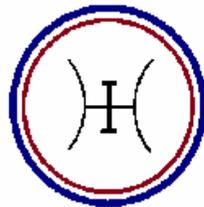


*"This is really neat stuff! qNumbers represent ideas, not physical things. Maybe that's how the World changes? It changes through new, better ideas. And, 'dialoguing' is the 'qMultiplying' that makes the 'bigger, better ideas' that change the World!"*

- 'Maya', a fifth-grader in a qStory, speaking out



In our world where 'making a difference' may seem to be increasingly difficult, this 'qBook' shows how, using "Heartful Dialog", we each/all can create a quality thinking/acting which actually gives us 'real solutions' ('resolutions') rather than the 'non-solutions' offered by our current 'all or nothing' thinking!



*"This brilliantly simple little book explains a new Idea that might change the world: that there is an arithmetic of ideas, and that it's different from the ordinary arithmetic we all learned in school." ...*

*"Why is an arithmetic of ideas important?"*

*Because ideas lay at the foundation of every important ... description of the physical universe"!*

- An enthusiastic reviewer of an early edition

*For Youth and Adults, everywhere!*

qBook-01

## Creating a Quality World using "Heartful Dialog"

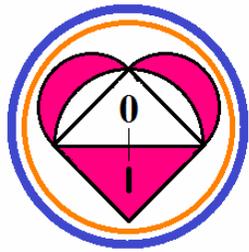


(Dialectics and 'qNumbers')

by  
Joy-to-You

*A primer on: Dialog and an Arithmetic of Ideas ('quality numbers') -- using entertaining 'qStories'!*





Creating a Quality World  
using  
“Heartful Dialog”  
(Dialectics and 'qNumbers')

qBook-01

by

Joy-to-You

qBook-01:

*Creating a Quality World using “Heartful Dialog”  
(Dialectics and ‘qNumbers’)*

First edition: December, 2012

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*(Thanks to those Reviewers!)*

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*Author Notes and Credits*

In April, 2012, the author discovered F.E.D. (via below website addresses) and immediately recognized the significance of the work contained there, and has been a contributing student of that work ever since. Though not a member of the Foundation, he is a ‘fan’ of some of its theory and mission. He interprets F.E.D. theory, and desires to present it playfully to a world needing ‘play’ as well as ‘better ways’ to truly ‘resolve’ its many problems. Thus, ‘Joy-to-You’ acknowledges that this ‘qBook’ is his ‘heartful version’ of an original methodology developed by and credited to:

**Foundation Encyclopedia Dialectica, (F.E.D.)**

authors of A Dialectical “Theory of Everything”...

**[www.dialectics.org](http://www.dialectics.org)** and/or **[www.adventures-in-dialectics.org](http://www.adventures-in-dialectics.org)**

## Dedication

For four special teachers ...

*For Hjalmer, who supported my love of mathematics;*

*For Jack, who spoke of the importance of rhetoric;*

*For Jean, who taught me the joys of literature;*

*and*

*For Marsha, who encouraged "talks" with  
her precious fifth-graders  
(over twenty years ago)!*

*This 'qBook' is dedicated to*

The Children of Today's World

and

The 'Idea' that they will make it

'A Quality New World'

for themselves and for their children

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\* indicates: "qStory may be suitable for children (10 years+)"

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A brief preview/overview of each qStory

### Part I: Rhetoric & "Heartful Dialog" 8

#### q0\*: Ms D's fifth-graders and 'the 3R's' 8'

*A taste of the entire qBook, via the '3R's' + 'Dialog', via Ms D's kids, and how 'qNumbers' might help solve 'human problems'.*

#### q1: Dinner and Dialog at the D's 12

*Intro to characters: Mr Fantov ('Mr Fan'), Ms Deary ('Ms D'), Mr Durer ('Mr D'); their shared dream of a "Better way" for youth/All.*

#### q2: Mr D's Speech/'Rhetoric' Class (the '4<sup>th</sup>R') 15'

*Mr Fantov discusses his views on 'rhetoric', his notion of 'heartful dialog', and his wish for the '4thR': Rhetoric, and its 'aRithmetic'.*

#### q3: 'Resolution' or 'Revolution'? 19

*A look at history before and after the American Revolution, using qNumbers, and the 'hurtful' consequences of 'un-heartful dialog'.*

#### q4: Developing Idea-Numbers: 'qNumbers' 21'

*Mr Fan, with 4<sup>th</sup>R students, together develop 'qRithmetic', a system of 'quality-numbers', to explain 'idea-interaction' via a multiplication (x) and an addition (+) of 'qNumbers'.*

### Part II: qRithmetic, Dialectics, from 'Now to New' 25'

#### q5\*: "Better ideas that change the world!" 26

*Mr Fan returns to Ms D's class to discuss qNumbers and how they work; he finds that the kids understand him (and contribute) well!*

#### q6\*: 'qRithmetic' and 'qMulations' 29

*Mr Fan contrasts qNumber 'qRithmetic' with regular Whole Number aRithmetic, with Ms D's kids discovering qMulations: idea-cumululations, or 'qSums'.*

#### q7\*?: From 'What Is Maybe?' to 'What May Be!' 35

*From his youth, Mr Fantov remembers the word 'Maybe' as 'not Yes, and 'not No'; he then explores 'What if Maybe' became 'What*

*May Be: Yes! 'Maybe' his qTalk was to Ms D's class (q7\*) or to Mr D's class (q7) -- we're not sure.*

**q8: 'Fun'mental Dialectic': New = Now + Change 38**

*Mr Fan explains how the Now, 'dialoguing with Itself', generates the New; he then explains it all 'Mary's Way' - in a "Heartful way" of acting in a play and how such 'acting' can also bring change.*

**q9\*: Thought Spirals and Nature's Own Dialog 41**

*With Ms D's kids, Mr Fan uses an example of 'building a better tree-house': together they explore how "thought patterns" arise, and how they might form an 'upward Thought Spiral'.*

**q10: 3-D: 'Definite Dialectic Detail' via an 'upLoop' 44**

*With Mr D's students, Mr Fan gets quite detailed on how an 'upward Thought Spiral' might work between our current thinking (thesis) and a new idea (counter-thesis); he uses 'resetting of a thermostat' as an example of an 'upLoop': upward 'feedback loop'.*

**Part III: 'Better Games' are Possible! 47'**

**q11\*: An 'Empty' Bag of "I'm possible" Tricks? 48**

*Mr Fan entertains Ms D's kids with three ideas inside an 'empty bag'; from each idea he makes a story or simple model, which shows how the "Impossible" can say: "I'm possible!"*

**q12: 'fUtbALL': A Game Where U and ALL Win! 52'**

*With Mr D's football/soccer players, Mr Fantov proposes a new kind of 'fUtbALL' game where yoU and ALL (especially the 'fans') ALLways win!*

**q13: 'WEbALL': a game WE ALL can WIN! 56'**

*Mr Fan addresses Mr D's 4<sup>th</sup>R class before graduation; he claims the Internet, or 'World Wide Web', offers us the chance to play a great new game of 'WEbALL', where WE ALL can be ourselves and still WIN!*

**q14\*: Don't let 'fun' become 'unfun'! 57**

*Mr Fan tells Ms D's kids his hopes for them, as he reminds them to 'Think fun only', and not to fall into the 'unfun game', which tends to stay 'unfun' without any Change!*

## How to use this qBook

*"Stars (\*) are for Kids"*

*This qBook is meant to entertain as it explains. It is perhaps more of a "dialog" or comment on human needs and their resolution than it is about qNumbers and qArithmetic.*

Its division into Parts shows a natural progression of the qStories, previewed in the **Overview Table of Contents**.

*We encourage younger (and all) readers to read all 'qStories' with a \* after their chapter number, e.g., q0\*, q5\*, q6\*, etc.; these stories involve Ms D's fifth-graders, and are especially 'geared' for the younger reader. We dialog with youth 'to keep things simple', and because, someday 'qRithmetic' may be taught as standard aRithmetic is now taught in elementary school.*

*qStories without the \* are intended for more mature readers: adults and more mature students. These chapters cover the greater issues being addressed (within Mr D's high school '4<sup>th</sup>R' Rhetoric class). Adults might read only those chapters without the \*, however, we recommend they also read the \* stories since they a 'youthful simplicity' that might be refreshing. Chapters q9-q10 are detailed and may be read lightly at first, going on to Part III, and later read again for a more thorough understanding of Dialectics.*

Note a few grammatical choices: *dialog* is always used instead of the longer *dialogue*, except in *dialoguing* or *dialogued*. Also, no periods are used in the abbreviations 'Ms' or 'Mr'. These choices reflect growing modern usage.

Finally, *I alert all readers to my fondness for using "wordplay"*. I ask the reader's indulgence, but do contend there is purpose in this 'inter-play of words'. ☺

Wishing you 'quality' in all you do and are!

- Joy-to-You

## “Dialogs on Dialog” and “Thinking Thanks”

The whole subject of this qBook can be summarized using one word: “dialog”. The book “talks” (“dialogs”) with you about dialogs between humans, dialog as Nature’s way, and dialog as an interaction of ideas (represented as a ‘multiplication’ between ‘quality numbers’).

Thus, it seems most appropriate that a book about dialog should be in a form that uses “dialog”. *Each chapter is a “qStory”: a dialog between Mr Fantov (‘Mr Fan’) and either: 1) Ms D’s fifth grade class; 2) Ms D and Mr D; 3) Mr D’s speech (rhetoric) class; or 4) with Coach D’s football/soccer players.*

***In essence, we find Dialog, especially “Heartful Dialog”, a most powerful tool for resolution of human problems, as well as for transformation of our World!***

*No Dialog or Thinking is complete without a proper Thanking* of the several reviewers who reviewed the “0<sup>th</sup> edition” of this qBook. Your comments helped make these subsequent editions of this qBook possess a much higher ‘qualitative content’ than otherwise. Our sincere Thanks!

I extend my special Gratitude to Hermes de Nemores of F.E.D. for his keen help in guiding my ‘qBook dREA<sub>L</sub>m’ into a REALity, esp. re: q7, q9, q10, and this “2<sup>nd</sup> edition”. It is he who first called this qBook a “*novella*”. I find this qBook fits that definition well: “*A short prose tale often characterized by moral teaching or satire.*” [American Heritage Dictionary]

The reader may wish to make a hardcopy of this qBook by following the procedure provided in Appendix qW.

Finally, this qBook represents my personal philosophy and “interpretation” of F.E.D. theory, and as such, I am primarily responsible for that interpretation and its overall accuracy.

- Joy-to-You!

## What is this qBook about? An Introduction

This is a ‘qBook’, where the ‘q’ stands for a ‘quality’ thinking which might lead to greater quality in our world. Presently, our world seems to lack a ‘common sense’ thinking, which is often reflected in our leaders’ inability to compromise. But even more crucially, *our current thinking-process lacks the more fundamental ability to ‘synthesize’ differing points of view into a new or ‘better way’!*

What prevails is a ‘Yes/No’ (1/0) logic, a ‘My way, or the Highway’ mentality, that results in “no results!” While such a ‘0/1’ logic is great for building electrical circuits, it is ‘not-so-great’ for building better ways to solve human and societal problems. What is needed is a more encompassing, and more inclusive ‘logic’, which would offer us possibilities beyond “My way vs. Your way”, to a “Higher way” of ‘Our Way’ -- a ‘better one’!

Is such a logic possible or available, or is its pursuit simply ‘wishful thinking’? Obviously, this author believes such a ‘better thinking’ is not only possible, but is ‘at hand’ -- available to us now if we but allow ourselves to perceive more openly, and more ‘heartfully’. Quite simply, we need a logic of both head and heart, for one without the other dooms us to more of the same, or worse! Ashley Montagu said it using a ‘better rhetoric’: “*Without love, intelligence is dangerous; without intelligence, love is not enough.*”

We begin by talking, or ‘dialoguing’. Here, ‘dialog’ is regarded as the basis for genuine thinking and acting among thinking beings. Dialog, or ‘interaction among societal players’, is represented as a ‘multiplication between quality numbers’, each of which represents an ‘idea’ or a ‘set of ideas’ (a qualitative ‘ontology’ or ‘kind of being’). We then observe a natural ‘pattern of thought’, or ‘dialectic’, that describes the

creation of new and better ideas ('syntheses') that serve us all.

In hopes of keeping our presentation entertaining, yet as simple as possible, we begin and continue our 'dialogs' with youth, who don't quite know the current rules or 'games' -- the currently used 'ill'ogic. They tend to be more open to 'new rules' or 'a better game'. Thus, our dialogs, or "talks" are with fifth-graders, who have much 'heart', and with high school students, who have 'heart and mind' to evaluate new and better ways.

Also contributing to the 'drama', are those who enjoy expressing themselves with their 'hands' (bodies) in football or soccer games. We examine these "games" for their competitive/cooperative aspects, and for what they tell us about ourselves, our society, and our current thinking (choices). Since we 'ALL' are the ones making up the rules, a new game of 'fUtbALL' is defined as a metaphor for a new 'societal game' which posits a "winning for ALL"!

Rather than employing the traditional numbers for measuring *quantities* of physical-things, a new kind of 'quality number' is needed to represent desired *qualities* of idea-things. Thus, qNumbers and qArithmetic are developed to reflect this new kind of thinking/need: a 'new logic' of head and heart, and of the 'hands of action' it requires. Such numbers and arithmetic offer a new logic that goes beyond *win/lose* (0/1), and gives 'something more' in creating a *win/win* game!

That's basically what this book is all about. Such dialog and numbers provide a basis for understanding ideas, qualities, and for creating 'heartful synthesis' (quality 'possibility

thinking'), as we attempt to create a world, and lives, of greater quality, individually and collectively.

"*Feeling is--if not all--almost all.*" [Gaylin, *Feelings*, p. 3.] The essenti-all contention of this "novella" is that since **The Human Heart** is a big part of Everything that we perceive and *feel*, no Theory of Everything (ToE) can exclude Heart and Its influence. (Keep that in mind, string theorists!) In F.E.D. Brief #4 [see Appendix qR], I argue that Heart is already within F.E.D. theory, but perhaps is not seen or felt.

Furthermore, as this qBook attempts to demonstrate, any ToE must also acknowledge the role of **human humor** and satire as other "eventities" of Everything! I ask rhetorically: ***What better way to conduct Heartful Dialog than to laugh at ourselves and our current ways -- as we earnestly seek better ways?!*** Together with Head and Hands, Heart and humor allow us to move from the Now to the New, no matter what Then (Past) from which we may have "ascended" (not "descended" from) -- personally as individuals, collectively as societies, or genetically as our species: *HumanKind!*

Perhaps this entire 'Introduction' can be better summarized by the simple direct words of 'Maya', a precious (and precocious) 'fifth-grader' in the qStories:

*"This is really neat stuff! qNumbers represent ideas, not physical things. Maybe that's how the World changes? It changes through new, better ideas. And, 'dialoguing' is the 'qMultiplying' that makes the 'bigger, better ideas' that change the World!"*

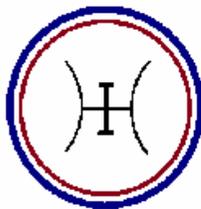
+ q0 x

(The above "+ q0 x" indicates "end of topic" or qStory.)

Part I:  
**Rhetoric & "Heartful Dialog"**



The 'qStories' q0 through q4 talk about Rhetoric as a '4<sup>th</sup>R', the meaning of "Heartful Dialog", and the development of qNumbers.



**q0\*: Ms D's fifth-graders and 'the 3R's'**

*A taste of the entire qBook, via the '3R's' + 'Dialog', via Ms D's kids, and how 'qNumbers' might help solve 'human problems'.*

It was early September, and school had started. Ms Diana Deary, a most caring fifth-grade teacher, noticed that many in her class weren't doing as well in their "3R's" (Reading, wRiting, aRithmetic) as she would like. After talking about this with her old high school friend, Jerry Fantov, she asked him to come and give her kids a "pep talk" that might help them want to learn more.

A few days later, Jerry arrived early at Ms D's classroom. She introduced him: *"Class, today we have, Mr Fantov, a special 'guest speaker', who is here to talk with you about 'You and the 3R's'. He likes to be called 'Mr Fan'. I'll let him tell you why."*

At first the kids were a little surprised at the name, 'Mr Fan', because it sounded somewhat "silly" to them. Then he said, *"If you erase the 't' in my name, Fantov, you get 'Mr Fan\_ov'. That's how I like to think of myself: As a 'fan of' you kids -- as your biggest supporter! So, please call me 'Mr Fan', or 'Mr Fantov', or whatever is respectful."*

The class began to think that "Mr Fan" himself was OK, despite his nickname. After all, they all liked someone who supports them!

Mr Fan then asked what seemed like a strange question to them: *"Students, why do you want to learn your Reading, wRiting, and aRithmetic, anyway?"*

"I guess because everyone thinks we should," answered Molly, one of Ms D's best students.

"Oh!?" Mr Fan wondered, and then surprised the class with, *"But, that's not a very good reason for me! Did you ever think that you should want to learn these subjects because they'll help you to do neat things?"*

"What kinds of things?" asked Reggie, who never really liked school.

"Well, who likes stories? Who likes reading them or imagining them?"

Right away Reggie and most of the kids raised their hands saying: 'We all do!'

"And who can write me a clear story they made up, and spell all the words right?" Mr Fan asked.

Only a few kids raised their hands this time.

Then Mr Fan suggested, *"Maybe we should record our talk today, that way we'll have a story to write! Once someone writes it, and someone reads it but doesn't like it, he/she can re-write 'Our Story'. But to do that, you have to read well and write well, right?"*

The class began to understand what Mr Fantov meant. He then started his recorder, and said, *"Remember, if you don't like your story, you can change it later. Nowadays, it is so easy to change things, especially with e-tablets, computers, and other neat devices."*

Then Reggie asked, *"But Mr Fan, what good is aRithmetic? Why should I learn that?"*

Mr Fantov, looked at Reggie, then asked the whole class, *"Girls and boys, do you like sports? Do you like keeping track of scores, or making things that involve counting, or measuring items in a recipe? If so, then you need to know your aRithmetic!"*

The class buzzed with his reasons why they should learn their 3R's! Then Mr Fan tested Ms D's students: "Suppose you want to help make eggs for breakfast, say 2 eggs for each of 6 people? Or, 3 eggs for each of 4 people? How many eggs do you need?"

*"That's easy, 12 eggs!" Reggie answered.*

"Good, Reggie! You see, you know some multiplication. That's aRithmetic! *It's not so hard when you want to use your math to make things -- something you want to do, right?"*

"Yeah, I guess so!" Reggie and several others agreed.

Then Molly asked a really good question. "Mr Fantov, I like school, but *I sometimes don't understand why I have to study things that don't help me live any better -- things that don't seem to make me any happier!"*

"I understand, Molly. That's what many people think -- even many adults. *But what if I told you that I know about special numbers that can help us all have more 'quality' in our lives? I call them 'quality numbers', or 'qNumbers', for short. Would you want to learn about such numbers, some day?"*

"Oh yes!" said Molly, as everyone nodded 'Yes!'

*"Please show us how these 'qNumbers' are used to make things better",* asked Johnny, a student who liked his aRithmetic.

*"OK, but first I need a 'Problem' -- not a math problem involving regular numbers. I need a 'human problem' -- maybe a problem you have with your mom or dad, or your brother or sister. Let me ask for a problem from someone who hasn't talked with me before!"*

Then Jock, a big, tough-looking boy, finally spoke, admitting, *"Well, I've got a problem with my mother! She always wants me to do my homework -- right after I get home from school!"*

"So, your problem is that you don't like your 'situation', right Jock?" Mr Fan repeated.

*"Yeah, but what can I do about it?"* Jock wondered.

"You could label this situation with a qNumber, say 'q1'. Then, q1 would represent your problem, or 'starting situation'," Mr Fan claimed.

"OK." Jock accepted.

*"Next, Jock, you could tell us why your mom wants you to do your homework as soon as you get home. Tell me how she sees the same situation, that same 'q1' from her point of view?"*

"Well, she thinks if I don't do my homework as soon as I get home, I won't do it at all!"

"Is that true?" Mr Fantov looked into Jock's eyes.

*"Well, yeah -- most of the time I won't do the homework, especially if I can get away with it!"*

*The class laughed -- for they all understood Jock and his situation. For many of them, it was their 'situation' too!*

Mr Fan smiled, then asked, "Jock, what if you talked honestly with your mom and promised that you would do your homework right after you played for one hour after getting home? Do you think she might agree to that?"

Jock wondered, "I guess (she would), if I promised -- and actually kept my promise!"

Again the class laughed because they knew Jock -- and they knew themselves.

"So Jock, and this whole class, let's look at how qNumbers can help us all, especially Jock and his mother in their 'starting situation', which we are calling q1."

"When Jock and his mother talk about their q1 situation, they are 'dialoguing' or 'interacting'. They are relating to what Jock sees as his situation, his q1, and what his mother sees as her situation, which is also part of the same q1, right? *What might they do with their q1's?"*

*"They could multiply them together to get some kind of answer!"* the usually shy Maya blurted out quietly. (Maya already seemed to have an understanding about Mr Fan's qNumbers.)

"Yes!" Mr Fan yelled out too! "Jock and his mom, by talking out their situation, or 'dialoguing', they would be 'multiplying' q1 times q1."

"I get it!" Johnny said excitedly, *"and maybe q1 times q1 is a qNumber more than q1?"*

"Very good, Johnny. Let's say that *q1 x q1 is q1 plus some q2.*" Mr Fan suggested. *"But what would q2 represent?"*

*"It could be a better situation!"* Maya realized. *"q2 could be the solution to Jock's q1 problem!"*

Mr Fan smiled once again, and then walked over to Jock and said gently, *"And Jock, what really is that q2 solution?"*

Jock lowered his head a bit, then lifted it up and said, *"q2 means I must promise that I'll do my homework as soon as my one hour of play is up, and then I must really do my homework!"*

"Yes! You must actually keep that promise to your mother!" Mr Fan looked at Jock sternly and reminded him of the 'overall situation': *"Remember Jock, if you don't keep your better 'q2 solution', your mother can always go back to her 'q1 solution', your not-so-good 'q1 situation'!"*

"OK," Jock admitted. "I'll talk to my mom when I get home to make and keep my 'q2 promise'."

\* \* \*

The whole class was amazed that Mr Fan had showed them how his qNumbers, or 'quality numbers', could actually help them solve their 'oh-so-human' problems.

Even Ms D, who had been watching from the back of the classroom, said, *"So, students, Mr Fantov has not only shown you why learning your 3R's is so important,*

*but he is also teaching you about another 'R', another kind of 'aRithmetic 'that helps you 'dialog and solve' your own human problems!"*

Mr. Fantov was quiet for a while, then he asked, *"OK, who wants to write down 'Our Story' that we've recorded? I'll give this recording to Ms D."*

Several students volunteered to write the story, a story about the 4R's, their own 'qStory' that would include their first talk about qNumbers!

Then Mr Fan added, *"And who will change the story once it's written?"*

Even more students volunteered to do that -- for they all had their own ideas on how to make it a better story.

+ q0 x

## **q1: Dinner and Dialog at the D's**

*Introduction to the adult characters: Mr Fantov ('Mr Fan'), Ms Deary ('Ms D'), her husband: Mr Durer ('Mr D' or 'Coach D'), and Dialog on their shared dream of a "Better way" for Youth & All.*

When it came to her fifth grade students, no one had more heart than Diana Deary. She saw each student as having the potential to change the world -- or at least, as having the potential to create a more quality world for each of them. After her friend, Jerry Fantov, had spoken to her class, she became convinced that she, her husband: Douglas Durer, and Jerry should have a chance to reunite after the many years since they attended the same high school.

That evening she brought it up. *"Doug, did you know that Jerry Fantov spoke to my fifth-graders today? The kids really got something out of his talk on what turned out to be 'the 4R's', and he seems to have many of our same concerns. As you may remember, Jerry went on to study mathematics, history, and philosophy, plus he likes kids. Let's have him over for dinner -- to catch up."*

*"Sounds good," Doug replied, "Jerry and I were in high school speech (class) together. He always had a way of seeing things as funny, even when they weren't!"*

So, they called Jerry, inviting him for dinner that weekend. When Jerry came to their door, he had a wide smile and a strange riddle for them: *"Hi, Diana and Doug! 'What side of the Moebius band, do you prefer?'"* he quizzed.

Neither Doug nor Diana knew what Jerry meant, so Jerry had to explain that a Moebius band was a strip of paper, and because it is made with a half-twist, it has only one side. *Therefore, either side is the same side!*

Being a good host, Doug faked a smile, and joked back, *"Jerry I never got your humor in high school speech class, either!"*

So began their dinner and dialog, a reunion of old friends. After dinner, and some small chit-chat, Diana asked, "So, Jerry, what have you been doing since high school?"

*"Oh, it's been many years of 'exploration', including a career in business. But, I'm now retired from that corporate world. That life wasn't for me. What I really have enjoyed, though, is all the travel that I've been able to do -- throughout the world."*

"That sounds fascinating! What impressed you most out of it all?" Diana inquired.

*"Well, even though I encountered many different languages, cultures, and laws, the thing that struck me most, is that people, and their needs and aspirations, are pretty much the same all over the world. And despite this basic 'sameness', every people or culture seems to come up with its own different solutions to those same human needs. -- Oh, enough about my travels. How about you both? What are you each doing these days?"*

Diana replied for them both: "Well, from your class visit, you know I teach fifth grade. *But, did you know*

*that Doug is both a football/soccer coach, and a speech/debate teacher?"*

*"Wow, football and speech -- like those two subjects really go together!?"* Jerry teased.

"Actually they do for me, Jerry! Both (subjects) are forms of expression: Football and Soccer are expressions of determination using the body, while Speech, Debate, or 'Declamation', offer various forms of expression of the mind, by way of the mouth!" Doug expressed in a humor that Jerry might appreciate.

"That's true, but I use my mouth to eat, too -- Thank you for that delicious dinner, Diana!"

*"You're welcome, Jerry -- but, do you ever quit joking?"* Diana laughed, then sighed.

"Oh, sometimes, I do ..." He smiled, then, in a more serious vein, he asked, *"Tell me, Diana, how do you like elementary teaching? I'll bet it's not so elementary!?"*

Diana then became even more serious, responding, "It sure isn't 'elementary'! It's really challenging. *I'm worried that my kids aren't making enough progress, especially in the three R's.* That is, of course, why I asked you to speak to them."

"I understand, Diana. I've had similar concerns about the young employees that I encountered in my business career. Many of them seemed so ill-equipped. Some couldn't even write out a complete thought, or say what they meant, even when they had a good idea that would have helped them and their company! *It's sad that so much human potential is not being used to make lives*

*better,*" Jerry expressed, showing his caring side as the Moebius band's only, one, unified side.

*"That's why I like what I do, when I teach speech or 'rhetoric',"* Doug added. *"It's so important to be able to express what you think and feel, especially when it comes to persuading others."*

*"Yes, Rhetoric is really 'the 4<sup>th</sup>R', isn't it, Doug? Maybe that's what our young people need more education in, or a chance to bring out -- what the Latin word educare really means!?"* Jerry added.

"Well, it sure has helped me in my career," Doug began. "As you know, Jerry, when we started speech class back in high school, I could barely open my mouth. But, by the end of the school year, I felt confident enough to speak on almost any topic. And that confidence and skill has also served me well as football coach and assistant soccer coach. As coach, I'm often asked to speak at public events, and that gives me a chance to 'lobby' for expansion of the football-soccer and/or speech-debate budget at the school."

"And Doug was able to get additional funding in all of those areas! *I'm proud of my 'football speaker'!*" Diana said joyfully.

"That's so great. You are both enjoying life, your jobs, and you both genuinely care about young people." Jerry noted, and then asked one of his mind-altering questions: *"If you each had an unlimited budget, what would you do to better prepare our youth?"*

"Well, I'd make sure that my kids had a good home life, if I could, and that they had a sincere desire to learn," Diana started. "I want to see them using their hearts, as well as their minds. *I just would like each of them to take all that is inside them, and make it real in their outer life.*" Diana waxed idealistically.

Doug's reply was not so different. *"Jerry, I'd make sure all students are given a chance to express themselves about all that's in them -- in art or speech, in science or math, or on the football or soccer field. Most importantly, I'd make sure that the kids could smell 'B.S.' when a person, such as a politician, is conning them, or playing with their minds."*

Jerry then summarized, *"So, you'd both like our kids to use their 3H's wonderfully: Head, Heart, and Hands -- to be all that they can be. Is that right?"*

"Exactly!" Diana and Doug said, in unison.

"Well, my concerns and dreams are essentially the same, but perhaps less idealistic, more tempered by my own life observations. Maybe we can talk, or dialog, more about this. *I truly believe that 'dialog' is the most powerful* of all of the 'd's: dialog, discussion, debate, declamation, disputation, discourse, etc.!"

"As a matter of fact, Doug, I tested Diana's class a bit, on how standard arithmetic solves quantitative problems. But I also introduced them to my 'arithmetic' that uses 'dialog' to solve their 'quality problems' in life."

"That sounds interesting, Jerry. Maybe you could have a talk with my speech class," Doug suggested.

"... and, maybe, with your football/soccer teams, too. After all, those are great games for many people," Jerry added.

*"But those games are so physical! To me the opposing teams behave as enemy armies on a battlefield!"* Diana decried. *"One side wins, and the other side loses -- often at such cost to both/all!"*

Surprisingly, Doug also lamented. *"In some ways I agree with you totally, my dear.* But, these games also teach sportsmanship and competition, and through teamwork, they teach cooperation! Quite honestly, in debate and dialog in speech class, I try to teach how to resolve problems in more peaceful ways -- through dialog, as Jerry suggests."

Jerry immediately observed a contradiction, "Doug, you seem conflicted in your dual career. In football, you teach the 'banging together of heads and bodies' to win, but in speech class, you teach 'the using of heads and hearts' to resolve problems!"

Doug just looked at Diana, conveying an admission that Jerry had touched upon a conflict within him.

She could only say, *"Oh, I wish there were a better kind of football game where everyone wins and no one has to lose: A game where students can use their heads, hearts, and hands -- their mental, emotional, and physical energies -- in a more constructive way. Then all would benefit."*

*"You know, Diana, such a game may be possible. Maybe someday someone will invent such a 'new kind of game', where all would win, yet those who wish, could also compete in ways they still seem to need (to compete)," Jerry predicted.*

"It's getting late. Jerry, why don't you first talk with my speech class next week, to explain this 4<sup>th</sup>R of Rhetoric through a new aRithmetic. Then later, talk with my football and soccer teams, just to understand why they like those games so much. Maybe we could even begin a dialog to dream up the kind of game Diana wishes for -- a game where all would win!"

*"Yes! And don't forget, my fifth-graders also want you back for another talk!"* Diana squeezed in before Jerry left.

With that, the dialog of the evening ended, and a promising new dialog was about to begin.

+ q0 x

## **q2: Mr D's Speech/'Rhetoric' Class (the '4<sup>th</sup>R')**

*Mr Fantov discusses his views on 'rhetoric', his notion of 'heartful dialog', and his hopes for the '4<sup>th</sup>R', Rhetoric, and its aRithmetic.*

As Mr Durer had asked, Jerry Fantov came to his high school speech ('declamation', debate, rhetoric, dialog) class, which included some of Mr D's football and soccer players. *Mr D introduced Mr Fantov as "a 'promoter of dialog and rhetoric' (as the "4<sup>th</sup>R"), in all forms, including via a 'new arithmetic of ideas'."*

To Jerry, Mr D's "Introduction" seemed a bit much to live up to, so he decided to first find out what these 'speech students' were all about. He began with, "Hi, I'm Jerry Fantov, but you may call me 'Mr Fantov', or 'Mr Fan', for short, because I want to be your greatest 'fan' or 'supporter' in your studies and in who you are!"

Then, 'Mr Fan' began with a 'surprise question': "Actually students, since it's been a long time since Mr D and I also were in speech class together, perhaps you should be teaching me!? *Would anyone like to 'fill me in' on 'Why is speech or 'rhetoric' important?', or maybe, to offer me a definition of 'What is rhetoric?' ?"*

Since no student felt confident enough (yet) to 'teach' Mr Fantov, he smiled, "OK, you had your chance!"

He then offered, "My favorite definition of Rhetoric was written by Aristotle over 2000 years ago: *Rhetoric is the art of finding the available means of persuasion for a given case'."*

"So, you can easily understand that mastering such an art gives you a tremendous advantage. That, students, is why rhetoric (and/or declamation) is important! Actually, though Mr Durer is too modest to admit it, his effective use of 'rhetoric' is the reason this school is well-funded in debate, drama, and other modes of dialog and discourse."

"So, you're saying *rhetoric* is important, but you use Aristotle's definition. I'm more interested in your definition. *How do you define rhetoric, Mr Fantov?*" -- an alert student named Adelle, quizzed him.

"Ah, very good, Miss. It's not enough for any of us to echo what another has thought, without thinking and offering what s/he thinks! But it is good to study the ideas of *the great minds before us* who have blazed or cleared *the path for us*. After all, we don't need to 'reinvent the wheel' by inventing our own definitions, when others may have already defined the topic well. *But, I'll now answer your question ...*"

"To me, *rhetoric covers all forms of verbal expression - oral or written expression* such as: The d's of discussion, dialog, debate, drama, declamation, disputation. *It includes written scripts, speeches, reasoned arguments using the Head, as well as the emotional arguments of the Heart*. I would, however, replace Aristotle's phrase: '*means of persuasion*', with: '*means of convincing by 'heartful dialog*'."

"Beyond the use of our brain and our alleged (and limited) 'logic', and beyond the use of emotions to manipulate, *I wish to define Rhetoric to be a solution-*

*generating process which yields effective, lasting solutions that result from 'heartfelt' or 'heartful dialog*'. What I seek is a dialoguing process that does not offer expedient 'band-aid' fixes, but creates relatively lasting solutions that truly resolve the differing or opposing views for a while -- until -- of course - newer 're-solutions' are again needed. All this dialoguing would be a recursive-progressive process of *dialectic* -- another 'd' term! That is what I, personally, mean by 'Rhetoric'. Does that answer your question, Adelle?"

"It does, Mr Fan. It sure exceeds any definition offered by a dictionary. *I especially liked that you wish 'relatively lasting solutions' requiring 'heartful dialog*'."

"Thank you. Now, let me, for a moment, contrast my notion of 'heartful dialog' with formal 'debate', a very misused term. Certainly what politicians call 'debate' is hardly real debate, where each side must really defend their positions with real facts from authoritative sources. And, *what they call 'debate' on today's news channels is merely one side 'stating its opinion/position then berating the other side*, using 20-30 second sound-bites'. In these 'debates', no real resolution is sought or offered! *Such is not 'de-bate' - it's a 'be-rate' (or 're-beat') of the other side!*"

Mr Fantov, then continued (on his 'soap-box'), "As you know from this class, formal debate begins with the Affirmative side announcing its resolution for *change in the status quo: 'Be it resolved that ...'*" But such a *start* is hardly the result of what I would call a 'heartful

dialog'. What I'm interested in is a meaningful, effective dialog by which *each side states its heartfelt needs for Change*, versus what Is (the *status quo*), AND *each side listens to, and respectfully acknowledges, the other side's needs.*"

*But aren't you being totally idealistic, Mr Fan?*" Adelle asked honestly.

*"Oh, admittedly I am! But that's my notion of 'an ideal dialog'. In fact, whatever does emerge from an 'honest' (or even a 'dishonest') dialog, can still be 'effective or heartfelt dialog' in bringing about Change -- as long as the result is some kind of genuine synthesis of both sides' positions,"* Mr Fan admitted.

"Class, please forgive me - for I have digressed, woefully! Back to our term, 'rhetoric'. Of course, some might say our leaders give us a lot of 'rhetoric', but no real action or solutions. *Under my definition, rhetoric would include dialog and action!*" Jerry went on ...

"Unfortunately, too often what we see happening, in our decision-making or our politics, is that there is no real process toward resolution. *We see and hear opposing sides nit-picking against each other, but ultimately, each side is vying for power or control.* And, once one side has obtained such control, that side proceeds to implement 'its solution', leaving the other side's concerns unaddressed. *It's a 'My way or the Highway' mentality, rather than a mentality of a 'Higher way' that benefits all.*

Adelle added, "Exactly, and when the other side, 'Side 2', gets into power, as it eventually will, because

of the excesses of 'Side 1', it rules with the same 'My Way or the Highway' philosophy that Side 1 did! *But how do we all arrive at that 'Higher Way' or 'Better Way' that you are suggesting?"*

"Class, 'That' is why I'm talking with you today. And I do mean talking *with you* - for I have only a few ingredients of that better way. Quite honestly, I'm counting on your minds, and other fine young minds like yours, to continue offering more such 'ingredients!'" Mr Fan asserted, as he invited their ideas, too!

Then an unlikely contributor spoke up. "I'm Brad Holloway. I play on Mr D's football team. *What you and Adelle have outlined is pretty much like a game of football. One team gets the ball and tries to beat the other team. If the other team doesn't get the ball and score, it loses -- until the next game, of course.*"

"Yes, Brad. *But why do we keep playing essentially the 'same game' over and over? Where is the 'lasting gain' for all, in that -- except maybe for the 'winningest team'?"* Adelle asked, 'rhetorically'.

Mr Fantov then announced: "*Ah, Brad and Adelle have uncovered the real problem, not necessarily with the game of football, but with the Game that We, as Society, are playing. It seems like a game that never really gets us anywhere. It's like thinking in circles, or like chasing each other on the same circle -- the same path to nowhere, or to the same old 'where' that we've been to so many times before. We don't ever seem to leave the same confining circle!"*

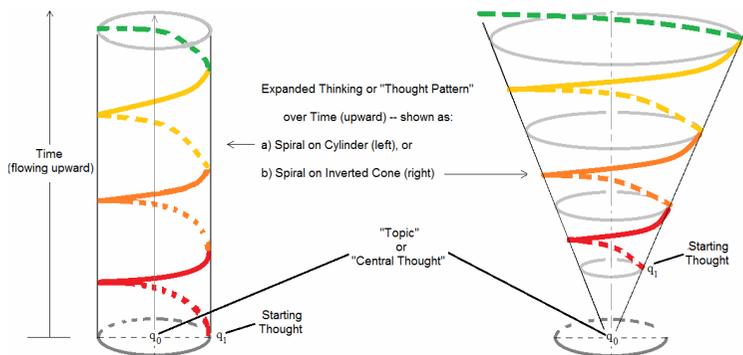
"We need to elevate our thinking up into a helix!"  
 Jeremy Brightner, a math student, exclaimed.

"What in the world does that mean?!" Adelle  
 exclaimed back.

Jeremy then explained what he had exclaimed:  
 "What I mean is: *To exit or transcend the same old  
 circle is to rise upward in our thinking. We leave the  
 '2-dimensional flatland of the circle', turning or 'winding'  
 upward into the third dimension, which describes a  
 'helix'!* It would be like our thoughts winding up and  
 around on the outside of a soda can, or on any cylinder!"

"Or, around on an upside-down cone. That would be  
 like 'inverting the dunce cap' that we are collectively  
 wearing!" Mr Fan joked, perhaps only to himself, as he  
 drew Jeremy's and his helices on the marker board  
 (Figure 2).

Figure 2. Helices on Cylinder (left), and Inverted Cone (right)



Then, seriously, he asked: "And what do you propose  
 would propel our thinking upward? What would stop the

endless 'thinking in a 'vicious' circle', making it a  
 'victorious rising', instead!?"

This powerful question sent the entire rhetoric class  
 into silence. Then, after some caring and careful  
 thought, Adelle announced: "In order to think or propel  
 our thinking 'upward', both sides who are chasing on the  
 circle, must benefit in a way that they cannot benefit  
 by playing the 'circle game of winning or losing'. In order  
 to 'think upward', both sides must win!"

"Yes, that's it! We need a game in which everyone  
 wins." Their 'greatest fan' agreed. "We need a new  
 game of thinking, where everyone who plays, wins  
 something relatively 'fair', and the resulting thinking  
 takes us *upward or forward*, not, downward, backward,  
 or, shall we say, 'no-ward'. My Friends of Rhetoric, the  
 days of Win/Lose games that truly affect so many --  
 such 'zero-sum' games -- must end!" Mr Fantov ended  
 his "speech" to Mr D's 'speech class'.

Everyone in the class had listened -- for they each  
 now saw that they had something to win by inventing a  
 new thinking/acting game. It would be a 'Game of  
 'Heartful Dialog' with others', and a repeated process (a  
 'dialectic' of cumulative, progressive change/resolution  
 that gets us all somewhere, not nowhere!

"What a great start toward creating a 'better game'!  
 We must have Mr Fantov back, soon," Mr D announced,  
 as he smiled at everyone - and as he thought to himself:  
 "Maybe such a new kind of game really is possible!"

+ q0 x

### q3: 'Resolution' or 'Revolution'?

*'Thought Patterns' in History*

*A look at history just before and after the American Revolution, using qNumbers: the 'hurtful' consequences of un-heartful dialog'.*

At the end of Mr Fantov's first visit, Mr D's class felt encouraged and challenged by his definition of rhetoric as heartful dialog and action. When Mr Fan returned, he started their dialog by saying ...

*"But before we can dialog effectively, we need a way of understanding or 'modeling' what effective thinking is, and how it might guide us. In our desire to have a real 'science of dialog', we need an arithmetic with new kinds of numbers that would capture the ideas being discussed, and 'heartfully synthesize them' into better ideas. Any ideas, class?"*

No one was ready to contribute yet, so Mr Fan continued, "Let me share with you some of the 'ingredients' about idea-dialog that I've already developed. Let's take history, and how ideas change history. Any suggestions?"

*"I've always liked what led to the American Revolution and what followed,"* offered Julia, who planned someday to major in History.

"That would be a great way to start," Mr Fantov agreed. "Was a revolutionary war really necessary?"

"Of course it was!" answered Brad, as if there were never a choice in the matter. "England was taxing us colonies without letting us have any say in the matter!"

"That's true. We had to fight!" said Steve, another football player, like Brad.

*"Well, they all had a choice!"* Mr Fan made clear, "but only a relatively few actually decided to fight with their lives, and only after exhausting various attempts to resolve objections to English policies constraining the American colonists. *But, why did the War have to occur, or: Why 'revolution' instead of 'resolution'?*"

"Because there was no effective communication, or 'heartful dialog', as you say, Mr Fan," answered Julia.

"OK, then. Maybe we could let some kind of 'quality idea-number', say *q1*, be England's policy, or the 'status quo'. And, let some *q2* be the objection or counter idea, from the colonists, to that 'status quo'. Let's say *q2* means: 'the colonists' right to a fair deal', or 'Taxation only with representation, only after dialog!" Mr Fan suggested, and then asked, "What might happen then?"

Julia then shared some of her fascination with history -- and with the weather! *"Well, history tells us that opposing ideas must get resolved -- one way or another. It's sort of like how high and low pressure systems resolve in Earth's weather. Nature is always moving to balance herself out, and hopefully in an 'upward' way. Maybe storms and hurricanes are really Nature's attempt to resolve an 'inward' imbalance and is 'Her way' of creating a greater balance 'upward' -- I sense that."*

"That's poetic, Julia, but try letting the opposing team 'resolve your imbalance' on the football field! *You'd better go on offense first!*" Steve said mockingly.

*"But that's the problem! Too often we go on offense first, without thinking -- without creating and offering*

*a possible resolution!" Mr Fan said most forcefully.*

"But, back to q1 and q2. How might these seemingly 'opposing' views/ideas, be resolved?"

"Ideally, England should have 'dialogued' with the colonists, *resulting in either a better arrangement, or if not, clearly a worse resulting situation.*" Brad offered.

"So, we could let dialog be a kind of 'multiplication' between our q1 and q2 ideas, with their product being a 'synthesis' or 'resolution', like this (Mr Fan wrote on the marker board):

$$q2 \times q1 = q1 + q(\text{'heartful joining' of } q1, q2) = q1 + q3$$

where the status quo is still part of the overall solution -- England would have insisted upon that. Let's just say that 'heartful-joining' (synthesis) was  $q3 = q(2+1)$ .

"Yes, and that 'combination' would be the 'synthesis' or result of a 'heartful dialog' -- as heartful as it could have been," Adelle added.

"But history shows us that the actual result of that dialog was more 'hurtful' than 'heartful', since it led to war," Julia reminded everyone.

"Yes, Hurt is often the result of Heart's unmet needs, especially when no other means of resolution is found or chosen," Mr Fantov said, realistically. "And, what was that q3 result then?"

"It was 'Independence from England!'" Adelle announced. "The *old status quo* gave way to a *new status quo: Independence ...* "

"and the formation of 'the US of A!'" Steve added.

"You mean, the formation via the 'A of C'," Mr Fantov clarified, leaving the class wondering what he meant.

Julia realized, "Oh, Mr Fantov means that *first there were the 'Articles of Confederation', the 'A of C'*, which held the 13 new 'nation-states' together, loosely. But that didn't work well because of a 'joint need' for a common currency and defense. The 'A of C' may have been patterned after the Iroquois Confederation of Native American tribes ('American Indian' tribes). A *confederation* may have worked well for those tribes, but not for the new 13 self-governing 'nation-states'. Maybe that problem should be some q4, or something."

Mr Fan smiled, "Exactly, Julia, let q4 be some idea that would result in fixing/resolving the weaknesses of the A of C. What might that idea be?"

"That would be the idea of a strong 'federation' or 'union', not a loose 'confederation' of 'nation-states', but a federal government under which each 'state' would now be a part -- a self-governing part within one 'larger unified nation-state'," Julia continued. "So, Mr Fantov, would we then multiply q3 by q4, since q3 was then the new *status quo*?"

"Yes, that's what I've been thinking," Mr Fan agreed. "We would (in symbols and in words) then have:

$$\text{New Status Quo} = q4 \times q3 = q3 + q(3+4) = q3 + q7,$$

'US of A' = 'idea of strong union' x 'AofC'

= 'individual states of AofC' + 'Federal gov't of US of A'."

Mr Fantov, then summarized: "*Using these 'qNumbers', we show and understand the thinking*

process that formed the 'US of A', and how the individual states partially subordinated their own 'individual-independences' for their mutual benefit, theoretically forming *one unified 'meta-nation' of 'nation-states'*! In turn, each 'constituent state' would offer 'its vote' ('electors') for a federal president. Hence, an 'electoral college' of states' votes selects the US President, not the people directly -- which, to some, is an un-resolved issue to this day!"

"Wow, that makes History almost like Arithmetic!" Adelle observed.

Mr Fantov claimed, "Precisely! Students, that is what an arithmetic of ideas (or of 'rhetoric') would do. It would allow us to understand how ideas (of 'human actors') interact in *re/creating existing/new* institutions that effect how we live, and the quality of life that we have."

"... And, by using your 'dialog', or 'idea-multiplication', an arithmetic of ideas would ultimately make us aware that our ideas interact to help create the world we want (Heart) and think (Head)!" Adelle added.

Mr Fan could only smile -- for Adelle had said what he had forgotten to say. "Right! Thank you, Adelle."

"Oh, by the way, for those who want to, let's meet in the auditorium tomorrow after school and develop our 'ideas about ideas' further." Only a few students really wanted to, but those few met Mr Fantov that next day to develop a "qNumber system" that would even amaze an ancient Greek philosopher, such as Plato or Aristotle!

+ q0 x

#### **q4: Developing Idea-Numbers: 'qNumbers'**

*Mr Fan, with 4<sup>th</sup>R students, together develop 'qRithmetic', a system of 'quality-numbers', to express 'idea-interaction' via a multiplication (x) and an addition (+) of 'qNumbers'.*

The next day, 'Mr Fan' was back to 'fan whatever flames about ideas' the students would start with him. In the school's auditorium, the synergy was amazing - almost as if Mr Fantov were directing a play, with each student being a key 'player' or 'actor' in a major drama ...

"So class, how might we envision ideas to behave under an addition and a multiplication?" he began, "But first, I suggest that we preface any 'idea-number' with a 'q' to suggest: 'qualitative-/quality-number', each of which will measure ideas, idea-qualities, or ontological 'kinds of idea-being', if you will?"

"Well, why don't we just assume that they might behave the same way as our standard numbers do, like the Fractions!" Jeremy suggested, being the math student he was.

"But you can't add or subtract an idea as you do a standard number, can you?" Adelle questioned. "I mean, suppose I have an idea qA, and I give it away to you. Then I still have idea qA. That would mean qA-qA = qA, for any idea, wouldn't it?"

"Ah, you're right, Adelle!" Jeremy realized. "And that, might equivalently mean that qA = qA+qA, for any idea in our set of idea-numbers" (if adding 'qA' is OK).

*"And what would that mean for your suggestion that idea-numbers could be like the standard fractions?"*

Mr Fan challenged him.

Jeremy thought on it, and in "doodling" about it, he quickly reached ('proved') some kind of result in his notebook. *"Gosh, it would mean that our idea-number set couldn't have either fractions, or opposites!"*

Although no other student knew why Jeremy claimed this, Mr Fantov seemed to smile in agreement. [See Appendix qR: F.E.D. Brief #8 may reveal this reason.]

*"What? No opposites?!"* Brad yelled out. Then your idea space is not like a football or soccer field 'cause in football we can 'sack' a quarterback for negative or opposite yardage (meters). *These idea-numbers wouldn't be like our standard numbers at all!"*

Mr Fan again gave a slight smile as he asked, "So, Jeremy, are you saying idea-numbers would necessarily have to be like the Whole numbers, without either negatives or fractions?"

*"Yeah, I guess I am saying that. Ideas would have to be 'whole ideas' and each idea would need to have Adelle's property:  $qA - qA = qA$ , or maybe:  $qA = qA + qA$ !"* Jeremy announced.

"So, ideas, or a 'set of ideas', has to be 'whole and vast'. And, not allowing any 'fractional ideas', would be like saying: *No 'half-vast' ideas are allowed! Right?*" Brad joked, cleverly indulging in 'football humor'.

Although Mr Fan 'got' Brad's humor, he didn't encourage it or dwell upon it. "OK, let's suppose Jeremy

is right. Then, what would a sum of idea  $qA$  and idea  $qB$  represent?"

"Well, I think it would simply be idea  $qA + qB$ , not necessarily reducing to any other pure, whole idea, but joined ' $qA + qB$ ' ideas!" Adelle claimed, more by intuition than any math reasoning, such as Jeremy had used."

Again, for some reason, Mr Fan seemed to agree with Adelle's guess, as he said, "OK, let's assume that. Let's assume that  $qA + qB$  is a simple 'sum-idea' that is not equal to any other one whole idea, but is the 'union' ( $\cup$ ) of each idea term, and is summarized as the *sum-idea* of separate ideas:  $qA \cup qB = qA + qB = \{qA, qB\}$ . Thus, the sum ' $qA + qB$ ' could represent a 'living-side-by-side' or a co-existence:  $qA$  'coexists with'  $qB$ . Somehow, all these interpretations make sense to me, Adelle."

"In that case, what would 'multiplication' be like, Mr Fan?" Adelle began. "In your last talk with us, you said that 'dialog' between people is like an interaction of ideas, a multiplication of ideas. *How would such a multiplication work?*"

*"How do we all want it to work?"* Mr Fan smiled broadly. "What are some properties we would want from a 'cross of ideas'. Would such a 'cross' ( $\times$ ) be anything like what we get from Mendel's genetic 'cross' of plants -- or of animals?"

*"Are you suggesting that ideas might multiply as animals multiply, and thereby create a 'child idea' as a mix of both parent ideas?"* Brad wondered out loud.

"I was merely wondering what a 'cross of ideas' might mean," Mr Fantov clarified himself, "but, Brad, you have suggested something quite 'brilliant'?"

Immediately, his classmates quietly started teasing him, "Brad the Brilliant!" or "Brilliant Brad -- oh sure!"

Even Mr Fan laughed a bit, but admired Brad's idea. "What Brad's mind leapt to, may apply well here. We do want our product idea,  $qA \times qB$ , to have aspects of each 'parent idea',  $qA$  and  $qB$ . But we also want that product to be some new combination of  $qA$  and  $qB$ . This combination would be a result of what I have called 'heartful dialog' of 'qA with qB', or of 'qB with qA'."

Jeremy once again scribbled into his notebook, then made his findings known with a brief 'extemporaneous speech': "In that case, I propose that we use the heart symbol ♥ and let  $qA \heartsuit qB$  represent this 'heartful combo' of  $qA$  and  $qB$ . Furthermore, if we want our  $qA \times qB$  to include aspects of 'qA and qB' (or of 'qA or qB'), we could just add them to  $qA \heartsuit qB$  to get our 'dialogued multiplication', like this:

$$qA \times qB = (qA \heartsuit qB) + qA + qB.$$

Adelle agreed, "You know, Mr Fan, I think Jeremy has given us all a reasonable way to multiply, especially if we can somehow determine what that idea number,  $qA \heartsuit qB$ , should be."

"I agree, also. I find Brad's 'brilliant idea', made into a formula by Jeremy, to meet all of my wishes for a successful 'dialog', or 'multiplication', of ideas. Let me explain:

"First,  $qA \times qB$  includes the parent ideas,  $qA$  and/or  $qB$ , summed into it. Actually, one parent may be sufficient, since the resulting 'heartful combo',  $qA \heartsuit qB$ , would 'contain' both parent ideas."

"Second, by including  $qA$  and/or  $qB$  as only a part the overall product, we override or 'negate' either as the entire product. The product is a 'new-kind-of-solution' idea, beyond  $qA$  and/or  $qB$ .

"Third, by using the  $qA \heartsuit qB$  term in the product-sum, we have a built-in 'heart-uplifted synthesis', which would represent a 'bigger or better' idea-number."

"Finally, we have that the "quantitative ordering" ( $<$ ) of Whole Numbers passes over to a "qualitative ordering" (" $<$ ") of  $q$ Numbers since

$$"A < B" \text{ mutually implies } "qA "<" qB".$$

Then Mr Fantov filled in for them some historical background about their emerging number system:

"Students, there was once a German philosopher named Hegel ('Hay-gle') -- gee, I sound like I'm starting a limerick -- so, let me try:

There once was one, named Hegel,  
who liked many a bagel.  
So, all greeted him with: "HeyBagel!"  
Like a 'synthesis' that he 'cradled';  
Or is it: That which he 'creat[e]led'?

"OK, that may have been quite 'lame', but thanks for letting me try it! Now, please, let me resume:

"Hegel wrote many words, and despite being difficult to follow, he suggested this very formula that we've just set down in our notes. He required so many words, so much thought back Then -- to help get us to our Now -- when we are able to express it all in just a few symbols. That's 'quality thinking' -- that's 'progress'! That's how historic ideas progress qualitatively! If we may, let's take a moment to thank Hegel and others who cleared the thick uncleared path, and helped pave it with the clarity of new/now ideas ..."

After a minute or so of 'ThanksGiving for Hegel's and others' Thinking', Mr Fantov resumed. "Now, back to our toughest problem: What should that  $qA \heartsuit qB$  term be? How do we calculate it?" he asked, despite (him) already having a simple answer in mind.

"Your turn, Mr Fan. *It's your turn to give us your 'brilliant idea'!*" Brad teased, as he funfully challenged Mr Fantov.

"OK, here's my 'brilliant, yet simple, idea'," he teased back. "As Jeremy said, these 'idea-numbers' have to be 'whole', like Whole Numbers - 'and vast' as Brad said," as he and Brad smiled. "So, if A and B are whole numbers, let's let  $qA$  and  $qB$  be the corresponding 'quality-' or idea-numbers. *Then we could say that  $qA \heartsuit qB$  is the qNumber formed by adding the A and B whole numbers within the 'q', so to speak, like this:*

$$qA \heartsuit qB = q(A+B).$$

"Since  $A+B$  is another whole number,  $q(A+B)$  would be another whole, pure qNumber!" he ended.

No one had any objection to Mr Fantov's simple solution -- no one except for Jeremy. "But Mr Fan, why

*just a simple sum? Why would this be the best solution? How do we even know if it will work?"*

"Jeremy, you never disappoint me. You have asked a 'brilliant question'! And, if you can see me after we are done here, I'll 'prove' to you that this is the 'best' solution and that it will work." [See qR: F.E.D. Brief #5]

"Oh, one final historical or philosophical note," Mr Fan began, "What we have defined as  $qC \heartsuit qT = q(T+C)$  is an example of *synthesis* ( $q(T+C)$ ) from *antithesis* or *counterthesis* ( $qC$ ) 'acting on' *thesis* ( $qT$ ).

"Although Hegel was not the first to use those terms, he was the one who uses the German word aufheben to describe the entire process encapsulated into our 'x' (not '&') multiplication formula:

$$qC \times qT = qT + (qT \heartsuit qC) \quad \text{or}$$

$$qC \times qT = qT + q(T+C)$$

$$\text{CounterThesis} \times \text{Thesis} = \text{Thesis} + \text{SynThesis} = \text{New Thesis}.$$

"Those of you who are studying German, may know that aufheben translates into English as 'to pick up, rise, or abolish'. It conveys three meanings in one word, which is, as Hegel himself wrote, why he used it!"

"Hegel (and F.E.D.) use aufheben to mean the process by which a CounterThesis ( $qC$ ) interacts with/on the Thesis ( $qT$ , or *status quo*), in which the original Thesis / NewThesis ...

- 1) Is 'preserved' or 'conserved' (as ' $qT+$ '), and
- 2) Is 'negated' or 'abolished' (i.e., 'not remaining the same result', i.e., 'not  $qT$ '), and

3) Is 'elevated', 'rises', or is 'picked up', as represented by the Synthesis of Thesis (qT) with CounterThesis (qC). (This SynThesis is, of course, the 'product' of 'heartful dialog',  $qC \heartsuit qT = q(T+C)$  which is, indeed, a 'higher' or 'elevated' form or 'qualitative status' -- since whole number  $T+C$  is greater than either whole  $C$  or whole  $T$ .)

"Again, Hegel uses many words to explain aufheben, and his other profound findings, while we simply use our 'few-symbol-formula' to condense everything:

$$qA \times qB = qB + q(A+B),$$

That in itself is an example of *the succinct explanatory power of mathematics!*" he felt compelled to say, perhaps to justify every mathematician's *reason for being, i.e.,* for studying math so hard :)!

Mr Fantov made a big deal about Hegel, *aufheben*, and what the students had done together, as he announced to all who had helped him:

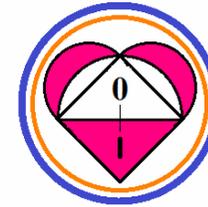
"Within only an hour (plus over 2000 years :), we have (HumanKind has) formed an idea-number system of qNumbers and qRithmetic, to reflect a 'natural dialog of ideas'. The Greek philosophers and purveyors of rhetoric would be proud of us! So would our 'Great Wonderful Friend', G. W. F. Hegel.

"You see, students, Plato had conceived of such numbers almost 2400 years ago. He and **others\*\*** have paved the 'highway' to a 'Higher way' for us. We now have such numbers available for all to use. May we use them in the 'Heartful Dialog' that we need to conduct -- the kind of dialog that these numbers, and our future, require."

$$+ q0 \times$$

\*\* **others** include: Karl H. Seldon (discoverer of q-numbers), Sophya Dors St. Germain, Hermes de Nemores, *et al.* of F.E.D. (Foundation Encyclopedia Dialectica), and G.W.F. Hegel, Kurt Gödel, and Charles Musés.

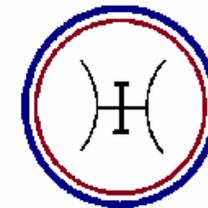
## Part II: qRithmetic, Dialectics, and from 'the Now' to 'the New'



'qStories' q5 through q10 talk about how to use qRithmetic,

about how the Now creates the New, and

about Dialectics with its upward thought spirals.



Note to Readers:

qStories q9-q10 are a detailed discussion of Dialectics, and therefore may be read lightly at first, then going on to Part III,

and later, read again for a more thorough understanding.

### **q5\*: "Better ideas that change the world!"**

*Mr Fan returns to Ms D's class to discuss qNumbers and how to use them; he finds that the kids understand him (and contribute) quite well!*

After forming the qNumbers with his high school 'fans', he being 'their biggest fan', Mr Fan went to visit Ms D's class again, as she and her students had desired. Before speaking, he read a few of the 'stories' that the kids had written about their first class time with him. He thanked them for their stories, but only chose to comment on Molly's version.

"Molly, in your story you changed Jock's problem-solution to your problem-solution. Why did you do that?"

"Well, I didn't do it to be mean to Jock. I just wanted to try out your  $q_1$  and  $q_2$  numbers on a problem I have with my sister, Milly. She's older than I am, but she always plays with my things without asking me first."

"So, how did you solve your problem with Milly?" Mr Fan asked.

"I didn't," Molly said sadly. "I didn't know how to talk with Milly in a way that gave me a  $q_2$  solution."

"Ah, I think I understand. Let's look at your problem," he started. "If you offer Milly a chance to play with your things if you could play with her stuff -- that would be an alternative, say  $q_2$ . Then you could

multiply  $q_2 \times q_1$  to get  $q_1 + q_3$ , which would suggest a  $q_3$  solution.

"But, Mr Fan, we don't know how to multiply qNumbers, yet!"

"Of course!" he realized. "Today we'll talk about that. Let's first talk about what qNumbers really are and about how to use them..."

*"First, a qNumber represents an idea or a set of ideas. After the 'q', we put a regular whole number N, like 0, 1, 2, 3, etc. to get  $q_N$ , or  $q_0, q_1, q_2, q_3$ , etc. We'll use all these 'pure qNumbers' to see how we can think better with their help."*

*"What happens when we add them?"* asked Johnny, who was very interested.

"Well, that's a good question. When you add  $q_1 + q_2$  you don't get  $q_3$ . You don't even get another 'pure qNumber'! Instead, you get a combination-idea number,  $q_1 + q_2$ , or the 'family combination' =  $\{q_1, q_2\}$ . So, whenever you add  $q_A + q_B$ , what's the answer?"

Johnny realized, *"It's the same,  $q_A + q_B$ . The answer is the same as the question! But Mr Fan, that's almost too simple!"*

"Yes, and it's even simpler when you add any qNumber to itself, because  $q_1 + q_1 = q_1$ , not  $q_2$ . It's that way for any qNumber,  $q_N$ !"

"You mean that  $q_N + q_N = q_N$ , for any whole number N? Why is that so?" Johnny asked.

"It's because each  $q_N$  stands for an idea, as the whole number 0 is an 'idea of' or 'absence of' something

specific you count or measure), and  $0 + 0 = 0$ . Zero is the only whole number that behaves like that, but every qNumber behaves like that! *When you add some idea to itself, it's still the same idea -- it's nothing new!*"

"OK, but what happens when we subtract an idea from itself? Do we get 'no idea?'" Molly asked.

"I don't think so," Johnny began, "because if you have an idea, and you give it away (after copying or remembering it), you still have the idea."

"You're right, Johnny", I thought Molly's question would trick you." Mr Fan admitted, as he wrote and said: " $qN - qN = qN$ , just as  $0 - 0 = 0$ ."

Then Johnny realized something neat. "So, you can add  $qN$  to itself many times, and you still get  $qN$ !"

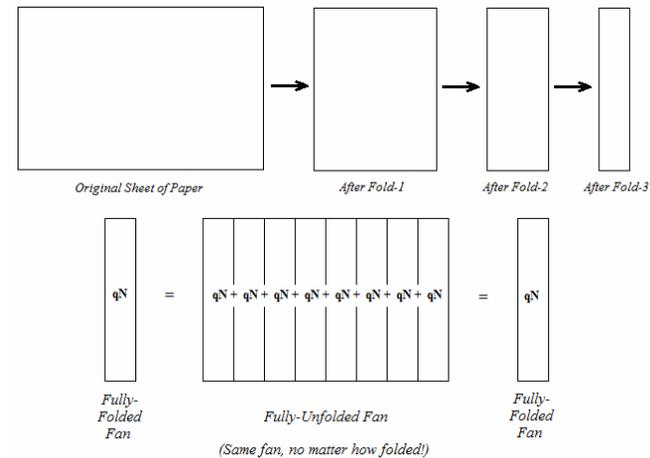
"Right again! Let me show you how to 'see and touch' this fact about qNumbers." He took a sheet of paper, and folded it 3 times to make 8 ( $= 2 \times 2 \times 2 = 2^3$ ) equal-sections, then wrote 'qN' in each section, like this ... (see Figure 5).

He refolded each section to make a 'paper fan', and said: "Now you can see that when you add all the  $qN$ 's on the sheet, they fold into just the one  $qN$ . It's like one idea becomes many same ideas when it is *shared or copied* -- all those same ideas are 'folded into' or 'unfolded from', that one idea!" He then wrote it down like this:

Folding:  $qN + qN = qN$ ,  
 Unfolding:  $qN = qN + qN$ .

then gave the fan to Molly to start passing it around to everyone in the class.

Figure 5. 'Fan's Fan', showing that for ideas:  $qN + qN = qN$



"Wow, this is 'Mr Fan's Fan!'" Molly cheered, along with the whole class.

After a few minutes of folding/unfolding it, as 'Fan's Fan' was passed around, Maya asked, softly, "Mr Fan, are you going to explain qNumber multiplication today?"

"Oh yes, of course! First, remember that adding different qNumbers, makes a 'family-combo', like this:

$$q1 + q2 + q3 = \{q1, q2, q3\} \leftarrow \text{'family combo': 'sum' or 'union'}$$

"Multiplying two 'parent' qNumbers makes a little family-combo also."

"What on Earth do you mean, Mr Fan?" asked Molly, not understanding him at all.

"Well, consider your own parents. When they decided to have a family, it was like multiplying their two wishes

together. Their 'deciding' was like a multiplication 'x' of their wishes, and it resulted in your family, like this:

$$\text{Dad} \times \text{Mom} = \text{Dad} + \text{Mom} + \text{You}.$$

"And 'You' each are a 'loving combination of Mom and Dad's wishes':

$$\text{Dad} \heartsuit \text{Mom} = \text{You}!$$

"So, wish-ideas of Dad and Mom multiplied together are:

$$\text{Dad} \times \text{Mom} = \text{Dad} + \text{Mom} + (\text{Dad} \heartsuit \text{Mom}).$$

"But what does this all have to do with qNumber multiplication?" Molly wondered.

"Well, 'qMultiplication' works the same. When two qNumbers, qA and qB, multiply, they form a little 'family of ideas': the parent(s) plus a super 'baby-idea', a loving 'combo-idea' of them both, like this (using '& times'):

$$qA \& qB = qA + qB + (qA \heartsuit qB).$$

"That's cute, Mr Fantov!" Johnny said, "but how do we calculate 'qA $\heartsuit$ qB'?"

"Well, I know a simple way, this way:

$$qA \heartsuit qB = q(A+B),$$

which makes another 'pure qNumber' because A+B is another whole number. This q(A+B) idea-set is a qualitatively-bigger set which contains *all the possibilities* in the synthesis of qA and qB!"

"Mr Fan, why did you call the 'baby idea', 'a *super-baby* idea'?" Molly asked, thinking that he had said 'super-baby'.

"Oh, I said, 'a super baby-idea' meaning that all babies are 'super'," he smiled, realizing that Molly had misunderstood him. "But, Molly, I like your '*super-baby*'

word better, because the 'baby idea', q(A+B), is actually bigger than (" $>$ "), or 'super to', either of its parent-ideas, because A+B is bigger than either A or B:

$$q(A+B) \text{ ">" } qA, \text{ and } q(A+B) \text{ ">" } qB.$$

"So, when you multiply ideas, they make a combination of ideas which includes a 'bigger idea' within the x-sum! This shows a 'same-structure correspondence' between Whole addition, +, and the Heart multiplication,  $\heartsuit$ :

$$A + B = "A+B", \text{ Whole no. } \leftarrow q \rightarrow qA \heartsuit qB = q(A+B), \text{ qNumber!}$$

Then, to everyone's surprise, the usually quiet Maya spoke up, excitedly, to say something amazing:

*"This is really neat stuff! qNumbers represent ideas, not physical things. Maybe that's how the World changes? It changes through new, better ideas. And, 'dialoguing' is the 'qMultiplying' that makes the 'bigger, better ideas' that change the World!"*

Mr Fan and the entire class were totally quiet for a moment, as he even 'misted up' a bit from Maya's beautiful observation. He now realized that Ms D's students were teaching themselves (and him) about 'qNumbers' -- about what they mean!

His "dialog" with the class was complete. But before Mr Fantov left the classroom, he said something to the young students that they would always remember:

*"You kids are definitely getting ready to create a 'Quality World!'"*

$$+ q0 \times$$

## q6\*: 'qRithmetic' and 'qMulations'

*Contrasting 'qRithmetic' with 'Whole No. aRithmetic'*

*Mr Fan contrasts qNumber 'qRithmetic' with regular Whole Number aRithmetic, with Ms D's kids discovering qMulations: idea-cumulations, or 'qSums'.*

By this time, some of the students were getting a good idea as to how qNumber aRithmetic, or 'qRithmetic', worked. But many students were still confused because qRithmetic seemed strange compared to standard 'Whole Number aRithmetic'. So, Mr. Fantov decided to make a chart comparing the two arithmetics (Figure 6).

He began by saying, "In Whole Number aRithmetic, we have 0, 1, 2, 3, ... , where Zero let's any number U be itself:  $U+0 = U = 0+U$ . Zero is the only whole number which, when added to itself, is just itself again:  $0+0 = 0$ . But, in qRithmetic, any qN is that way:  $qN + qN = qN$ , for any N. That's because the same idea, or same set of ideas, can only make the same idea, or same idea-set, when added.

"In qNumbers, we also have a q0, which is like 0 is in Plus, and like 1 is in Times, in Whole number addition and multiplication. q0 let's qU be qU in both + and x, like this:

$$q0 + qU = qU = qU + q0,$$

$$q0 \times qU = qU = qU \times q0.$$

*"So, q0 is like 0 and 1 at the same time. That makes it really amazing!" Mr Fan said excitedly.*

"In standard numbers, '0 apples', means 'no apples', but that '0' also conveys 'the topic-idea of an [absent] apple thing'. In qNumbers, q0 conveys the topic-idea

about the main topic subject that the qN's are used to represent, like 'your quality of happiness', or some idea like that."

### Note to Readers:

Actually, that's why each of these qStories ends with a ' + q0 x '. It lets you, the reader, know that the qStory, which started as our 'topic idea: q0', is now complete, by using both + and x kinds of 'dialog' around the 'q0'.

Then he explained more about multiplying. "But, when you multiply qNumbers with themselves or with other idea-combos, they form a 'heart join' synthesis,  $qK \heartsuit qN$ :

$$qK \heartsuit qN = q(K+N) \text{ ">" } qK \text{ (or } qN),$$

*which is a bigger than (">") either qK or qN, along as K and/or N aren't Zero.*" This join,  $\heartsuit$ , is a multiplication too. In a way, its 'product',  $q(K+N)$ , is a 'bigger qNumber', as the whole number product:  $K \times N$ , is a bigger whole number! *That's why I say that the 'heart-join' creates all kinds of possibilities beyond what qK or qN have alone!"* Mr Fan emphasized, then continued as follows:

"To complete the multiplying, this 'heart-join' is added to the parent-ideas, as in a 'two-parent family' multiplication (&):

$$qK \& qN = qK + q(K+N) + qN = qN \& qK,$$

in which '&' is 'order reversible':  $qK \& qN = qN \& qK$ .

"Multiplying ideas could also be like in our x multiplication, where only the second parent ('custody factor') is added in:

$$qK \times qN = q(N+K) + qN,$$

but x is a 'non-reversible' multiplication, since:

$$qN \times qK = q(K+N) + qK,$$

so,  $qK \times qN$  is not the same as  $qK \times qN$ ,

"When you multiply  $q1$  times  $q1$  using  $\times$  or  $\&$ , you get  $q2+q1$ , where  $q2$  stands for a 'bigger idea' than  $q1$ , as you *generally* get when you multiply Whole Numbers."

Then Johnny asked, "*But, Mr. Fan, what is each arithmetic used for? When do I use the standard arithmetic, and when do I use qRithmetic?*"

Mr Fantov then made it very clear: "*We use 'Whole Number arithmetic' whenever we need to keep track of 'How many things there are', or 'What the quantity of the thing is'.*" He then contrasted as follows:

"*However, we use 'qRithmetic' to help us keep track of 'How our ideas combine and grow', or to answer 'What is the quality of our ideas as we 'qMultiply' (or share) them?' And we sometimes share them by using 'Heartful Dialog' with others!*"

He then handed out a chart that compares the rules of qNumber arithmetic with the rules of standard Whole Number aRithmetic. [See Figure 6 or Appendix qZ at the end of this qBook.]

Once the students learned "The Rules of qArithmetic", they could add and multiply "*the qualities of ideas*", represented by qNumbers, just as they had learned to add and multiply Whole Numbers, which represent "*the quantities of things*".

\* \* \*

Figure 6. Chart of aRithmetics (page 1 of 2)

<b>The Rules of Standard 'Whole Number aRithmetic'</b> <i>Whole Numbers are used for 'quantities' &amp; interaction of things</i>	<b>0</b>
0 lets U be U in + : $0 + U = U = U + 0$	<b>1</b>
1 lets U be U in $\times$ : $1 \times U = U = U \times 1$	<b>2</b>
" $A + A = A$ " is only true for the whole number $A = 0$ : $0 + 0 = 0$	<b>3</b>
Sum of any two different non-zero wholes is <u>another</u> whole number. $A + B = C$ , whole	<b>4</b>
Addition is "either-pair-wise" (associative): $(A + B) + C = A + (B + C)$	<b>5</b>
Addition is "reversible" (commutative): $A + B = B + A$	<b>6</b>
Whole numbers have a natural "less than" ( $<$ ) ordering: $0 < 1 < 2 < 3 < \dots < M < \dots < N < \dots$ <u>Note</u> : $<$ is a <u>quantitative</u> ordering, based on <u>quantitative</u> differences.	<b>7</b>
Multiplication of "2" wholes makes a whole "bigger" than either: $A \times B = AB$ , where $AB > A$ , $AB > B$ (unless A and/or B, is 0 or 1)	<b>8</b>
$\times$ is "either-pair-wise" or "associative": $(A \times B) \times C = A \times (B \times C)$	<b>9</b>
$\times$ is "reversible" (commutative): $A \times B = B \times A$	<b>10</b>
$\times$ "distributes" +: $(A + B) \times C = (A \times C) + (B \times C)$ , or 'C-touches Sum' = Sum of C-touches: $C(A + B) = CA + CB$	<b>11</b>
The addition: $1 + 1 = 2$ , makes "something new" (2)! But ... The multiplication, $1 \times 1 = 1$ , makes nothing new!	<b>12</b>
The sum: $A + B$ , in Whole Number space, ... <i>corresponds to</i> ...	<b>13</b>
$1 + 1 + \dots$ (N times) = $(1) \times (N) = N$ ... <i>corresponds to</i> ...	<b>14</b>

Figure 6. Chart of aRithmetics (page 2 of 2)

**	The Rules of qNumber 'qRithmetic'
q0	<i>qNumbers</i> are used for 'qualities' of ideas, and 'dialog'
q1	q0 lets qU be qU in + : $q0 + qU = qU = qU + q0$
q2	q0 lets qU be qU in x : $q0 \times qU = qU = qU \times q0$
q3	$qA + qA = qA$ is true for any qNumber qA
q4	Sum of any two different qNumbers is <i>not another</i> qNumber. $qA + qB$ is a 'combo-qNumber' (not a qNumber if $qA \neq qB$ )
q5	Addition is "either-pair-wise": $(qA + qB) + qC = qA + (qB + qC)$
q6	Addition is "reversible" (commutative): $qA + qB = qB + qA$
q7	qNumbers have a natural " <i>progressive qualitative</i> " ordering (" $<$ ") **: $q0 < q1 < q2 < q3 < \dots < qM < \dots < qN < \dots$ <i>Note:</i> The " $<$ " is a " <i>qualitative</i> " ordering", of <i>qualitative</i> differences.
q8	Multiplication of "two" qNumbers makes a "bigger" qNumber: $qA \times qB = q(A+B) + qB, q(A+B) > qA$ or $qB$ (unless one/both = q0!)
q9	$\&, \heartsuit$ are "associative", $\times$ is not: $(qA \& qB) \& qC = qA \& (qB \& qC)$
q10	$\heartsuit$ is "reversible": $qA \heartsuit qB = qB \heartsuit qA = q(B+A)$ $\times$ is "not reversible": $qA \times qB \neq qB \times qA = q(B+A) + qA$ $\&$ is "reversible": $qA \& qB = qB \& qA = q(B+A) + qB + qA$
q11	$\times$ "distributes" +: $(qA + qB) \times qC = (qA \times qC) + (qB \times qC)$ , or 'qC-touchesSum' = Sum of qC-touches: $qC(qA + qB) = qCqA + qCqB$
q12	The addition: $q1 + q1 = q1$ , makes nothing new. But ... The multiplication: $q1 \times q1 = q1 + q2$ makes "something new" (q2)
q13	... product: $qSumA \times qSumB = qSum(A+B)$ , in "Open qNumber space"
q14	... $q1 \times q1 \times \dots$ (N times) = $(q1)^{(N)} = qSumN = q1 + q2 + \dots + qN$ .
**	$qM < qN$ is our notation for: $qM \rightarrow qN$ in F.E.D. notation.

Several days after Mr Fantov had handed out the Chart, the students began asking new questions. Shane, a classmate who usually never asked Mr Fantov any questions, wanted to share a 'discovery' he had made:

"Until now, I haven't talked much, but I have to tell everyone that I have been practicing my qMultiplying a lot. Last night, I discovered something neat!

"What did you discover, Shane? Here's the marker!" Mr Fan encouraged him to go to the marker board to share his discovery with everyone.

"Well, if you have only q1, you have:

$$q1 = q1.$$

"If you multiply q1 to (or with) itself, you get:

$$q1 \times q1 = q1 + q2.$$

"If you multiply that answer to (by) q1 again, you get:

$$(q1 \times q1) \times q1 = q1 + q2 + q3.$$

"I even did it one more time, and got:

$$(q1 \times q1 \times q1) \times q1 = q1 + q2 + q3 + q4.$$

"By multiplying by q1, you keep adding the next qNumber! And, it works for both the  $\times$  and  $\&$  (not  $\heartsuit$ ) types of multiplication." Shane said, not showing off.

"Wow, Shane! You've discovered something really important. Please 'talk' with us more often!" Mr Fan encouraged.

"That's sure not like Whole Numbers!" Molly observed. "When you multiply '1' by itself you get only '1'. Nothing changes!"

"But Shane explored how  $q_1$  times itself  $N$  times gives us the  $qSum$  of  $q_1$  up to and including  $q_N$ . That is so neat!" Johnny said, as he wrote Shane's discovery into his notes.

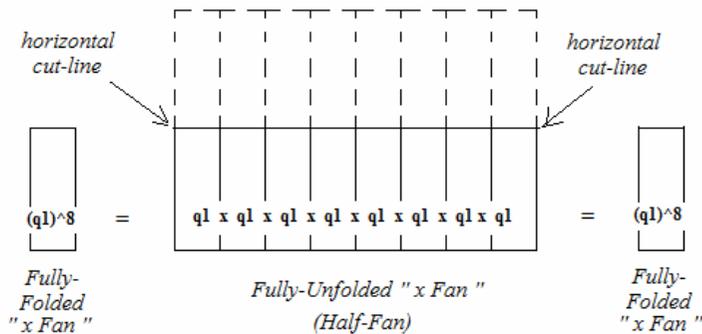
"It's so neat that there should be a word for this  $qSum$  from  $q_1$  to  $q_N$ !" Molly stated strongly.

"There is a word for it," Mr Fantov answered, "It's called 'the  $N^{th}$  cumulum', or ' $N^{th}$  cumulation', for short! It's how ideas accumulate". Then, as Johnny had already mentioned, Mr Fan wrote the general rule of what Shane had discovered:

$$(q_1)^N = (q_1) \times (q_1) \times (q_1) \times \dots (N \text{ times}),$$

$$(q_1)^N = q_1 + q_2 + q_3 + \dots + q_N.$$

Figure 6a. The "xFan" to explain 'Products of many  $q_1$ 's'



Then Mr Fan showed them all how to understand 'cumulations' by making an 'xFan'. First, he took his previous 'Fan's Fan', changed all the '+'s to x's, then cut it in half horizontally (Figure 6a), and said, "This is our 'xFan', which represents ' $q_1$  times itself 8-times', like this:

$$(q_1)^8 = q_1 \times q_1.$$

"Did you ever realize that the word 'multi-ply' literally means 'many folds? And that's what our 'xFan' shows and does!"

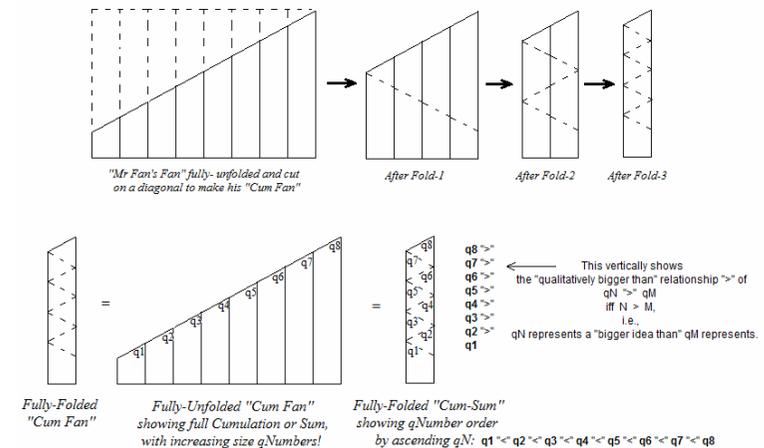
He then took another identical 'Fan's Fan, unfolded it, changed the ' $q_1+q_1+q_1+q_1+q_1+q_1+q_1+q_1$ ' to  $qSum_8$ :

$$qSum_8 = q_1 + q_2 + q_3 + q_4 + q_5 + q_6 + q_7 + q_8.$$

He then cut this fan along its diagonal and called it his '+Fan' (Figure 6b). "OK, students, the xFan and +Fan are both half-fans. What also do they represent?"

The class wondered. Then Johnny realized, "They represent the  $8^{th}$   $qSum$ ,  $qSum_8$ ! The xFan is the product way ( $q_1^8$ ), and the +Fan is the sum way ( $qSum_8$ ). But, both 'half-fans' represent the same  $qNumber$  combination in two different forms!"

Figure 6b. "+Fan" to explain  $qSums$ , or 'Cumulations'



Mr Fan smiled broadly at Johnny and said, "You see, class, we can think of the 'cumulation idea' in two different ways - one is the multiplying way, the other is the adding way!"

\* \* \*

"Now, I want to show you something else about the +Fan. On this fan, each fold is a different qN, so when you add up all the folds from q1 up to q8, you get qSum8, as Johnny noticed! And, because one is above another, you can also see how the qNumbers are 'qualitatively ordered' (<"), in a way *like* that the way that the Whole Numbers are 'quantitatively ordered' (<), :

$$q1 < q2 < q3 < q4 < q5 < q6 < q7 < q8$$

$$1 < 2 < 3 < 4 < 5 < 6 < 7 < 8$$

"But, Mr Fan, what does it really mean for one qNumber to be 'bigger than' another?" Molly asked.

"That is a very good question, Molly. Let me try to answer with a simple example. Suppose q1 = 'the idea for a line segment, or toothpick', then  $q1 \times q1 = q1 + q2$ . Suppose q2 is then the idea of a 'disk' (a circle and its inside) that is made by spinning the 'q1 toothpick'. Finally,  $q1 \times q1 \times q1 = q1 + q2 + q3$ . Suppose q3 is then the 'ball' you get by spinning the q2 'disk'.

"Oh I get it!" Johnny once again said, as he explained it to the class: "*q1 is like 1-dimensional, or 1-D. q2 is like 2-D, and q3 is like 3-D!*"

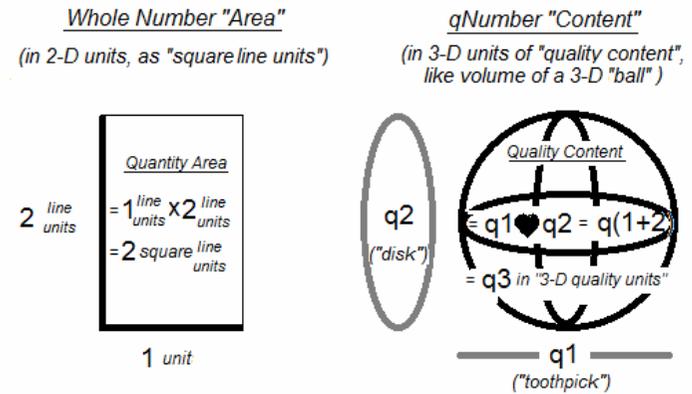
"Yes, Johnny said what I'm getting at. Then we write:

$$q2 < q3 \quad \text{or} \quad q3 > q2$$

because 'q3 > q2' means the 'ball' is 'qualitatively more', or 'bigger than' the 'disk'. The 'ball *contains* the disk, or 'q3 *contains* q2' as '3 = 1+2 contains the '2'!"

Most in the class seemed to understand Mr Fan's explanation. However, he explained his example again, where  $q3 = q1 \heartsuit q2$ . He let q2 be the disk, which with q1, makes a ball q3, whose 'volume' he called: the ball's "qualitative content", as he showed it (Figure 6c):

Figure 6c. Quantitative vs. Qualitative Content



\* \* \*

"But Billy still wondered about 'cumulations'. "*Why don't regular numbers 'cumulate' like that?*" he asked.

Mr Fan didn't know how to answer Billy. He tried with, "Well, with Natural Numbers, 1 times itself is always 1.

$$(1)^{(N)} = (1) \times (1) \times (1) \times \dots (N \text{ times}) \dots \times (1) = 1.$$

"Billy, maybe I can answer your 'Why question' by showing you all something very interesting."

"What? Please show us!" Johnny was eager to learn that 'something interesting'.

*"When you add 'Natural' or 'Whole Numbers', it's like multiplying 'cumulations' in a 'parallel world of qSums!'"*

Mr Fantov announced to the whole class.

"What do you mean?" again Johnny replied.

"Well, it's like a special connection between our Natural Numbers and our Cumulations of qNumbers.

Then he wrote an example on the marker board:

$$1 + 1 + 1 = 3 \leftrightarrow q1 \times q1 \times q1 = q1 + q2 + q3,$$

Where the  $\leftrightarrow$  arrow means 'corresponds with'. So, you see, 3 'corresponds with' the third Cumulation, qSum3. In general,  $N \leftrightarrow q\text{Sum}N$ , or 'N corresponds with the  $N^{\text{th}}$  Cumulation'."

"Wow! So, plussing the whole number '1' three times to get '3' is like 'times-ing 'q1' three-times' to get the third qSum, or 'the third qMulation', as you say," Molly explained it in her own way, using the cute term 'qMulation' for Cumulation. Mr Fan liked this word and thought she said it all in a better way than his way ...

"Yes that's it!" Mr Fan confirmed, "Now, here's why Shane's discovery works: A 'star-connection', \* (or a 'magical star-map') exists between the Whole Numbers and the qMulations:

$$N \leftrightarrow q\text{Sum}N, \text{ or the longer way:}$$

$$1 + 1 + \dots + 1 = N \leftrightarrow N^* = q\text{Sum}N = q1 + q2 + \dots + qN.$$

"It's like you replace the '+' with an 'x', and let the star (\*) do the magic!" said Mr Fan, almost like a 'mathe-magician'!

"So, if you replace an 'N' with  $N^* = q\text{Sum}N$ , and an M with  $M^* = q\text{Sum}M$ , then  $N^* \times M^* = q\text{Sum}N \times q\text{Sum}M = q\text{Sum}(N+M) = (N+M)^*$ , right!?" Johnny explained to everyone.

Mr Fan explained, "Exactly, the 'star-map':  $N \leftrightarrow N^* = q\text{Sum}N$ , does all the magical connecting of our Natural Numbers = {1, 2, 3 ...} under Plus (+) to our 'kind of parallel space' of qNumber qSums under qTimes (x)!"

\* \* \*

*"But so what! How does this help me have more fun?"* Jock asked, criticizing all of Mr Fan's connections.

*"Well, Jock. It's like learning anything, you have to trust that it will give you the chance to make yourself happier. It depends on you, Jock -- just like when you talked with your mom about your 'q2 solution'."* Mr Fantov made it clear to him, and to everyone.

"Don't you learn it just for the fun of it?" said Johnny, proclaiming his own view of learning.

"Yes, for some of us! We regard it as 'fun' -- that's why I'm here with your class: To try to make it fun, so that you might also find it fun!"

"Well, Mr Fantov," Ms D interrupted, "I do hope it is *fun* for most of my students. But right now, I have to end all this 'fun' and ask my students to take out their 'standard arithmetic' books. Mr Fan, maybe you have also helped make their Whole Number arithmetic more fun, too!" Ms D hoped ... and 'trusted'.

+ q0 x

## **q7\*?: From 'What is Maybe?' to 'What May Be!'**

*From his youth, Mr Fantov remembers the word, 'Maybe', as meaning: 'not Yes, and not No'; he then explores 'What if Maybe' became 'What 'Maybe' may become: Yes!' 'Maybe' this qTalk was to Ms D's class (q7\*) or maybe to Mr D's class (q7) -- we're not sure.*

Mr Fantov began by telling this story:

*"When I was a little boy, we had a very simple reading book about 'Dick and Jane'. It had simple sentences like: "Look, Jane, see the tree." Or, "Listen, Dick, hear the car." It was a very simple world when I was a boy."*

*"Then one day, the 'Dick and Jane' book had a story in which Jane asked her mother if she and the family could do something, like 'Mom, can we go to the store?' "*

*"Jane's mom answered, 'Maybe'. The Dick-and-Jane book was careful to explain to us kids, us readers, by saying: "Jane's mom didn't say 'Yes', and she didn't say 'No'. Instead, she answered with another word: 'Maybe'."*

*"As a little boy, I wondered why the book was making a big deal about the word 'Maybe' since I already knew that word and what it meant. Even then, I guessed that mothers should always use 'Maybe' instead of promising 'Yes', and later disappointing us kids with a 'No'. And secretly, we kids thought that if we were patient (over a bit of time), our mother would change her 'Maybe' into a 'Yes'! Perhaps for these reasons, I have never forgotten that story about 'Maybe'."*

*"But now, many years later, I also want to make a 'big deal' about the word 'Maybe', especially when we don't know for sure if we can say 'Yes' or 'No'. Too often we claim something is true, and later learn it is not. Or, we*

*claim something can't exist, when in fact, we later learn that it can or does exist!"*

*"You all remember about the planet Pluto. First it wasn't known to exist, until it was discovered in 1930. Then it was considered to exist as a 'planet', until 2006, when it 'got demoted' and is now considered not to be a planet! Speaking of being in 'Maybe-Land'!" he sighed, as he wondered how often "scientists" make this kind of 'definitional mis-take'!*

*"We often speak with certainty when we are not certain. So, should we answer all such questions with 'Maybe this' or 'Maybe that'? Should we, therefore, talk as if everything is "Maybe'?" Mr Fan asked, then continued...*

*"The answer is probably that we should only say 'Yes', 'No', or 'Maybe', as is deemed most appropriate at the time. The most important thing is not to fall into the 'Yes/No' or "True/False' trap, where we reduce our thinking about the world to only those two choices. Not allowing the 'Maybe' option, or the choice of 'Maybe', is what philosophers would call 'excluding the middle'. 'Maybe' would allow for a 'middle possibility', where something could be 'not true', but could also be 'true!'"*

\* \* \*

*When we use a 'Yes-No only' thinking we are using 'Boolean logic'. If we use only this kind of logic, we become "Boole's fools"! Instead, we need a logic that is a 'tool for the cool' - a 'cool' way of thinking, that gives us choices beyond 'This way, or the highway!'.*

Let us illustrate with some simple diagrams. In Figure 7a we have the circle S showing that whatever is inside (or on) the circle S exists, has S-qualities, or is 'Yes, in S', and whatever is outside the circle does not exist, does not have S-qualities, or 'No, is not S'.

Figure 7a. Only "Yes/No" areas of possibility



We can say that both the inside/on and outside of the circle are in 'ALL', our Universe of ALL Possibility. So, either something is inside/on circle S, or outside it, in 'ALL minus S', or in 'ALL - S'. This means that S intersects ALL - S in nothing! So, our *Boolean logic* is saying that there is nothing that is in both S and in ALL - S at the same instant in time:

$$S \cap (ALL - S) = \emptyset, \text{ which means 'Nothing'.$$

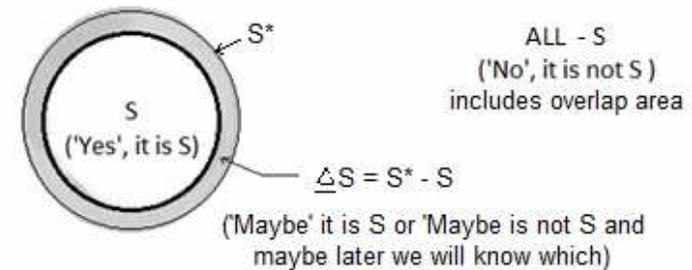
If a 'multiplication' (.) were defined as set-intersection ( $\cap$ ) and ALL = 1, and  $\emptyset = 0$ , then  $S.(1-S) = 0 \rightarrow S - S^2 = 0 \rightarrow S^2 = S \rightarrow S = 1$  or 0, in quantitative space. In this 'Boolean world', S can produce only itself (under .)! S with S produces nothing new, nothing beyond S itself.

\* \* \*

But, what if someone said, "Maybe something could exist in 3 'places': 1) inside circle S, 2) on circle S, or 3) outside circle S", or "What if circle S were thicker,

or inside a bigger circle S\* (as shown in Figure 7b), which also implies 3 choices?" And, "What if we don't know now: a) if some quality exists now: i.e. 'Yes, it is in S'; or, b) if it does not exist, i.e., 'No, it is not in S', or c) 'Maybe it is in S', and maybe later we can know if it is S or if it isn't?"

Figure 7b. A 'Maybe' area of 'as yet undetermined possibility'



Let's play with this "Maybe idea". Let's consider the circle S\* around circle S as shown in Figure 7b. Let's say that anything on or inside circle S\* AND outside circle S are 'Maybe' possibilities: a) inside/on S\* BUT outside S. Let's call that 'Maybe' area:  $\Delta S = S^* - S$ .

In our world of ALL, and its 'middle possibilities' of 'Maybe', we can write the overlapping region for a 'non-Boolean logic', as:

$$S^* \cap (ALL - S) = S^* - S = \Delta S, \text{ which is not Nothing.}$$

Now let's define a 'multiplication' or 'times' operation (x), which performs the 'time'-transition of set S into set S\* as: " S 'times' S " =  $S \times S = S^*$ . Then, we have:

$$S^2 = S \times S = S^* = S + \Delta S \quad [F]$$

The now S, multiplying itself by itself (S), creates S\*, a 'future S', which clarifies the 'Maybe', making it S\*, the

new S. This new S,  $S^*$ , includes the former "possibilities of being in S". Equation [F] above, along with the recursion relation: 'new Now = New', together become the 'Fundamental Equations of our Dialectical thought' process!

Note: We can think of our 'Maybe' area as analogous to an annulus of a tree: 'the cross-sectional area of tree growth - for that is exactly what the 'Maybe' set reflects': 'the growth in set S to become set  $S^*$  (if realized)!

This '3-possibility view', or 'dialectic', has resulted from these simple conscious reasons:

- 1) First, we allowed a 'Maybe' set of possibilities of 'What may be!
- 2) Second, we defined a multiplication, x, which defines an interaction within S, or  $S \times S$ , which produces (transitions S to) the new set,  $S^*$ .
- 3) Third, we allowed this new 'logic' to occur over time (from a now S to a new  $S^*$ ), whereas Boolean logic can supposedly take place at the same instant in time, producing only itself,  $S.S = S$ , under an '.' interaction!

Net Benefit: Under the 'x of Maybe',  $S \times S$  produces not only itself, S, but an additional 'something more',  $\Delta S$ :

$$S' = S \times S = S + \Delta S!$$

Having the notion of 'Maybe of S-quality' helps cover a number of possibilities. For example, whether some 's' is in S or not, means we have to 'detect s', or to 'determine if it is of S-quality', now or later. Also, we must consider whether s is 'distinguishable' or 'identifiable' as being in S, or as being in not S. If it is 'indistinguishable' between having an 'S quality' or a 'not S quality', s must lie in 'Maybe-Land', in  $\Delta S$ .

Allowing a 'Maybe' set,  $\Delta S = S^* - S$ , says that "What is Maybe in S" is equivalent to "What S May Be(come)", namely  $S^*$ !

Allowing 'Maybe' has correspondingly allowed us to uncover/describe a natural mathematical process of change using a "times" (x) operation. Via  $\Delta S$  ('Maybe' or 'May be-come'), we have created non-Boolean (or 'contra-Boolean') possibilities, a 'non-Boole tool' for thinking and generating that 'something more' beyond 'What Now Is'!

*Summarizing again:* S is defined to be what can be known for sure now, but there can be a "Maybe set",  $\Delta S = S^* - S$ , between the Now (S) and the New ( $S^*$ ).

*That 'Maybe' set allows us to transition from 'what now is' (S), to 'what may be' ( $S^*$ ), a transition from the Now to the New, via 'times', x, a multiplication on 'quality set-numbers'. This entire transition process is captured by the formula:*

$$\text{New} = S^* = S \times S = \text{Now} \times \text{Now} = \text{Now} + \text{Change.}$$

How simple 'Maybe' is, or should we say: How simple 'May (it) be'!

$$+ q0 \times$$

**q8: 'Fun'mental Dialectic': New = Now + Change**  
(with newNow = New)

*Mr Fan explains how the Now, 'dialoguing with Itself', generates the New; he then explains it all 'Mary's Way' - in a 'Heartful way' of acting in a play - and how such 'acting' can also bring change.*

After they had formed the qNumber aRithmetic that they needed, Mr Fan began showing the rhetoric class how they could use 'qRithmetic' in that "Better Way" he had sought. He began: "One essential ingredient that helps us define a Better Way of thinking is to realize that 'the Now creates the New'. *Tomorrow does not have to be the same as Today, as it is when you 'think in a circle'. Let me explain.*"

He then asked the class several Questions to which he also gave his own Answers: "When do we have problems? Of course, we have them Now! And, what do we have with which to solve those problems? The Now and all of the Past that has led us to this particular Now, and which is, therefore, contained in (as *history* within) this Now. So, what do we get when 'the Now dialogs with Itself'? What is 'Now x Now'?"

"It must be 'the New!'" Adelle answered, with a confidence that always seemed to shine forth from within her.

"Exactly. Only from the Now can the New arise!"

"I'm not so sure about that, Mr Fan," Jeremy interrupted, to question Mr Fantov's claim. "What if a meteor suddenly hit Earth, giving us a 'new situation'. Our 'Now' wouldn't have created that 'new', would it?"

Jeremy's example stumped Mr Fan for a moment, but soon he replied: "Well, we would experience that 'meteor new' in our Now, wouldn't we? I guess what I'm saying is: *Whatever our Now contains -- seen or unseen, foreseen or unforeseen -- is part of our entire 'Now'. In my view, there is nothing 'outside' the 'Now'!* But, our Now can contain whatever beliefs we presently have; actually, those beliefs also help shape the New. Thus, I claim that our 'Now' contains whatever is needed to create the 'New', as Adelle said."

"Now that you put it *that* way, I'm OK with that view," Jeremy agreed.

Mr Fan then resumed, "So, what is needed to move from the Now to the New? What is the difference between the New and the Now?"

"That's easy, that difference is Change, the Change (in the Now)!" Jeremy, was again quick to respond, as that fact (or 'language identity') was obvious to him, since 'Change = New - Now', by definition.

Then Mr Fantov went to the marker board, and wrote these findings, as if they were some kind of "*Einstein-like formulas of both simplicity and truth*":

$$\text{Now}^2 = \text{Now} \times \text{Now} = \text{New}, \text{ and}$$

$$\text{New} = \text{Now} + \text{Change}(\text{in the Now}), \text{ so}$$

$$\text{New} = \text{Now} \times \text{Now} = \text{Now} + \text{Change} \quad [\text{FED-0}]$$

$$\text{newNow} = \text{New} \quad [\text{FED-1}]$$

"I call these tandem equations [FED-0 and FED-1]: *the 'Fundamental Equations of Dialectic'*, since a repeated 'dialectic process' occurs as the New (over a time

interval, or 'epoch') becomes the 'newNow', or 'Now', as we substitute that New for Now:  $New \rightarrow Now$ , then insert that Now into FED-0 again! I also call these two equations, our 'dynamic duo' -- our 'FunAndMental' Dialectic!" he laughed. "What's more, this reminds me of my favorite saying:

***FUN is KIND of Mental, but KINDness is FUNdaMental!***"

Ignoring Mr Fan's attempt at 'poetry', Jeremy explained: "Yes! The first equation is what our qNumbers reflect in their qMultiplication, don't they? Like this:

$$\begin{aligned}(qN)^2 &= qN \times qN = qN + q(N+N) \text{ or} \\ (qN)^2 &= q(N) + q(2N) \\ New &= Now + Change.\end{aligned}$$

"So  $q(2N)$  represents the Change when  $qN$  'squares itself!'"

Mr Fan replied: "Exactly, our qNumbers merely reflect this simple truth in a way we can 'see' on paper! And the  $q(2N) = qN \heartsuit qN$  is the result of the 'heartful dialog' that  $qN$  has with itself. This shows us that the 'heartfully-dialogued' idea,  $q(2N)$ , is a 'much more developed' idea than  $qN$  is. For fun, I'll call it a 'doubly-developed' idea."

\* \* \*

Then, all of a sudden, Mary, a sensitive student, who seemed on the verge of tears, cried out: "Mr Fantov, I'm so confused! *I get scared whenever I see math symbols, no matter how simple they are to you.*"

Then Mr D himself, who was always in class when Mr Fantov was there, spoke, "Oh, Mary. Remember how it was during the first days of this speech class? Remember how you and almost everyone were afraid to get up and speak?"

"Yes, I do. But this is different -- this is math!"

"It's really no different, Mary. It's just a matter of Changing your Now-Fear into a New-Confidence!" Mr D said gently.

"I'll try," was all that Mary could say.

Mr Fan then added, "Thanks, Mary! *That's really all you need to do, or can do. Simply 'try dialoguing' with your best friend: You!* And soon:

***You x You = newYou = You + Change(in You)!***"

Mary smiled, a bit more cheerfully, as she said, "Oh, Mr Fantov, you see math in everything, don't you?"

He smiled back, "Not in everything, Mary. To me, there are some things that cannot be understood using math. You're right, though, math is *my primary way* of understanding," he admitted, "but it's not everyone's way. So, you can put all these 'ideas about ideas' into 'Your Way' of understanding them. It doesn't have to be with your head. It can be with your heart. Mary, listen to your HEAR'T: 'HEAR iT!' Your heart will tell you 'Your Way'."

"OK, I'll try." Mary smiled again, this time quite relieved by Mr Fan's words.

Mary's word 'try' and her earnest smile spoke to Mr Fan, 'echoing' rather loudly within him, "*Don't say it Your way. Say it Mary's way!*"

This 'inner voice' then led him to say out loud: "Maybe I need to explain things 'Your way', not 'My way'. Tell me, Mary, what do you like? What do you do in your spare time?"

"Oh!" she answered happily, "I like acting in our school plays. There I can be emotional, and I can put my feelings into whatever role or character I'm playing. Someday I hope to be an actor."

"That's wonderful!" he said spontaneously, ... paused..., then asked:

"Mary, did you ever realize that when you study your play scripts, you're reading a 'dialog' -- and when you act out those scripts, you're making a dialog come alive?"

"I may have, but I really do now," Mary realized.

"*And, when you are on stage, do you ever get stage-fright, or see others get it?*"

"*I see others get it, but I myself never get afraid on stage.*"

"*That's probably because 'Acting' is 'Your way' to understand things. Did you ever think or feel that when a play is written, it is someone's idea on paper -- and often it represents a 'new idea'? It is you, and the other actors, who perform that play, who give it its pathos, allowing the audience to feel that new idea! And, if many audiences, or 'reviewers', like the play, or say that it has merit, then that play helps us all to*

accept 'the new idea' that it is. You see, *Society is the 'Ultimate Audience!'*"

He looked gently at her and said, "And you, Mary, would help us all, through your acting (action). You would help Society 'change itself' by 'taking in that new idea', and thereby changing how Society itself acts -- for *Society is the 'Ultimate Actor', too!*"

"Oh, Mr Fantov, that's such a nice way for me to understand what you are trying to explain to our class. Thank you for saying it all, 'My way!'"

It was then that *Mr Fan himself realized that, before Mary's outburst, he had been 'Kind of mental'. He now had 'practiced what he preached': 'Kindness is Fundamental!'*"

"*Thank you, Mary - for teaching me how to 'heartfully dialog' with you, and for letting me learn that 'My math way' is not always the 'Only way'.*"

\* \* \*

Mr Fan sure got 'off topic' (off of the 'q0 topic' of 'New = Now + Change'). Or, did he just expand that topic (that 'q0') as it needed to be expanded? Mary felt much better, and 'maybe' the entire class had begun to realize that there are '*Many Ways*' to learn, or to explain, a '*Better Way*'.

However, there was one thing that the whole class did realize and appreciate for sure: They liked the 'little break' they got when Mr Fan did go 'off topic'.

+ q0 x

### q9\*: Thought Spirals and Nature's Own Dialog

*With Ms D's kids who wanted to join him after school, Mr Fan uses an example of 'building a better tree-house'; together they explore how "thought patterns" arise, and how they might form an 'upward Thought Spiral', which Nature seems to use too!*

Mr Fan began by sharing some of his ideas about a possible *pattern of thought*. "You see, I am interested in how people think, even when *they* don't know how they think!"

*"I've noticed that Nature seems to give us a pattern to the flow of ideas.* This pattern often appears when a group of you might try to make a project/club decision."

"You mean like when us boys form a tree-house club?" Reggie asked.

"Yes, sort of. Let 'Making the best possible tree-house' be our topic-idea (q0). First, maybe Reggie makes a First Try (q1) at making a tree-house, but the tree isn't strong enough. Then, another one of you, say Johnny, in response to that first try, disagrees with or objects to that Try's idea. Maybe he picks out a stronger, and taller tree -- his 'counter-example tree idea' (q2).

"Well, I would want a strong and safe tree for us all," Johnny said.

"Yes, you would. So, everyone in your club would realize that there was something missing in, or maybe hidden in -- that First Try (q1) at building the tree-house. It was something that needed to be 'brought in',

or 'brought out', before a better, stronger tree was picked or found.

"Then what would they do next?" Molly wondered.

"Well, another of you, maybe you, Molly, shows the tree-house boys a way to combine Reggie's First Try (q1) and Johnny's Objection (q2), to design a tree-house that is better still, like adding a permanent ladder in order to safely climb up the taller, stronger tree (q3).

"So, in each of these three steps, something new is added, something 'qualitatively better' is discovered. That discovery is in this form (as Mr Fan wrote the pattern):

NewWay or NewTry =

Original Try + Objection(safety-lack) +

+ 'a Joining-Glue' (that sticks both ways together) !

New Try = q1 & q2 = q1 + q2 + q(2+1) !

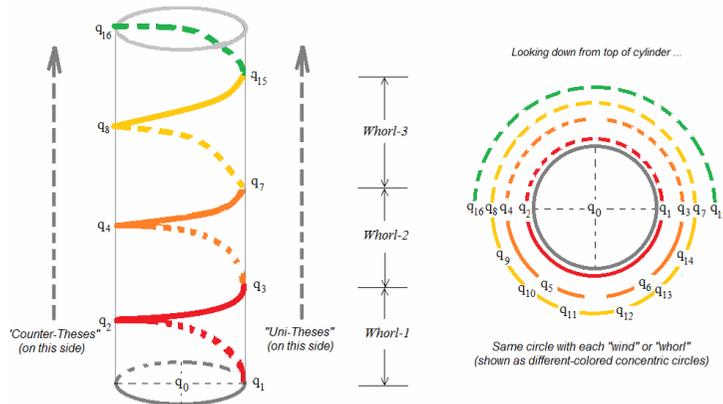
"And that 'Glue that sticks both ways together' is really 'the heart-join', q(2+1) = q3, between the Original Try (q1) and the Objection (q2). That 'join' can best occur through 'heartful dialog' between the two 'idea-positions'." Mr Fantov insisted.

"Otherwise, a 'nil dialog' may reduce the 'join' to nothing (q0), and we would continue to think in the same lower circle (q1 + q2), never rising upward in our thinking. *That's not Progress; that's it's opposite: Congress!*" Mr Fan mumbled a joke referring to modern politics, and to his surprise, many of the fifth-graders laughed, since they had also heard it from their parents!

He then continued where he left off ... "But, then, that New Try (q3) is itself like a New First Try (q3 is like q1 was), so there may again be some 'objection' or 'problem' (q4) with that solution or 'New Try', which would require another 'dialog' or multiplication, namely:  $q_3 \& q_4$ , which would include (and produce)  $q(4+3) = q_7$ .

"So, as long as each try is "better" (as long as the dialog is 'heartful') the result, or new 'joint product', is on an upward spiral, like the one I've already drawn on this sheet", as he handed out copies of Figure 9 to all. "But that Resulting New Try (q7) still may not be perfect, or isn't 'the best way'. Have you noticed this pattern when you try to do things?"

Figure 9. The Upward Thought Spiral  
(a 'helix', or upward winding on a soda can)



Notational Note:  $q_N$  is F.E.D.'s notation for  $q_N$  in this qBook's notation.

"Yes, sort of," Johnny agreed, "but not only in my club group. When I think to myself about a problem or a

project, I've noticed that same kind of pattern happens -- whenever I try to do things in a better way."

"That's very alert of you (to notice that), Johnny," Mr Fan said, as he went on to make his own ideas clearer: "So, you express your thoughts 'outside' your head by speaking to your group of friends. And you have thoughts 'inside' your head as you sort of 'talk with yourself'. Both of these 'talks' usually have that same pattern -- of 'spiraling upward' toward a 'better and closer solution', right?"

He then re-drew his 'Figure 9' onto the marker board. "I think of this thought pattern as a spiral around a soda can. It can rise upward over time, much like a 'climber plant' climbs as it 'grows upward'! The spiral itself is called a 'helix' and it represents a 'growing' accumulation' of ideas about a topic."

"I've heard that word, 'helix', on a TV program about Life," Molly noted.

"Yes, class, what Molly probably heard is that all life on Earth is based on a 'DNA double helix'. That topic is part of Biology. Here, I'm just viewing our thought patterns as a helix, even though it might not be the same as that DNA 'Helix of Life'."

Then Maya had her own 'noticing'. "Sometimes, when I study for school or prepare for 'show-and-tell', I practice or rehearse my thoughts to myself."

"Ah, that's another kind of thought! Very good, Maya." Mr Fantov replied. "Often when you speak to a class, presenting your ideas in spoken words, that same

'thought-spiral' happens again! After a while, that pattern can become Your Way to show or teach others!"

"Actually, some teachers use it deliberately because they believe that this 'pattern' makes learning more orderly and easier, faster, clearer, and deeper, for their students," Mr Fan explained further.

"Wow, I never thought that we think in patterns. There should be a word for this 'magic spiral' pattern of thinking." Molly said, because she always liked having 'special words' for 'special ideas'.

Mr Fan agreed. "You're right, Molly, and there is a special word-phrase for it. *It's called 'systematic dialog' (or 'systematic dialectic')* - that's a system or pattern of talking back and forth, each time forming better and bigger thoughts. *The spiral up to point  $q_N$  represents the  $qSum(N)$  'qMulation', and the part of the spiral between  $qSum(N)$  and  $qSum(N-1)$  represents  $qN$ .*"

"But is this pattern just the way we humans think, or is it also the way that Nature does things, like even before human thought existed, or as 'Nature's way' - Its natural kind of movement?" Maya asked in her quiet, but profound way.

"Excellent question! In fact, you asked your question so well that it makes me think that you already have an answer to it in mind. If so, would you please answer your own question, Maya?" Mr Fan encouraged.

So Maya began: "Well, in our science studies, we just studied about the Big Bang." [Thus, the topic-idea  $q_0$  was: 'Universe creation / unfolding'.] "Then I saw a television program about it. They said that in the first kinds of

*'particles' were the very light (not heavy) particles, including 'electrons' ( $q_1$ ). And, the second kind of 'things' to come into being were particles that were opposite to that first kind: they were the much heavier particles, like the 'protons' ( $q_2$ ).*"

"Later," she continued, "after that Big Bang had made the electrons and protons, both kinds of particles started to combine. *Together they formed even newer kinds of particles -- like 'neutrons' (in  $q_2 + q_1 = q_3$ ), and then 'Hydrogen atoms' (also in  $q_2 + q_1 = q_3$ ). Hydrogen, that's the first, and simplest element, you know.*"

"Right you are, Maya! You have summarized a lot of the 'creative self-growth' in the Universe! And, you've done it all in such a simple but universal way. There's a phrase for what you described -- it's called "the way, or 'dialectic', of natural history", or "Nature's own dialog with Itself". Thanks a lot, Maya!"

"As Jock would say: 'What else is this 'thought pattern stuff' good for?'" Johnny asked, as if Jock were present.

Mr Fan smiled, "Well, actually, it can be used to explain a lot of things - things like many developments in the different fields of Science. It might even be used to explain Politics and how ideas change the world (History) - as Maya once said."

Then Mr Fantov asked them all to keep that upward Thought Spiral sheet that he handed out (Figure 9). He then said "Good-bye", and left, to catch the last period of Mr D's '4<sup>th</sup>R' class at the high school.

+  $q_0 \times$

### **q10: 3-D: 'Definite Dialectic Detail' via an 'UpLoop'**

*With Mr D's students, Mr Fan gets quite detailed on how an 'upward Thought Spiral' might work between our current thinking (thesis) and a new idea (counter-thesis); he uses 'resetting of a thermostat' as an example of an 'upLoop': 'upward feedback Loop'.*

Mr Fantov had arranged to visit Mr D's Rhetoric class at the high school, right after talking with Ms D's fifth-graders about a "Thought Spiral". He began by explaining 'whorls' on a 'Thought Spiral', and the 'implied dialog' -- or 'dialectic' -- in Nature. He gave Mr D's students similar examples (as for Ms D's students), but used the complex words *dialectic* and *dialectics* much more often with the older 4<sup>th</sup>R students.

Adelle even offered her definition of dialectics: "To me it means: 'to engage in a dialog where each time you develop your view more clearly, depending on your previous results'. I think engineers call this process: 'feedback', or a 'feedback loop', or something like that."

Proud of her, Mr Fan said, "Adelle, you define 'dialectic' better than most dictionaries do! Yes, *dialectic* is a kind of feedback loop, but I would call it an 'upLoop' because it leads us upward in thinking, rather than staying on repeating the same loop/path!"

"The thought feedback is about how well each 'New Try' meets our expectations. It's sort of like a thermostat in your home. You *set it* at a *desired temperature* (a 'q1 level of comfort quality'), say 68°F (20°C), and the furnace goes on whenever the house temperature drops below that setting. But, with no change in that setting (q1), the furnace simply goes On

(1) and Off (0), like on a 'set circle' -- the circle of 'setting q1'. But, suppose someone in your home develops a 'new quality expectation' of a 'new comfort level': somewhat warmer (q2), say 72°F (22°C), and they register that as an 'Objection' (q2) to the old setting (q1)."

"A new setting is then the 'resolution' of a 'family dialog' that determines the new setting for all (to resolve q1 and q2, as say: q1&q2 (perhaps, a 'compromise comfort' setting of 70 F°, or 21 C°). The 'family comfort system' (S) then makes a New Try (new setting) for the entire family's comfort - on 'a higher comfort circle'. And, the overall result is an upward movement on the spiral - a spiral of thought 'qMutations'." Mr Fantov said, as he explained his notion of Dialectic as upward feedback:

$$\text{New S} = \text{Now S} + \text{Change(in setting S)}$$

He then resumed from where he left off: "I described the 'Dialectic of Natural History', or 'the way nature works'. *Actually, qNumbers can be used to model the progressions of both 'Systematic Dialectic' and 'Historical Dialectic' alike.*"

"I don't follow -- *how* do you use the q-numbers to 'model' dialectic? *What kind of 'model' are we building?*" Brad asked, not understanding Mr Fan at all.

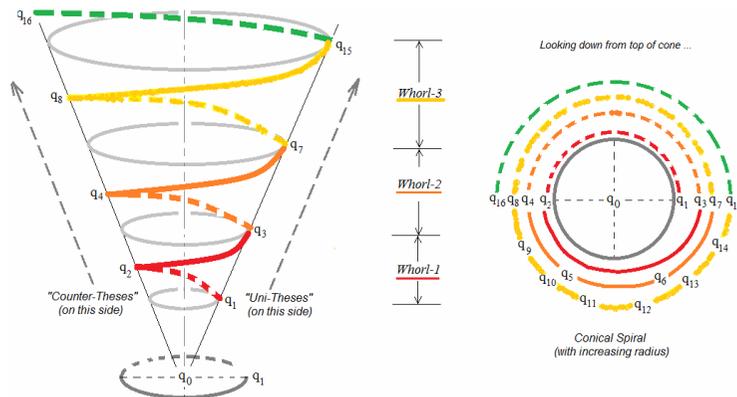
Before Mr Fan tried to explain, he drew a new kind of spiral, as shown in Figure 10, as he said, "*This 'upside-down cone spiral' pictures my notion that with each 'whorl' or 'winding upward', the radius of our*

current circle keeps increasing, to reflect the growing quality of our solution. This is my view, but I think it works well toward an answer to your question."

[And, as he drew the inverted cone spiral, it reminded him of a tornado -- a vortex of Nature's energy, which triggered this interesting silent thought within him: "Could this 'Thought Spiral' be Nature's own *kundalini* -- pulling Nature herself upward?"]

Then he continued ...

Figure 10. The Upside-Down Cone Thought Spiral



Notational Note:  $q_N$  is F.E.D.'s notation for qN in this qBook's notation.

"For example, on the First 'Whorl' ('first complete 360° turn' on the upside-down cone, from q1 to q3 of the progressing 'spiral pattern'), q1 can represent the quality of the First Try. And, q2 = q(1+1)' can represent the quality of the 'First Objection', 'First Counter-Example', or 'First Alternative' to the First Try). Then, q2♥q1 = q(2+1) = q3, can represent the quality of the "heart join', 'synthesis', or 'complex unity' of q2 with q1

(as in the previous qStory, when Molly had suggested that the boys build a permanent ladder to the tree-house). Then, 'q7' = ..."

"Wait a minute, Mr Fan. *This is getting to be 'No Fun! We need you to go slower,*" Steve registered his 'first objection' to the 'speed and quality' of Mr Fan's presentation.

"Sorry students. I'm excited about this, but I'll try a 'better way' to explain it all." *He then went a little slower...* "You see, then in the next whorl of the spiral, q4 = q(2+2), serves to represent the quality of the Second Objection".

Adelle wondered out loud. "Mr Fan, you're using qNumbers just like my father uses 'Real numbers'. He's an engineer, so he uses those 'quantitative numbers' to design and build new products. *What are you building with qNumbers?*"

"That's such a 'quality-question', Adelle!" he replied. "With qNumbers we are building ways to think more effectively. We do this by noticing our spiral pattern, and by using Dialectic, which is a progressive, growing Dialog, to understand things, better and better."

"And what's 'q7', you were about to tell us?" Julia reminded everyone.

"I'll tell you," Mr Fan continued, "q7 = q(4+3) will represent the quality of the 'SynThesis', which of course, means 'combined into one'. It's also called a 'UniThesis', or the 'Second Full Complex Unity'.

"And so on, into later whorls in our spiral, for as many winds as we can or need to go to obtain a 'Good-Enough-Thesis!'" he smiled, as he emphasized:

*"Remember, 'good enough' may be the economically optimal solution (to our 'quality problem'), given that 'diminishing returns' do set in at some point in our 'attempts' ('tries') to solve, via 'winding up the spiral'."*

"But your explanation doesn't mention 'q5' and 'q6'. Aren't they in your 'thought-pattern model' or 'dialectic?'" Jeremy wondered, as he too used Mr Fan's term 'model' to help inform the others.

"That's a good 'objection', Jeremy. You might think of 'q5 = q(4+1)' as standing for the separate quality of a Partial SynThesis -- but not yet enough ideas for the Full SynThesis of q7 = q(4+3)', a synthesizing which combines q4 (the Second Objection) with q3 (the First SynThesis).

"Put another way, q5 = q(4+1) might represent the combination of the Second Objection (q4) and the First Try (q1), or the 'reconciling' or 'adjusting' of them both to/with one another.

"Likewise, 'q6 = q(4+2)' could represent the separate quality of a different Partial SynThesis, for the 'combining' or 'reconciling' of the Second Objection (q4), with/by the First Objection (q2)"

*"Doesn't this 'combining' or, as you often say, 'heart-joining', ever end?"* Brad asked, feeling a bit overwhelmed by all of the 'qTalk'.

"Not really, *not until the problem is solved 'enough'*. You see, the same pattern continues for Whorl 3, and, if needed, for even more, even higher whorls. But, as I mentioned earlier, *someone, or 'some-many', must say when 'good enough' has been reached.*"

"Mr Fan, is the 'World' made from these 'Whorls', as you call them?" Steve just had to ask, since the words sounded so alike.

"Actually, 'Yes!' -- in the sense that each 'whorl[d]' is a continuing progression of ideas *upward*, until the next whorl." Mr Fantov replied, to what he considered a good question from Steve.

"You were talking about 'Whorl 3 and other whorls.'" Adelle recalled.

"Oh, as with each new whorl, there are ever more qNumbers standing for separate qualities -- qN's standing for ever more New Partially Unifying Combinations, or 'Partial SynTheses'.

"Does this mean that we 'catch all the combinations possible along the way' -- in each 'whorl' as you say?" Adelle said as she 'caught' his point.

"Well said, Adelle! *Yes, this model of dialectic registers all combinations.* Not all of them are necessarily in a given 'discussion', or specific 'dialectic'. But this 'general kind of dialectic' has them all -- just in case they are needed in some specific 'thinking process' or 'dialectic' to be modeled."

"So, you have 'a dialectical model of everything', don't you, Mr Fan!" Julia just blurted out, astonishing everyone.

"Julia, have you been reading my mind! -- or some websites?" he responded with amazement, but not necessarily with surprise -- for he had now come to expect these wonderful students to amaze him!

Then he concluded his talk, with this mind-boggling statement:

*"Every Newest Objection combines with the Original Thesis, and with every Older Objection, and with every Older Full SynThesis - and with any Older Partial SynTheses - **before it combines** with its Immediately-Previous Full SynThesis, to produce the Newest Full SynThesis."*

Having tired himself out too, he simply left the class with a quick "Good-bye". Mr Fan's 'word barrage' prompted Brad to say, "Boy, that was a '3-D' demo, or 'Definite Dialectic Detail!'" The 4<sup>th</sup>R class now genuinely wished that Mr Fan had used his usual succinct form of expression: *Simple mathematical symbols!* (They then gave that task to Jeremy, their math guy.)

But, Mr Fantov had left before they could tell him: *That for once, they would have appreciated his 'math way' as a 'better way'!*

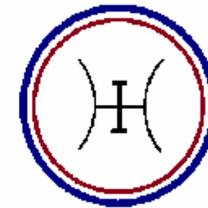
+ q0 x

### Part III:

## 'Better Games' Are Possible!



The 'qStories' q11 through q14 talk about how the Impossible can become Possible, and how New and Better Games can be invented!



**q11\*: An 'Empty' Bag of "I'm possible!" Tricks**

*Mr Fan entertains Ms D's kids with three ideas he had written inside an 'empty bag': from each idea he makes a story/model, which shows how the "Impossible" can say: "I'm possible!"*

It was getting toward the end of the school year, and Mr Fan had a few more ideas to share with Ms D's class. He came prepared -- with a big, brown paper bag.

"Hello, students! Today I want to show you a few more 'tricks' that will help us all understand qNumbers more, and what is possible by using them. I brought my 'Bag of Tricks'. Tell me, Jock, is it a heavy bag?"

"Jock lifted the closed bag, then shook it, "It's light, and it feels empty."

"But, is it empty? Molly, you try."

Molly opened the bag and looked into it, "Yeah, it's empty. There's nothing in the bag."

"Are you sure? Maya, tell me if *you* find it empty."

Maya didn't hold the bag or look into it, but she answered, "Well, it has 'air' in it!"

"Yes, but does it have anything else in it?"

"No, it just has air in it", Maya said, without looking too carefully.

"Let me check," Johnny insisted. Then he looked into the bag carefully, "It has writing on the inside side of the bag."

"Yes, it does, and what does that writing say?" Mr Fan quizzed.

"Let's see, it's entitled: '3 Trick-Ideas', and it lists these ideas ...":

- 1) The Zero and One trick
- 2) The Square and Circle trick
- 3) The Wedding Band trick

"So, the bag is not empty at all - it has both air, and three written trick-ideas in it! *Ideas have no weight, but they are still there! And some ideas are very powerful, more powerful than an 18-wheeler truck, or a '777' airplane!*"

.....  
Trick 1: 0 and 1, and Heartful Dialog  
.....

Mr Fan began: "I'll start with Trick 1. It's a story about Zero and One. Let's pretend that long ago they were like a mother and child -- and *the only way of talking and playing with each other was multiplying -- the 'Times game'*. What would happen if this were their only kind of 'game'?"

"Zero would win most of the time!" Johnny replied, because he figured, " $0 \times 1 = 0$  and  $1 \times 0 = 0$ !"

"Yes, and  $0 \times 0 = 0$ , but  $1 \times 1 = 1$ . When they multiply by themselves they could only make themselves! They couldn't make any 'new' numbers' to play with! It seemed there could never be any 'new numbers' in their tiny number family!"

"Oh, how sad that is!" Molly lamented, "Tell us what happened!"

"Well, one day One complained to Zero, 'Mom, why

don't we have other friends - some other numbers to play with? I want someone 'new' to play with!

Zero looked at her only child and said, "I know, One, but that's the way it is for now. Maybe we can find or make new friends?"

"But how, Mom? Our only way to make friends is by playing the 'times' game!". *One then took his little foot and sadly made what he viewed as a big 'X' in his sand box.*" Mr Fan narrated.

"What happened then?!" Molly asked impatiently.

Mr. Fan continued, "Well, Zero looked at One with a mother's love and concern, then she looked at One's X, wanting to find a new way. Fortunately, she looked at it from a different angle than One did. Suddenly, *instead of seeing a big X, Zero saw a little +, a 'Plus sign', which gave Zero the idea about Addition!*"

*"And that's how they made the other numbers!"*

Johnny blurted out: "With the idea of Plus, One could make the rest of the Whole Number Family -- all their brothers and sisters, like this:  $1+1 = 2$ ,  $2+1 = 3$ ,  $3+1 = 4$ , etc."

"Yes, that's how Zero and One 'talked together' and discovered 'Plus', a new game to play! *They 'talked it out' 'heartfully', by telling their need for new friends.*" Mr. Fan explained. "It's like 'q1' was 'their need to have other numbers to play with' -- and *the 'multiplying of their q1's' was 'talking out what their hearts needed'.* One 'objected' to being sad (q2), and his mother Zero wanted to help make him happy, but she only knew about

'times', or 'x' (q1). Their 'heartful talk' was like multiplying 'q2 x q1' to get 'q1 + q3'. And, who knows what the q3 was?"

"They discovered Addition, the 'Plus' game -- that's their q3!" Johnny said with a real glow. *"And they still had their 'times' game (their q1), within the result of  $q2 \times q1$ , which was  $q1 + q3$ ."*

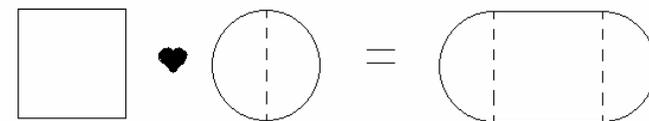
"That was a cute and 'heartful' story, Mr Fan. The '+ solution' (q3) came from the numbers talking about how they felt. *People can do this, too!*" Molly observed.

*"Exactly, that's the 'magical' trick of 'Heartful Dialog',"* Mr Fan emphasized.

.....  
Trick 2: Square and Circle make \_\_\_\_\_ ?  
.....

For his next trick, Mr Fan used Ms D's class supplies. He cut out a Square and a Circle, then said, *"Pretend that you are an artist, who makes good squares out of straight lines, but who has just learned how make circles, or curved lines as well. What can you make now?"*

*"You can make an egg!"* Johnny said, "If you cut the circle into halves, and put the half-circles on the opposite sides of the square, like this:

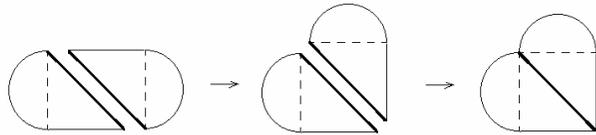


Mr Fan smiled, but he seemed to want another answer. So he said, "But an egg hatches, so what would

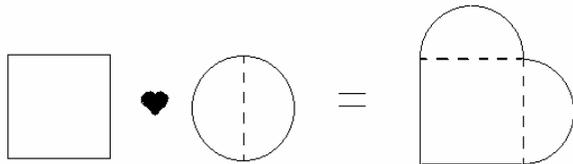
happen if the egg, as it 'hatched', broke open on the diagonal of its square part?"

"Then *we'd have two half-eggs,*" Johnny replied.

"Actually, Johnny, *we would have two half-hearts!*" Molly realized. "Look, flip one half-heart over, and put the two halves together, and you'll get a full heart, like this:



Then, Maya noticed, "*You can make the Heart an easier way. Just take the two half-circles, and put them on two sides of the square that touch,* like this:



Mr Fan smiled at Maya and everyone, "*Yes, Maya's way is easier, or 'neater'.*" Johnny had the idea to cut the Circle, and Molly used two half-hearts, but Maya used the half-circles directly to make a Heart! Although the word *di-a-log* means 'two sides talking', it can also mean *many sides talking*. Sometimes, we all need to keep dialoguing until we get to the '*better neat idea!*'"

"*All of these answers are 'example-ideas' of what the heartfelt-join,  $q1 \heartsuit q2 = q3$ , would contain.* After all, an

artist can make 'many kinds of drawings' by just using 'straight lines (q1)' and 'curved lines (q2)'."

Then Molly added, "I have a better way of saying all this: '*Just imagine that Circle opened up to the Square, so that she could hug him, and, together, their hug made a happy heart!*' "

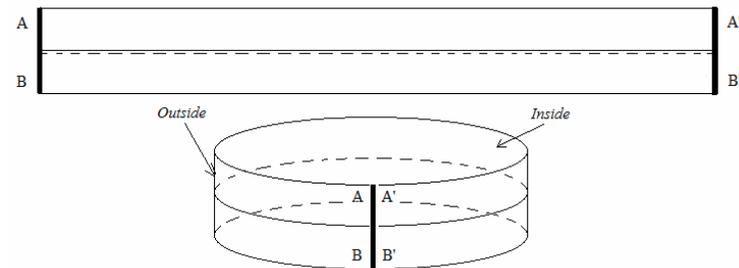
"Wow! That's a cute and heartfelt mini-story, Molly!" Mr Fan was impressed.

.....  
 Trick 3: The Wedding Band: '2 in 1!  
 .....

For his last trick Mr Fan asked, "Is it possible to make two opposite sides be the same side?"

Johnny and everyone wondered, but no one could think of 'How' that might be done, right then. So, Mr Fan showed them one way. He cut two thin strips of paper and asked, "These are identical two-sided paper strips, right?"

Everyone agreed. "Now, if I bend one into a ring, and tape it together, I get a two-sided ring, like this:

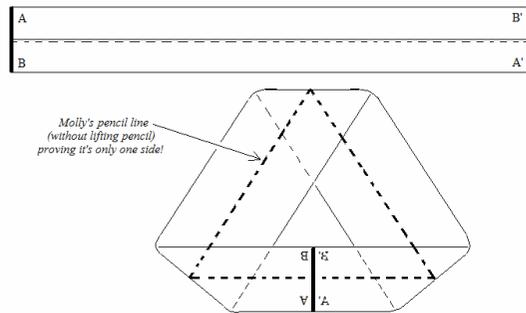


Johnny checked it. "Yes, it has two sides, just like the original paper strip.

Mr Fan then bent the other strip. But this time *he gave the strip a 'half-twist' before taping its ends together, claiming: "This is a one-sided piece of paper!"*

At first, no one believed him, not even Johnny. But Molly checked it by putting her pencil in the middle of the paper ring, and made one continuous line around the paper ring, without lifting her pencil off of it. "So, Mr Fan is right. This paper ring has only one side!"

The Wedding Band: A ring where two sides become one!



Maya smiled, "Wow, the two sides become the same side!"

Mr Fantov, then named it: "This is called a 'Moebius strip' or 'Moebius band', but I call it a 'Wedding Band'. Do you know why?"

Johnny figured it out this time. "Because, when two people get married, they make one pair. *The two people, are like two sides, who become one side -- one couple!*"

"Yes, Johnny! They are '2 in 1'! It's sort of like when two ideas,  $qA$  and  $qB$ , make their heart-join idea:  $qA \heartsuit qB$ . *The two join to make a single something that is more than each of them alone!*"

"Oh, that's so neat, Mr Fan! I want to do that -- someday, I want to make something bigger than me!" Maya exclaimed.

"Then someday you will, Maya!" Mr Fan replied, before he summed up his tricks and what they mean:

"These tricks were only ideas written inside what seemed to be an empty bag. That's *all we really needed: the ideas!* These are 'math-e-magical' kinds of tricks, but they show you that almost anything is possible.

"Remember kids, if you say: '*M is Impossible*', what you really mean is: '*You don't think M is possible.*' Perhaps M is saying back to you: '*I'm possible!*'"

"Sometimes it's just a matter of 're-spelling' ... Sometimes we just have to change the 'un-magic spell' we are under - a spell which says: 'Impossible'. But ... *someone, maybe You, might see a 'magic new spell', a new way of thinking in which 'It's Possible'.* You can then perform the 'magic' (actions) to make it come true!"

Their 'many-sided' dialog had ended, so Ms D dismissed her class for the day. As Johnny walked out, *he handed a folded note to Mr Fan* (on which he had written 'another way'), "*Here Mr Fan, here's 'another way' that two opposite sides can be on the same side.*"

After everyone had left, Mr Fantov unfolded Johnny's note, and instantly he saw that it 'spelled' the new idea that he needed to show Mr D and his football and soccer players, a better way (better game), too.

+  $q0 \times$

**q12: 'fUtbALL': a Game where U and ALL Win!**

*With Mr D's football/soccer players, Mr Fantov develops a new kind of 'fUtbALL' game where yoU and ALL (especially the 'fans') ALLways win!*

Mr Fantov had been delayed in visiting Coach Durer's (Mr D's) football and soccer teams, which he had wished to do much earlier. To make up for his delay, he asked Mr D to arrange a meeting with players from both teams -- in the school gymnasium. Upon seeing the assembled players, he recognized several of them who were also in Mr D's speech class.

Mr Fan began by asking, "What do all of you players like about football, or soccer?"

Marco, their star soccer player, was first to speak up, "In soccer, we like to catch the other team's goal-tender off guard, and make a quick kick in for a goal! Also, we have a great time stealing the ball from the other team as they advance down field."

"Steve spoke for the football players, "I guess it's the 'rush' we get being able to execute a great play -- or when we sack the other team's quarterback, just when he's about to throw a long pass!"

Brad added, "*Yeah, it's a great feeling to do it, and to get all the praise from our fans when we do it well.*"

"Hey, what about this 'Fantov fan'? I'm your greatest fan!" Mr Fantov teased. "*Seriously, fellas, doesn't all that 'body contact' get to you, especially if you lose?*"

*"Sometimes, especially if we lose by just a point or so. Then, it's as if all our effort didn't matter! And our*

*fans are disappointed, too.*" Brad said, rather dejectedly.

"So, at times you all get frustrated that the winner wins all (the 'Win'), while the loser wins nothing (the 'Loss', except if you 'Tie'), no matter how much 'effort' both teams make, effort that keeps their scores close!"

"Yeah, wouldn't you feel disappointed, too, Mr Fantov?" Brad asked.

"You bet! That's why *I play only games where I always win something, instead of possibly losing everything, even if I play my best!*" their greatest 'fan' replied.

*"But, what choice do we players have? These games have been around long before we were even born. 'Rules are rules!' "* Steve uttered the standard answer.

"No doubt '*Rules are rules*' -- *once you've agreed upon the game.* But, what if we were to design a different game - a game that preserved much of what you like about Football (or Soccer), yet a game that also ensured that your fans would always win something -- just for your playing your best?" Mr Fantov suggested.

"Well, sure we'd like such a game, if it was possible!" answered Brad.

*"Almost anything's possible, guys! Maybe you've been getting your bodies banged up so much that you've never had a chance to see or feel other possibilities?!"* 'Coach Fan', their newly-appointed 'game-design coach' said, giving them his 'straight talk' about Possibilities!

"OK, 'Coach Fan'," Brad agreed, "show us how you'd design a 'fair-er', more Win-Win kind of game."

"OK, teams. Let's try re-designing Football today. The same ideas can be applied to a new Soccer game, too. Let's call our new game, 'fUtbALL', since it will be a game yoU play and that ALL can win. Also, *fútbol* is the Spanish word for *soccer*, the 'football' that actually uses your 'foot'! So, by using the word 'fUtbALL', we'll be reminding ourselves that this new game can also represent a new kind of 'Soccer-for-ALL' game!" Mr Fantov suggested, then continued ...

"fUtbALL' can be a game where you can still play to win as a team, but even if you lose, you and the fans can still rightly feel that they've 'Won'. What do you think?"

"I wouldn't mind that!" most of the players mumbled affirmatively, as they asked: "But how?"

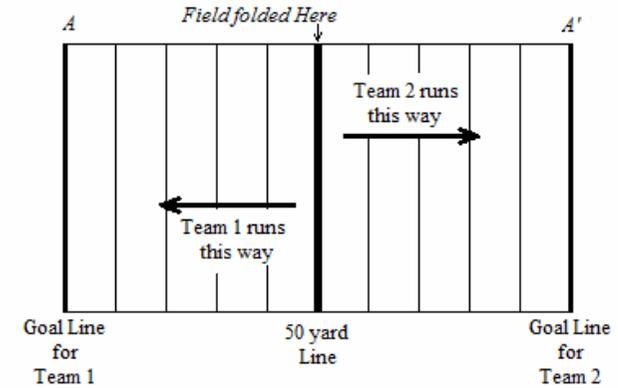
'Coach Fantov' was ready for that question. From his "Game Design" folder, he took out a clear plastic sheet (transparency) on which he had already drawn a diagram of a football field, with 'arrows' showing the 'direction' each team would run (Figure 12). He asked Brad to verify that his drawing was accurate enough.

"Yes, that's how it is," Brad said, as he handed the transparency back to 'Design Coach Fantov'.

Mr Fan then showed them what they all knew: "Team 1 runs this way towards its goal line, and Team 2 runs the opposite way toward its (opposite) goal line, right?"

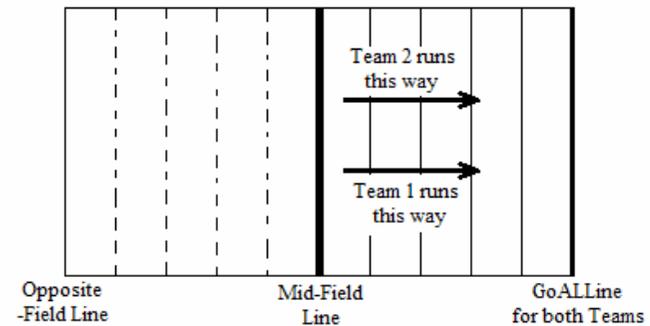
"Nothing new there, Mr Fan," Steve teased.

Figure 12. Football's field and fUtbALL's 'folded field'



*Above: Field for traditional "Football", where One team Wins, the Other team Loses (or both teams Tie), and their Fans win/lose too!*

*Below: Field for proposed "fUtbALL", where teams Win/Lose as in Football, but ALL Fans WIN by helping to score a Good/Bad game!*



Then, Mr Fantov did something utterly simple (as Johnny's "folded note" had shown him). He folded (and creased) the transparency at the 50-yard (mid-field) line, and said, "On this 'folded-field' (as shown in Figure 12), both teams run in the same direction, toward the same goal line, or 'goALLine', as I'll call it! That way,

the fans see one goALLine, and they see both teams 'go-ing ALL out' to cross it, giving themselves (the fans) a 'rush', too!"

"Let me see that!" Steve demanded, as he studied Mr Fan's clever 'design play! "I think he's right: *We would all run toward the same goal line -- or the same 'goALLine', as he says!*"

"And, that would be the first step toward making a game where ALL might win!" Mr Fan smiled, as the players also smiled, having a new kind of hope they had never before known.

"But, how would we score this 'fUt**ALL**' game?" Marco, the soccer player, asked.

"The same as we do for Football now. We would still have that 50 yard line ('fold-line'), but in fUt**ALL** both sides would run the same way. Two teams play against each other just as before -- you just don't have to switch directions at half-time, since you'd switch direction whenever the ball changed teams. However, if a pass is intercepted, the interceptor might not have to reverse direction, as long as he runs toward the 'goALLine'. This new rule might even make the game more exciting!" Mr Fantov claimed.

"But, how would everyone win if we still play the same game?" Brad pressed 'Coach Fan' for a solution.

"Well, the teams still play the same game as always, and score the same way as usual. *Only, in fUt**ALL**, yoU and ALL the fans (of both teams) also get a chance to vote as to how much they liked the game!* And, because

they may have their own 'standards' of what constitutes a good game, they might score far differently than the way that the referees would, that is, according to the usual rules. You see, *we would have some new rules -- rules that support the very reason you play: 'For the Fans'* -- and the joy and praise of those fans and what they give yoU and your school!"

"And just how might the fans score such a game, Jerry?" Coach Durer (Mr D) quizzed his 'game design coach'.

"Well, Doug, they could vote from 1 to 100, perhaps by 'texting' on their smart phones as to how much they enjoyed the game: '100' would be the best game possible", and '1' would be the worst game possible, according to the fans. Then computer software would automatically calculate the 'FanFactor' of overall 'Fan satisFactory-ness' (as shown below)." Mr Fantov had suggested a possible way of voting in 'fUt**ALL**' -- a game for yoU, the player, and for ALL involved, *especially for the Fans!*

Total Sum of Fan Votes / 100

FanFactor = -----

Number of Voting Fans

"But how would this 'FanFactor' be used to score the overall game. Would the 'FanFactor' itself be 'the Game score', or would you use it to adjust some other score?" Brad asked, perceptively.

"Good question, Brad, I like your idea about using the FanFactor to adjust (multiply into) some other 'raw

score'. And I have an idea of how we might best arrive at that 'raw score'," Mr Fan began:

*"Fans, in general, like a 'close game', where the winning team doesn't overwhelm the losing team by too many points. Then, the game is a 'real contest'. And, that way, neither team's fans are very disappointed, because it was a 'close game'."*

"Now, let TOT1 be the point total of Team 1, and let TOT2 be the point total of Team 2. Let's assume Team 2 wins in the usual scoring, that is TOT2 > TOT1. Then take the game's total scores Sum = TOT2+TOT1, and divide it by 2, to get the 'GameAverage score'. Also, divide that same Sum by the game's 'closeness', or scores Difference, Diff = TOT2-TOT1, to get a 'Game Closeness' factor (= Sum/Diff)."

"Multiply those two together to get a 'TotALL Raw' score, measuring how good the game was for the fans:

'TotALL Raw' score = GameAverage x (Sum/Diff)

$$\text{TotALL Raw} = \frac{(TOT2 + TOT1)}{2} \times \frac{(TOT2 + TOT1)}{(TOT2 - TOT1)}$$

*"The TotALL Raw score gives us a fair measure of how well the game was played, without the fans voting, yet!"*

"Oh, one other thing, we must have a rule against 'Ties', which would mean that TOT2 - TOT1 = 0, and we can't divide by 0!" Mr Fan mentioned out loud, but silently reminded himself: *"But with qNumbers, we can divide by 'q0', since it's like 1!"*

"Once the fans vote, and the FanFactor is calculated, the 'TotALL Raw' score is then multiplied by the FanFactor to obtain an overall 'TotALL Game' score for everyone attending/voting-on that game:

$$\text{TotALL Game} = \text{FanFactor} \times \text{TotALL Raw}$$

So, in addition to a team's scores (TOT1 or TOT2), this fan-determined 'TotALL Game' score could also be used to determine league standings against other fUtBALL teams' TotALL Game scores."

*"And, although we are using 'quantitative' numbers to score it, our new game is the result of 'qualitative' number concepts, since the New game of 'fUtBALL' still contains the Now game of 'Football' plus a 'Change(in rules/scoring) within it:*

$$\text{New 'fUtBALL'} = \text{Now 'Football'} + \text{Change(rules/scoring)}$$

The tired 'Coach Fantov' sat back, ready for comments.

The players talked among themselves about the proposed 'fUtBALL'. Finally, Brad summed up their feelings, "So, as we understand you, Coach Fantov, *fUtBALL scoring would really depend, ... as we always say: 'on how we play the game', wouldn't it?"*

*"You've got it, guys!"* their greatest 'Fan' then realized that Brad and the other players really understood what his 'new game' meant for them and ALL: fans, players, coaches, referees, schools, announcers -- all who are in some way involved in the Game. "Thanks to you, Brad, and to all you other fine players!"

\* \* \*

"That's an amazing proposal, Jerry! I think you've helped us 'All' start inventing that 'Everyone Wins' football game that Diana ('Ms D'), has been wishing for!" Mr D exclaimed, as he secretly thought: "And, maybe we could even have a less violent game, too. *I'm tired of seeing 'my boys' get hurt!*"

"I'll try to explain all this to Diana this evening. Say, Jerry, why don't you come over and explain it to her yourself? *We can celebrate! I'll order us all a big pizza.*"

"Great!" Jerry replied. "By the way, Doug, did you know that 'Pizza' itself is the formula for the Volume (V) of a cylinder of radius 'z' and thickness 'a':

$$V = \text{Pi } z z a !$$

"Speaking of 'thick-ness' ... !" Coach D sighed, "No, Jerry, I didn't know that, nor did I want to. *Are you coming to eat pizza, or to digest your formula?!*"

"OK, eat pizza it is!" Jerry 'got' Doug's comment, and said no more out loud. He did, however, have another thought to himself:

*"Wow, this pizza will be another free meal (for me), just like ideas and qNumbers are free -- free to use, and free to give away! And, by giving away ideas (unlike pizza), I still have (within me) what I give away!"*

+ q0 x

### q13: 'WEbALL': a game WE ALL can WIN!

*Mr Fan addresses Mr D's 4<sup>th</sup>R class just before graduation; he claims that the Internet, or 'World Wide Web', offers us the chance to play a great new game, of 'WEbALL', where WE ALL can be ourselves and still WIN!*

During that night of 'free Pizza', Mr D invited Jerry to visit his 4<sup>th</sup>R class one last time, before many of those students graduated from high school. Being their 'greatest fan', he had to visit again, this time with some thoughts on a new fair Game for each and ALL ...

*"My friends of the 4<sup>th</sup>R, especially you graduating students:*

*A New World is emerging -- right before our eyes and ears. The New is being made from the Now dialoguing with itself. Excitingly, we each are part of that Dialog. We are each a Now-part of that New!"*

*"The Internet, or 'World Wide Web', is showing us how easy it is to share -- by exchanging thoughts with the World. And, as in sharing ideas, it's (virtually) free! The Web is a great tool to assist us in almost anything we choose to do. Actually, it is a Great EqualIzer, which helps us to 'see or be', with 'equal-I's' so each 'I' can make their dream come true!*

*"Our dREAMs contain the REAL. To me, a dream contains within it that which is needed to make it real. With our own 'self-dialog' from within us, we can become in touch with all that is needed to realize -- see with 'real eyes' -- our dream!*

*"Note that 'Web', slightly 're-spelled', is 'WE b'! Indeed, may 'WE be ourselves'! And, by using Heartful Dialog, let us construct a New game - the game of WEbALL - a game, IN Which, WE ALL can WIN!"*

*"Good luck to you, ALL-ways!" -- 'Your B-est Fan' ☺*

+ q0 x

**q14\*: Don't let 'fun' become 'unfun'!**

*Mr Fan tells Ms D's kids his hopes for them, as he reminds them to 'Think fun only', and not to fall into the 'unfun game', which tends to stay 'unfun' without any Change!*

After his "WE\_b address" to Mr D's class, Mr Fan felt that he should use Ms D's open invitation to visit her fifth-graders again before the school year ended. When he got there, he began with this little speech ...

*"My wonderful students of Ms Deary -*

*Soon you will be out of school for the whole summer -- doing whatever you (and your parents) want to do. Remember that 'playing' is a big part of learning -- it's a way to learn without working or studying. It's a way to have 'fun' while you learn!"*

Then, as he often did in the past, he pulled out one of his trick cards, a card with only one word on it:

fun

"That's your goALL: 'go ALL out and have fun!'" Then, he rotated 'fun' upside-down until it became

unf

He wrote 'un' at the end of 'unf', to get ...

unfun

and he rotated that upside-down, to get ...

unfun

But, it stayed the same 'unfun' -- without Change!

Mr Fan then wrote all this as:

unfun x unfun = unfun, [the Boolean property]

or: unfun x unfun = unfun (+ noChange !)

As he wrote, he realized to himself: "It's another example of being a 'Boole fool!'" Then he "interpreted" it all -- as to what it meant for Ms D's students:

*"You see kids, if you allow your 'fun' to become 'unf', your 'fun' can become 'unfun'. And 'unfun' kind of stays 'unfun', without change, without changing back to 'fun'! It's hard to get out of 'unfun situations'. So don't think 'unf'. Think only 'fun!'"*

The kids laughed with him. Then Molly said, "We'll remember that! Thank you for a fun year, Mr Fan."

Then Johnny added, "Yeah, thanks for your thoughts about thinking. 'Think' and 'Thank', they kind of go together!" Johnny had adopted some of Mr Fan's ways.

So, did Molly. "You know, Mr fan, if you replace the 'a' in 'Mr fan', with the 'u' in 'You', you become 'Mr fun!'"

"Yes, I do! Thanks, Molly. And 'Thank U, ALL!' for a good year of 'fun dialogs'."

'Mr fun' then said "Good-bye" -- expressing the following hopes and wishes for them all ...

*"I have great hopes for you and for other kids like you. I 'wish' and 'know' that you each will grow up and make a 'Quality World' for yourselves and for your own kids.*

*"Use your WONderful Heads and your WONdrous Hearts in Heartful Dialog with everyone you meet! Then you'll make better ways for us ALL, and yoU will have WON (and will continue to 'Win') the Game of Life for yoU and ALL!*

+ q0 x

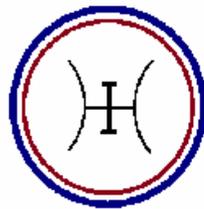
## qAppendices

("Special Credits")



The following sections are for those who wish further information about the author, qNumber arithmetic, and dialectics, or who want to make their own hardcopy qBook.

*Mr Fan, Ms D and Mr D gladly extend "special credit" to these readers.*



## qA. About the Author

"Joy-to-You" is my 'pen name'. It states my sincere wish for/to anyone. I care for my fellow humans and our quality of thinking and feeling, and am concerned that we have not yet found 'better ways' to 'relate and share' -- to 'heartfully dialog'.

Each 'dialog character' in this qBook 'lives' within me in some form of thought-feeling. The fifth-graders live as 'fond memories of talks with kids' over 20 years ago. The 'Mr Fan' 'character' is far more like 'me' than I might care to admit!

My Life has been a quest to unite thoughts, feelings, actions -- as a unity of **human Head/Heart/Hands (& humor)** - - and to describe this interplay of thoughts/feelings/actions (& 're-actions') mathematically, because 'That way' is '**My (priMary) way**'. And, I'm happy to say, That way is 'My Joyful way'.

And speaking of Joy, it can be found in the simple beauty and fragrance of a *flower - flowing (sharing)* itself outward! I also repeat what I've said many times elsewhere, especially in a 'Now World' that seems to have difficulty acknowledging and enjoying It's own Joy: *Joy is easily found, in ourselves or others. All one need do is look at the word 'YOU' in a mirror. Reflected back, one sees 'JOY!' So ...*

**! YOU are JOY !**

Such is a 'free thrill', economically and quantitatively, but such a valuable 'emotional joy', *heartfully and qualitatively!* Such was/is the Joy of Writing this qBook.

*- Joy-to-You*

## qR: Suggested References

The following references are suggested for exploration, many of which are available at [Foundation Encyclopedia Dialectica \(F.E.D.\)](#) websites: [www.dialectics.org](http://www.dialectics.org) and/or [www.adventures-in-dialectics.org](http://www.adventures-in-dialectics.org).

**Author's favorites:** "syntheses" of *Head, Hands in Heart/humor* "Metropolis", Fritz Lang's 1926 movie: Heart uniting Head & Hands. "The Big Bang Theory", (humor), CBS-TV show, also in syndication.

### F.E.D. Briefs (by author "Joy-to-You")

Brief #3: Toward Understanding "A Dialectical Theory of Everything" - A General Summary of Theory, Purpose, Application.

Brief #4: The Role of Universal Heart in Our Theoretical Models

Brief #5: Discovering Natural-Qualifier Space via N-Cum Space

Brief #6: Discovering Whole-Qualifier Space via W-Cum Space

Brief #7: Discovering Integer-Qualifier Space via Z-Cum Space

Brief #8(2013): A World without Opposites via a "Folded-Field"

"Briefs' page" link is in the top right on [dialectics.org](http://dialectics.org) homepage.

### Other F.E.D. Free Download Materials

**Introductory Letter:** *Dialectical Ideography and the Mission of F.E.D.*, by Hermes de Nemores (F.E.D. General Secretary).

Found at [dialectics.org](http://dialectics.org) & [adventures-in-dialectics.org](http://adventures-in-dialectics.org).

Aoristos's Blog (5/19/2012) at [dialectics.org](http://dialectics.org): **The F.E.D.**

"Psychohistorical-Dialectical Equations", by Aoristos Dyosphainthos (F.E.D. Public Liaison Officer).

Link found at the end of second line atop [dialectics.org](http://dialectics.org) homepage.

Vignette #4, Parts I & II: The Gödelian Dialectic of the Standard Arithmetics, by Miguel Detonaciones (F.E.D.'s newest member).

Vignette #7: Dialectic is the Organizing Principle of the «Kosmos», of Nature as Totality, by Aoristos Dyosphainthos

"Vignettes' page" link is in center 2nd line atop [dialectics.org](http://dialectics.org) homepage.

### Books or CD-ROMs available from F.E.D. Press

Foundation *Encyclopedia Dialectica, A Dialectical "Theory of Everything"-- Meta-Genealogies of the Universe and of Its Sub-Universes: A Graphical Manifesto :*

Volume 0: **Foundations for a Unified Theory of Universal Dialectics**, F.E.D. Press [Terminious, CA: 2010].

Volume 2: **Dialectical Meta-Models of the Human Phenome**, F.E.D. Press [Terminious, CA: 2012], forthcoming.

### Books by 'Other Authors'

Archie J. Bahm, *Polarity, Dialectic and Organicity*, World Books [New Mexico: 1970].

Willard Gaylin, *Feelings*, Ballantine Books [New York, NY: 1979].

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Joachim Israel, *The Language of Dialectics and the Dialectics of Language*, Munksgaard [Copenhagen, Denmark: 1979].

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Morris Kline, *Mathematics: The Loss of Certainty*, Oxford University Press [NY: 1980].

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Nicholas Rescher, *Philosophical Dialectics: An Essay on Metaphilosophy*, SUNY Press [Albany, NY: 2006].

Brian Rotman, *Signifying Nothing: The Semiotics of Zero*, Stanford University Press [Stanford, CA: 1987].

Thomas K. Simpson, *Newton, Maxwell, Marx: Spirit, Freedom, and the Scientific Vision*, Green Lion Press [Santa Fe, NM: 2012].

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## **qW. Making your own qBook With/From a "pdf"**

Although this qBook may be available from F.E.D. Press (at a small cost and with better quality print), you may wish to make your own 'hardcopy' qBook from a printout of the downloaded "pdf" file. To do so, follow these steps:

### Print out all pages:

- 1) Print out a copy of the downloaded e-file (pdf) onto single-sided sheets (20# paper).

### Prepare Front / Back covers:

- 2) Print out cover sheet (first page) onto white card stock (65#), or laminate a 20# sheet.
- 3) Cut cover sheet in half into Front/Back covers.
- 4) Use multi-holed punch of your choice. (*Be sure to punch Back cover on its reverse side to match Front.*)

### Prepare Pages for assembly:

- 5) Fold each single-sided sheet in half, so that each half-sheet is an outside page of text. *On page 61, cut  $\frac{1}{2}$  inch (1 cm) off right side so it will unfold if used.*
- 6) Arrange all folded sheets in page number order, with page X' being the back-fold of page X. (*Note: For hole-punching, folded-edge is to right, unfolded-edge is to left - for inserting into punch!*).
- 7) Use same multi-holed punch to punch holes through each folded sheet on unfolded edge.

### Assemble Covers + Pages into qBook:

- 8) Bind Front Cover + Pages + Back Cover, using binding 'spine' ('comb', 'spiral', or 'binder') that matches holes.

*Happy Reading of your qBook!*

*With wishes for a Quality World and*



*for Heartful Dialog among and for us ALL!*

**qZ: "Chart of Rules" for each aRithmetic**

The Rules of Standard 'Whole Number aRithmetic' <i>Used for whole 'quantities' of and interactions of things</i>	0	q0	The Rules of qNumber 'qRithmetic' <i>qNumbers are used for 'qualities' of ideas, and for 'dialog'</i>
0 lets U be U in + : $0 + U = U = U + 0$	1	<u>q1</u>	q0 lets qU be qU in + : $q0 + qU = qU = qU + q0$
1 lets U be U in x : $1 \times U = U = U \times 1$	2	<u>q2</u>	q0 lets qU be qU in x : $q0 \times qU = qU = qU \times q0$
"A + A = A" is true for only one whole number A = 0: $0 + 0 = 0$	3	<u>q3</u>	$qA + qA = qA$ is true for every qNumber qA
Sum of any two different non-zero wholes is <u>another</u> whole number: $A + B = C$	4	<u>q4</u>	Sum of any two different qNumbers is <b>not another</b> qNumber: $qA + qB$ is a 'combo-qNumber' (not a single qNumber if $qA \neq qB$ )
Addition is "either-pair-wise" or "associative": $(A + B) + C = A + (B + C)$	5	<u>q5</u>	Addition is "either-pair-wise": $(qA + qB) + qC = qA + (qB + qC)$
Addition is "reversible" or "commutative": $A + B = B + A$	6	<u>q6</u>	Addition is "reversible" (commutative): $qA + qB = qB + qA$
Whole numbers have a natural "less than" (<) ordering: $0 < 1 < 2 < 3 < \dots < M < \dots < N < \dots$ <i>Note:</i> The < is a <u>quantitative</u> ordering, of <u>quantitative</u> differences.	7	<u>q7</u>	qNumbers have a natural " <u>progressive qualitative</u> " ("<") ordering**: $q0 < q1 < q2 < q3 < \dots < qM < \dots < qN < \dots$ <i>Note:</i> The "<" is a " <u>qualitative</u> ordering", of <u>qualitative</u> differences.
Multiplication of "2" wholes makes a whole "bigger" than either: $A \times B = AB$ , where $AB > A$ , $AB > B$ (unless A and/or B, is 0 or 1)	8	<u>q8</u>	Multiplication of "two" qNumbers makes a "bigger" qNumber: $qA \times qB = q(A+B) + qB$ , $q(A+B) > qA$ or $qB$ (unless one or both = q0!)
x is "pair-interchangeable" or "associative": $(A \times B) \times C = A \times (B \times C)$	9	<u>q9</u>	&, ♥ are "associative", x is not: $(qA \& qB) \& qC = qA \& (qB \& qC)$
x is "reversible" (commutative): $A \times B = B \times A$	10	<u>q10</u>	♥ is "reversible": $qA \heartsuit qB = qB \heartsuit qA = q(B+A)$ x is "not reversible": $qA \times qB \neq qB \times qA = q(B+A) + qA$ & is "reversible": $qA \& qB = qB \& qA = q(B+A) + qB + qA$
x "distributes" +: $(A + B) \times C = (A \times C) + (B \times C)$ , or 'C-touches Sum' = Sum of C-touches (x implied): $C(A + B) = CA + CB$	11	<u>q11</u>	x "distributes" +: $(qA + qB) \times qC = (qA \times qC) + (qB \times qC)$ , or 'qC-touchesSum': Sum of qC-touches: $qC(qA + qB) = qCqA + qCqB$
The addition: $1 + 1 = 2$ , makes "something new" (2)! But ... The multiplication, $1 \times 1 = 1$ , makes nothing new!	12	<u>q12</u>	The addition: $q1 + q1 = q1$ , makes nothing new. But ... The multiplication: $q1 \times q1 = q1 + q2$ makes "something new" (q2)
The sum: $A + B$ , in Whole Number space, ... <i>corresponds to</i> ...	13	<u>q13</u>	... product: $qSumA \times qSumB = qSum(A+B)$ , in "Open qNumber space"
$1 + 1 + \dots$ (N times) = $(1) \times (N) = N$ ... <i>corresponds to</i> ...	14	<u>q14</u>	... $q1 \times q1 \times \dots$ (N times) = $(q1)^{(N)} = qSumN = q1 + q2 + \dots + qN$ .

\*\* Note on Notation:  $qM < qN$  is this qBook's notation for:  $qM \rightarrow qN$  in F.E.D notation.

+ q0 x