

**—THE—
TRUTH
—IN—
MONEY
—BOOK—**

**BY
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The Pluto experiment

"In order to understand the mechanism which causes inflation, we must first understand how money is created and how it is extinguished. The problem is that, although many textbooks, television reports and magazine articles describe *parts* of the creation/extinguishment cycle, few references have ever pieced the process together to explain why a debt-money system is unstable and how it inevitably causes inflation, followed by recession and depression.

"To illustrate the basics of debt-money creation and extinguishment, we need to start from scratch. To do this we are going to go to a place with no money. We will set up a debt-money system and you will quickly see exactly why this kind of system is inherently unstable.

"Remember, the purpose of this expedition is to simplify and clarify the fundamentals of the present United States debt-money system. Because we will start from scratch on Pluto, the 'subtle errors' in the design of the system will be more readily detected as the 'gross errors' that they really are."

"Okay, let's go!" Ed interrupted. "Count down—five seconds, four seconds, three, two, one, zero . . . *blastoff!* We're on our way to the planet Pluto!"

Creating money on Pluto

"We arrive on Pluto and set up our new community. We develop our economy and soon need a more convenient means than barter to exchange our goods and services. Since I have expert knowledge of finance, I persuade the colony to adopt the system of 'bank checkbook credit'—as now used on Earth—and to appoint Carl as the banker with me as consultant. The majority of the colonists are satisfied to put the 'complicated business of banking' into someone else's hands, so they approve legislation, which I write, giving the banker exclusive authority to govern the monetary affairs of the colony under broadly stated objectives.

"Carl and I then proceed to work out operating rules and procedures, that we may alter from time to time as our 'good judgment' might dictate.

"Carl names this private corporation the Pluto Central Bank. He assumes the authority to create Pluto dollars, just as the Federal Reserve assumed the authority to create United States dollars."

"But we didn't bring any money with us to Pluto," Nancy said. "Where will Carl get the Pluto dollars for his bank?"

"He will create them!" I replied.

"Out of what?"

"Out of nothing!"

"Is that legal?" Martha asked.

"Well, remember that is exactly the way the Federal Reserve and commercial banks in the United States create money: *out of nothing*."

"Yes, I know," Martha said. "But I can't seem to make myself understand that banks can create money out of nothing."

"Someone must create money. As we have said so many times, money doesn't grow on trees. At the moment, banks are creating money here on Earth as interest-bearing debt. Our Pluto experiment will reveal the problems inherent in this method in just a moment. Let's see how Carl is getting on with his bank.

"The first customer Carl has at his bank is Ed who comes in to borrow \$100, which represents an adequate money supply for our little community. Ed has an honest face and property worth more than \$100, which he is willing to pledge as security for the loan. Carl prepares a promissory note for Ed's signature and gives him a checkbook and a deposit credit of \$100. This he does by making a simple bookkeeping entry. Presto! Carl has created a \$100 debt against Ed, which Ed is obliged to pay back to Carl at interest of, say, 6%. Now let's see what happens.

"One year passes. Carl notifies Ed that an interest payment of 6%—\$6—is due. What are the consequences of Ed's obligation to pay this interest cost? There are two possibilities:

1. Ed could write a \$6 check to the bank to pay the interest. The result is that \$94 will be left in

circulation. (For the purpose of this example, we're going to assume that the bank doesn't spend any money into circulation—an unlikely circumstance to be sure. If we took into consideration the funds that the bank creates to meet its expenditures, the figures used in this illustration would become extremely complex.) A \$100 debt will remain. The loan must be renewed for another year. At the end of the second year, \$6 more of interest is due. When Ed pays this interest there will be \$88 left in circulation. If Ed continues to pay \$6 per year interest, by the 17th year there will be no money left in circulation, but the debt will still be \$100. Carl will ultimately be obliged to take possession of Ed's pledged property, according to law. It is obvious that Ed wasn't wise to pay the interest.

Ed interrupted at this point, "But suppose I'm a farmer up there on Pluto. Why don't I pay the interest by giving Carl a sack of potatoes worth \$6?"

"According to the loan agreement, you pledged to repay the principal and interest in Pluto dollars. If Carl weren't such a good friend, we might suspect that by creating a limited amount of money and demanding repayment only in money, he is trying to get hold of your pledged collateral. Here is the second way that Ed might pay off his loan."

2. At the end of the first year Ed chooses not to pay the interest but to borrow it from the banker

thereby increasing the loan principal to \$106. Carl is happy to lend the additional \$6. It's no problem for him. He can create it just as he created the initial \$100 as an additional debt against Ed. As a good banker, Carl will hasten to point out that the interest on the additional \$6 is only 36¢ the first year. This is a paltry sum to keep our circulating money supply up to full strength of \$100."

"Do I detect a note of sarcasm in your voice?" Ed laughed. "Is this second alternative really as innocent as it sounds?"

"Well, let's find out. We will need to calculate your interest cost and total debt during the first five years.

Table 5

Growth of a \$100 debt at 6% interest

Year	Original borrowed principal	Interest due at year end	Debt at year end	Money in circulation (M1)
1	\$100	\$6.00	\$106.00	\$100
2	remains	6.36	112.36	remains
3	the same	6.74	119.10	the same
4	for the	7.15	126.25	for the
5	five years	7.57	133.82	five years

"The debt at the start of the second year is the original \$100 plus the interest at 6%.

$$\begin{array}{r}
 \$100 \text{ original principal} \\
 +6 \text{ interest charge} \\
 \hline
 \$106 \text{ debt after one year}
 \end{array}$$

The second year's interest is:

$$\begin{array}{r}
 \$106 \text{ original principal plus one year's interest} \\
 \times .06 \text{ interest rate} \\
 \hline
 \$6.36 \text{ interest charge for the second year}
 \end{array}$$

So, the debt at the start of the third year is:

$$\begin{array}{r}
 \$100.00 \text{ original principal} \\
 6.00 \text{ first year's interest} \\
 6.36 \text{ second year's interest} \\
 \hline
 \$112.36 \text{ total debt after two years}
 \end{array}$$

What is the debt at the end of the fifth year?

$$\begin{array}{r}
 \$126.25 \text{ debt after four years} \\
 +7.57 \text{ fifth year's interest charge} \\
 \hline
 \$133.82 \text{ total debt after five years}
 \end{array}$$

"Wow," Nancy said. "Look how the interest makes the debt grow."
 "What do you think of this system of borrowing to pay interest?"
 "Well, I don't think it's so bad," Ed replied. "The interest is only \$7.57 for one year."

Martha interrupted, "But Ed, look at the debt. It has increased by one-third in five years."

"Yes, I know," Ed replied, "but the interest has only increased from \$6.00 to \$7.57. That's only \$1.57. We can handle that."

"Do you suppose you could handle the increase after 50 years?" I asked. No-one answered.

"In 50 years the debt will have grown to \$1,842—an increase of almost 2000%!

Table 6

Debt growth 70 years at 6% annual interest rate				
Year	Original principal P	Interest due at year end (6%) I	Debt at year end* D	Money in circulation (M1)
1	\$100 (remains the same)	\$ 6.00	\$ 106.00	\$100 (remains the same)
2		6.36	112.36	
3		6.74	119.10	
4		7.15	126.25	
5		7.57	133.82	
10		10.14	179.08	
20		18.15	320.71	
30		32.51	574.36	
40		58.22	1,028.57	
50		104.26	1,842.02	
60		186.72	3,298.77	
70		334.39	5,907.59	

*includes interest due

"This table reveals several important facts about a monetary system which is based entirely on debt."

- The debt increases each year, but the actual amount of money in circulation (M1) remains the original borrowed principal.

- The debt increase is moderate in the early years but it increases exponentially with time to unbelievably big numbers: the increase in the Pluto example being \$79.08 in the first ten years, but \$2,608.82 between the 60th and 70th year.

- At no time can the debt be paid with the money that is in circulation! Even at the end of the first year, the \$100 in circulation is \$6.00 short of the indebtedness. The bank can foreclose on the borrower's pledged property.

- In the 50th year, all the money in circulation (\$100) won't even pay the interest due to the bank—\$104.26.

- As the debt increases more property must be pledged as security.

"Calculating Ed's interest looks like a long and tedious job to me, and it's my bank that he owes the money to! I really ought to learn how to figure it quick and easy."

"You have a whole year to calculate the interest," Ed laughed. "\$100 multiplied by 0.06 equals \$6.00 of interest due at the end of the first year."

"That one is easy," Carl replied. "Debt multiplied by the interest rate equals the interest due for that year. But what will your debt be at the 20th year . . . without looking at Table 6?"

Ed sat silently for several moments. Then I broke in, "Well, as our colony appointed me consultant to the Pluto Central Bank, I will show you how to calculate Ed's debt quickly. This is a problem in compound interest. The formula for calculating compound interest is:

$$D = P(1+r)^n$$

Where:

D is the debt at the end of the year

P is the borrowed principal (\$100 in this case)

r is the annual interest rate (6%—0.06 in this case)

n is the year in question

"This formula is similar to other formulas where the result is determined by multiplying one quantity times another quantity which, in turn, is being raised to an exponential power. 'Being raised to an exponential power' means that this second quantity is being multiplied by itself. The number of times it is being multiplied by itself is indicated by the little number to the right. Mathematicians speak of this type of formula as having the following general form:

$$y = a^x$$

"The 'x' in the general formula is the *exponent*.

"Another characteristic of this general formula is that as the 'a' in the formula is multiplied by itself more and more times, the graph of these

amounts traces a curve that is flat at first but then rises steeply higher until it becomes almost a vertical line. Because the formula for the compound interest on any given debt principal is in this general form, the graph of any compound interest debt will be one of these *exponential curves*. For instance, the Total Debt chart (Figure 4, p. 61) is a classic example of an exponential curve. We will be seeing more of these curves in just a moment.

"Now let's find the debt at the end of the first year (n=1) using the compound interest formula.

$$\begin{aligned} D_1 &= \$100 (1.06)^1 \\ &= \$106 \end{aligned}$$

"The debt at the end of the second year (n=2) is:

$$\begin{aligned} D_2 &= \$100 (1.06)^2 \\ &= \$112.36 \end{aligned}$$

"The debt at the end of the 20th year (D=20) is:

$$\begin{aligned} D_{20} &= \$100 (1.06)^{20} \\ &= \$320.71 \end{aligned}$$

"Do you have any questions about these calculations?" I asked.

"Yes, I do," Martha said. "Could you explain how to raise a number to exponential power, like (1.06)²⁰? How do you do that?"

"One way, of course, is to multiply 1.06 by 1.06

and then multiply that product by 1.06 and continue the process 20 times! Like this:

$$1.06 \times 1.06 \times 1.06 \times 1.06 \times 1.06 \times \dots 3.2071$$

"Fortunately there is an easier way: simply use a calculator! Another easy way is to use the mathematical tables which give the exponential values for various interest rates for any given year. Bankers frequently use such tables.

The exponential curve

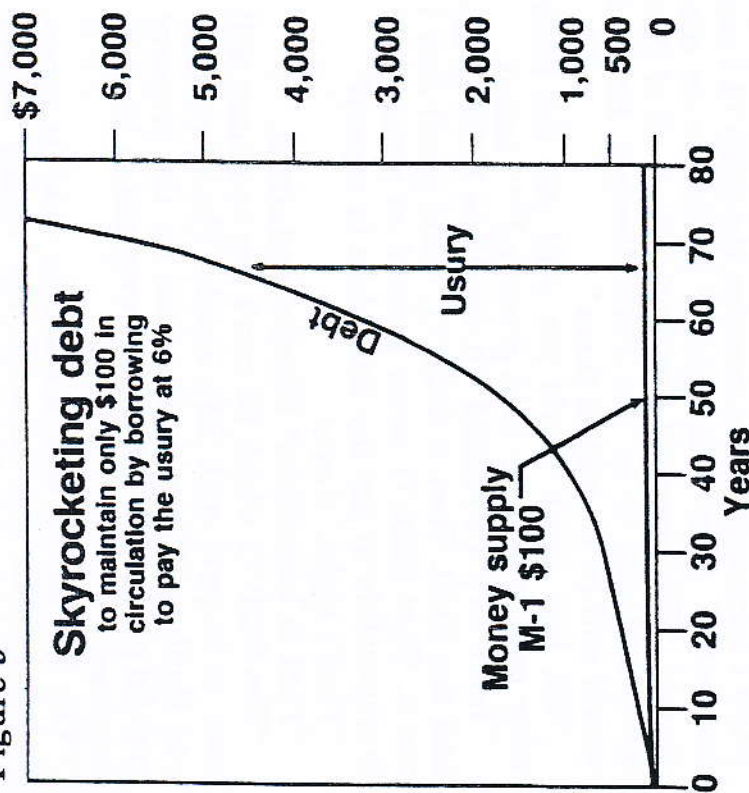
"A moment ago I mentioned that an exponential formula traces a distinctive type of curve—an exponential curve."

"Wait a minute," Nancy interrupted. "I don't understand how a formula can make a curve. Will you explain how that works?"

"Of course," I replied. "The method is very simple. All you do is apply the formula to calculate several different numbers and then plot these numbers on graph paper. To illustrate this I have drawn a chart for the exponential formula used to calculate compound interest. This chart shows how a small debt grows very rapidly when interest is compounded.

"Just look at Figure 9," I continued. "The horizontal line across the bottom of the chart is marked off in years—10 years, 20 years, 30 years,

Figure 9



etc. The vertical line is marked off in dollars. Using the formula for compound interest, we can find what the debt will be after 10 years, 20 years, 30 years, etc. Using the \$100 debt and a 6% interest rate, we find that the debt grows from \$100 to \$320.71 after 20 years.

$$D = P(1+r)^1 = \$106.00$$

$$D = P(1+r)^2 = \$112.36$$

$$D = P(1+r)^3 = \$119.10$$

$$D = P(1+r)^{20} = \$320.71$$

"To draw the curve which illustrates the growth of the debt, we simply make points on the chart which correspond with the growing amounts, as shown in Figure 9. The line connecting these points traces a curve which is quite flat at the beginning but then becomes steeper as time goes on. Mathematicians explain that these numbers are increasing *exponentially*—they increase by bigger and bigger amounts each time the exponent increases another notch. When these points are plotted, the result is an *exponential curve*.

"In the example on Pluto, Ed pays neither his interest nor the original \$100 principal. Do you see what is happening to his debt? It is following the path of the chart. *Because of the mathematics of the compound interest formula, his debt grows exponentially.*

"The \$100 which he borrowed originally is staying in circulation and has probably been subdivided into smaller amounts—\$20, \$10, \$5, \$1, etc."

"What about that \$320.71? Isn't that in circulation too?" Nancy asked. Then she added hastily, "No, of course it isn't. Only the \$100 original debt principal is in circulation."

"That's right," I said. "The chart shows the original \$100 debt as a straight line along the bottom. This line represents a \$100 debt that has been turned into cash and is in circulation. The curved line above this \$100 represents the increasing interest charges on this \$100 debt. The bank is keeping a record of these increasing charges. The bank is adding them to Ed's loan

account. Ed will have to pay off this debt eventually. But at the moment he could only pay off \$100 of it in money, since this is all the money there is in circulation."

"Hold it," Ed said, "I spent that \$100 a long time ago. A few dollars come back from time to time in exchange for my potatoes, but I have to spend them on things my family needs. What I have in my pocket is peanuts compared with the \$100 I borrowed, not to mention the \$320.71 I owe the bank." After a thoughtful hesitation he continued, "Hey, even if I could earn back all of that \$100 and pay it to the Pluto Central Bank, I would *still* be in debt to them."

"Ed, how much would you still owe the bank after paying off your debt principal?" I asked.

"Let's see," he replied, "it would be \$320.71 minus the \$100. That is \$220.71. Good grief! Now I see it. That \$220.71 never existed as money so it is impossible to pay my total debt in money!"

"That's right," I said.

"That is incredible!" Martha exclaimed.

"The \$220.71 which Ed can't pay in money will have to be paid with Ed's assets. The Pluto Central Bank will have to foreclose on the property that Ed pledged in increasing amounts as his debt increased.

"On the graph this unpayable debt is represented by the gap between the money supply (\$100 in our example) and the line tracing the skyrocketing debt."

"What a rip-off!" Ed exclaimed.

"The \$220.71 which Ed will owe the bank at the

20th year *never existed as money*. The general term for this unpayable debt is *unmonetized debt* which means debt which has never been turned into money."

"Is there such a thing as *monetized debt*?" Nancy asked.

"Yes, the \$100 is *monetized debt*. The \$100 is money, checkbook money. It is created money. The Pluto Central Bank created it as a bookkeeping entry credited to Ed's account.

"So you see that Ed's total debt is composed of two parts:

\$100.00 *monetized debt*
\$220.71 *unmonetized debt*
\$320.71 *total debt at the 20th year.*

"That \$220.71 is *accumulated* interest charges at the 20th year resulting from the original \$100 I borrowed, right?" Ed said.

"That's correct. You obligated yourself to pay the bank a fee for use of the \$100."

"Yes I know that. But I didn't agree to pay \$220.71 interest for the use of a measely \$100!"

"Oh yes you did agree," Carl protested. "I've been practicing on my calculator. You agreed to pay 6% interest. Well, \$100 borrowed at 6% grows to a \$320.71 debt after 20 years."

"Well I can't pay it. Now what happens?"

"I foreclose and take the property you pledged.

I'm calling the loan and calling my lawyer," Carl declared.

"Not so fast," Ed replied. "I'm beginning to see a way out of this box. The trouble is there's not enough money in circulation. John, let's get some more money into circulation and I'll solve my problem!"

"Okay, that's easy enough. The Pluto Central Bank can create some more just like the first \$100 it loaned to you. How much more do you want?"

"No, I don't want to borrow any more. I'm in enough trouble now. Someone else should borrow it. Borrowing is the only way we can get more money into circulation."

"Yes, in the debt-money system that is the only way. How much do you want in circulation, Ed?"

"Enough to cover my bank debt with some to spare. Let's make it a round \$1,000 for easy calculating. If we can't get nine more people like me to borrow \$100 each, let's get the Pluto government to borrow the money for a public project like defense, bridge repair or road construction."

"Borrowing for a public project will put plenty of money in circulation," I broke in, "but remember, certain conditions must be met."

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- The colonists must vote in favor of it.
 - They must be willing to tax themselves to pay for it.
 - There must be sufficient manpower available to accomplish the project.
-

"Those are reasonable conditions," Martha said impatiently. "Why don't we just agree on them and go ahead with a project. I'm anxious to see how Ed is going to get out of debt!"

"We are all agreed, then. The borrowed principal has now been boosted from \$100 to \$1,000. The money in circulation (M1) is \$1,000. Let's make a new tabulation to show the Pluto colony's combined debt."

"That will be simple," Nancy said. "All we need to do is multiply the dollar numbers in Table 6 by ten. I'll write them out."

Here is what she wrote.

Table 7
Growth of Pluto's \$1,000 debt

Year	Total P borrowed principal	Interest I due at year end (6%)	Debt at D year end	Money in circulation (M1)
1	\$1,000 (remains the same)	\$ 60.00	\$ 1,060.00	\$1,000
2		63.60	1,123.60	(remains the same)
3		67.40	1,191.00	
4		71.50	1,262.50	
5		75.70	1,338.20	
10		101.37	1,790.85	
20		181.53	3,207.14	
30		325.10	5,743.49	
40		582.21	10,285.72	
50		1,042.65	18,420.15	
60		1,867.22	32,987.69	
70		3,343.92	59,075.93	

"My portion of the debt is the same as in Table 6," Ed said as he studied the new tabulation. "That extra money in circulation really solves my problem. I'm going to work like a trojan in my potato field and flood the market with potatoes. I'll save and save and pay back the bank at the start of the second year . . . \$106 . . . no problem. And there's plenty of money left in circulation after I pay my principal and interest."

"But suppose the potato crop fails because of wet weather or a drought and you can't pay the bank until the fifth year?" Carl asked.

"Still no problem," Ed replied. "I simply pay the \$126.25. There's plenty of money in circulation. All I have to do is work hard and earn it."

"Ed is right, if he works hard and is thrifty then, according to the American tradition, he can pay off his bank debt and even build up a surplus. But if he does, others must fail in order for Ed to succeed."

"Why, that's ridiculous," Martha said.

"It may sound ridiculous," I replied, "but with a debt-money system there is never enough money or credit to pay off *all* the borrowed principal plus *all* the interest. Some people may accumulate enough money or credits to pay off their portion of the principal and interest fees, but that results in a money shortage in the general economy. More borrowing is necessary to postpone the bankruptcy. And mind you, it is only a postponement. The ultimate collapse of the Pluto economy is inevitable."

"Suppose that Ed has success growing potatoes. He accumulates \$106 and pays off his bank loan plus interest at the end of the first year. There will then be \$894 left in circulation. (\$1,000-\$106 = \$894)."

"Wait a minute" Carl protested. "That \$106 doesn't disappear, it's in the bank."

"True, the \$106 is in the bank, but it is not in circulation. It is no longer part of the money supply, M1. Interest and principal payments paid to a bank always remove that amount of money from circulation."

The extinguishment process

"Why that's fantastic," Nancy said. "You mean to tell us that money paid to a bank is out of circulation?"

"Precisely. The definition of the M1 money supply is 'notes and coins and checkbook money in circulation with the public'. If a loan is paid back to a bank it is no longer in circulation with the public. It frees up some reserves, but new money can't be created and circulated until someone takes out another loan.

"A little booklet from the Federal Reserve Bank of New York called *Money: master or servant?* (page 15) explains the extinguishment process this way:

... bank credit isn't a one-way street. It adds

to our money supply, to be sure, but our money supply declines as bank credit is repaid. Banks, then, can 'destroy' or 'extinguish' money as well as 'create' it,

"The booklet then goes on to clarify the extinguishment process with this helpful statement:

When borrowers repay loans, they use money in their checking accounts. Banks destroy money they created, when the economic need for it expires.

"All you need to remember about the important extinguishment process is that it is the reverse of the creation process. Thus, when you pay off a bank loan, the money is simply cancelled from the bank's books. Actually, any money paid to a bank for any reason—interest, principal, service charges—reduces the money supply by the amount paid.

"Since the banks create money out of nothing, when it is paid to the bank it goes back to nothing, so to speak. Of course the banks must support the money they create with reserves. When payments are received by the banks and the money is extinguished, reserves are freed. With these free reserves on hand, the bank can now create more money to make new loans, pay expenses and salaries, or create money for interest payments or dividends.

"Are you saying that when loans are repaid to a commercial bank there is less money in circulation?" Ed asked.

"Exactly," I replied.

"So when announcements are made on TV that 'M1 declined \$3 billion today' it means that \$3 billion was repaid on loans to banks?" he asked.

"Yes," I said and then added, "or it could mean that money was moved into savings accounts which aren't part of M1. But more often it means that money was extinguished through loan repayments."

Pluto's money shortage

"Now let's see how this process affects Pluto's money supply."

"Let's suppose that Ed doesn't pay the bank until the 20th year. How much will the money supply be reduced when he finally pays off the debt? Here are the figures:

\$100.00	Ed's original principal
+220.71	interest at the 20th year
\$320.71	payment to the bank at 20th year.

"How much money is left in circulation in the colony?"

\$1,000.00	money supply
-320.71	Ed's payment
\$ 679.29	left in circulation at 20th year

"Over the 20 years the debt of the Pluto colony has been compounding even though the money supply has remained at \$1,000. At the end of the 20th year, and after Ed pays off his debt, the figures look like this:

\$3,207.14	Pluto colony's total debt
-320.71	Ed's payment from the money supply
\$2,886.43	remaining total debt to be paid
	with a money supply of \$679.29!

"If Ed doesn't pay his debt until the 40th year, conditions will be even worse—in fact, impossible!

\$ 100.00	Ed's original principal
+928.57	total interest due at 40th year
\$1,028.57	debt to the bank at 40th year

"Comparing this with the money supply, we find that Ed's debt *exceeds* the \$1,000 that is in circulation!—

\$1,000.00	money supply
-1,028.57	Ed's debt to the bank
\$ 28.57	<i>more debt than money!</i>

"Of course the total debt of the colony has been compounding over the 40 years and stands at \$10,285.72."

"Hold it a minute," Carl interrupted. "You mean we owe the Pluto Central Bank \$10,285.72? Why, we can't pay that off. Even Ed's debt couldn't be paid off with the entire \$1,000 money

supply . . . if he could get his hands on it—which he can't! The colony is bankrupt!" Then he paused for a moment. "Do you mean that the United States money system works like this? Do you mean that the United States is bankrupt because of the debt-money system?"

"Yes," I replied. "Day-by-day in the United States, the public and private debts are compounding while the money supply is not keeping pace. In order to keep the economy from collapsing, more and more money must be borrowed into existence just to keep some money in circulation."

My friends looked stunned. Finally Ed broke the silence, "I've never heard anything like this. For years I've wondered what was wrong with the economy. Things just never added up right. Finally I understand what is going on."

"And so do I," Carl added. "This is fantastic. This \$100 example makes the cause of the problem stand out so clearly you can't miss it. Now I see why we were getting into serious trouble up there on Pluto. The thing that worries me is that it looks as though we're in the same kind of trouble here on Earth!"

"Hold it, Carl!" Ed objected. "What do you mean *we* were in trouble up on Pluto? You weren't in trouble, *I* was! I was the one up to my neck in debt. It looks to me as though you stand to gain from this money system. If I can't pay my debt to you, which I can't unless someone else borrows from you, then you get my property!"

"Don't get so up-tight," Carl replied. "I'm only running the system that John suggested. When

we landed on Pluto none of us had any idea about how to create money. John was the one who set up the whole thing. If you're going to blame someone, blame him—not me. I was just trying to make a living too. I didn't understand what was going on any more than you did!"

"Now cool down, Carl," Nancy said. "We all know you were just working the system that John set up. But surely there must be another way to create money without causing all this trouble."

"Yes there is," I replied, "and we will get into that subject during our next session. But let's finish off our Pluto example and see how it relates to our problems here on Earth."

"The fundamental mathematics of a money system based on debt are the same anywhere in the universe and at any time in history. Table 6 illustrates this basic fact."

"And Table 7 is similar but ten times bigger because Ed wanted more money in circulation. Figure 10 compares the debt experience on Pluto to what has been happening to the citizens of the United States since 1914."

"The upper curve is for the Pluto colony. The scale to the left applies to this curve which represents the growth of the colony's debt after it borrowed \$1,000 into circulation. This was what Ed wanted loaned into circulation so that he could manage to pay off his bank debt."

"The lower curve is the actual total debt of the United States, taken from Figure 4. The scale is at the right."

"This is hard to believe," Martha exclaimed.

"The curves are almost the same shape, but not quite."

"Both curves are exponentials so they obey the mathematical law:

$$D = P(1+r)^n$$

"On Pluto we kept the interest rate (r) constant at 6% as the years (n) increased. Thus,

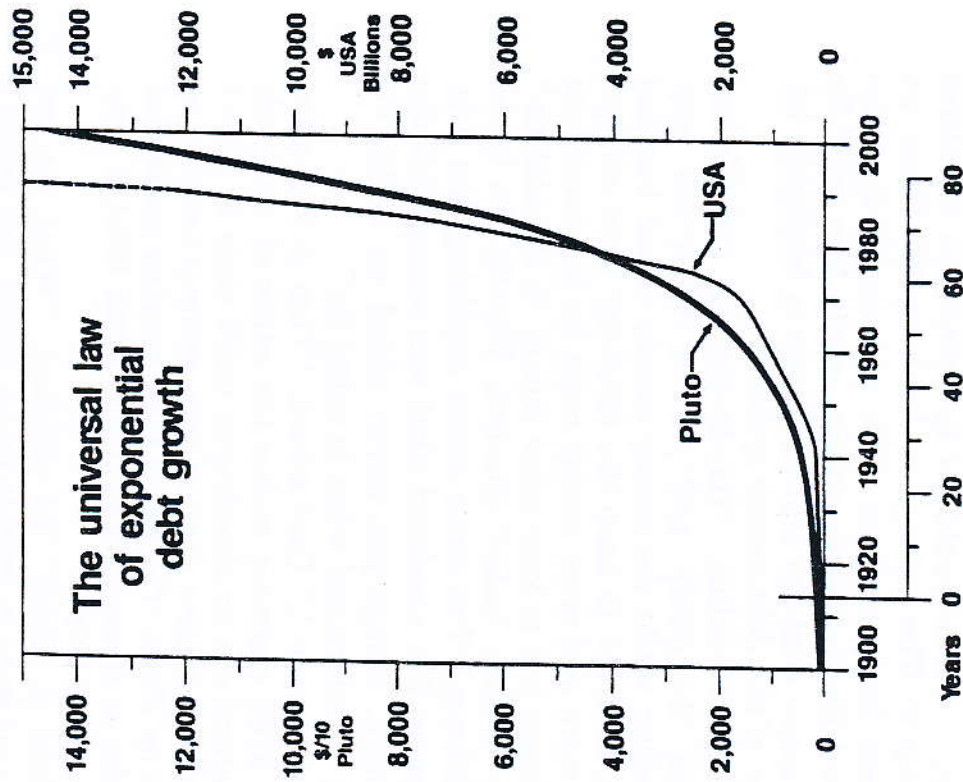
$$\text{Debt} = \text{Borrowed Principal } (P) \times (1 + .06)^n$$

"In the United States the interest rate over the years has varied from less than 1% to over 20%. The borrowed principal has increased from less than \$100 billion in 1915 to several thousands of billions in the 1980s.

"The interest rate determines how fast debt grows. The pace of Pluto's debt growth was determined by a steady interest rate of 6%. The pace of America's debt growth, however, has been accelerating. Debt has been growing larger, faster, than in the Pluto example. Why? Because the United States interest rates have been pushed up from under 1% (during World War II) to over 20% in recent years. This is why the line tracing the U. S. A.'s debt growth after 1970 becomes much steeper than the line tracing Pluto's debt growth."

"It's clear to me now that 'the gross errors' in the money system are the root of our economic troubles," Ed said. "That compounding of unpayable interest on the total debt causes terrible trou-

Figure 10



bles in the economy—troubles that affect my life. But how can we solve such an overwhelming problem?" he continued. "You said, that Canada, France, Great Britain, Australia—all these countries have the same type of money system. It seems as though we are all going down the bankruptcy chute together unless a miracle comes to pass."

"We are in deep trouble," I agreed. "But the situation should not be considered hopeless in the 20th century. One would think that a nation that can develop the technology, equipment and automatic controls to put teams of men on the moon and bring them back safely to earth, certainly ought to be able to solve its money problems. Don't you think so?"

"Yes, it would seem so," Nancy agreed. "But sending men to the moon was a scientific and engineering achievement. Scientists and engineers have to deal with facts. The money problem involves politics and that alone seems to compound the difficulties."

"Solving the problems of space travel was once considered, by most people, to be a wild, impossible dream. But when capable men of goodwill were organized to accomplish it, the effort succeeded! It is this same kind of co-operative spirit and scientific approach that we need so urgently right now to solve the country's economic problems. I sometimes wish that the scientific community would take a sabbatical from its many research interests and concentrate for just one year on solving the problem of the debt-money

system. What a breakthrough that would bring to mankind.

"To finish this evening's session, let's review the principles we have been discussing.

The DUM Equation

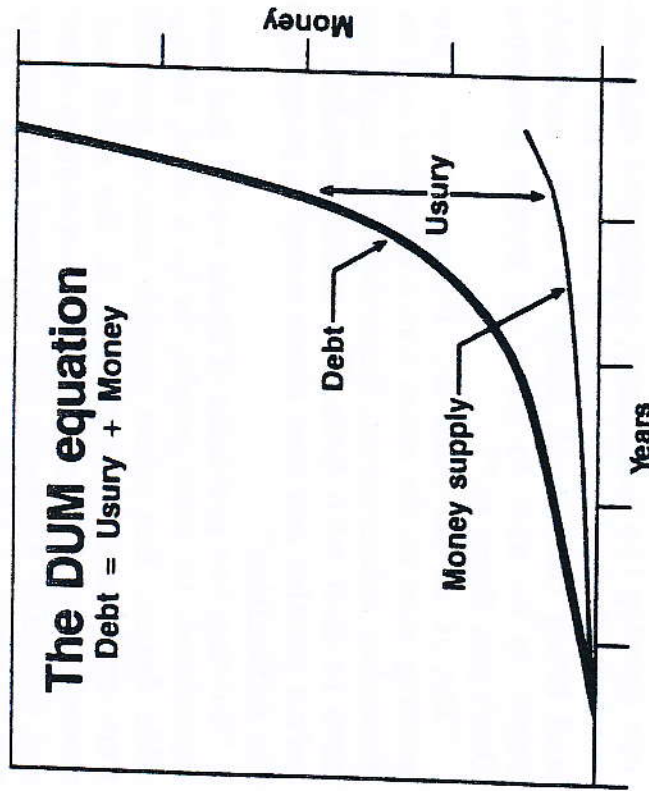
"Figure 11 is a generalized picture of the condition that always develops in a country having a debt-money system.

"The vertical scale can be American dollars, Canadian dollars, English pounds sterling, Australian dollars, German marks, Japanese yen, or what have you. The shape is always an exponential curve. It has to be because debt grows according to the fixed formula: $D = P(1+r)^n$. This formula causes exponential growth of debt. It is a mathematical law.

"This is the formula which governs the growth of debt. In a debt-money system, the money needed to pay the interest on any debt generated according to this formula is not automatically created with the debt. Under this type of system the entire money supply is a debt which we collectively owe to the banks.

"The money supply is the 'monetized' portion of the total debt to the banking system. It is the portion which has been turned into checkbook money, currency and coins. The total debt consists of this 'monetized debt' plus the 'unmonetized

Figure 11



debt' which is in the form of bookkeeping entries made to borrowers' loan accounts.

"The difference between the monetized debt (the money supply) and the total debt is *usury*. This can be expressed mathematically:

$$\begin{aligned} \text{Debt} &= \text{Usury} + \text{Money} \\ \text{or} \\ D &= U + M \end{aligned}$$

"Which is just plain dumb!" Nancy exclaimed. "Exactly. That is why we call it the DUM Equation. Here is the scientific definition of *usury*."

Usury:

any charge at all by a private lender

(whether 1% or 100%)
 (the Federal Reserve
 or commercial banks)

for the use of money
 the lender is allowed
 to create

(as a deposit to the
 bank account of the
 borrower, who may be
 an individual, a
 company or
 government)

out of nothing as a
 debt to the borrower
 and an
 interest-earning asset
 to the lender.

"That's strange," Martha said. "I always thought of usury as excessive interest." But you say that a 1% charge can be usury. How come?"

"Here is the distinction. If the lender is a private group and creates money to be loaned, out of nothing, the fee for its use is more accurately called *usury*. Carl created the \$100 as a debt against Ed. Therefore whatever interest rate he might charge is correctly defined as *usury*, even if it is only 1/4%."

"Well, then, if Ed would lend some of his potato money and charge 50% per year, that wouldn't be usury?" Nancy asked.

"That would *not* be usury, because Ed did not create the potato money. He *earned* it by his work

in the potato field. He is entitled to a fee for giving up the use of his earned money. The distinctive name for that fee is *interest*. Perhaps no-one would be willing to pay him 50%, as Martha suggested, but he might compete with the Pluto Central Bank and ask for 6%. Yes, and if someone needed the money badly enough, Ed might charge 10% or even 25% and still be able to lend the money at these higher prices. In a free society the amount of interest would be negotiated between Ed, the lender, and his borrower.

"Here is a good way to remember the distinction between *interest* and *usury*.

- Money created by a private lender, when loaned, gives rise to *primary debt* and the fee for its use (while commonly called interest) is correctly defined as *usury*.
- Earned money, when loaned, gives rise to *secondary debt* and the fee for its use is *interest*.

"When primary debt is repaid to the agency which created it out of nothing, the money is extinguished and is subtracted from the money supply. Usury payments, too, remove money from the M1 money supply.

"When secondary debt is repaid to the lender, however, the money is *not* extinguished. It is transferred from one checking account to another and remains a part of the M1 money supply. In

this way secondary debt and interest do not cause a drain on M1— as do primary debt and usury. But they do constitute a cost of production and therefore contribute to higher prices. In 1987 the total secondary debt in the United States was approximately \$8 trillion and the interest on this debt amounted to \$750 billion.

Table 8

Breakdown of the total debt of the United States (end 1987) \$ billions						
	Federal	%	Private	%	Total	%
Primary (created by lender)	475	19.5	1,981	25.1	2,456	23.8
Secondary (Not created by lender)	1,957	80.5	5,919	74.9	7,876	76.2
TOTAL	2,432	100.0	7,900	100.0	10,332	100.0

"The combined influence of usury and interest on the economy is subtle and not always obvious, even to well-trained students of the money system. Once the fundamentals are learned, however, it becomes simple to understand how these two important elements work together to destabilize our financial affairs.

Table 9

**Breakdown of the usury and interest due
on the total debt of the United States**
(end 1987) \$ billions

	Federal %	Private %	Total %
Usury (primary debt)	38.0	19.5	24
Interest (secondary debt)	157.2	80.5	76
TOTAL	195.2	100.0	985 100

"Current administrations in Washington have been blamed for the spectacular growth of the debt during the 1980s but we know from the mathematics of compound interest that this growth was inevitable. Even so, it is amazing to see that from 1981 to 1987 the total debt increased by almost 100%. Projecting this rate of growth into the future we can see that by 1990 total debt will be over \$14 trillion.

"The next table breaks down this debt first according to the amounts owed by public and private sectors, and, second, according to primary and secondary debt.

"This evening we have covered a lot of new ground. Let's stop here and summarize the main

Table 10

**Debt growth rates 1981-1987
and projection to 1990**
\$ billions

	DEBT			GROWTH RATES %	
	1981	1987	projected 1990	Total '81-'87	Average Annual '81-'87
Public debt	1,029	2,432	3,739	136.3	15.4
Private debt	4,171	7,900	10,823	89.4	11.2
Total debt	5,200	10,332	14,562	98.7	12.1
Primary	1,448	2,456	3,199	69.6	9.2
Second- ary	3,752	7,876	11,363	110.0	13.2

points. When we finished last week, we had a five-point summary. Tonight we will start with point six."

"It would help to go over those five points again," Ed said.

"That's a good idea," Carl agreed.
Here is our review.

Key facts

1. Approximately 25% of the money supply is in cash.
2. Approximately 75% of the money supply is in bank deposit credits.
3. Money is not just Federal Reserve bank notes and Treasury coins. Most of our nation's money supply (M1) is in the form of numbers in depositor's checking accounts.
4. Under the present debt-money system, most money is created as debt by the commercial banks when they make loans.
5. Federal Reserve checks enter banks as deposit credits. These are then used by commercial banks to create more new money as deposit credits through the method called fractional reserve deposit expansion.
6. The Federal debt was \$2,432 billion at the end of 1987.
7. The interest on the Federal debt was \$195.2 billion in 1987.

8. The path of both the debt and the interest continue to rise steeply upward.
9. The total debt of the United States in 1987 was \$10,332 billion (\$2,432 billion of Federal debt plus \$7,900 billion of private debt).
10. The annual interest load in 1987 was \$236 billion and increasing exponentially.
11. This \$236 billion was paid by consumers, you and me, because interest costs were incorporated into the selling price of all products and services.
12. Money created by a private lender (the Reserve and commercial banks) when loaned, gives rise to *primary debt* and the fee for its use is *usury*.
13. Earned money when loaned gives rise to *secondary debt* and the fee for its use is *interest*.
14. The money supply of the American people is seriously reduced every year by the extinguishment of usury payments which are paid to commercial banks. In 1987 this amount was \$236 billion.

15. The purchasing power of the American people was further reduced by the price increases from rising *interest* costs.

16. Total debt in an all-debt monetary system equals *usury* plus the money supply:
 $D = U + M$ (The DUM Equation).

17. All money paid to a commercial bank for principal payments, usury payments, service charges, etc., is extinguished and thus removed from the M1 money supply.

18. A debt-money system is unstable because:

- a) most money is created as loans and therefore debt;
- b) only the principal is placed into circulation as the money supply (M1) when bank loans are made;
- c) any payment of usury withdraws money from circulation and makes total debt unpayable;
- d) the withdrawal of money causes a shortage which triggers demand for additional borrowing to keep the money supply up to acceptable levels;
- e) the additional borrowing expands the debt exponentially, thereby expanding the usury burden exponentially;
- f) the rate of debt expansion always exceeds the rate of money supply expansion.

sion, thereby causing the debt-to-money ratio to expand exponentially.

19. The usury burden in a debt-money system consumes an ever-increasing share of the money supply. This consumption of the money supply renders it impossible for a debt-money system to sustain stable economic growth without violent intervention at some point in the debt growth cycle.

"This exponential growth of debt is the force which causes prices to rise," I said.

"One thing is really clear to me now," Ed added. "I've learned that money isn't created as a result of work. Money is created *first* and then you have to work to pay it back, plus the uncreated interest—the *usury*! I always thought that people worked and created wealth and, well, somehow money was created as a result. But since you need money first—to get started in any venture—I now see that money is created and that allows you to work. And maybe you can pay off your debts and maybe you can't."

"And I can see that there is only debt principal in circulation as our money supply," Martha continued. "So when someone pays usury to a bank, that money disappears. Then there isn't enough money left to cover all the debt and usury that is owed. This is an awful problem. Is there any solution?"

"Yes there is," I reassured her. "A problem well understood is two-thirds solved. Now that we understand that creating money as debt is at the root of our economic problems, it will be relatively easy to find the solution. Finding the solution will be our topic next week."

And so our second meeting came to a close.

Footnotes

1. The bibliography lists a number of publications available from the government on the Federal Reserve. Helpful publications are also available from the Board of Governors of the Federal Reserve and from the 12 regional banks. These publications are listed in a digest entitled "Public Information Materials of the Federal Reserve System" which can be obtained, free of charge, from the public information offices of the regional Federal Reserve banks.

Readers may be interested in a statement made by Woodrow Wilson in 1911 when he was Governor of New Jersey: "The greatest monopoly in this country is the money monopoly. So long as that exists, our old variety of freedom and individual energy of development are out of the question. A great industrial nation is controlled by its system of credit. Our system of credit is concentrated. The growth of the nation, therefore, and all our activities are in the hands of a few men. This is the greatest question of all: and to this statesmen must address themselves with earnest determination to serve the long future and true liberties of free men." (Quoted in *The Story of Our Money*, 2nd Edition, by Olive Cushing Dwinell.)

2. *Money in the Economy*, (San Francisco: The Federal Reserve Bank of San Francisco, 1981), page 23.

3. Paul Meek, *Open Market Operations* (New York: Federal Reserve Bank of New York, 4th edition, 1978)

4. Board of Governors of the Federal Reserve System. *Federal Reserve Bulletin* (Washington, D. C.: Federal Reserve System, December 1988), Table 1.41.

5. U. S. Treasury Reports: *Public Debt of the United States*, House Document Number 93-78 (Part 2) 93rd Congress 1st Session, pages 1117 and 1118; *U. S. Treasury Bulletin*, September 1975, Table FD-1 Summary of Federal Debt; Table FD-2 Interest Charge, page 27; U. S. Department of Commerce: *Statistical Abstract 1975*, Public Debt of the Federal Government 1900 to 1974, Table 396 page 240; *Economic Indicators*, October 1988, page 32. (All of the above documents available through the Government Printing Office in Washington, D. C.)

6. U. S., Executive Office of the President and Office of Management and Budget, *The United States Budget in Brief FY 1989*, (Washington, D. C.: Government Printing Office, 1988), page 2.

7. Board of Governors of the Federal Reserve System. *Credit Market Debt Printout from Flow of Funds Account Z.7* (Washington, D. C.: Board of Governors of the Federal Reserve System, June 7, 1988) Table 1. *Annual Report of the Governors of the Federal Reserve System*, 1987, Table 2, page 220. Council of Economic Advisers, *Economic Indicators*, (Washington, D. C.: Government Printing Office, August 1988), page 32.

8. *AT&T Annual Report 1980, 1981, 1983*; Tables listing Interest Deductions and Long and Intermediate Term Debt.

9. *The Pillsbury Company Interest Expense, 1981*. Standard and Poors, November 6, 1982. *The Pillsbury Company Annual Report 1987*.

10. Peter Cook, *Free Enterprise in Deep Trouble*, (Wickliffe, Ohio: Monetary Science Publishing, 1976), pages 6 and 9.

11. Thomas Robertson, *Human Ecology: The Science of Social Adjustment*, (first published in Great Britain, 1947;

reprint ed., Hawthorne, California: Omni Publications, 1975), Chapter 7 entitled "The World Disease." Mr. Robertson writes: "In the previous chapters we depicted the usurious technique by which debt is created and through which power is centralized. The centralization of power can be readily traced in recent history; but the results of 'usury' are not so easily perceived, because of the slowness of the cycle of operations, which usually extends over several centuries.

"This means that the resulting disasters happen with such frequency that they may only be witnessed by one generation of men in many, and to perceive the sequence of events we must consult history.

"To those acquainted with the facts there can be no doubt as to the antiquity of money lending at interest (usury). Extant evidence shows that it was practiced in ancient Egypt, Persia, Babylon, Greece and Rome; and there is evidence that it has always been regarded as a disastrous device. It is, as has been shown, at the very foundation of our European civilization, which, for good or ill, is now world dominant." (page 110)

12. *Webster's Dictionary*: "Usury" 1. the act or practice of lending money at a rate of interest that is excessively high; 2. an excessive or unlawfully high rate or amount of interest; 3. (obsolete) interest paid on a loan.

Note: Sources listed under footnote 7 were used to compile Tables 8, 9, and 10.