The Space-sci Sherlocks Deduce

F	Pico, lifting forks and spoons		
Impulse = *mgt*	**Speed** = *m/s*	**Work Done** = *mgh*	**Productivity** = *work/im*$\Delta\rho$
38.4 ρ	***0.5 m/s***	$19.2\,J_{\left[\frac{1}{0.5\ m/s}\right]}$, $19.2\,J_{\left[\frac{1\ \rho}{0.5\ J}\right]}$	***0.5 J/*ρ**

Impulse-Joule Production Rates Control Work

Professor Du-Ane Du

www.Wacky1301SCI.com, *"Looking at serious science, sideways!"*

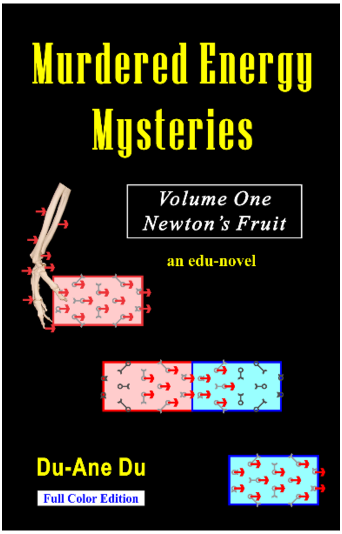
> Three sisters, Pico, Hectii, and Tera, the "Space-sci Sherlocks," are traveling through the Asteroid Belt. They perform kitchen experiments and discover how to measure, average, and use impulse-joule production rates.
> —Excerpted from *Murdered Energy Mysteries*, Epilogue (Part 2B), Chapter 2, by Du-Ane Du, (Amazon, Kindle, ebook 2018, paperback 2021).

"Something's bothering me," Pico confessed the morning after the lifting-bricks experiment. She had just finished a hardy breakfast of simulated eggs, bacon, toast, and apple juice. "How'll we pay the worker when the work is complete?"

“What worker?” Hectii said curiously.

“In Grandpa Proge’s story,” Pico said, as she rinsed off her last dish and placed it in the dish washer. “I told you about it, the man pushed a cart of bricks, then he lifted the bricks one by one and put them on a high shelf. Work is (*force-rate*)(*distance*) because the worker lifted the bricks against gravity.”

Excerpted from:



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“Or, since gravity is involved, you could say that work is (*mass*)(*gravity*)(*height*),” Hectii recited. “That is, as long as the starting and ending velocities are zero.”

“The problem is, both equations involve multi-linear work-joules$_{[IC]}$, and they involve expanded work-impulse. So how are we going to pay the worker?”

“How about paying the worker for how long he worked, rather than by how much he lifted?” Hectii said as she slipped her fingers into a data-input ball. “Then you could use the equation:”

$$im\Delta\rho = (force\text{-}rate)(time)$$

“And pay him for the time he spent lifting the bricks,” Pico echoed, as she closed the dishwasher and turned it on a quick wash cycle. "But if you do that, then the worker will tend to lift slowly to earn more."

"Not only that, scientists are always trying to measure how far things move during experiments," Hectii added.

"And you can't build something without moving things around," Pico agreed.

"Which means there must be another answer," Hectii said, as she adeptly keyed. "Let's look at the units for work that we encountered when we were lifting the bricks up the cliff. Here's one of the data tables we developed:"

A	**Work Done and Impulse Used** to lift bricks.			
	Mass	**Work J[1/S]**	$\boldsymbol{Work}(\frac{time}{distance})$	**40 ρ used.**
2	0.5 kg	$\mathbf{138.6}\,\boldsymbol{J}_{[\frac{1\,\rho}{3.46\,J}]}$	$138.6\ \rho m/s(\frac{6.667\ s}{23.1\ m})$	**= 40.0 ρ**
3	2.0 kg	$\mathbf{22.2}\,\boldsymbol{J}_{[\frac{1\,\rho}{0.555\,J}]}$	$22.2\ \rho m/s(\frac{1.667\ s}{0.925\ m})$	**= 40.0 ρ**
4	0.5 kg	$\mathbf{169.4}\,\boldsymbol{J}_{[\frac{1\,\rho}{4.235\,J}]}$	$169.4\ \rho m/s(\frac{10.0\ s}{42.35\ m})$	**= 40.0 ρ**
5	1.5 kg	$\mathbf{88.8}\,\boldsymbol{J}_{[\frac{1\,\rho}{2.22\,J}]}$	$88.8\ \rho m/s(\frac{3.33\ s}{7.4\ m})$	**= 40.0 ρ**
6	4.0 kg	$\mathbf{14.4}\,\boldsymbol{J}_{[\frac{1\,\rho}{0.36\,J}]}$	$14.4\ \rho m/s(\frac{1.25\ s}{0.45\ m})$	**= 40.0 ρ**
* Remember, $[\frac{1\,\rho}{1\,J}] = [\frac{1\ s}{1\ m}] = [\frac{1}{speed}] = [IC] = [\frac{1}{productivity}]$				

"The red column on the right," Pico identified, "shows we used 40 ρ of muscle impulse with every experiment. But some of the experiments were a lot more productive than others."

"Productivity?" Hectii said. "That seems like an important observation."

"The faster you move, the more work you can do with the same amount of impulse," Pico said, as she activated her phone and began keying. "Looking at the second experiment, we can find out how productive the worker was by dividing the joules$_{[IC]}$ of work done by the ρ of impulse used. The calculation will look like this:"

$$\textit{work-im}\Delta\rho\ \textit{productivity} = \frac{\textit{work-done}}{\textit{impulse-used}}$$

$$\textit{W-im}\Delta\rho\ \textit{productivity} = \frac{138.6\ J}{40\ \rho}$$

$$\textit{W-im}\Delta\rho\ \textit{productivity} = \frac{138.6\ \rho m/s}{40\ \rho}$$

work-im$\Delta\rho$ productivity = 3.46 J/ρ, or 3.46 m/s

"That seems sim… PICO!" Hectii enunciated, "You just discovered another fact, only it isn't really new."

"We'll call this **Pico's fact #2 of work-impulse productivity**," Pico said excitedly. "It should begin by noting that work done occurs when something moves from one stationary position to another stationary position."

"Whenever work is done," Hectii continued, "the work-impulse productivity is the same as the average speed that the work was done…"

"And that means, the equation for productivity and speed are interchangeable," Pico said as she keyed:

$$\textit{work-im}\Delta\rho\ \textit{productivity} = \textit{speed} = \frac{\textit{work-done}}{\textit{impulse-used}}$$

$$\textit{speed} = \textit{work-im}\Delta\rho\ \textit{productivity} = \frac{\textit{distance}}{\textit{time}}$$

"For example," Hectii said, "Here's a quick table of the efficiencies of experiments two through six:

B	**Work-Impulse Productivity** and speed when lifting bricks.			
	Work $J_{[1/S]}$	**Im$\Delta\rho$.**		**Productivity or Speed**
2	$\mathbf{138.6\,J}_{[\frac{1\,\rho}{3.46\,J}]}$	= 40.0 ρ	$\frac{138.6\ \rho\frac{m}{s}}{40\ \rho}$	**3.46 J/ρ, 3.46 m/s**
3	$\mathbf{22.2\,J}_{[\frac{1\,\rho}{0.555\,J}]}$	= 40.0 ρ	$\frac{22.2\ \rho\frac{m}{s}}{40\ \rho}$	**0.555 J/ρ, 0.555 m/s**
4	$\mathbf{169.4\,J}_{[\frac{1\,\rho}{4.235\,J}]}$	= 40.0 ρ	$\frac{169.4\ \rho\frac{m}{s}}{40\ \rho}$	**4.235 J/ρ, 4.235 m/s**
5	$\mathbf{88.8\,J}_{[\frac{1\,\rho}{2.22\,J}]}$	= 40.0 ρ	$\frac{88.8\ \rho\frac{m}{s}}{40\ \rho}$	**2.22 J/ρ, 2.22 m/s**
6	$\mathbf{14.4\,J}_{[\frac{1\,\rho}{0.36\,J}]}$	= 40.0 ρ	$\frac{14.4\rho\frac{m}{s}}{40\ \rho}$	**0.36 J/ρ, 0.36 m/s**
* Remember, $[\frac{1\,\rho}{1\,J}] = [\frac{1\,s}{1\,m}] = [\frac{1}{speed}] = [IC] = [\frac{1}{productivity}]$				

"Wait, look!" Pico said. "Look at the work column. The unit of joules$_{[IC]}$ has a subscript that… the bottom of the fraction gives us the work-impulse productivity, and it also gives us the speed that the work was done."

"We had forgotten about that!" Hectii declared. "It's like a best practice. Work is multi-linear, and the relationship between work and impulse is the speed and/or productivity. So recording the inverse speed or productivity as a part of the [IC] subscript tells the reader a lot!"

"Just to clarify," Chip said. "We've been doing this the entire time. The inverse of the [IC] impulse coefficient is the speed, and the inverse of the speed is the impulse coefficient, see:"

$$\frac{1}{[IC]} = \frac{1}{[\rho/J]} = \frac{1}{[s/m]} = [speed] = [productivity]$$
$$[IC] = \left[\frac{1\,\rho}{1\,J}\right] = \left[\frac{1\,s}{1\,m}\right] = \left[\frac{1}{speed}\right] = \left[\frac{1}{productivity}\right]$$

"And Pico's fact #1 explained that work is a scalar expansion of the amount of impulse used—which is also why it's best to record the inverse speed/productivity of the task as a part of the unit—$J_{\left[\frac{1}{speed}\right]}$."

"It also fits the current standards," Chip said. "The Education Reform Act of 2081 requires that the joules$_{[IC]}$ unit of multi-linear work done must always be followed by a subscript indicating the inverse speed/productivity of the task—$J_{[IC]}$, $J_{[\rho/J]}$, $J_{[s/m]}$, $J_{[1/speed]}$, or $J_{[1/productivity]}$."

"It is a best practice!" Hectii said.

"What's a best practice?" Tear queried, as she entered the room.

“Whenever someone writes down how much multi-linear work is done,” Pico explained, “the unit of joules$_{[IC]}$ needs to be followed by a subscript indicating the inverse speed and productivity of the job—which is the same thing as the [IC] we’ve been using all this time.”

“Speaking of jobs,” Tera said. “The dish washer is done, so…”

“Let’s have Chip record the distances and time that are involved as we put the dishes away,” Pico playfully suggested. “Can you do it, Chip?”

“I’ll video record, so Chip can analyze our activities,” Hectii said, as she stepped to a corner of the kitchen and aimed her Chip Micro camera at her sisters. “Who wants to start?”

“I’ll put away the glasses and bowls,” Tera volunteered, as she opened a cupboard.

Pico opened the dishwasher and slid out the drawer, so Tera could reach the glasses and bowls. “Chip, all we care about is the lifting part. Don’t count the time when Tera is leaning down to pick up another dish.”

“Ready, two, one,” Hectii said, as she activated the video camera.

“Go, go, go,” Pico chimed, as Tera grabbed two dishes at a time and lifted them to the shelves.

“Last one,” Tera said half-a-minute later… “Now stop!”

"Got it," Chip said. "Tera did 16 lifts, each lift took 1.0 s, for a total of 16 seconds. She lifted each pair a height of 1.2 m for a total distance of 19.2 meters. The lifts involved an average mass of 0.5 kg. A table of her data looks like this:

C	**Hectii, lifting cups and plates**		
Mass	**Gravity**	**Time**	**Height**
0.5 kg	*8 ρ/s/kg*	*16 s*	*19.2 m*

"Excellent," Pico said, as she methodically keyed. "In this situation, the calculation of impulse used involves mass, gravity, and time. It looks like this:"

$$im\Delta\rho = (mass)(gravity)(time)$$
$$im\Delta\rho = (0.5\ kg)(8\ \rho/s/kg)(16\ s)$$
$$\mathbf{im\Delta\rho = 64\ \rho}$$
was written on the display.

"My lift used 64 ρ of muscle-impulse," Tera read. "I'll do the calculation for speed:"

$$speed = \frac{height}{time}$$
$$speed = \frac{19.2\ meters}{16\ seconds}$$
$$\mathbf{speed = 1.2\ m/s}$$
was written on the display.

“That was pretty good,” Tera appraised. “Here’s the calculation for how much work I did:”

$$\textit{work done} = (\textit{mass})(\textit{gravity})(\textit{height})$$
$$\textit{work done} = (0.5\ kg)(8\ \rho/s/kg)(19.2\ m)$$
$$\textbf{work done} = \mathbf{76.8}\ \boldsymbol{J}_{\left[\frac{1}{1.2\ m/s}\right]}\ \textbf{or}\ \mathbf{76.8}\ \boldsymbol{J}_{\left[\frac{1\ \rho}{1.2\ J}\right]}$$

was written on the display.

“You did $76.8\ J_{\left[\frac{1\ \rho}{1.2\ J}\right]}$ of work done, working at a speed of 1.2 m/s,” Hectii concluded. “I’ll calculate the productivity. That’d be the amount of work done, divided by the muscle-impulse used. Those calculations look like:”

$$\textit{productivity} = \frac{\textit{work-done}}{\textit{im}\Delta\rho\textit{-used}}$$
$$\textit{productivity} = \frac{76.8\ J}{64\ \rho}$$
$$\textbf{productivity} = \mathbf{1.2}\ \boldsymbol{J/\rho}$$

was written on the display.

“It matches!” Pico said triumphantly, “The speed was 1.2 m/s, and the productivity was 1.2 joules$_{[IC]}$ of work for every ρ of muscle-impulse used!”

“Which is why Chip included the 1/1.2 subscript when he wrote the number of joules$_{[IC]}$ for work done,” Hectii said.

“Chip,” Tera said, “put all of this data in a table, and show it on the kitchen display.”

“Certainly,” Chip said as the following appeared:

D	**Tera, lifting cups and plates**		
Impulse = *mgt*	**Speed** = *m/s*	**Work Done** = *mgh*	**Productivity** = *work/im*$\Delta\rho$
64 ρ	*1.2 m/s*	$76.8\,J_{\left[\frac{1}{1.2\,m/s}\right]}$ **or** $76.8\,J_{\left[\frac{1\,\rho}{1.2\,J}\right]}$	*1.2 J/ρ*

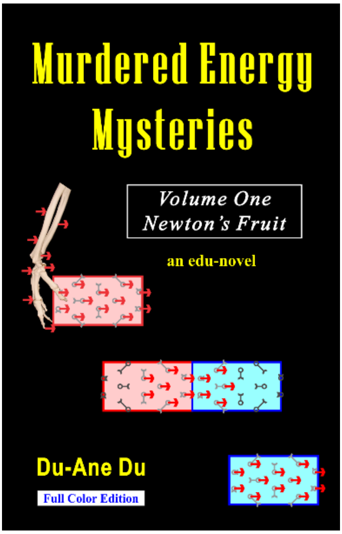
"Now it's my turn," Pico said as she opened a drawer. "I'll put the forks and spoons away. But I won't race, so we can see if that makes a difference. Hectii are you going to record again?

"All set," Hectii said as she aimed the camera at Pico and clicked the record button.

Pico grabbed two spoons, gently lifted them to the drawer, grabbed two forks… "Stop," she commanded as the last pair of forks landed in the drawer.

"Got it," Chip said. "Pico did 20 lifts, each lift took 1.2 s, for a total of 24 seconds. She lifted each pair to a height of 0.6 m for a total lifting distance of 12 meters. The spoons and forks had an average mass of 0.2 kg per lift. A table of Pico's data looks like this:

Excerpted from:



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E	**Pico, lifting forks and spoons**		
Mass	**Gravity**	**Time**	**Height**
0.2 kg	*8 ρ/s/kg*	*24 s*	*12 m*

"We know that calculating impulse used involves (*mass*)(*gravity*)(*time*), so we can let Chip do that calculation," Pico proposed. "I'll do the calculation for speed:"

$$speed = \frac{height}{time}$$

$$speed = \frac{12\ meters}{24\ seconds}$$

speed = 0.5 m/s

was written on the display.

"And we know that calculating work done involves (*mass*)(*gravity*)(*distance*)," Tera said. "So, we can let Chip do that calculation too. Chip? What's the new table for impulse-used, speed, work-done, and productivity look like?

"This," Chip said as the following appeared on the kitchen display:

F	**Pico, lifting forks and spoons**		
Impulse = *mgt*	**Speed** = *m/s*	**Work Done** = *mgh*	**Productivity** = *work/imΔρ*
38.4 ρ	***0.5 m/s***	$19.2\,J_{[\frac{1}{0.5\ m/s}]}$, $19.2\,J_{[\frac{1\ \rho}{0.5\ J}]}$	***0.5 J/ρ***

"Pico used 38.4 ρ of muscle impulse, but she only accomplished 19.2 $J_{[\frac{1\ \rho}{0.5\ J}]}$ of work done," Hectii read. "I'll calculate the productivity. Those calculations look like:

$$productivity = \frac{work\text{-}done}{im\Delta\rho\text{-}used}$$

$$productivity = \frac{19.2\ J}{38.4\ \rho}$$

productivity = 0.5 J/ρ

was written on the display.

"It matches again!" Pico said jubilantly. "The speed was 0.5 m/s, and the productivity was 0.5 joules$_{[IC]}$ of work for every ρ of muscle-impulse used, 0.5 ρ/J!"

"So what are the totals?" Tera queried. "I know the total impulse will be 102.4 ρ, because that's what you get when you add 64 ρ and 38.4 ρ."

"And it makes sense," Pico said, "because muscles provide the impulse, and that's the total amount of muscle impulse that Tera and I used. But can we add the joules$_{[IC]}$ of work-done?"

"That's a loaded question," Hectii said. "The scenarios don't match. The objects were different, the masses were different, you lifted them different heights…"

"And we worked at different speeds," Tera pointed out. "And that's my point! How can you compare Pico's work to my work?"

"More importantly," Pico said. "How can we know how much total work we did?"

"The joule$_{[IC]}$ production rates were different, because you worked at different speeds," Hectii said. "The use of a base/subscript on the joules$_{[IC]}$ unit suggests that you can't compare the results, and you can't simply add the results."

"Why not?" Tera said.

"It's sort of like the bottom of a fraction," Hectii patiently explained, "1/5 is not the same thing as 1/9. The denominators are different, so the numbers have different meanings. You can't add or compare the joules$_{[IC]}$ values unless the subscript is the same."

Tera rolled her eyes, "It's math, it doesn't have to make sense."

"What about some type of average?" Pico pondered. "If we average the productivity… maybe then we can add the work done?

"Wait, we could use Pico's fact #2 of work-impulse productivity," Hectii excitedly declared.

"Whenever work is done," Pico said, with an understanding nod, "the work-impulse productivity is the same as the speed that the work was done. So, the equations for productivity and speed are interchangeable." Pico tapped an icon on her phone and the following appeared on the kitchen display:

$$work\text{-}im\Delta\rho\ productivity = speed = \frac{work\text{-}done}{impulse\text{-}used}$$

$$speed = work\text{-}im\Delta\rho\ productivity = \frac{distance}{time}$$

"Exactly," Hectii said. "We can't really compare Tera's work to Pico's work because there are too many variables. However, we can use the concept of averaging the productivity to develop a total of the amount of work done."

"Ignoring the subscripts for a moment," Pico said. "The total joules$_{[IC]}$ would be 76.8 plus 19.2 for a total of 96… somethings."

"We've established that the total amount of muscle-impulse was 102.4 ρ," Tera interjected.

"Fabulous," Hectii said. "And both of those ideas will be valid if we find the corresponding productivity multiplier."

"Pico's fact #2?"

"Yes," Hectii confirmed, as her strong athletic fingers rapidly keyed. "We'll divide the work done by the ρ used, like this:"

$$productivity = \frac{work\text{-}done}{im\Delta\rho\text{-}used}$$

$$productivity = \frac{96\ J}{102.4\ \rho}\text{''}$$

productivity = 0.94 J/ρ or 0.94 m/s

was written on the display.

"That means we worked at general average speed of 0.94 m/s," Pico said. "And the productivity was 0.94 joules$_{[IC]}$

for every ρ of muscle-impulse used. Oh, and the productivity goes on the bottom of the subscript fraction!! You know, 1/productivity, like 1/speed."

G	Tera + Pico Totals		
Total Impulse Used = *mgt*	**"Average" Speed** = *m/s*	**Total Work Done** = *mgh*	**"Average" Productivity** = *work/im*$\Delta\rho$
102.4 ρ	*??? m/s*	**96 *J*** $_{[\frac{1\ \rho}{0.94\ J}]}$	***0.94 J/*ρ**

"I've got a call coming in," Tera said, as her phone flashed on and off. She tapped the screen and stepped out of the room.

"I need to put the pots away," Hectii said, as she opened a cabinet.

"I'll record this time," Pico offered, as she switched her phone to camera mode. "Chip will analyze your lifts—use the top shelf. And fast, you're the most athletic, make it good!"

"Only lifting counts, so I can pause between lifts," Hectii remarked. She grabbed the largest pot and rushed it to the highest shelf she could reach, and repeated the process 4 times. "Whew, done."

"Here's a summary of the data," Chip said. "Hectii did 5 lifts, each lift took 1.2 s, for a total of 6.0 seconds. She lifted each pot a height of 1.8 m for a total distance of 9.0 meters.

The pots had an average mass of 2.0 kg per lift. A table of Hectii's data looks like this:

H	**Hectii, lifting pots**		
Mass	**Gravity**	**Time**	**Height**
2.0 kg	*8 ρ/s/kg*	*6.0 s*	*9.0 m*

"Let's cut to the deducing," Pico suggested. "Chip, show us the amount of muscle-impulse used and the amount of work that Hectii did."

"That table looks like this," Chip said as the following appeared on the kitchen display:

J	**Hectii, lifting pots**		
Impulse = *mgt*	**Speed** = *m/s*	**Work Done** = *mgh*	**Productivity** = *work/im*$\Delta\rho$
96 ρ	***1.5 m/s***	$\mathbf{144\ J}_{\left[\frac{1}{1.5\ m/s}\right]}$ **or** $\mathbf{144\ J}_{\left[\frac{1\ \rho}{1.5\ J}\right]}$	***1.5 J/ρ***

"Great job Hectii," Pico praised. "You accomplished 144 joules[IC] of work, with only 96 ρ of muscle-impulse."

"Now let's see what the grand totals look like," Hectii suggested. "Chip, put together a table that shows the total amount of muscle-impulse that we used, and the total amount of work that we did."

"How's this," Chip said, as the following appeared on the kitchen display:

K	Total Impulse and Total Work			
	Impulse Used = *mgt*	**Speed** = *m/s*	**Work Done** = *mgh*	**Productivity** = *work/imΔρ*
T	*64 ρ*	*1.2 m/s*	$\mathbf{76.8\ J}_{[\frac{1\ \rho}{1.2\ J}]}$	*1.2 J/ρ*
P	*38.4 ρ*	*0.5 m/s*	$\mathbf{19.2\ J}_{[\frac{1\ \rho}{0.5\ J}]}$	*0.5 J/ρ*
H	*96 ρ*	*1.5 m/s*	$\mathbf{144\ J}_{[\frac{1\ \rho}{1.5\ J}]}$	*1.5 J/ρ*
	Total ImΔρ	**"Avg"**	**Total Work**	**"Avg"**
	198.4 ρ	*??? m/s*	***240 J**???*	*??? J/ρ*
* Remember, $[\frac{1\ \rho}{1\ J}] = [\frac{1\ s}{1\ m}] = [\frac{1}{speed}] = [IC] = [\frac{1}{productivity}]$				

"Stunning," Pico observed, "We used a total of 198.4 ρ of muscle impulse. But to fully understand how much work we accomplished, we'll need to use Pico's fact #2 of work-impulse productivity."

"I'll do the calculations for productivity," Hectii said as she keyed:

$$productivity = \frac{work\text{-}done}{im\Delta\rho\text{-}used}$$

$$productivity = \frac{240\ J}{198.4\ \rho}$$

productivity = 1.21 J/ρ or 1.21 m/s

was written on the display.

"Our average joule$_{[IC]}$ production rate went up," Pico said, "thanks to your final efforts. Chip, can you add that to our final totals?"

"How's this," Chip asked.

L	Tera + Pico + Hectii Totals		
Total Impulse Used = *mgt*	**"Average" Speed** = *m/s*	**Total Work Done** = *mgh*	**"Average" Productivity** = *work/im*$\Delta\rho$
198.4 ρ	***1.21 m/s***	$\mathbf{240\ J}_{\left[\frac{1\rho}{1.21\ J}\right]}$	***1.21 J/ρ***

"Great!" Pico continued. "And now the big question, which figures should we use to pay the workers?"

"According to the previous table, Pico's impulse-used was higher than her work-done," Hectii observed, "so it'd be logical to pay you based on muscle-impulse used."

"Tera's work-done has a higher value," Pico said. "So, she'd prefer that number. But work-done is multi-linear… that isn't really as valid as paying someone for the amount of muscle impulse used."

"There's some logic to paying people based on their productivity," Hectii suggested. "My productivity was very high, so I'd like that. Scientists tend to ignore productivity entirely—I wonder why?"

"What about some type of average?" Pico said. "You know,"

$$average = \frac{work + im\Delta\rho}{2}$$

$$average = \frac{J + \rho}{2}$$

"The only other type of average I can think of, would be a root-mean-square," Hectii said. "That would look like:"

$$rms\text{-}average = \sqrt{\frac{work^2 + im\Delta\rho^2}{2}}$$

$$rms\text{-}average = \sqrt{\frac{J^2 + \rho^2}{2}}$$

"This sounds like a situational problem," Pico said. "The employees will favor one method, and the bosses will favor another."

"True," Hectii said, "but what's important is that we discovered another fact of pure science!"

"**Pico's fact #2 of work-impulse productivity**," Pico said gleefully.

"Work done occurs when an object is moved from one stationary position to another stationary position," Hectii began. "Because work done involves multi-linear mathematics, the joules$_{[IC]}$ unit should always include a base indicating the inverse speed/productivity-multiplier involved—$J_{[IC]}$, $J_{[\rho/J]}$, $J_{[s/m]}$, $J_{[1/speed]}$, or $J_{[1/productivity]}$. The productivity multiplier is the same as the speed that the work was done."

$$work\text{-}im\Delta\rho\ productivity = speed = \frac{work\text{-}done}{impulse\text{-}used}$$

$$speed = work\text{-}im\Delta\rho\ productivity = \frac{distance}{time}$$

"Measurements of impulse-used are linear," Pico said, "so several impulse values can be combined for a total."

"However, work done involves multi-linear values," Hectii said. "If several measurements have the same impulse coefficient, then they can be added. However, if the impulse coefficients are different, then…"

"First, you must calculate the ρ of impulse involved, and add to get the total ρ," Pico said. "Then you can add to find the implied total $\text{joules}_{[IC]}$—"

"—and then you must use the total $\text{joules}_{[IC]}$ divided by total-ρ equation to find the *average* productivity," Hectii concluded. "The unit for multi-linear work done should then be written as $J_{[IC]}$, $J_{[\rho/J]}$, $J_{[s/m]}$, $J_{[1/speed]}$, or $J_{[1/productivity]}$."

"And that's **Pico's fact #2 of work-impulse productivity!**"

CONCLUSION: More research needs to be done into the relationship between mechanical energy and other theoretical forms of energy. Many common beliefs may actually be philosophical myths.

Murdered Energy Mysteries seeks to increase understanding of the various forms of momentum and momentum transfer, as well as the various forms of energy and energy transfer. The lack of understanding on the part of the scientific community is substantial, and more research needs to be done.

—Du-Ane Du, author of the edu-novel *Murdered Energy Mysteries* (Amazon, Kindle, e-book 2018, paperback 2021.)

More information, see:
Murdered Energy Mysteries,
an edu-novel

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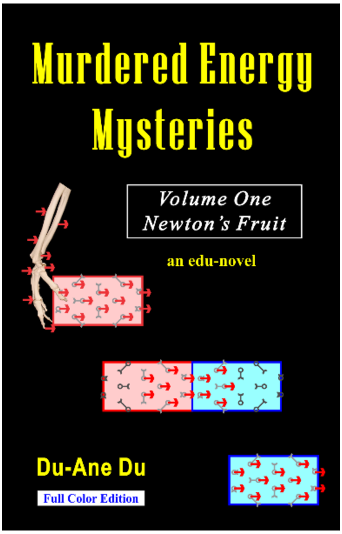

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