Cantower XXVII
Atoms in Motion

June 1ˢᵗ 2004

I intrigued my wife Sally this morning,[1] while she sipped coffee, by puttering around with a coat-hanger, two identical cups, a pot of water, and some string. I strung the two cups symmetrically to the ends of the coat hanger, which I then hung on a convenient horizontal support: a piece of a lamp as it happened. The coat hanger stayed horizontal, the cups dangling on either side. Got the picture? Next I raised the pot of water under one of the cups. Since I had tied the cups by the handles in such a way that the water did not enter the cup, the result was startling: an immediate unbalance. What was going on? To get a more modest effect, and to get at the result I was looking for more easily, I moved the string so that the cups' sides here horizontal. Then when I raised the pot of water round the cup, the water entered the cup: the results were not so startling, but the other cup moved downwards. Sally puttered some more: she moved the pot about, getting the feel of the whole business. I puttered some more, intrigued myself, even though this was supposed to be territory familiar to me. I had studies it first in some detail more than fifty years before; I had lectured hydrostatics in the late fifties. Yet the motion of the cups still intrigued me. Am I just simple-minded, heading for my dotage at 72?

So there I was, watching cups in motion, scarcely believing my eyes. The cups are the same weight. The water should surely make no difference, especially when I adjust the string so that the cup doesn't float. Yet the other cup moves downward. What is going on?

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[1]It was a morning of Spring, 2003, when I was first tackling the works of Archimedes, pondering this 27ᵗʰ-*Cantower* new beginning on, as it happens, p. 27 of the new edition of *Insight*. For me, of course, the new beginning has wide resonances, some of which shall appear both in the ***Cantower*** and in the Appendix to it. The book *Process: Introducing Themselves to Young (Christian) Minders*, finished in 1989, ends (in chapter six) on that first page of *Insight*, calling for a new beginning.

27.1   Childout Physics

At a conventional level what is going on is that I am someway writing to you about the beginnings of two books,[2] round and about beginnings, "run past Eve and Adam".[3] We are "on" the first page of the first chapter of each book. We are at the title of Feynman's chapter, but our atoms in motion, if you wish to think of it that way, are manifested to us as cups in motion through our puttering. We are at the bottom of the first page of the chapter in *Insight*, which ends, in the recent edition with the excitement of "Weigh the crown in water!"; the early edition ends with the phrases "comes suddenly and unexpectedly".

You are not already, I hope, growing impatient with me? My central push - or pull - here is to displace us to a different pace and a different poise, a different drumbeat. I am amused to find another reading as I read the turn-of-the-page in the new edition of *Insight*: "implicit in this directive were the principles of displacement and of specific gravity". I am distracted into thinking of the specific gravity of Bouvard and Pecuchet, talked of by Ezra Pound as symbolizing the busyness of the twentieth century before it began.[4] So, I ask you to lighten up, be displaced, share a little of my apparent lunacy. The very extraordinary man Archimedes spent hours puttering round with bodies in and out of water: the fifty pages of his two little books on Floating Bodies are enough for a year's prayer.[5] I am asking you to take the advice imported from Descartes by Lonergan into the first paragraph of his first chapter: home in on the simple things. Descartes had a conviction "that too many people felt it beneath then to

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[2]The two books are Lonergan's *Insight*, and I shall continue my habit of giving the reference to the first edition first. The second book is the First Volume of *The Feynman Lectures on Physics*, edited by R.Feynman, R.Leighton and M.Sands, Addison-Wesley Publishing Company, 1964, with many reprints. I refer to this volume as Feynman I. What was promised was that I would deal with the first five chapter of each book in these next five **Cantowers**. I stick with Feynman's titles for the five. Do you need to have a copy of Feynman? It would obviously be better, especially if you are serious about "metaphysics", but you can manage without it.

[3]*Finnegans Wake*, Beginning.

[4]Forrest Read (ed.), *Pound/Joyce: The Letters of Ezra Pound to James Joyce, with Pounds Essay on Joyce*, Faber and Faber, 1967, 194-5.

[5]I am, of course, recalling the pointing of **Cantower XXI**, regarding contemplation and physics (or whatever). The fifty pages I mention are available in T.L.Heath's 1897 translation: *The Works of Archimedes*, Cambridge University Press, 1897. There is a Dover Edition.

direct their efforts to apparently trifling problems". What is your conviction, position, on this?

I am bringing you back, or bringing to minding in you, the struggle we shared in the past three **Cantowers**. I am, perhaps, being impolite, pressing upon you a policy or doctrine that ill fits the mood of our times, the patterns of our education. "Doctrines that are embarrassing will not be mentioned in polite company."[6] So, I ask you to pause, articulate to yourself your honest objections: you really don't have time for this; you have wider interests and responsibilities. What I an asking you to do is, in a precise sense, a post-axial twist to your **axial** life. In the post-axial third stage of meaning, if you are "within the Tower", the luminosity in question will be native to the mode of your performance: such is the meaning of generalized empirical method or its pop-equivalent, the Childout Principle.[7]

The pause, then, is important, growing for some into a THEN poise.[8] My embarrassing doctrine might be made more discomfortingly pointed by noting that some of the apparently very serious Lonergan scholars disagree with me on this, and on the style of reading that one is to bring to the first page of *Insight*. Certainly there are those who, for good or shady reasons, need a *haute vulgarization* of *Insight.* But my interest here is in Tower People, in those who wish to take the pain of the world and the pointings of Lonergan committedly serious. To skim over the principle of displacement in a second or third reading of *Insight* - or as a committed permanent position - is to deny the value of the displacement to *theoria* that is the core of the genesis of adequate self-knowledge. But I have sung that song often enough in our **Cantower** journey.

So, I am going to shortly give you the challenge of reading the few beginning pages of Archimedes' "On Floating Bodies" that lead up to the solving of the crown-weighing problem. There is, in fact, more to this exercise than solving the problem, but let us leave that aside for the present except to say that Archimedes' presentation does

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[6]*Method in Theology*, 299.

[7]We have met both before, but perhaps there is no harm in repeating them here. "Generalized empirical method operates on a combination of both the data of sense and the data of consciousness: it does not treat of objects without taking into account the corresponding operations of the subject; it does not treat of the subject's operations without taking into account the corresponding objects" (*A Second Collection*, 141). The Childout Principle reads: "When teaching children geometry one is teaching children children".

[8]Recall the reflections of **Cantowers V & IX**.

not make for easy reading.

But then the world of theory does not make for easy reading, even when the presentation is top-notch. This is a central crisis of our general culture that effects the reading of both Lonergan and Feynman and the demands made on them or indeed of those in the world of theory to supply *haute vulgarization*. I wont pause here over what Lonergan has to say of that view or to rehearse the manner in which it blocks the adequate self-knowledge crucial to our times. In so far as you have never seriously tried to enter the world of theory you just do not have a serious intellectual clue about life, however aesthetically or religiously refined you have become. A hard saying; a heavy claim. Talk your way round it intelligently; send me your *apologia*!

I have previously invited Lonergan students, especially those in the literary and religious streams of education, to have a shot at the world of theory. That was a key facet of *The Redress of Poise*, chapter one, "The Worth of Lonergan's Economics for Lonergan Students". That is the core significance of the little problem I posed in the first volume of the *Journal of Macrodynamic Analysis*, "Underminding Reading": it was a problem of finding out how many seating arrangements there were for couples of men and women round a table under certain circumstances. The reality of the situation created by that problem is the reality of the scientific revolution, of leaving behind Aristotelianism and siding with Aristotle. Until you tackle seriously the problem of figuring out the number of ways of seating the folks you are totally "out of it" in regard to the difficulty of this type of understanding. Further, you really have little clue about "the control of meaning", especially the control of meaning and its expression that is to emerge in the third stage of meaning. So, for instance, it is quite something to reach such a control of meaning with regard to the problem of the seated couples that you can present both the problem and the solution adequately to a relatively cultured audience. Try for that.

But not just now. For now, the invitation is to struggle with Archimedes' first six propositions regarding floating bodies. The seventh is where you are edged towards solving the problem of the crown: we save that one for the Appendix, because you just might be able to figure it out for yourself without the help offered there. Anyway, here we are, at the top of Archimedes' "On Floating Bodies. Book 1", which starts with a quite weird postulate: the second postulate doesn't turn up until the beginning of the 8th proposition. So, in you go, at this deep end or beginning.

27.2   Plunging in with Archimedes

    "*Postulate 1.*
'Let it be supposed that a fluid is of such a character that, its parts lying evenly and being continuous, that part which is thrust the less is driven along by that part which is thrust the more; and that each of its parts is thrust by the fluid which is above it in a perpendicular direction if the fluid be sunk in anything and compressed by anything'.

Proposition 1.

    If a surface be cut by a plane always passing through a certain point, and if the section be always a circumference [of a circle] whose centre is the aforesaid point, the surface is that of a sphere.

    For, if not, there will be some two lines drawn from the point to the surface which are not equal.

    Suppose O to be the fixed point, and A, B to be two points on the surface such that OA, OB are unequal. Let the surface be cut by a plane passing through OA, OB. Then the section is, by hypothesis, a circle whose centre is O.

    Thus OA = OB, which is contrary to the assumption. Therefore, the surface cannot be a sphere.

Proposition 2.

    The surface of any fluid at rest is the surface of a sphere whose centre is the same as that of the earth.

    Suppose the surface of the fluid cut by a plane through O, the centre of the earth, in the curve ABCD.

    ABCD shall be the circumference of a circle.

    For if not, some of the lines drawn from O to the curve will be unequal. Take one of them, OB, such that OB is greater than some of the lines from O to the curve and less than others. Draw a circle with OB as radius. Let it be EBF, which will therefore fall partly within and partly without the surface of the fluid.
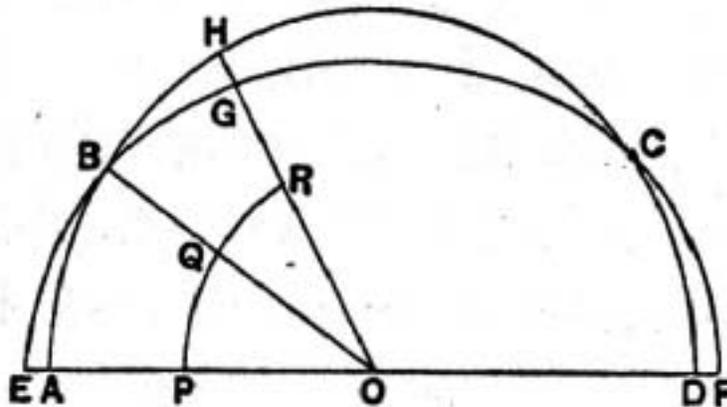
Draw OGH making with OB an angle equal to the angle EOB, and meeting the surface in H and the circle in G. Draw also in the plane an arc of a circle PQR with centre O and within the fluid.

Then the parts of the fluid along PQR are uniform and continuous, and the part PQ is compressed by the part between it and AB, while the part QR is compressed by the part between QR and BH. Therefore the parts along PQ, QR will be unequally compressed, and the part which is compressed the less will be set in motion by that which is compressed the more.

Therefore there will not be rest; which is contrary to the hypothesis.

Hence the section of the surface will be the circumference of a circle whose centre is O; and so will all other sections by planes through O.

Therefore the surface is that of a sphere with centre O.

Proposition 3.

Of solids those which, size for size, are of equal weight with a fluid will, if let down into the fluid, be immersed so that they do not project above the surface but do not sink lower.

If possible, let a certain solid EFGH of equal weight, volume for volume, with the fluid remain immersed in it so that part of it, EBCF, projects above the surface.

Draw through O, the centre of the earth, and through the solid a plane cutting the surface of the fluid in the circle ABCD.

Conceive a pyramid with vertex O and base a parallelogram at the surface of the

fluid, such that it includes the immersed portion of the solid. Let this pyramid be cut by the plane of ABCD in OL, OM. Also let a sphere within the fluid and below GH be described with centre O, and let the plane of ABCD cut this sphere in PQR.

Conceive also another pyramid in the fluid with vertex O, continuous with the former pyramid and equal and similar to it. Let the pyramid so described be cut in OM, ON by the plane of ABCD.

Lastly, let STUV be a part of the fluid within the second pyramid equal and similar to the part BGHC of the solid, and let SV be at the surface of the fluid.

Then the pressures on PQ, QR are unequal, that on PQ being the greater. Hence the part at QR will be set in motion by that at PQ, and the fluid will not be at rest; which is contrary to the hypothesis.

Therefore the solid will not stand out above the surface.

Nor will it sink further, because all the parts of the fluid will be under the same pressure.

Proposition 4.

A solid lighter than a fluid will, if immersed in it, not be completely submerged, but part of it will project above the surface.

In this case, after the manner of the previous proposition, we assume the solid, if possible, to be completely submerged and the fluid to be at rest in that position, and we conceive (1) a pyramid with its vertex at O, the centre of the earth, including the solid, (2) another pyramid continuous with the former and equal and similar to it, with the same vertex O, (3) a portion of the fluid within this latter pyramid equal to the

immersed solid in the other pyramid, (4) a sphere with centre O whose surface is below the immersed solid and the part of the fluid in the second pyramid corresponding thereto. We suppose a plane to be drawn through the centre O cutting the surface of the fluid in the circle ABC, the solid in S, the first pyramid in OA,OB, the second pyramid in OB, OC, the portion of the fluid in the section pyramid in K, and the inner sphere in PQR.

Then the pressures on the parts of the fluid at PQ, QR are unequal, since S is lighter than K. Hence there will not be rest; which is contrary to the hypothesis.
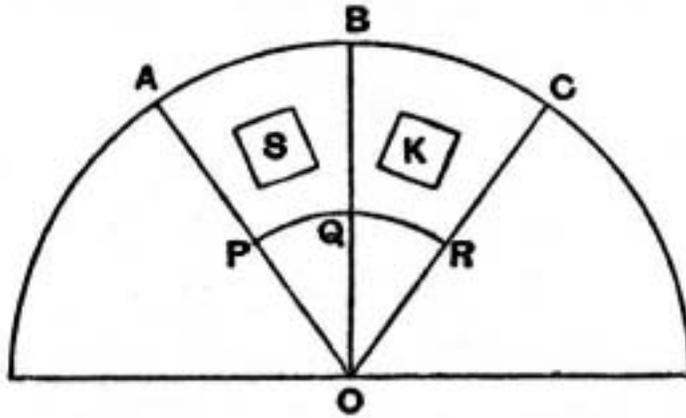
Therefore, the solid S cannot, in a condition of rest, be completely submerged.

Proposition 5

Any solid lighter than a fluid will, if placed in the fluid, be so far immersed that the weight of the solid will be equal to the weight of the fluid displaced.

For let the solid be EGHF, and let BGHC be the portion of it immersed when the fluid is at rest. As in Prop. 3, conceive a pyramid with vertex O including the solid, and another pyramid with the same vertex continuous withe the former and equal and similar to it. Suppose a portion of the fluid STUV at the base of the second pyramid to be equal and similar to the immersed portion of the solid; and let the construction be as in Prop. 3.
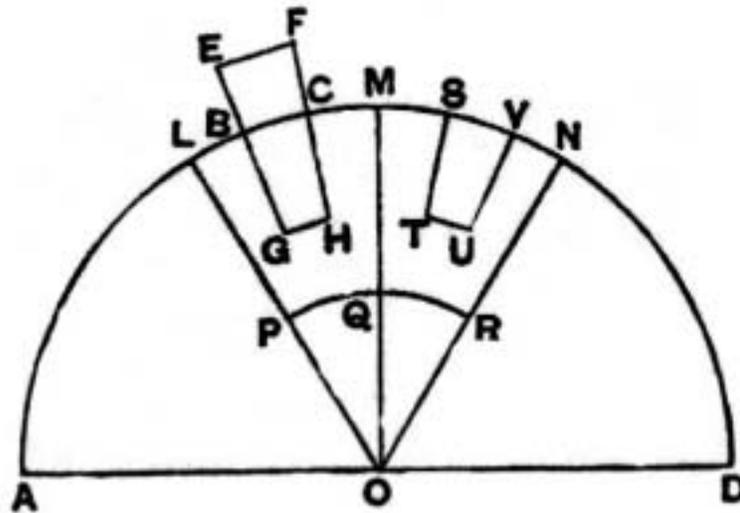
Then, since the pressure on the parts of the fluid at PQ,QR must be equal in order that the fluid may be at rest, it follows that the weight of the portion STUV of the fluid must be equal to the weight of the solid EGHF. And the former is equal to the weight of the fluid displaced by the immersed portion of the solid BGHC.

Proposition 6.

If a solid lighter than a fluid be forcibly immersed in it, the solid will be driven upwards by a force equal to the difference between its weight and the weight of the fluid displaced.
For let A be completely immersed in the fluid, and let G represent the weight of A, and (G + H) the weight of an equal volume of the fluid. Take a solid D, whose weight is H, and add it to A. Then the weight of (A + D) is less than that of an equal volume of the fluid; and, if (A + D) is immersed in the fluid, it will project so that its weight will be equal to the weight of the fluid displaced. But its weight is (G + H).
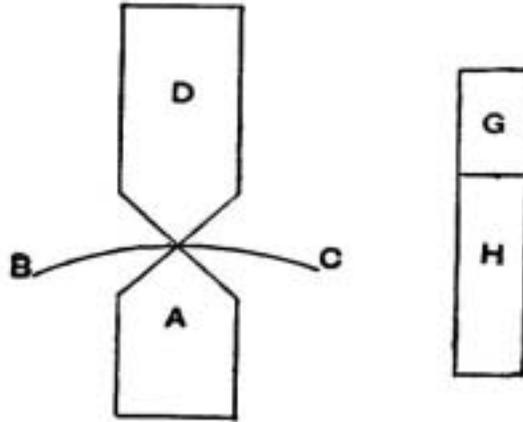
Therefore the weight of the fluid displaced is (G + H), and hence the volume of the fluid displaced is the volume of the solid A. There will accordingly be rest with A immersed and D projecting.

Thus the weight of D balances the upward force exerted by the fluid on A, and therefore the latter force is equal to H, which is the difference between the weight of A and the weight of the fluid which A displaces."

27.3   Luminous Presence and Presentations

There follows then, of course, **Proposition 7**, reproduced on pg. 27, leading into the crown-weighing business. But a pause is needed now to draw your breath of vision, to sketch your poise, to lift your poise towards a third order of consciousness.

How, then, does this reading of Archimedes leave you, or rather perhaps stay with you? If you are like me, then you found the presentation rather unhelpful, with its 'therefores' and 'hences'. Perhaps it is worth recalling for you one of my regular illustrations of the general problem.

"In a circle of, say, unit radius, two diameters, perpendicular to each other, are drawn. From an arbitrary point P on the circumference two perpendiculars PR and PS are drawn to the two diameters. The problem is, What is the ratio of RS to the radius? You have now drawn the figure? Perhaps even solved easily the puzzle? Your reaction to the puzzle and your solution of it will depend very much on your habits of

mathematics. If mathematics leaves you cold, then you may find it hard enough to make a proper diagram much less solve the puzzle. If you are a mathematician then the solution is just too obvious. If you fall in between these two extremes than you may draw and mark and puzzle, even try trigonometry. Joining R and S will be an evident thing to do; but it may take a pedagogue to adequately dispose the phantasm by the drawing of another line. The line to draw is the line joining the centre toe the point P, say, OP. Eureka! With the insight emerges the solution, the relation between RS and the radius.

　　　Now note that the solution can be formulated or thrown into syllogistic form, and this will help you to get some light on features of the syllogism which are often misrepresented. We have, therefore, the syllogism:

$$RS = OP$$
$$\text{and} \quad OP = \text{Radius};$$
$$\text{therefore} \quad RS = \text{Radius}.$$

　　　In this light I may note important characteristics of procedure. We started, not with two premises, but with the conclusion in the form:

$$RS \; ? \; \text{Radius}.$$

Our search, through diagram, was for a middle term, and the middle term was supplied as soon as one adverted to the significance of OP."[9]

　　　This little distraction back to an elementary text may be just an echo of what is present to you habitually at some level: so, it is part of your possession, self-taste, of your own humanity. "All we know is somehow with us."[10] But it may not be a luminous presence: it certainly was not an operative presence in Archimedes' presentation. Archimedes' present-ation involved an absence in Archimedes' presence. He is, if you like, in the adventure of the second stage of meaning, but the control of his presentational meaning is in the hands of the likes of Euclid. What then of your own presence to Archimedes or to that first page of *Insight*? I am not going to venture further on the answer, a complex one of orders of consciousness, but have I not at least jostled your attention? And if you are a settled Lonergan scholar who habitually skipped the crown-weighing problem, I have no doubt annoyed you. But I am also a threat: for

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[9]P. McShane, *Wealth of Self and Wealth of Nations. Self-Axis of the Great Ascent*, 1974, 66-67. Available on www.philipmcshane.ca . For a fuller reflection on the syllogism see Lonergan, *Phenomenology and Logic*, 101-106.

[10]*Insight*, conclusion of chapter 9.

some of the guinea-pigs in your class may have read this and be foolish enough to ask questions!

The appended essay on the wonders of water broadens the teasing and the threat. The issue is not difficult to name: it is general bias lurking under a linguistic competence that can be eloquent about yet totally lacking in adequate self-knowledge, pleasantly disdainful of *theoria*. It is a bias, of course, that can pick up on what "every school boy knows" in section 2 of this first chapter of *Insight*, and talk about how to get the definition of a circle by puzzling over a diagram. But it has no sense whatever of the struggle for a fuller definition of a circle, nor is it capable of even the beginnings of a serious phenomenology of geometry.

"Insight is an elusive thing. You get hold of insights properly only by considering the history of science, the history of philosophy, and so on. You put insights together insofar as you say, 'Well, a geometer understands the whole of Euclid, he can tell you where the key propositions are, and prove all the propositions that follow from a given set of axioms. He's got the whole thing in his intellectual paws, so to speak.' But that comprehensive grasp of the whole subject is not some phenomenon that you can pin right down and describe the structure. When you're seeking insight into insight, not only have you a different term of attention, but your methods of procedure have to differ if you are going to get anywhere".[11]

Certainly, a beginner reading *Insight* cannot be expected to have this control of meaning. But what of the teacher, the so-called expert? We have had now two generations of teachers of *Insight*, eloquent perhaps about the whole book, whose term of attention has nonetheless not gone beyond the serious beginner's achievement: in their lack of theoretic conversion they can be identified as serial killers.

But theoretic conversion is not enough, and here I turn my attention to Feynman as presenter, a genius perhaps in Archimedes' class, and indeed an altogether better presenter than Archimedes though the comparison is hardly legitimate. We shall be dealing with Feynman's presentations in some detail in the next four **Cantowers** and, much later, with his genius for popularization under the title, "Quantum Electrodynamics, Popularization, Pedagogy".[12] Here our reflections and clues are

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[11]Lonergan, *Phenomenology and Logic*, 357.

[12]**Cantower LVI** September 1st 2006 deals with the topic, the centre of attention being one of Feynman's best efforts at popularization: Richard P. Feynman, *QED. The Strange Theory of Light and Matter,* Princeton University Press, 1988.

modest and mainly negative, though forward-looking.

In the third stage of meaning the first chapters we are dealing with - of Lonergan, of Archimedes, of Feynman - will merge: that is the meaning of generalized empirical method. If one is introducing physics then one is introducing metaphysics, and vice versa. How does Feynman fare as introductory metaphysics? Archimedes, in a prior culture, is not bedeviled by a spread of popular deviant metaphysics, even if he is controlled by a Euclidean perspective. Feynman lives in the warped language-world of post-Enlightenment talk and the control of it on his presentation is more complex and subtle. Broadly speaking, he is a methodological mess, a truncated victim.

Surely I exaggerate? Feynman ends his first section by asking "what *is* our over-all picture of the world?" : I am leaving it to you to read Feynman as you read Archimedes, perhaps even sentence by sentence to find, in Feynman's own words, "by a long, remarkable process of detective work,"[13] his implicit arrangement of minding, "What *is* Feynman's over-all picture of knowing the world?" The level of your drive depends on you: lurking in his brilliant pedagogy of water, you may find a simple primitive atomist; at another level you may make precise his muddles about concept, word and idea; at a subtler level you may reach for his meaning of the question mark, a meaning trapped in axial truncation.[14]

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[13]Feynman I, 1.7.

[14]If you have the text of Feynman, you can take time off to have this adventure. In the absence of Feynman's text, any contemporary text in physics or chemistry will supply equivalent exercises. For the advanced Lonergan student the issue becomes a precise attention, from the viewpoint of metaphysical equivalence, to each sentence, phrase, word. We will return to Feynman and this exercise in the final section of the next **Cantower**. But, with or without the Feynman text, you can get an interesting start on one piece of the problem immediately by brooding over the following extract from the beginning of the second section, "Matter is made of atoms", of his first chapter.

"To illustrate the power of the atomic idea, suppose that we have a drop of water a quarter of an inch on the side. If we look at it very closely we see nothing but water - smooth continuous water. Even if we magnify it with the best optical microscope available - roughly two thousand times - then the water drop will be roughly forty feet across, about as big as a large room, and if we looked rather closely we would *still* see relatively smooth water.... magnify it two thousand times again. Now the drop of water extends about fifteen miles across, and if we look very closely at it we see a kind of teeming, something which no longer has a smooth appearance - it looks like a crowd at a football game as seen from a very great distance. In order to see what this teeming is all about, we magnify it another two hundred and fifty times and we see something similar to figure 1-1.This is a picture of water magnified a billion times, but

The reading may seem quite different from reading Archimedes, mainly because Feynman is trying for communication here: elsewhere he can be as organized as Archimedes, pressured perhaps more by Weierstrass than by Euclid.[15] But my present interest is in your cultivation of your own luminosity in reading, in answering in a peculiar fashion, "What am I doing when I am reading this or that chapter one?; what am I doing when I read the word *water*?" My push is towards you breaking with the *ethos* of an axial control of your meaning. In the third stage of meaning, a fullsome answer to the "What am I doing" question will be the tower-air that we breath. But for the moment I would be content simply with a break in the next generation's reading of chapter one of *Insight.* Later generations will read *Insight* as an evolutionary sport, a tadpole in search of a frog.

Readers of my previous reflections on chapters of *Insight* will not be surprised when I cut off here. I normally focus on a paragraph or two, seeking to create a mood of reading. Here I have paused over the principle of displacement and hinted about a larger perspective on defining the circle. But I would note that, because the book and the chapter are evolutionary sports, the weave of the final three sections of the chapter is problematic. So, there are secondary reasons why I comment as I now do about them. "Higher viewpoints"? Here we meet a massive contemporary problem that can only be

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idealized in several ways.

Water magnified one billion times
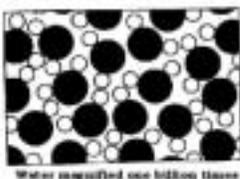
In the first place, the particles are drawn in a simple manner with sharp edges, which is inaccurate. Secondly, for simplicity, they are sketched almost schematically in a two-dimensional arrangement, but of course they are moving around in three dimensions. Notice that there are two kinds of 'blobs' or circles to represent the atoms of oxygen (black), and hydrogen (white), and that each oxygen has two hydrogen tied to it. The picture is idealized further in that the real particles in nature are continually jiggling and bouncing, turning and twisting around one another. You will have to imagine this as a dynamic rather than a static picture. Another thing that cannot be illustrated in a drawing is the fact that the particles are 'stuck together' - that they attract each other.... The whole group is 'glued together', so to speak. On the other hand, the particles do not squeeze through each other. If you try to squeeze two of them too close together, they repel". There is some great pedagogy here, but are there flaws? So now you have homework for July 2004: go figure.

[15]Chapter 4 of *Lack in the Beingstalk* deals with Weierstrass in the context of Husserl's thesis.

tackled slowly: Lonergan efforts may be paralleled to defining the circle while sliding over Euclidean axioms. "Inverse Insight"? This is a tough and complex issue that certainly needed to be introduced, but it opens up the vast territory of minding that relates to incompleteness, a range of concrete problems running up from Goedelian incompleteness theorems to the incompleteness of the exigence that is the heart of our empirical residence. And finally, there is "The Empirical Residue", of which I will have a few introductory things to say in *Cantower XXXII*, titled "The Empirical Residence", but whose fullsome definition requires the final eschatological reachings of the final *Cantowers*.

Appendix: The Wonders of Water

This appendix is integral to the ***Cantower***, to the fresh beginning. At least, it is integral for me, my fresh beginning. What is integral for you is your discovery-challenge. I would like to think that, if I do offer distant adult vision, it is glimpsed as that by you, so that you can climb - or not climb - at your own pace, gentle with your own needs yet tuned to the world's thirst.

The appendix is an article promised for the Journal *Divyaadan: Journal of Education and Philosophy* 15 (2004) to celebrate the centennial of Lonergan's birth in 2004. The topic, obviously, is water: we are still on the first page of *Insight*, yet in the peculiar sense that one gets when one thinks of Joyce's first word of *Finnegans Wake*: "riverrun". The entire book is a "riverrun past Eve and Adam" that never leaves that first word, that winds back to it on the last page with the word "the".

And this last point is important to your tackling with me here these first chapters of both *Insight* and Feynman. You don't need to have Feynman's work to hand to push on with these ***Cantowers***, certainly if you are a beginner and a student. Even if you are a teacher, it is not essential to the re-reading of *Insight* involved here. Still, the teacher who is trying to share with me the task of lifting the teaching of *Insight* to a theoretic level would do well to have some such text to hand. But I shall have more to say about the problems of teaching contexts and selectivity in the first section of ***Cantower XXVIII***, where I shall in fact be making a strategic shift to chemistry instead of physics. The important feature of guiding students through this first chapter of *Insight* is the guiding of them towards and through the experience of struggling for a serious concept. One needs the experience of leisured interest, patient messing, growing clues, suspicions, insights, and then the shock of the problem of accurate formulation that Archimedes' postulate and his seven propositions give. The advantage of using Heath, of course, is that you have no copyright problems with the 1897 text, so it can be provided for a class. You don't even need the book: just down load the stuff from the ***Cantower***, with the Appendix giving the seventh Proposition!

17

The Wonders of Water: The Legacy of Lonergan

Perhaps I might say that this is the story of a Summer, or really two Summers. And perhaps I can say further that this is the story of a life, or really three lives. The three lives? Your life; my life; Lonergan's life. Is this not obvious? Who am I addressing, and who is it that is addressing you? Surely, concretely, it is biography reaching to biography within history? Anything else is just some strange impoverishing[16] abstraction. We are from different villages, perhaps with different coloured skins, with different memories and musics and miseries and merriments. But we have water in common: and it is the having, the possession, the possession by, that is my present focus that is not a focus but a global pilgrimage, a pond perhaps but a pond orbiting the thirsty sun.

> *"I had a house in Malabar*
> *and a pale-green pond.*
> *I did all my growing there*
> *In the bright summer months.*
> *I swam about and floated,*
> *I lay speckled green and gold*
> *In all the hours of the sun,*
> *Until*
> *My grandmother cried,*
> *Darling, you must stop bathing now.*
> *You are much too big to play*
> *Naked in a pond."[17]*

You are not too big, I hope, or too small, or worse, too hurried, to share with me a glimpse of the waterworld of Archimedes? To swim about and float in a playfilled problem of silver and gold, in what for you now is perhaps the bright summer months -

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[16]Recall *Insight*'s brief treatment of the topic: *Insight*, 87-9[111-2].

[17]Kamala Das, "Summer in Calcutta" (1965), *Modern Indian Poetry in English*, edited by Bruce King, Oxford University Press, Delhi, 1987, 150.

even south of the equator - of 2004?

I mentioned three lives and two summers. The two summers I have in mind are the summers of 2003 and the summer of 1953, fifty years apart. In the summer of 1953 Lonergan was facing the challenge of finishing the book *Insight* : he had tried for more time before taking up the Roman job, but did not get it, so he put in a remarkable summer's effort doing those dense final chapters. In that same summer I was orienting myself for a second university year of mathematical science: I had already met Archimedes in a course on hydrostatics, of which he was the inventor. And now, as I write in the summer of 2003, I am spending a great deal more time with Archimedes, dazzled by his genius which is quite beyond me. We will be dipping [pun intended] into the first of his two books "On Floating Bodies". He has a second book on the topic: "The second book is a mathematical tour de force unmatched in antiquity and rarely equaled since."[18]

The edition of Archimedes' works that I have to had is Heath's old one of 1897, where the complete works occupy a little over 300 pages; Book I, "*On Floating Bodies*" is just ten pages; the second book is 38 pages. The larger work of which this is the second half tells more of my summer of 2003: hours of light and fun presenting the problem of displacement to audiences in different countries.[19] Nor does the fun lessen or the enlightenment decrease on repetition: rather, the wonder grows, me growing as I never did before, so that I might well [pun intended] say, "I did all my growing there / In the bright summer months / I swam about.... " about what? About water. About about. Indeed, I can meaningfully say about about about water.[20] But let's leave that for the present: venture with me a little in my ponderings [pun intended] of the summer of 2003.

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[18]I quote G.J.T 's article on Archimedes in the *Encyclopedia Britannica* of 1992.

[19]The present essay is the second half of an essay titled "Atoms in Motion", and that essay is the 27th in a series of 117 monthly essays (April 2003 - December 2011) with the general title **Cantowers.**

[20]This is a triplet that I have used more frequently in the recent essays mentioned in the previous note. It refers to an important set of distinctions that Lonergan made in unpublished writings. Roughly, we are curious about things. But we can be curious about that about. And history bears witness to a series of such curiosities, about which we may be curious. So, if you think it out, you find that there are studies that are studies of method; but there is also the study of that study, which is the refined meaning of **methodology**.

Were I Proust or Joyce I could waft you into a mood of detailed delight in the dipping of a crown or a banana in water. The companion essay to this certainly would help, beginning as it does with my first dipping: my wife and I on a spring morning, skipping our usual walkabout [the same 'about' again!] among our flowers to poise and lower a coat-hanger with two dangling cups, one of them over and into a pot of water. Later I found bananas better than cups. Find yourself a coat-hanger or whatever and share the joyous fascination: yes, the potted banana skews the coathanger! WHAT is going on in the universe?

The rest of this essay, growing into a large book - like Proust's digesting of a cup of tea - could weave around about that embracing of the universe. How to invite you into the embrace? A shabby way is to share with you an outline prepared for one of my invitations to share, an invitation of an afternoon in Mexico. I did not hold to the outline, of courses; but we'll come back to that. So: there is the first page outline, and there is the context page which some of you may recognize from elsewhere.

The Wonders of Water:
The Future of Bernard Lonergan's Thought

Philip McShane June 10th 2003

Contexts:

(a) *Method in Theology*, p. 48, diagram.

<u>**Individual**</u>		<u>**Social**</u>	<u>**Ends**</u>
Potentiality	*Actuation*		
capacity, need	**operations**	**cooperations**	**particular good**
plasticity, perfectibility	**development, skill**	**institution, role, task**	**good of order**
liberty	**orientation,**	**personal**	**terminal value**

(b) *A Brief History of Tongue*, p. 124 .

1. The Group Future

[i] The present situation, (a) in history, (b) in Lonergan studies

[ii] The climb to the future: strategies

[iii] Rescuing *Insight.*

2. The Individual Future

[i] Helen Keller and signs of water.

[ii] Archimedes' water-invitation.*

[iii] Shakespeare, Joyce, and water: Sign of End.

*Let it be supposed that a fluid is of such a character that its parts lying evenly and being continuous, that part which is thrust the less is driven along by that which is thrust the more; and that each of its parts is thrust by the fluid which is above it in a perpendicular direction if the fluid be sunk in anything and compressed by anything". (*On Floating Bodies*: his first postulate).
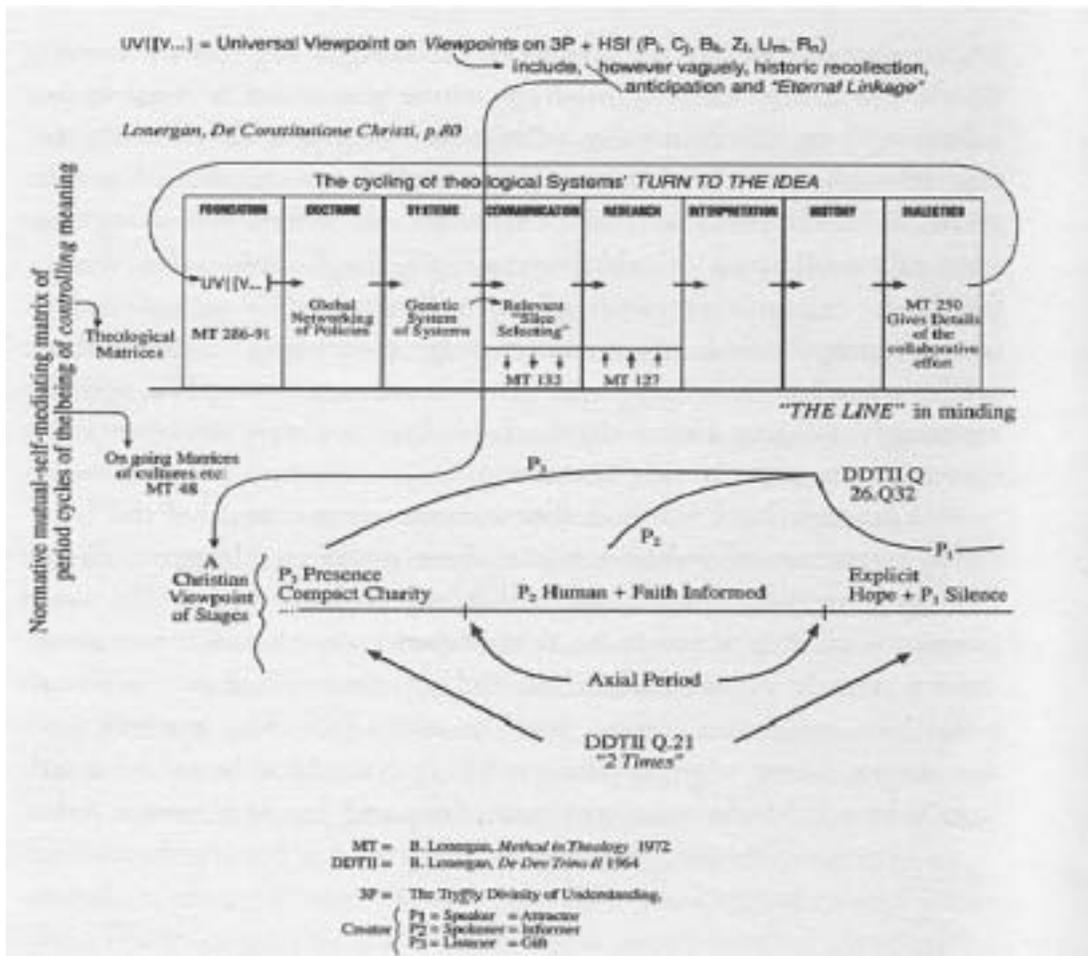
"The diagram in fact introduces complexities such as 'mutual self-mediation' which are beyond the present introductory sketchings. The diagram seemed important in itself, an invitation to do one's own reaching that would always be partial, revisable, open. From that point of view the key reference, near the top left corner, is the reference to Lonergan, *De Constitutione Christi*, Gregorian Press, 1959, 80. On that page Lonergan reaches the 24th point of his discussion of the identity of Jesus in which he notes that, unless you have a diagram you won't have a controlling understanding. Obviously, I took his advice seriously, and have passed it on to you. Further, and paradoxically, the diagram is an invitation not to take fright: as humanity progresses, images necessarily complexify as invitations both to control and to reverence the density of growing meaning. Instead of the notes of birds we have the melodic and symphonic notes,

manuscripts of musical genius, mightily beyond our own sensabilities. A good diagram, like the printed image of a piano concerto, calls us, if not to actual reading at least to admiration. So, there is a final general point to be made about the diagram here.

It has a central dividing line: above is 'the turn to the idea', the rolling of chapter three; below is the zone of general common meanings."[21]

Even if you are unfamiliar with the sub-topics mentioned, you probably would agree that this is not the outline of a single lecture, even if it ran on for four hours, as most of my sessions over the years in Universidad Iberoamericano of Mexico City did. Later I shall comment on the outline, for it is a compact expression of the legacy of Lonergan, but here I wish first to follow the strategy of the actual session that June afternoon.

One needs, of course, a context of relaxation and a step out of the mood of standard academic presentation. Indeed, one needs the talent of a stand-up comic; I think of the Scottish comedian, Billy Connally, and his "World Tour of Scotland". We were on a world tour of water, but it was a tour of the inner worlds in the room, the battered neurochemistry of our wonderbones. Could we ease into a non-axial mood, mode? Can you? One must pick up on liberating circumstances of time and place and culture: For Spanish speakers, Ortega y Gasset comes to mind; for others there is T.S.Eliot or George Eliot or a slow-paced ponderer from the Orient or the African continent. At all events, we weave - you and I weave now - towards that postulate of Archimedes that ends the first page. It has been the centre of my attention these past months. What does it mean? Now, there is a question that we must return to in some detail: how is the postulate to be interpreted, where by *interpretation* I mean what Lonergan writes about in various parts of *Insight* and *Method in Theology*.[22]

But, back to my lecture and to our reflections, and to some elementary response to the question, What does this postulate mean? Why have I spent so much time reading and re-reading it, despite the fact that I studied hydrostatics over fifty years ago, and hydrodynamics a couple of years later? Yes I have spent wonderfilled hours wandering with Archimedes over the hills and hollows of Sicily, looking with him at

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[21]*A Brief History of Tongue*, 123, note 27.

[22]Footnote 1 of p. 153 of *Method* points to the division of the task of interpretation as it is sketched in *Insight*. Those divisions are the concern of the essays of 2005-6 noted a few pages back.

streams and pools and ocean, remembering my own naked swims in the predawn Mediterranean awaiting a sunrise. The story of Archimedes leaping naked from the bath is a good one: but the truth of the tale is that there are months of genius-musings behind his leap into the sunrise of hydrostatics. In the second volume of his three-volume lectures Feynman gives just over a page of two chapters on hydrodynamics to the topic of hydrostatics. He writes: "we will leave hydrostatics because it is not nearly so interesting as the situation when fluid is in motion".[23] Perhaps, for Feynman, it was all too simple, a speedy genius leap on the way to the sticky flowing of hose-water. But, for me, teaching hydrostatics steams with sweat and fun.

So, we arrive at the moment of experimentation: the coat-hanger poised with its symmetrical burden. One of the suspended weights enters the water, and the hanger unbalances. What is happening? Let me tell you, as an encouragement in your patience and play, that no one in my audiences of the New World or the old could tell us in any luminous fashion. Is the water pushing? Perhaps you say immediately, But yes, isn't there the principle of displacement? And what precisely is that?

So my comic presentation continues. There was, fortunately, a transparent jug of water on the table. Assume, with Archimedes that the water is continuous and still, happily snoozing in all its parts in the jug. Forget about Brownian movements or thermodynamics and settle to cherish, embrace, a block of the water half way up the jug. Cut it off with your calculating eye: a cube, say, of a few centimeters sides.[24] There it sits, held safely above the centre of the Earth. How? Why?[25] It is in the grip of the surrounding water just as safely as if it were in its own little vessel. Its weight - whatever that means - does not carry it anywhere. The grip is all around the sides, but with Archimedes we attend to the "perpendicular direction". There is a push down, a

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[23]Feynman II, 40-2. In *Cantower LIV,* "Quantum electrodynamics, Pedagogy, Popularization" I shall return to the problem of Feynman's teaching, but certainly you can notice from the above that there is in general a problem related to compactness of presentation. Each of Feynman's chapters represents a lecture. How much of each lecture was merely doctrinal, pointing to work that had to be done?

[24]A cube? Well, nearly: check with Archimedes if your wits done leap!

[25]The "Why" is a much larger question: it carries curiosity five ways and curiosity about curiosity towards five "becauses" that reach out and round about about about. See P. McShane, *Process: Introducing Themselves to Young (Christian) Minders* chapter 1, section 4, "Bhagavad Gita: Song of the Adorable". The book is available (free) on www.philipmcshane.ca

"thrust", across the top surface, equal all the way (otherwise the water would be "driven). There is a push up across the bottom surface. But this pushes are nicely met by our little cube, which of course is not driven anywhere.

How are we, you and I, doing? You are not in a hurry, I hope? Again, I recall my audiences, regularly impatient for an answer. Impatient for an answer? Such impatience is for a nominal answer: real answers, real definitions, do not come quickly, suddenly. Indeed, as we will sniff, they come with the patience of history. But back to our little cube, happily orbiting the sun, tugging on the heart-strings of millions of galaxies on a June day in Mexico City at midnight in Moscow. Stay with it for a while, resting your head in the cherishing hold of the global spirit.

Have you come to glimpse that the up-and-down thrust of the neighbourly grip is - please don't think 'obviously', for there is no *opi via* - balanced by the weight (whatever that is) of the little cube? So: take out the little cube with your imagination and put in a little cube of gold. It will sink, of course: unless the jug is in free fall! What about a cube of ice? It will surface. What about a cube of ice with a little bit of gold at its centre? Well, it depends on the size of the little bit, and whether it is really at the centre. But - have you got it now, happily and homely?[26] Whatever cube you put in, it will have the up-thrust of the weight of the little cube of water that was there before. But no, you are not at home yet, no more than you are when you "get" the definition of a circle a few pages later in *Insight*. However, we had best leave that twist till later.

Still, we have made a start on *The Principle of Displacement*, stated dully in textbooks: " a body wholly or partially submerged in a fluid is buoyed up by a force equal to the weight of the displaced fluid". Have we made a start on Archimedes' first postulate, which in fact supports the first seven of the propositions of that first book on floating bodies? Well, no: and here I return to my musings about Archimedes as he meandered around Sicily, his searching eyes not on the stars but on the well with its spherically-surfaced water, on the thrusting streams, on the sea's horizon. For him, local rivers like the Simeto or the Salso, when they hit the costal plain, moved in circles. Just as the Ganges does, in decent approximation.

Have I given you pause: spherical-surfaced wells and rivers? Rivers running through points on Great Circles? So we edge towards Archimedes' "**Proposition 1**. *If a surface be cut by a plane always passing through a certain point, and if the section be always a*

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[26]You may think here of "being at home in transcendental method" (*Method in Theology*, 14), which is both easy and difficult, as homely and difficult as serious systematics (*ibid*, 350-1).

circumference [of a circle] whose centre is the aforesaid point, the surface is that of a sphere."
The proposition follows immediately after that first postulate and, I suspect, your
reaction was like mine on a first reading: What in heaven's name has this to do with the
postulate or with floating bodies? What is on this wiseguy's mind?

Proposition 2 puts you on the right track: "*The surface of any fluid at rest is the
surface of a sphere whose centre is the same as that of the earth*". A somewhat broader view,
then, of ponds than that to which we are accustomed. So what would Archimedes think
of our little cube: have you sorted that out already? The propositions that follow
suggest that he was happier thinking in terms of a pyramid sliced by two spheres.

But let us move past this larger view to what is considered the key proposition in
the crown-weighing business. At this stage it seems as well - for we are moving
towards the trickier question of what it is to interpret a text - to quote Archimedes as he
is translated by Heath, adding some of Heath's long bracketed reflection on the actual
problem of the crown-weighing.

<div align="center">

"**Proposition 7**.

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*A solid heavier than a fluid will, if placed in it, descend to the bottom of the fluid, and the solid
will, when weighed in the fluid, be lighter than its true weight by the weight of the fluid
displaced.*

(1) The first part of the proposition is obvious, since the part of the fluid under
the solid will be under greater pressure, and therefore the other parts will give way
until the solid reaches the bottom.

(2) Let A be a solid heavier than the same volume of the fluid and let (G + H)
represent its weight, while G represents the weight of the same volume of the fluid.

Take a solid B lighter than the same volume of the fluid, and such that the weight
B is G, while the weight of the same volume of the fluid is (G + H).
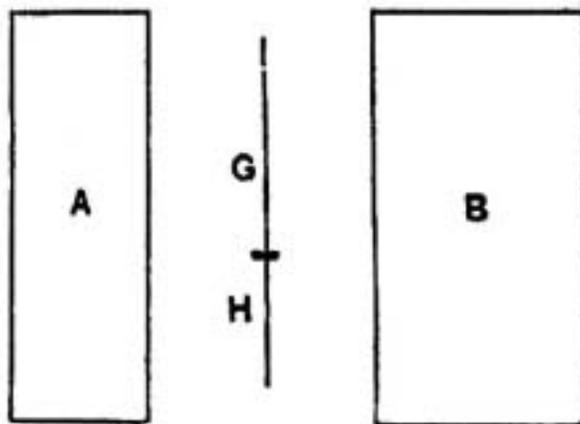
Let A and B be now combined into one solid and immersed. Then, since (A + B) will be of the same weight as the same volume of fluid, both the weights being equal to (G + H) + G, it fo9llows that (A + B) will remain stationary in the fluid.

Therefore the force which causes A by itself to sink must be equal to the upward force exerted by the fluid on B by itself. This latter is equal to the difference between (G + H) and G [Prop.6]. Hence A is depressed by a force equal to H, i.e. its weight in the fluid is H, or the difference between (G + H) and G."

This is the translation of Proposition 7 of Archimedes. Heath goes on then to comment:

"This proposition may, I think, safely be regarded as decisive of the question, how Archimedes determined the proportions of gold and silver in the famous crown. (Cf. Introduction, Chapter 1). The proposition in fact suggests the following method.

Let W represent the weight of the crown, w_1 and w_2 the weights of the gold and the silver in it respectively, so that $W = w_1 + w_2$.

(1) Take a weight W of pure gold and weigh it in the fluid. The apparent loss of weight is then equal to the weight of the fluid displaced. If F_1 denote this weight, F_1 is thus known as the result of the operation of weighing.

It follows that the weight of fluid displaced by a weight w_1 of gold is $[w_1/W].F_1$

(2) Take a weight W of pure silver and perform the same operation. If F be the loss of weight when the silver is weighed in the fluid, we find in like manner that the weight of fluid displaced by w_2 is $[w_2/W].F_2$.

(3) Lastly, weigh the crown itself in the fluid, and let F be the loss of weight. Therefore the weight of fluid displaced by the crown is F.

It follows that $[w_1/W].F_1 + [w_2/W].F_2 = F,$
or $w_1F_1 + w_2F_2 = (w_1 + w_2)F$
whence $w_1/w_2 = (F_2 - F)/(F - F_1)$."[27]

Heath goes on to discuss the source of this particular presentation, and gives another. But this need not concern us for the moment. What I am interested in immediately is your estimate, your feel for, the two types of presentation of the principle of displacement: Archimedes combined with Heath as just quoted, or our adventure with the little cube?

If I am right in my anticipation of your estimate, you were more taken, and taken someway along, by my jugglings [pun intended] with the little cube? Although you may be the type whose training is in logical presentation: you then follow the "it follows stuff". But, Do you "get it"? The question cuts deep into our axial culture, as I hope to vaguely intimate, and as an initial help I pitch to you an analogy. Lonergan, in writing *Insight*, was focused on a principle of displacement. In place of Archimedes postulate he presents his own: "*Thoroughly understand what it is to understand, and not only will you understand the broad lines of all there is to be understood but also you will possess a fixed base, an invariant pattern, opening upon all further developments of understanding*".[28]

Certainly, in his first paragraph, he notes that little things like cubes and ponds are important, but he moves quickly towards what proves to be The Empirical Residence of the human spirit (whatever *spirit* means, for its meaning is remote from our fringe-spirit).   Is there something Archimedean about his presentation? Let us leave that question dangling for the moment.

You could place our present discussion in a wide variety of context, but let us hold to the question of presentation, making present to. Then we may move into the

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[27]T.L.Heath, *The Works of Archimedes*, Cambridge University Press, 1897, 259-60.

[28]*Insight*, xxviii[22].

context of Lonergan's discussion of presentation in *Insight*, which is a meaning of *interpretation*. Archimedes presents: I present. And I can present reflectively, and do here in random fashion. I do not wish to enter into this topic at present. But do note that our reflections are elementary, and this in two senses. First, they are elementary in that our interest is in the operations of what Lonergan later calls the elements of meaning. You can recognize that interest as he seeks to foster it in that first chapter of *Insight*. But also our interest is elementary in another sense: we are not in the context of functional specialization. If you like, I am, in my presentation above, like a guitar maker that I once met, who fondly made each guitar, from naked wood to vibrant instrument. My guitar player had no wish to avail of the suggestion of Adam Smith: divide the labour. "The division of labour, so far as it can be introduced, occasions, in every art, a proportionable increase in the productive power of labour".[29]

So, one might produce sets of guitars, and indeed varieties of guitars: for the right-handed and left-handed, for blues singers and for the classics. In such an enlargement and loosening of operation, presentation - making present to -   becomes divided, functional, each step ordered to the next stage: the beginning function is the supplying of the right wood, the right words. So we shift from the struggle of chapter 17 of *Insight* to the tasks *Method in Theology*: I presume that you are not-unacquainted with the tasks in question. Here I wish to bring them to bear on Archimedes' text, with an eye and an emphasis on the meaning of function. The emphasis comes with my using the word *presentation* instead of *interpretation*. Then we have a series of presentations, making present, indeed giving a present, a gift.[30]

Here I am anticipating in some popular fashion a series of essays that shall seek the bring into centre stage and centre globe a luminous meaning and presence of **Function**.[31] Think of keen teamwork, in a soccer team or in a relay racing team. They are psyched into what they are at. Passing the ball or the baton is a luminous challenge. Katya runs the first leg of the 400 meters and Ako awaits: they know each other's pace and hands: the task is to - beautifully, efficiently, in sweet unity - move the baton forward in the circuit. Sometimes in a soccer team there are a few brilliant members,

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[29]Adam Smith, *The Wealth of Nations*, chapter one.

[30]Lurking behind this word is the problem of the supernatural: perhaps a perusal of the index entries in *Method in Theology* under *Gift* would open doors?

[31]The 34th of the essays mentioned above (   ) begins the discussion of this topic.

with classy moves: to this the team tunes itself, with rivalries disdained. I recent heard the great Pelle speak of this to an audience in Russia. he pointed out how a team of first class players need not be world- cup winners: what was needed was the coordination, which could be the achievement of a less classy group.

Back to Archimedes, then: and the beginning - but of a new cycle - is the sweet provision of a better text. Might there be an improvement on the Greek and Latin in Johan Ludvig Heiberg's *Archimedis Opera Omnia* (1910-5; reprinted 1972)? And certainly there are better translations (for example, the French of Paul ver Eecke in 1921) than Heath's.

So, there is the gift to the next athletic effort, a creative surge of interpretation in a precise new sense: what is the meaning of the text, not in its influence but in its incarnate saying. I would insist here on creativity, if the cycling is to be beautiful and efficient: there must be an ethos of excellence, not a push for publication.[32] And notice here the possibility of what I might call *sporting* creativity: indeed, I might claim that this is the topic lurking in this entire essay. Archimedes is saying things about floating bodies: but he is also saying things about saying: might one not go on to claim that he is saying things about about? At all events, there is a sense in which Archimedes is saying "this is the way to say things about floating bodies". And now I turn up as sporting interpreter claiming that his saying is axial.

What do I mean by axial? Well, at least I can point to the diagram on page 2 of the lecture outline above! But saying What is axial, now that is another matter, bordering on the post-axial, but at least the diagram of that p. 2 above gives an initial clue of a long period in history in which we struggle. So, there is a vague notion to be had in musing on the identification of a period of human history between the first relatively-compact stage of meaning and a third stage that is to be relatively-integral and luminously thus. However, the important point is that I come to interpret - as does anyone to any of the tasks - with a view.   I am stressing here a methodological view, but there are other components of my view that could lead to fresh subtleties of interpretation, fresh baton-passing.[33]

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[32]This insistence reaches out to each individual, each thesis director and writer. We are a global team, seeking out what was skipped that might give us all a lift, seeking out wrong cultural turnings such as I have emphasized in this paper regarding "axiomatic presentation".

[33]So, for instance, one might envisage the odd contribution of studies of Sicilian linguistics and neurodynamics to find historical sources of both the axiomatic bent and the

So, I pass the baton on to the historian of physics and chemistry. A freshness causes discomfort in the stale historian, but it is a welcome disturbance in the alert. Still, let us be realistic in the worst way: an axial Archimedes just does not jive with present historical comfort. If there are other fresh things, then, yes, there is a shuffle in the study of what was going forward in hydrodynamics or related zones. So, a twist from 20th century gravitational or rotational theory nudges Archimedes' pyramid analysis into a new geodesic context.

However, what I am talking about here, wishing to have passed on, is a methodological shift, a cousin to the shift that I advocated in a previous article in this journal.[34] Might this interpretation of warped presentation take root in a few historians of education? Such a presence, a presentation, a gift, a baton from history to dialectic reduces the creative strain on the dialectic effort. The gift is sifted through the exercises described in that devastating and discomforting page 250 of *Method.* Then, with luck and the pressure of embarrassment,[35] some fraction of the dialectic community registers a post-axial twist on presentation - on hydrostatics, on everything! - as foundational.

It is for an allied foundational sub-group to fantasize the heuristic strategies of getting the new rhetoric into schools and colleges, journals and books. The fantasy is to breed new policy within a specialized inquiry: but to think this work out precisely is a major effort in the present culture. A precising of policy is a task remote from the accepted meaning of policy: just as there is to be an ever-more-accurate foundational conception of questioning's relation to image,[36] so there is to be an enlargement of that perspective to include new levels of its global identification and implementation: this is

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Mafia! But this is an enormously complex undeveloped zone of Lonergan's reflections, as a reading of "The Sketch" in chapter 17, section 3.6, would make painfully evident.

[34]Reference to the previous McShane article, *Divyadaan: Journal of Education and Philosophy*, ...

[35]"Doctrines that are embarrassing will not be mentioned in polite company" (*Method in Theology*, 299).

[36]One may ask oneself, What do I mean by image? There can be the embarrassment of noticing that one doe's not mean anything neurodynamic by the word. Yet we are being nudged by contemporary culture to such a perspective. For a good popular introduction see Rita Carter, *Mapping the Mind*, A Phoenix Paperback, 2002. Moreover the nudge is part of Lonergan's fantasy: "From such a broadened basis one can go on to a developed account of the human good" (*Method in Theology*, 287).

quite beyond present fantasy.[37]

But at least you have a vague impression of a forward-looking division of labour, a sublation and contextualization of old light-weight divisions of policy, planning, executive directives that will eventually constitute three identifiable global communities.

This is, of course, all to hasty: but it is worth going all the descriptive way to intimate how an interpretation of Archimedes entrapment in Euclidean presentational modes can ground, through slow specialized cycling, a shift in, say, school geometry or physics or history or whatever. And readers of my previous effort in *Divyadaan* will notice how this second approach is simply a fuller context for that previous strategy of classroom reform.

But now I must return to the context from which I began. We were gathered round my coat-hanger and waterworks, dipping ourselves in the pond of Archimedes' puzzle. We were also dipping into the first page of *Insight*, heading for the topic "Rescuing *Insight*" by way of "Archimedes' water-invitation". I am re-presenting Lonergan's presentation of that invitation, and that re-presentation, that gift of me to you, raises questions. Is there something axial about Lonergan's presentation? Was he corrupted by the *ethos* of Fontanelle,[38] ironically open to his own criticism of *haute vulgarization*? The question is deliberatively provocative but in fact genuine and enormously complex. However, that *Insight* needs rescuing is to me quite evident. The

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[37]The end of an essay is no place to tackle this very central topic of fantasy, but a few points may help. For one thing, it helps locate Lonergan temperamentally. I recall presenting the topic to my colleagues {Crowe, Doran, Lawrence, Vertin} when we put together the volume *Searching for Cultural Foundations*, University Press of America, 1984. Professor Lawrence remarked then that"Lonergan did not have the tome to fantasize" and there is some truth in that. But I would claim also that his bent was towards dialectic work - witness his last efforts in economics, supposedly producing a primer, but actually busy on dialectic work (see my Introduction to Lonergan's *For a New Political Economy*, University of Toronto Press, 1999). The aim of dialectic work is the provision of the best contemporary foundations. The aim of foundational work is fantasy: pushing forward the best towards a richer creativity regarding the future. You now perhaps recognize that in my descriptions of the previous pages.

[38]Fontanelle's place as key figure in the modern drift towards compact readable presentations is sketched in compact readable form by Herbert Butterfield in the final chapter of *The Origins of Modern Science*.

book has been brutally trivialized by disciples "never bitten by theory,"[39] "lost in some no man's land between the world of theory and the world of common sense".[40] "giving an illusion of knowledge, a false idea of what science is, that clutters the mind".[41]

This view of Lonerganism is no more acceptable to some people than my view of axiality. What, then, of rescuing *Insight*? History is on the move towards that rescue in the slow but inevitable implementation of his central legacy: the global division of labour in all areas of inquiry and culture.[42] This is the large topic lurking in page 2 of the lecture outline above: it is the topic of the million-word project of the **Cantowers**.

This paper and that lecture, then, began in the second section of Part Two of the Outline given above. I invited a viewing the individual future, your future, in the light - or dark - of Archimedes' water-invitation. I tried to enliven that invitation and contextualize it. That effort wound its way round the topics of Part One of the Outline. I described a present situation in Lonergan studies in the context of a longer cycle of decline not unrelated to what I call the axial period of history. It is a period out of which we must climb, cunningly scheming recurrences of creative reading and speaking. And the central scheming is to be the scheming that will bring forth the ever-more refined, efficient, beautiful, functional division of labour that is Lonergan central legacy. It is the legacy that was described so briefly above and diagramed obscurely on the second page of the Outline.

And what of the individual future? What was suggested above may well nudge forward some few to challenge the warped axial educative structures that even Aquinas did not dodge. Primitive apprenticeship is lost in a Greek deviation, yet still present in stray teachers and in some patterns of oriental discipleship. Individuals must emerge that lift their own questing into that larger view, or rather that are lifted by the schemes of functional re-cycling. The re-cycling is a vortex that is to build a tower of redemptive meaning, a vortex that continually whirls into the present the reaching of those that reach larger meaning.

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[39]Lonergan, *Collected Works*, volume 6, University of Toronto Press, 1996, 121.

[40]*Ibid.*, 155.

[41]Lonergan, *Topics in Education*, University of Toronto Press, 1993, 145.

[42]This is a thesis that I have proposed regularly, but with a new pragmatic edge in chapter three of *Pastkeynes Pastmodern Economics. A New Pragmatism*. Axial Press, Halifax, 2002.

So, the young Helen Keller's five-week struggle to name water can lift our view of signing, and the elder Shakespeare's *Pericles* can bring us to savour ocean water. *Pericles* has "much more than a happy ending. Suffering has literally changed all beyond recognition. They are all sea-changed. Marina was sea-born. Thaisa was cast up by the sea, and the sea by its effects has so battered Pericles that he is like a man cleansed, purged, salted, until his ears are clean enough to hear the divine harmony to which others are deaf."[43]

What, then, is water and its buoyancy? It is for the metaphysician to reach out concretely and integrally to all the waters that lace satellites of stars and faces in tears, to be "set thinking of all the streams and rivers in the world, of all that is wet and cold; of Homer's sea, and the waters on which Peter walked to Christ."[44] It is a foundational solitude that yet can enter the whirlpond of history on a summer's day and hold a poise on a view of embracing water that all might share, for we all thirst to hear in our different ways the call of the sea. *Theoria* as a common way of life is a hope of the third stage of meaning, and "theoretical understanding seeks to solve problems, to erect syntheses, to embrace the universe in a single view".[45]

And was my lecture, is my essay, trapped in axiality?! Since I have drawn your serious attention to the trap, you and I may have a slight edge on probabilities of escape. The escape and the escapade is to reading *Insight* with more lonely molecular care, more sense of the gift that is the universe, the gift that is to be embraced, the gift that is our common contemplative urge to bathe naked in the pond of God.

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[43]I am quoting here from a talk by the Irish poet, Patrick Kavanagh on the last play of Shakespeare. The talk is reproduce in my *Lack in the Beingstalk. A Giants Causeway*, available on the Website www.philipmcshane.ca . See there, p. 75.

[44]Herman Hess, *Narcissus and Goldmund*, Penguin Books, 61.

[45]*Insight*, 417[440].