & faster.} What the astronomer calls the red-shift in a Nebula's spectrum is, ultimately, what the poet calls the transfiguration of a man. Wordsworth found the leech-gatherers, who was talking at his side, rapt to 'some far region'. This ^{Comical} ~~subject~~ ^{isolation substance} is not incidental in ~~an expanding~~ ^{the} UNIVERSE: it is basic.

But ~~is~~ the reason it is not ²⁰ evident at lower levels is that it is offset
^{contrary,} the Newtonian attraction ^{or} ~~the~~ tendency to take the closer view. Not before
 Universe-level, does the centrifugal tendency clearly win, & the urge of the
 parts to contemplate one another under the form of the whole comes to be the
 mainspring of their behaviour. Universes are the shrinking petals of an
 unfolding flower. ~~It is~~ Is then, at the other end of the hierarchy, another
~~equally paradoxical~~ flower whose petals expand as the flower closes?
~~Apparently this is.~~ Eddington ^{suggests that} took upon the beginning of things as a condensation
 within ^{a cloud of evenly distributed} ~~an undifferentiated mass~~ protons & electrons, & "As the matter drew
 closer together in the condensations, the various evolutionary processes followed." & he
 says, "The expansion of the UNIVERSE ^{could} be interpreted as the shrinking of our
 material standards: "the theory of the expanding ^{universe} UNIVERSE" might also be
 called the theory of the shrinking atom."

"The belief," writes D.A. Mackenzie, "arose that life was in the sky — that the "head" of the Universe was pulsating somewhere in the firmament, & that, further, the "wells of life" — the "axis of life" had their sources in the sky..... The idea ultimately emerged that life in the sky emanated from what the Hindus ~~and~~ know as "Divine Cosmic Energy," symbolized by Kundalini, the coiled serpent — a spiral." ⑤

Staphylococcus aureus the Galaxy
with the living cell, with its
streaming protoplasm. Says
this great & lovely analysis
he writes, "must be alive, must
have intelligent experience of
itself & of things other than it."
(Star Maker, p 331)

- Centuries of Meditations, I, 80

* Spinoza, in the last part of the Ethics, urges us to see all things (so far as this is possible) as God (i.e. Nature) sees them, as ^{belonging in} unity with the whole. Evil appears to have existence because we look on the parts of the whole as self-subsistent.

o C.A. Richardson
(Happiness, Freedom & God, p. 81)
Connects the expansion of the
universe with the ~~materialism~~
the 'material' universe, material
development; but for him this
development is the simultaneous
~~Not only as such~~
extension of the 'material' uni-
verse & the development of the
'mental'. I am unable to dis-
pense with the 'material'
aspect.

+ Einstein's cosmical repulsion is imperceptible in the region of EARTH & SUN, & only becomes dominant in the Universe region of 10^{25} light years, & is felt only at astronomical distances. The Solar System only forms group of stars. Nebulae: it is not the distance between the Nebulae that are expanding.

⁷⁶
+ Expanding Universe, p. 59.
 limitation, on the other hand,
 conceives the beginning of the
 world as a projection from
 a point or atom.
 * Ibid., p. 1).

then. In this forward series, the Nebulae as a whole thin down, the nucleus shrinks as the spiral arms develop. The diameter increases as the arms spin, the speed of rotation apparently increases, & the nebulous matter in the earlier types is increasingly resolved into separate stars. It is conjectured that this classification corresponds to the evolutionary development of Nebulae. ~~E₀ is, in fact, called an Early Type Nebula, = S₀ & S_{B0} are, called Late Type Spirals.~~ There are, in addition to these regular types, Irregular Nebulae whose position in the series is doubtful. Our own ^{in fact} Galaxy is a rather large Late Type Spiral (S₀)

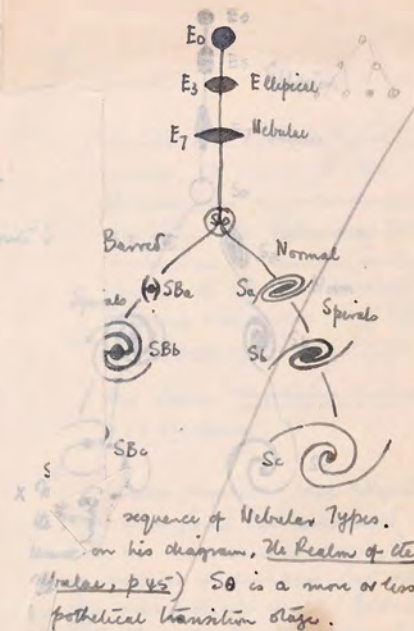
Stars are organised into ~~series~~ ^{islands} ~~groups~~ & ~~universes~~ ^{islands} ~~arrange themselves in similar fashion.~~ The Galaxy, for instance, has two companions - Irregular Nebulae called the Magellanic Clouds - and the trio belong to a Local Group of nine (or alternatively twelve) ^{Nebulae} of different types & sizes. Their distances are of the order of a hundred thousand light-years, which is close for Nebulae. Not all are so grouped. There are many solitary Nebulae; & there are some ~~lovely~~ ^{lovely} Nebulae Clusters, each comprising about five hundred Nebulae.

The limit of exploration with the 100-inch telescope is a sphere of perhaps 1000 million light-years diameter, containing some 100 million Nebulae. Then was no sign of thinning-out near the surface of this sphere. With the larger telescopes reveal another 100 million, or with the ^{rather, indefinitely} UNIVERSE of Islands Universes turn out to be an isolated ^{in addition to this relatively small, individual motions} ~~grounded~~ ^{universe}. The puzzle is not solved by the motion of the Nebulae, they appear to be receding from us at high speed - the more remote the Nebulae the faster it is retreating. The explanation that is often given is that the whole is finite and expanding. We are witnessing the explosion of the Cosmic Egg. At any rate, for we are at the end of the Scientist's account of what ~~is~~ in space. At the circumference there is the same mystery & the same paradox as at the centre, & science is out of the depth. As Eddington points out, it has been calculated that in 100 million years the Nebulae double their distances apart; the Galaxy has not unlimited time to stretch them out before they disappear altogether.

162 The Whole & the regions.

To the observer who takes up the viewpoint of an ^{island} Universe, I am an ^{only one} Universe. He is contemplating me in & from one of my ~~regions~~ ^{regions}. Is there a region still ~~more~~ further afield, where all the Nebulae coalesce? And, if there is, is the resulting unit the whole? x

x Denis Savat (*Death & the Dreamer*, pp 104, 105) describes a dream in which the ~~universe~~ ^{universe} ~~is spread-out in~~ ^{is spread-out in} zones, beginning with zones of forgetfulness, etc., the body, going on to more comprehensive zones, & ending in God.



$$5 \div 4 = 9 \div 2$$

+ There are Hubble's figures about (The Realm of the Nebulae, p 21) Other observers give very different estimates.

+ See Eddington: The Expanding Universe, p 17 ff.

• Einstein's law of gravitation involves the mutual repulsion between objects, increasing in direct proportion to their distance from one another. But Einstein's world is not so big that the Nebulae attain the speed of light. Eddington: The Expanding Universe, p 22.

CHAPTER 11A (12)

Sometimes I should ~~was~~ ^{be} above the stars, & enquire how the Heavens indist, & what was beyond them. In this passage of Trubner's the doctrine of regions is implied. To think of Stars & Universes is to ~~see~~ ^{see} in those regions.

$$5 \div 4 = 9 \div 2$$