Essays
&
Ephemera

Catherine Inculet

Essays & Ephemera

E. E. Cummings
Joseph Haydn
Torques
A History of London Ontario
Canadian Reformers
Pressure of Fluids

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The Poetry Of E. E. Cummings

Edward Estlin Cummings was born on October 14, 1894 in Cambridge, Massachusetts. He was the son of the Reverend Edward Cummings, a Unitarian Minister and occasional teacher at Harvard University. E. E. Entered Harvard in the Fall of 1911 and received his B.A. in 1915 and his M.A. in 1916. It was at Harvard that he began writing poetry and was a regular contributor to the Harvard *Monthly*, the Harvard *Advocate*, and *The Dial*. The latter publication was responsible for staring him on the road to fame.

At the age of twenty-three, in 1917, he embarked for France as a volunteer ambulance driver for the Norton Harjes Ambulance Corps, "being neither warrior nor conscientious objector; saint nor hero." [1] After four months in France, he and William Salter Brown, who he had met on the boat there, was arrested and held in a concentration camp for three months. Brown had written letters to people in the USA which authorities had considered pro-German. Cummings was suspected because of his association with Brown. This experience was recorded in his first book, the prose work *The Enormous Room*.

In 1925 Cummings received the Dial Award for poems in his first two books of verse; Tulips and Chimneys, (1923) and XLI Poems, (1925). He then began to exhibit his paintings and drawings, of which he actually did more than his poetry. In 1927 he turned to Drama. His play, Him, opened at the Provincetown Playhouse in 1928. In 1935 he published Tom, a poetic choreography used in the Broadway success, *The King and I*, fifteen years later, and in 1946, a one act play entitled *Santa Claus: A Morality*, was performed. It expressed Cummings' view that love and individuality are scarce in the modern world.

During his lifetime, Cummings published many volumes of verse, including: *&, is 5, W (or ViVa), No Thanks, New poems, 50 Poems, 1X1, XAIPE, 95 poems, and 73 Poems.* In the Spring of 1931, he went to the Soviet Union for one month and recorded his travels and reaction to Communist society in a diary which was to be published in 1933 as Eimi. In 1953, Cummings published his discussions with Charles Eliot Norton, a lecturer of poetry at Harvard, as i: six nonlectures, and in 1957, he received both the *Boligen Prize for Poetry* and the *Boston Arts Festival Award.*

E. E. Cummings died of a cerebral hemorrhage on September 3, 1962 while living on a farm with his third wife, Marion Morehouse. They lived in the White mountains near North Conway, New Hampshire.

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1. E. E. Cummings, *i: six nonlectures* (Cambridge, 1959, p. 52)

Edmondo Dodsworth, in November 1938, wrote an article in *Broletto*, which stated: "*1. The logical world in which the 'normal man' moves or thinks he moves, far from being the whole of truth, is only a narrow division of it, a mere system of abstractions, invented and maintained for reasons of practical convenience, whether technical or social. From the poetic point of view this world is by definition 'the maximum of irreality.*

2. Consequently the supreme task of poetry is to destroy and transcend this irreality in the service of something immensely more profound and vital. . . . This something is indomitable lyricalness . . . (and) Cummings is one of its most vital representatives." [2]

E. E. Cummings used this tangible quality along with his very unique way of seeing things to produce many different kinds of poetry. These range from conventionally metered and rhyming works such as *a man who had fallen among thieves*, through blank verse to free verse and what is called *cubist* poetry. Finally, the unusual arrangements of stanzas, lines, words, and letters to make typographical pictures or ideographs. In his use of the last style, which probably originated from his painting skills, he has made poems shaped like a football on end, a wine glass, and billowing smoke. However, it is his cubist or futurist poetry for which he is most renowned.

"This achievement is quite different from pictures formed out of type or calligraphy. Cummings was the first to introduce and develop those structural elements on the printed page that act as doors and passageways to ultimate effects. A simple test is to take any of his poems and note how his lines and divisions of lines help to establish meaning and accent as well as movement. In this respect, he was the innovator." [3]

r-p-o-p-h-e-s-s-a-g-r is an extreme example of this style which is included here to simplify its recognition in subtler works:

2. C. Norman, *E. E. Cummings*, New York, 1967, forward.
3. C. Norman, *E. E. Cummings*, New York, 1967, p. 119.

```
                              r-p-o-p-h-e-s-s-a-g-r
                    who
a)s w)e loo)k
upnowgath
         PPEGORHRASS
                      Eringint(o-
aThe):l
        eA
          !p:
S                                        a
              (r
rIvInG              .gRrEaPsPhOs)
                         To
rea(be)rran(com)gi(e)ngly
,grasshopper;
```

By breaking up the words into syllables and letters, running words together for speed of motion, capitalizing "hopper" and parts of the leap for emphasis, and using punctuation in curious places for maximum effectiveness (such as in the middle of the leap) instead of at the end of the line where the action is over, a visual image is formed that is part of the poem; the grasshopper hops.

****

(of Ever-Ever Land i speak
sweet morons gather roun'
who does not dare to stand or sit
may take it lying down)

down with the human soul
and anything else uncanned
for everyone carries canopeners
in Ever-Ever Land

(for Ever-Ever Land is a place
that's as simple as simple can be
and was built that way on purpose
by simple people like we)

down with hell and heaven
and all the religious fuss
infinity pleased our parents
one inch looks good to us

(and Ever-Ever Land is a place
that's measured and safe and known
where it's lucky to be unlucky
and the hitler lies down with the cohn)

down above all with love
and everything perverse
or which makes some feel more better
when all ought to feel less worse

(but only sameness is normal
in Ever-Ever Land
for a bad cigar is a woman
but a gland is only a gland)

  In this poem, Cummings is being satirical, but the satire is definitely Horatian, causing the mood to be rather amusing. The theme is that people are afraid to be individuals; they like everything to be in a nice set order so that they can just blindly and inconspicuously follow along with the crowd and not have to think. It is cleverly shown by Cummings jumping in and out of the brackets. Out of them, it seems as though he is making a speech in favor of the Ever-Ever Landers' apathetic way of life, but in them is a whispered truth; Cummings is in Ever-Ever Land, but he isn't part of it so he can have an unbiased view. The brackets also serve another purpose which relates directly to the theme. People are not afraid to speak out about what they know everyone agrees with, but if they think to the contrary, the best they dare to do is to whisper it, bracket it, and perhaps meekly put it as an afterthought.

  Cummings starts out as a politician calling the "morons" around his platform where he will give a speech full of idiotic propaganda, which the people do take "lying down" because they are afraid to stand up for their rights. The very lack of punctuation is further proof of this. Traditionally, periods assert statements; commas are pauses for thought; question marks inquire; and an exclamation mark show strong feeling, none of which Ever-Ever Landers seem to do. There is a strong resemblance to J. M. Barrie's Never-Never Land in *Peter Pan*. Both are fantasy worlds, but whereas Never-Never Land could never exist, there is a bit of Ever-Ever land everywhere. The stanza about the canopeners describes the mechanized, materialistic, robot-like society. A place where "one inch looks good enough" has people with closed minds, no goals or aspirations, no dreams. Again, this is in contrast to Never-Never Land, which is totally a dream world. As is "Peter Pan Syndrome" a dream world in the mind and not the real world. The statement *down above all with love / and everything perverse is ironic*. It serves to illustrate the corruption of the society, which with a little propaganda can be lead to believe anything. There is also irony in *or which makes some feel more better / when all ought to feel less worse*. Both mean essentially the same thing, but together they are given a Communistic twist where no one person rises; all go up and down together. On this note, the paradox that is the "lucky to be unlucky" can be resolved. If people are lucky, they will stand out as an individual which nobody wants to be (let alone be convicted as a traitor to the country's ideals, *for the people, by the people, of the people.*)

  Cummings does use some imagery in this poem, but only visual and very unrealistic. When one pictures little robots walking around with their little canopeners and saying down with, down with, the utter exaggeration not only gives a comic effect but also enables the reader to see those qualities in himself. The absence of any other sensual appeal goes with the idea of a cold, mechanical, unsensing society as does the use of repetition. The phrase "down with" is the phrase

of a mob; people lumped together. A demagogue yells "down with" anything and the Ever-Ever Landers are programmed to destroy. Cummings makes use of only two metaphors, and very odd ones at that. *a bad cigar is a woman* sounds like something a politician once said which everyone now misquotes, because everyone does so it must be very profound. In the next line, *a gland is only a gland* is a rather strange usage of a synecdoche, where men are reduced to glands. Glands don't think; they just follow the orders of hormonal secretions from the brain.

There is one regular meter in this poem, but there is some pattern to its switching around. Outside the brackets, there is a tendency toward anapestic meter, as these stanzas are spoken with confidence. The stanzas are bracketed are given more of a regular dactylic, thoughtful rhythm, with some anapestic spurts (perhaps as society's brainwashing with memorized phrases coming through.) The rhyme is very regular, A-B-A-B all the way. It gives it a childish tone, as if it is memorized and just being rattled off without the knowledge of its meaning. Cummings omitted the "d" in round in the second line to keep the rhyme regular.

This work shows Cummings was anti-mechanistic . In another poem, he wrote with a similar theme:

(While you and i have lips and voices, which
are for kissing and to sing with
who cares if some oneeyed son of a bitch
invents an instrument to measure Spring with?)

He has often been quoted as saying that *"Radio has taken the ears away from people completely . . . progress (is) regression to barbarism"* and science is *"the omnipotent Genie of the uncorked Unknown."*[4] It also hints at his great regard for the individual, expressed in many poems such as:

any man is wonderful
and a formula
a bit of tobacco and gladness
plus little derricks of gesture

I mentioned what I thought was a comparison to Communist society in the poem. This poem was published in 1938, in New Poems, written a few years after his visit to Russia, so it is possible that it is his impression of the way in which the American people are much like the Russians, except in a different situation. Whereas

kumrads die because they're told)
kumrads die before they're old
the "Ever-Ever Landers" don't live.

****

my sweet old etcetera
aunt lucy during the recent

war could and what
is more did tell you just
what everybody was fighting

4. C. Norman, *E. E. Cummings*, New York, 1967, p. 7.

for,
my sister

isabel created hundreds
(and
hundreds) of socks not to
mention shirts fleaproof earwarmers

etcetera writers etcetera, my
mother hoped that

i would die etcetera
bravely of course my father used
to become hoarse talking about how it was
a privilege and if only he
could meanwhile my

self etcetera lay quietly
in the deep mud et

cetera
(dreaming,
et
          cetera, of
Your smile
eyes knees and of your Etcetera)

This poem is also satirical, and its mood is very lighthearted and amusing. The theme is that people will talk about anything and everything even when they know nothing about it, and in reality nobody really understands anything, even those who are experiencing it. The ending is somewhat of a surprise, because after portraying the four people as ignorant loud-mouths, we expect "myself" who is laying in the mud to be bitter. Instead we find that he is exactly the same.

The poem makes use of metaphors or similes. This gets across the face value impression; people talk shallowly with no meaning behind their words. The visual images help to make a contrast so that the ending is more effective. At the beginning, the most vivid mental picture the reader can form is of Isabella surrounded by her creations. They are in a silly world, so their silly talk is understandable. However, when we are given a concrete image os a man laying in the mud, it is a shock to find dreaming where we expected blatant reality.

The repetition of the word etcetera is very significant, in that it is what people say when there is nothing else to say. In the first lines, *my sweet old etcetera / aunt lucy* . . . is a zeugma. If the etcetera is a continuation of "*sweet old*" then it implies that he did not really know his aunt. He calls her sweet and old because everyone's aunt is sweet and old but other than that he can't tell anything about her. If the etcetera is taken as a description of his aunt, then it is a unique adjective to describe someone who talks and talks etcetera about everything. In the line, *mother hoped that / i would die etcetera / bravely* . . . the etcetera emphasis the shallowness of the remark. It is just "the thing" that one says and can be classified along with "hell, how are you, I am fine." On top of that I am sure his mother did not want him to die, even bravely. The use of etcetera in . . . meanwhile *my / self etcetera lay quietly* is significant in that he doesn't know himself, and in the *eyes knees and of your Etcetera* because he does not know the girl or what it is about her that he loves.

This poems is done in free verse and lacks a regular metric pattern and rhyme, but the variations in pace, pause, and line apply to the theme. In the first two lines, Aunt Lucy is introduced, then there is a pause and the next little stanza reads quite fast, the rhyming of "war" and "for" is quite noticeable and almost lends a singsong quality to that section, giving the impression that once she is started on her spiel, she keeps going until the record stops. The pause after "fighting" serves two purposes. First it gives the phrase a double meaning; namely that she knew "what" everybody was fighting as well as "what for." This doubles the irony that neither she nor anyone else knew anything. Secondly, the pause is Aunt Lucy taking a breath. The comma shows her intention to continue, but as if in a conversation, "my sister" interrupts and tells her bit, just as fast. The idea of "fleaproof earwarmers" sounds ridiculous; she just made them because it was fashionable to, not really knowing what war is or what a soldier needs. In the same way "my mother" interrupts Isabella while she is on a comma. Father is still talking about how it was in his day and what a privilege it is when a pause between stanzas takes us to a different place, where "myself" is. Here, the pace is slowed to a dreaming speed by the chopped-up words, and ironically, we see that although he is at war, he doesn't understand what it or anything else is all about; he is just dreaming. In the last line, we see that he really is like the rest of them because the reading pace speeds and he is thinking in the same gossipy, run-on way.

This poem was published in 1926 in *is 5*. The war was over long enough before that it couldn't have been his reason for the writing of the poem, only the excuse. It is interesting that

Cumming's arrest during the war was caused by Brown's written gossip about the war and he was held because of a general lack of communication and yet in this poem gossip and ignorance are supposedly a harmless integral part of human nature. He is not bitter about them. It is also significant that Cumming's, whom "myself" is taken in the poem to be, should portray himself as not paying any attention to what is going on around him. This coincides with his concept that:

> "The difference between a business man and an artist is this: the business man lives in a world which is completely outside him. That's his reality. When that world collapses, he collapses. But the artist never turns a hair. Why? Because an artist's country is inside him." [5]
>
> * * *
>
> but if a living dance upon dead minds why, it is love; but at the earliest spear of sun perfectly should disappear moon's utmost magic, or stones speak or one name control more incredible splendor than our mere universe, love's also there: and being imprisoned, tortured here, love everywhere exploding maims and blinds (but surely does not forget, perish, sleep cannot be photographed, measured; disdains the trivial labeling of punctual brains . . . Who wields a poem huger than the grave? From only Whom shall time no refuge keep though all the weird worlds must be opened?)Love

This poem is written almost as a narrative, but the mood which it conveys is one of awe and respect for love. The theme is that love exists in many different forms, some free and some restricted, but nobody can say which of the "weird worlds" of love represents true love until after death, because time never destroys true love. "Perhaps love can only come when we are young and stupid. Of course, later on, sometimes your gut feeling was right and that person was right for you, but that giddy-in-love, put-your-brain-on-the-plate kind of love, I don't think it will ever be found. He faught for humanity. Strength is not power unless it is focussed and used. Focus is not enough, there must be desire and belief for nothing is so strong as true love. It is no wonder we cannot understand love, for it does not belong to us, it belongs to life, and each of us can only hope to know that tiny part upon which we are entrusted, and to use it with the care and sense of duty which should be given another's most precious belonging. Perhaps that is why we all try and give love away, nobody wants the responsibility of having to hold it." [6]

It is odd that Cummings does use a metaphor, "spear of sun," in this poem because he rarely uses such devices in any poems and especially those about love. "Only an extraordinary accomplished and controlled technique could have communicated so much intensity." [7] However, the poem is about different kinds of love, including those which extol flowery phrases of devotion. The use of the word "spear," a killing weapon, is ironic with "sun," the source of all life. It is actually a subtle paradox, which can be solved by the recognition of a type of love

5. C. Norman, *E. E. Cummings*, New York, 1967, p. 9.
6. C. Inculet, *Day Lilies*, HMS Press, London 2020
7. C. Norman, *E. E. Cummings*, New York, 1967, p. 132.

which is wounded or prevented by occurrences in people's lives and yet true "loves also there," because it doesn't die. It could also just as easily mean the first "rays" of sunlight which spear and overpower the weak light of the Moon in the morning. Love is personified as "Who" and "Whom" at the end; the fact that Cummings capitalizes them shows his respect for love. Perhaps that "Who" is a poet and the "Whom" is immortal, is a comment on the immortality of poetry about love which causes some love to remain forever. This is just as in Shakespeare, in his sonnet *Shall I Compare Thee*, supposedly gave immortal life to the girl he was describing.

This prose poem lacks visual images. Cummings is talking about love, which *cannot be photographed, measured.* It is abstract and therefore must be felt and not seen. Cummings, like Gertrude Stein, was "a futurist who subordinates the meaning of words to the beauty of the words themselves. This art is the logic of literary sound-painting carried to its extreme." [8]

To covey this feeling to the reader, he has used many literary devices. The first line is of particular interest to me. First, there is the elision of a noun for the word "living." The prose poem has no meter, so to omit it cannot be for structural regularity. It is for the intangibility of love; love is not a noun here. Cummings did not like nouns. He defined his "child-art" as depicting

> ". . . houses, trees, smoke, people, etc. . . . not as nouns but as verbs . . . to appreciate it we are compelled to undress one by one the soggy nouns whose agglomeration constitutes the mechanism of Normality, and finally to liberate the actual crisp organic squirm - the IS." [9]

People cannot say what love is; they can only describe it such as *Love is and shall be this / the moment just before / and just after a kiss*, [10] and Cummings says it is a living. This mood of insecurity about what love is, is established from the first word, "but"; a word used, just as the poem is, to separate conflicting ideas in an attempt for resolution. The forth line, *Moon's utmost magic, or stones speak or one* is full of s's. This produces a dreamy, euphoric feeling, just as the type of love which it describes is an infatuation, with one name meaning more than the whole beauty of the universe. The phrase moon's utmost magic is metonymy, the moon as it does, symbolizing romance and the mysterious thing which kindles it. The line *love exploding maims and blinds ,*is given a double meaning because it is a zeugma.

8. C. Norman, *E. E. Cummings*, New York, 1967, p. 43.
9. Ibid. P. 179
10. W. Ray, Poetics III, HMS Press, London, 1995

If it is read as *love exploding everywhere*, then it is very outwardly expressed love that is being described, and Cummings says that such love *maims and blinds love.* It is, in his opinion, a false love, but only time will give the true test. The phrase could also be inferred as universal love which destroys all personal vices and defects, the love being so strong that it is blind to them.

      The poem is in the form of a Petrarchan Sonnet, composed of an octave followed by a sestet, but it is still free verse, without regular meter or rhyme. There are, however, two rhyming couplets which stand out because of this. The first makes up the second and third lines and its significance lays in the two rhyming words; "spear" and "disappear." Spear, as I mentioned before, represents a killing weapon. It is after death that false love "disappears" and is exposed as false love by its inability to survive. Whereas true love *wields a poem huger than the grave.* The second couplet is the tenth and eleventh lines. Here, the rhyming has an artificial, mechanical, robot-like quality. The rhythms of the two lines match as well, and it illustrates the way people try to fit love as a certain size of wheel in a certain type of machine. This rhyming couplet also serves to separate the two parts of the sonnet because of its change of tone. It is the commercialization of love; all the little witticisms of people trying to qualify and categorize it so that they can touch it and say, *There, that is love*, and produce the perfect fail-safe formula for it. This is in direct contrast with the first part which describes love as that which can bring "dead minds" to life, but it is casual and seemingly temporary, infatuated, or very outward and demonstrative. These are all love.

<div align="center">***</div>

suppose
life is an old man carrying flowers on his head.
Young death sits in a café
smiling, a piece of money held between
his thumb and first finger

(i say "will he buy flowers" to you
and "Death is young
life, wears velour trousers
life totters, life has a beard" i

say to you who are silent. - "Do you see
Life? he is there and here,
or that, or this
or nothing or an old man 3 thirds
asleep, on his head
flowers, always crying
to nobody about something les
roses les bluets
          yes,
              Will He buy?
Les belles bottes - oh hear
, pas chères")

and my love slowly answered I think so. But
I think I see someone else

there is a lady, whose name is Afterwards
she is sitting beside young death, is slender;
likes flowers.

This poem is very calm, quiet and thoughtful, and pitying, almost crying for life! The theme is that nobody knows what they want in life until afterwards, when it is to late and death is beside them. It is done in free verse with absolutely no meter or rhyme. This applies to the mood of the poem, which is in turn set by the first word, "suppose" followed by a pause in the reading of the poem which gives a quality of dreaming.

The personification of life and death is important to the poem. *Life is an old man carrying flowers on his head.* He is silly and senile. He also *wears velour trousers.* This sartorial imagery contrasts with that of a flower-seller. Velour is a velvety material, representing material wealth; he is rich on the outside, but actually poor like a flower-seller because people won't buy the flowers which represent the wealth in the beauty of nature and love and all things in life, which people tend to overlook because of money. Death, however, *sits in a café / smiling, a piece of money held between his thumb and first finger.* Death is very young. This is Cummings' twist to the usual portrayal of life as youth and vitality, death as a gaunt skeleton with an evil leer. The different visual image may be of interest to the reader.

Repetition plays a part in the effectiveness of the poem. The repetition of "life" in the eighth and ninth lines gives an accusing, almost mocking tone. This increases the reader's sympathy with the old man. It is also noticeable that in this stanza, in contrast to the first two, "Death" is capitalized and "life" is not. This serves to raise death above life. It is bigger and eventually takes over and wins. Life, as in the second line, has a period after it - it ends, but death has no period - it never ends. The repetition of "or" in the twelfth and thirteenth lines gives the impression of uncertainty. Cummings is saying that life means different things to different people.

The meaning of this poem is conveyed by the words themselves, and by the image or picture which Cummings paints, as well as by the aforesaid devices. At the end of the line *life totters, life has a beard* i, the i is significant in that Cummings puts himself beside life; his description of life runs right into himself, therefore we return to his conception that a poet is alive and has the necessary extra sensitivity to be so. Then, in the next line, *he speaks, to you who are silent*, those who are living but quiet and dead on the inside because life is only outside of them and in the form of materialistic wealth. The use of a number in *3 thirds asleep* is rather unorthodox (even frowned upon) but in this case it has the effect of disguising the fact that life is totally asleep. Also, the use of fractions illustrates the slow process by which life goes to asleep, a pseudo-death. In the next line is a device typical of Cummings, the inversion of "flowers" and "on his head." Cummings thought

that to obey the correct order of words was to create sterility, and thus in this case, rearranging them produced liveliness and vitality (which life once had). The usage of "buy" and "pas chères" reinforces the idea of material wealth being the only important thing until it is too late and people will not spend it for the abstract loveliness of what a flower represents. At first, "Life" tries to sell them solely on the merit of beauty, and then as an afterthought (after a comma) tries to speak in a language which people will understand - money! In the next line, *and my love slowly answered I think so*, Cummings makes use of a zeugma. *I think so*, could be his love's answer, or he could be expressing doubt as to whether or not she answered. Either way it signifies a non-committal, ignorant, doubtful, goalless life. It is interesting that Cummings uses "I" three times in the twenty-second and twenty-third lines. Almost as a trademark, he uses the lower case "i" because "I" wasn't important to him. He once stated that "it is the conventional way that is artificial and affected . . . only in English is the "I" capitalized." [11] Any time he violates his own rule, it has a meaning. In this case it puts him, as a poet, above those *who are silent*.

This poem was published in 1925 in *& (AND)* is in many ways similar to his play *Santa Claus*, in which (aphadepherous) Santa cannot give his gift of understanding because it cannot be sold. It is interesting that Cummings has set the poem in France. He was in Paris from 1921 until 1923 and felt (as did many writers and poets at the time did) that America stifled him whereas in France & Europe he was appreciated.

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The Imaginist Credo, in which Ezra Pound et al. Of the English Group stated certain goals, had a great effect upon Cummings' writing, especially the aim "To produce poetry that is hard and clear, never blurred, no indefinite." [12] Cummings also influenced his contemporaries, Pound, Eliot, and Joyce, in his search for the secret of emotion and movement that lies at the heart of words.

> "A poem is the culmination of a poet's experience and is itself part of the experience. Cummings communicates his experience by means of language and forms that dramatize it, so that the experience is still taking place, so far as the reader is concerned." [13]

However, regardless of what style he uses, Cummings strives to bring about a theme, that of the universe in a type of spiritual harmony.

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11 C. Norman, *E. E. Cummings*, New York, 1967, p. 211

12. C. Norman, *E. E. Cummings*, New York, 1967, p. 38.

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      Oxford University Press, 1964.

Definitions

Anapestic	Metric Foot characterized by two short syllables followed by a long one.
Aphadepherous	Where the head and the body are rotund, round. The opposite of Anorexic where the head and body are narrow.
Elision	The omission of a sound or syllable / the action of merging.
Metonymy	Substituting the name of an attribute or feature for the name of the thing itself. Eg: "they counted heads"
Zeugma	The use of a word to govern two or more words though appropriate to only one.

Joseph Haydn

Franz Joseph Haydn was born on March 31, 1732 at Rohrau, Lower Austria. He was the second child and oldest son of the wheelwright, Matthias Haydn and Anna Marie Koller. When he was five, still a very small boy, it was his father who played the harp without knowing a single note of music, who was his first teacher. Because he sang all of his father's simple pieces correctly, at the age of six he was taken to Hainburg by a J. M. Franklin to learn the rudiments of music and other requirements. When he was seven years of age, George von Reutter heard his voice and took him to the Choir House of St. Stephen's Cathedral in Vienna, where he learned the art of singing, the harpsichord, and the violin with von Reutter as his teacher. Later he was taught by Gegenlauer and Finsterbusch.

When Haydn was eighteen, his voice broke and he was dismissed from the choir. Up until then he had tried his hand at composition only once. This was not encouraged by his teacher, von Reutter. Now he went after composition with great zeal. He wrote diligently but not as correctly as he should have, until he learned the true fundamentals of musical composition from Niccolo Porpora, who was in Vienna at the time.

At the age of nineteen, in 1751, Haydn was writing for and playing in street bands until he composed a comic opera *Der krumme Teufel*, for the Viennese comedian and impresario Feliz Kurz-Bernadon. He finished the opera in the Spring of 1752. After spending the Summer in Wienzierl Castle near the city of Melk, with Austrian nobleman Count Carl Joseph von Furnberg, where he wrote his first string quartets, he returned to Vienna to compose music and teach from 1756 - 1759. At this time he was engaged as music director to Count Ferdinand Maximilian Morzin. Haydn wrote his first symphony at the Summer castle in Lukavec in Bohemia. Then, just before the musicians were dismissed, the Count fell into financial difficulties. In 1761, Prince Paul Anton heard of and invited Haydn to become assistant Kapellmeister of the Esterhazy Court Orchestra. When Prince Anton died in 1762, he was succeeded by his brother Nicholas Joseph who was a great music lover who also played an instrument called the Barytone. Haydn was required to write many pieces for it. Nicholas also enlarged the orchestra and its operatic forces and a regular opera season was created.

In 1766 Haydn advanced to the post of musical director and was removed to Esterhazy. Two years later a fire at the castle destroyed much of his work. In 1769 he composed an opera for the Court Theater in Vienna, which rejected the piece. In the same year another fire destroyed many of Haydn's works. In 1781, at the age of 49, Haydn and the Esterhazy musicians met with Clementi in Vienna and entertained the Grand Duke Paul of Russia who was passing through on a visit to the Emperor Joseph II. He became friends with Mozart and the songs of Haydn were published for the first time. The Copyrights were sold by him to Forster of London. The next year he composed the opera *Orlando Paladino*, and a Mass entitled *Missa Cellensis*, for the Monastery of Mariazell.

In 1784 at the age of 52, he engaged Mozart, who was 28 at the time, to play at Esterhazy's musical evenings in Vienna. Both musicians took part in Chamber Music. They met Paisiello and Sarti on their way to and from Russia. The next year the setting for *The Seven Words* was commissioned by Cadiz. In 1790, on the death of Nicholas Esterhazy, Haydn retired with a pension and went to live in Vienna. A gentleman named Salomon invited him to London where he went the next year. While there he attended Oxford and received his Music Doctor's degree. When he returned to Vienna in June, Beethoven became his pupil at the age of 22. In 1793 he met and encouraged another musician, Hummel at which point Beethoven abandoned him for Schenk.

In the last twenty years of his life many of his works were performed publically (see Appendix). During the 1760's Haydn began to solidify and deepen his style of music and composition. He worked on many different forms at the same time: Opera, Symphony, Church music, the Piano Sonata, as well as the Concerto.

Haydn began to explore new harmonic fields. His interest in new harmonic structures is most apparent in the later Piano trios. His last six Masses showed great strength and grandeur, ranging from the brightness of the *Missa in Tempore Belli* to the drama of the *Missa in Augustiis*. Here, the symphonic principles brought to perfection in the London Symphonies are brilliantly combined with older contrapuntal forms. He blended solo voices with vocal quartet and choir, and there was a constant juxtaposition of the available forces. Austrian and Czech Monasteries did much to spread abroad his Church music as well as his symphonies, divertimenti, sonatas, and concertos. The same musical principles are used in *The Creation* and *The Seasons*. In the purely orchestral passages Haydn shows that he is capable of discovering new tonal continents. In Haydn's last instrumental works, the string quartets' *Opus 76* and *Opus 77* (and the unfinished Opus 103) the art of the Quartet was brought to a new pinnacle.

Haydn began by composing works designed primarily for entertainment, like divertimenti, which naturally included dance movements. They could be preformed either by an Orchestra or by a Chamber Music ensemble. It was from these that he progressed to music designed from the first, for a string quartet. The structure of these works as well as of his Symphonies and Piano Sonatas show a variety of influences - influences that appear generally in the instrumental music of the late 18th Century. The tonal relationships of the old dance movements provided the basis for an extended movement in which the modulation from the related keys back to the tonic, offered the opportunity for a varied treatment of the thematic material of the initial "Exposition" (the section ending with the related key); and the return of the tonic was made the excuse for "recapitulation" of the material heard in the exposition. The recapitulation was not however, identical with the exposition, since everything was now in a tonic key and could be followed by a "Coda," or a tailpiece that brought the movement to a decisive end. This type of structure was not rigid, since it did not dictate the number of themes or their character, and the extent to which they were used or alluded to in the development

was open to considerable variation. This structure was normally used n the first movement of a Sonata or Symphony, but it might also appear in others, except in the Minuet and the Trio which were, in fact, a pair of dances with the first repeated as in a "da capo" Aria. Unlike many of his contemporaries, Haydn did not exclude polyphony from his instrumental works; it appears frequently in the shape of movements that either are wholly fugal or make extensive use of contrapuntal technique. The Quartets and Symphonies of Haydn had a great influence on the works of Mozart and Beethoven and are easily discernible in them. Haydn died in Vienna on May 31, 1809. He was seventy-seven. Haydn was a deciding factor in forming the Viennese Classical Style. There was a growing realization that instrumental music could be just as dramatic as Opera. His early style was rooted in Austrian and German Baroque.

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Experiments on Torques

Report
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Experiments on Torques

Abstract

The experiments presented in this report show the experimental verification of the laws postulated by Newton regarding the motion of a rigid body in two dimensions. The apparatus involved a metre bar suspended at two points by means of strings, pulleys, and various weights. By changing the weights and the position of the mass centre of the bar, both the conditions for static equilibrium ($\Sigma F_{ext} = 0$ and $\Sigma \tau_{ext} = 0$) as well as the conditions for translational and/or rotational accelerated motion ($\Sigma F_{ext} \neq 0$ and $\Sigma \tau_{ext}$) were verified.

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Objectives

The purpose of the experiments was to show:

1. The types of motion which can be undergone by a rigid body which is free to move in two dimensions

2. The conditions for the static equilibrium of a rigid body.

Introduction

Any motion of a body in a two dimensional space may be completely described by a combination of a translational motion of its centre of mass combined with a rotational motion about an axis through that same centre. While this statement is valid in a three dimensional

space, the experiments which were performed used equipment which allowed motion in a two dimensional space only. These experiments in a two dimensional space can be easily generalized to three dimensional space motion.

To analyse fully the general motion of a body under all conditions including acceleration, one must analyse the forces acting on the body. It can be shown that mechanical forces acting on the body can also be represented by a combination of a translational force and torque. The laboratory experiments dealing with the analysis of the external forces on the rigid body were limited to finding the conditions under which

static equilibrium exists.

Theory

A. The analysis of the general motion.

If one considered a body of mass m and of moment of inertia I which is subjected to a force of F and a torque of τ the following two equations apply simultaneously
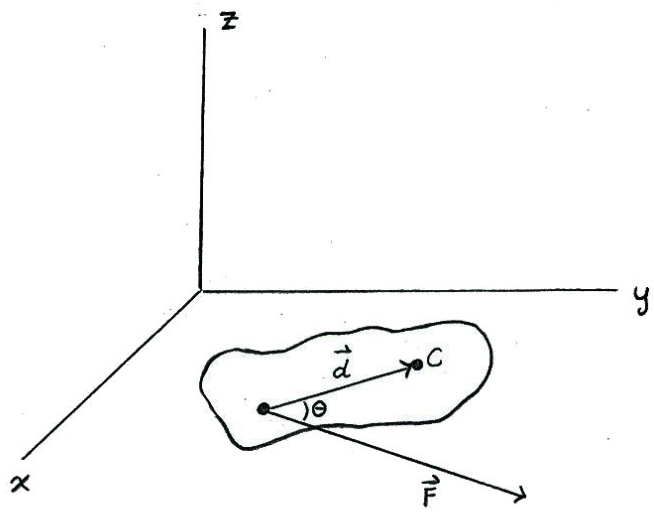
$$F = ma$$ where a is the linear acceleration

$$\tau = I\alpha$$ where α is the angular acceleration

and are sufficient to analyze the motion at any one time.

Let us assume that force F in figure I acts on the body at point P which is at distance d from the

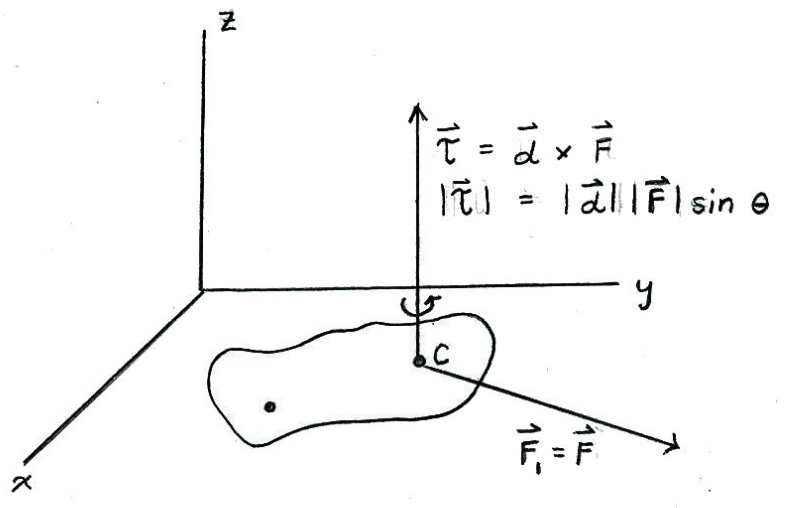C is centre of mass of body
xy   is plane of motion

FIGURE I

$$\vec{\tau} = \vec{d} \times \vec{F}$$
$$|\vec{\tau}| = |\vec{d}||\vec{F}|\sin\theta$$

$$\vec{F_1} = \vec{F}$$

FIGURE II

centre of mass C. Figure II shows
an entirely equivalent system where
F has been replaced by F_1, which
is equal in magnitude to F but
applied to the centre of mass, and
also by a torque $\tau = \vec{F} \times \vec{d}$ about
the same point C.

B. The analysis of the external
forces.

According to Newton's laws of
motion, the necessary and sufficient
conditions for a body to be at rest
or undergoing uniform motion are:

1. The sum of all the external
   forces must be equal to zero

2. The sum of all the external
   torques acting on the body
   relative to the centre of mass or
   any given point must be equal

to zero.

Experimental Method

The equipment which was used in all of the experiments is shown schematically in figure III
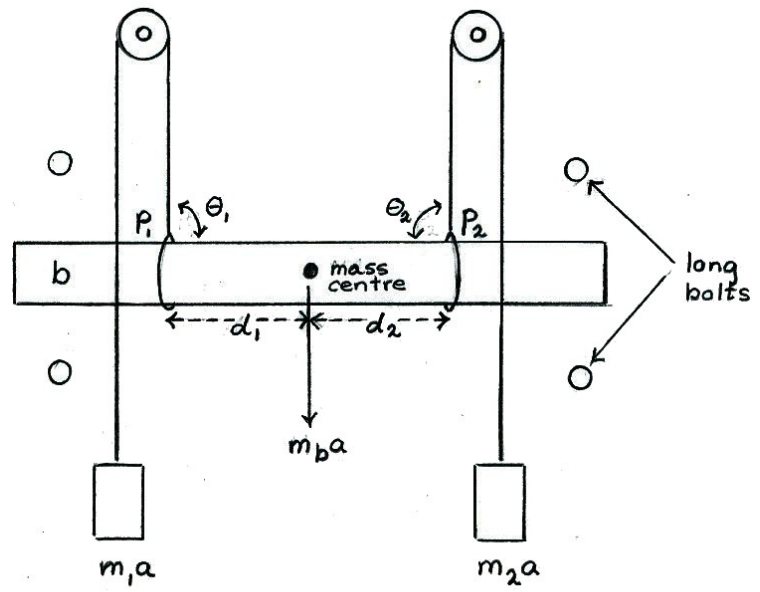
a = acceleration due to gravity

FIGURE III

It consists essentially of a metre bar b supported at points P_1 and P_2 by two strings pulled by weights $m_1 a$ and $m_2 a$ over pulleys. The long bolts on either side of the bar confined its motion at both ends.

A total of five experiments were carried out as summarized in Table I. Prior to the series of experiments, the mass of the metre bar was determined using a pan balance and the position of its centre of mass was found by balancing it on a sharp edge. In all experiments, the distance between the suspension points P_1 and P_2 was set such that $\theta_1 = \theta_2 = 90°$.

8.

TABLE I

EXP'T #	DESCRIPTION	MASSES	DISTANCES
1	static equilibrium	$m_1 = m_2$ $m_1 + m_2 = m_b$	$d_1 = d_2$
2	static equilibrium	$\frac{1}{2}m_1 \simeq m_2$ $m_1 + m_2 = m_b$	$d_1 \simeq \frac{1}{2}d_2$
3	rotational motion	$\frac{1}{2}m_1 = m_2$ $m_1 + m_2 = m_b$	$d_1 = d_2$
4	translational motion	$m_1 = m_2$ $m_1 + m_2 > m_b$	$d_1 = d_2$
5	translational and rotational motion	$m_1 < m_2$ $m_1 + m_2 > m_b$	$d_1 = d_2$

In experiment #1, the forces $m_1 a$ and $m_2 a$ were varied until static equilibrium was achieved. In experiment #2, the locations of the points P_1 and P_2 and the forces $m_1 a$ and $m_2 a$ were varied to attain static equilibrium. The remaining three experiments involved the arbitrary setting of the forces and distances as specified in Table I and the resulting motions were observed and recorded.

Experimental Results

The mass m_b of the metre bar was measured to be

$$m_b = (125.0g \pm 0.5\%) + (2.89g \pm 0.02g)$$
$$= 127.9g \pm 0.7g$$

where 0.5% is the error on the

TABLE II

| EXP'T # | WEIGHTS (g) | | DISTANCES (m) | | CALCULATED FORCES AND TORQUES | | OBSERVATIONS |
	m_1 ±0.5%	m_2 ±0.5%	d_1 ±0.0005m	d_2 ±0.0005m	ΣF_{ext} (N)	$\Sigma \tau_{ext}$ (Nm)	
1.	65.0	65.0	0.1330	0.1330	$\dfrac{(65+65-127.9)9.81}{1000}$ = 0.021 ± 0.001	$\dfrac{+65 \times 0.133 \times 9.81}{1000}$ $\dfrac{-65 \times 0.133 \times 9.81}{1000}$ = 0	static equilibrium achieved
2.	85.0	45.0	0.0910	0.1750	0.021 ± 0.001	0.001 ± 0.002	static equilibrium achieved
3.	80.0	40.0	0.1330	0.1330	0.077 ± 0.001	−0.052 ± 0.002	rotational motion (neg. torque and angular acceleration)
4.	80.0	80.0	0.1330	0.1330	0.315 ± 0.002	0	translational accelerated motion upwards
5.	60.0 .5%	90.0	0.1330 .4%	0.1330	0.217 ± 0.002	0.039 ± 0.008	translational and rotational accelerated motion

standard masses and 0.02g is the error in reading the scale. The centre of mass was determined to be at 49.99 cm ± 0.03 cm. The experimental observations, results, and calculations are described in Table II.

Evaluation of Results

One notices that in experiment #1, the static equilibrium was achieved although the sum of the forces was slightly different from zero. This can be readily explained by considering the friction of the pulleys. In this particular case the sum of the forces $m_1a + m_2a$ is slightly greater than the weight of the metre bar m_ba. This implies that

the frictional force in each pulley
could be represented by a small
force of $1.06 \, g \times 9.81 \, ms^{-2} = 0.01 \, N$
As this friction would work in
both directions, the static equilib-
rium could very likely be effect-
uated with a set-up in which
the sum of the two masses is
slightly less than the mass of the
metre bar. Considering the possible
errors listed in Table II, they
cannot justify the small difference
between the upwards and down-
wards directed forces and thus
the pulley friction appears to be
the only explanation.

    In experiment #2 the same
comment as in the previous
paragraph applies; the pulley

friction accounts for the discrepancy
between the sum of the applied
weights and the weight of the
metre bar. Furthermore, a similar
comment may be applied to the
sum of the external torques which
were found to result in rotational
equilibrium. The small torque
difference can only be explained by
assuming pulley friction.

In experiment #3, with the
conditions shown in Table II
(in particular, $\Sigma F_{ext} \simeq 0$) the
pure rotational motion was con-
firmed but such motion can only
be considered over a very small
rotational angle. At any appreciable
angle, the new position of the bar
will change the torques and the

respective right angles θ_1 and θ_2, thus changing completely the calculated torques.

In experiment #4, where $\Sigma \tau_{ext} = 0$, the pure translational motion was observed up to the point when the bar hit the long bolts. In this displacement, the angles θ_1 and θ_2 remained at $90°$.

Experiment #5 showed how one can achieve simultaneous rotational and translational accelerated motion

Conclusions

The experiments showed that a rigid body in a two dimensional space achieves static equilibrium only when the sum of the external

forces acting on the body equals zero and the sum of the external torques acting on the body equals zero. When the sum of the external forces on a rigid body is equivalent to a pure torque ($\Sigma F_{ext} = 0$) the body undergoes rotational motion only. When the sum of the external forces acting on a rigid body is such that the sum of external torques about the centre of mass is equal to zero, the body experiences a pure translational motion. When the sum of the external forces is such that $\Sigma F_{ext} = 0$ and $\Sigma \tau_{ext} = 0$, the body undergoes a simultaneous translational and rotational accelerated motion

The History of London Ontario

Real Estate Values

From the first the value of real property had steadily augmented but it made ominous leaps from 1952 to 1858. In 1853 the assessed value of real estate in the city was $146,020; in 1854 $228,160; in 1858 $426,966. Then the collapse occurred. The frenzy of speculation had effectually worked off and the assessment barometer stood next year at $234,976. When the crash happened very few escaped, and a large number who had yielded to the allurements of the time, and had rushed into unheard-of schemes, were ruined.

Entertainment

London possesses few places of amusement or pleasure. Pleasure grounds, properly speaking, are not to be found in the city. The Episcopal Cemetery, in the summer months, is much frequented.

City Government

The municipal records of the early days remind one very forcibly that history repeats itself. The formal minutes of proceedings make it clear that...there were the usual motions, amendments to motions, amendments to the amendments, varied by occasional ejection of a councillor from a meeting "for cause", the councillor retaliating by smashing the windows.

Cows on the Sidewalk

The records of 1843 furnish evidence of London's advance in civilization in an enactment that "no cows should be milked, slopped or otherwise fed on the sidewalks in the town of London."

Theatre

London also possessed a theatre in its very earliest years...The Old Town Hall. This was opened by one John McFarlane, of Detroit, whose wife, Jessie, was an actress, and also danced between the play proper and the after piece. It was here that Maggie Mitchell appeared in the character that made her famous throughout the world..."Fanchon, the Cricket".

Speaking theatrically...."In 1844 a number of young men fitted up a temporary theatre out of a barn and gave a series of performances. Here Simcoe Lee, afterwards celebrated throughout the whole of American, (voice: and now an inmate of the Forrest Home) made his first stage appearance. He played a female part (voice: which part?) until the performance was interrupted by his father walking on stage and taking him off." (voice: Critics!)

Circus

And don't forget the circus! P.T.Barnum brought the circus to town in the mid 1800's but had to beat a "surreptitious departure". It seems our good citizens took umbrage when one of the performers gave a rendition of "Yankee Doodle".

Water

It may be broadly stated that the water is free from all impurities, being supplied to the citizens precisely as it bubbles from the hillside of limestone formation. The best practical test of its purity is the fact that brook trout live and flourish (voice "and fornicate") in it, which would not be the case were the water in any way contaminated.

Slippery Jack

The police force of 1867 was greatly exercised -- as was the whole city -- over the criminal pranks of a man called, for want of a better or more accurate name, "Slippery Jack". His practise was to gain entrance to the sleeping apartments of women -- sometimes three or four in a night -- and awaken the sleeping inmates by tickling their feet. He was never caught, though often seen and several times shot at.

Early Description by Col. Campbell 1830

A traveller coming from the west might have found the prospect rather romantic. As he approached the hamlet, about to cross the York Street bridge, he would not the rows of butternut trees that shaded the river bank. Casting his eye upwards the imitation Malahide Castle with its towers and turrets would come into view; around its base clustering the little houses of the settlement, like a village on the Rhine in the shadow of some baronial keep. Upon his ear would strike the clank of anvil and the thud of axe, the lowing of cattle and him of busy men and women in the little market on the court house square.
        But coming from the east the picture would be less attractive. Travelling over rough corduroy roads, winding through the woods, suddenly he would come upon a little half cleared space with a number of more or less unfinished huts in front of the court house -- looking smaller by contrast with the big building which overshadowed them; streets where were in embryo, dotted with half-blackened stumps of trees. Men and women bustled about like ants seen stalking along with stolid indifference; or perhaps a white man whose early potations had made him walk unsteadily; If the weather had been rainy the traveller's footsteps over the unpaved pathways would be in shallow mud or deeper mire; if it was a dry season the wind would blow the sand over him. While there might be evidence of activity and energy among the people the prospect would be none too pleasing.

Community

        We are as a species "programmed" to form a community. The reason is simple; a community was and is the reason for our survival. Human beings, individually are quite pathetic predators; no match at all for a lion or a bear. We succeeded in surviving as a species (Note: not as individuals) against those predators because of:
1. our numbers,
2. our propensity to look after our own (this propensity was formed by knowledge that was passed down and reinforced by learning from war and the hunt that numbers count) It took a number of riders to corral the buffalo to Buffalo Jump Off. I think that's part of the name, it seems to me the name goes on about the buffalo being dead at the and of it (Buffalo Jump Off Head Bashed In? (yes, it's somewhere in the west)

Drink

Whiskey was abundant; most of the leading citizens made the article and sold it cheap; and nearly everybody drank. Total abstinence, and abstainers were looked upon with some contempt. Temperance societies were being introduced slowly. Col. Talbot, in a speech at St. Thomas referred to them as "those damn cold water societies". It is said that being a good churchman he used to have the settlers come to his house on Sundays for divine service, and in order encourage their attendance, the whiskey was passed around freely.
        In 1837, Mrs Jamieson, wife of the Vice-Chancellor, saw more whiskey than beauty in London. This is her words from her book "Summer Rambles and Winter Studies".
"The population consists principally of artisans--and blacksmiths, carpenters and builders are flourishing. There is, I fear, a good deal of drunkenness and profligacy; for though the people

have work and wealth, they have neither education not amusements. Besides the seven taverns, there is a number of little grocery stores which are in fact, drinking houses. And though a law exists which forbids the sale of spiritous liquor in small quantities by any but licensed publican, they easily contrive to evade the law. The Government should be more careful in the choice of the district magistrates. While I was in London a person who had acted in this capacity was carried from the pavement dead drunk. I find the women in the better class lamenting over the want of all society except in the lowest grades, in manners and morals. For those who are recently immigrated and are settled in the interior, there is absolutely no social intercourse whatever."

The Garrison Town (Anonymous, Circa 1840)

Sing the delights of London society --
Epaulette, sabretache, sword-knot and plume;
Always enchanting, yet knows no variety --
Scarlet alone can embellish a room.
While spurs are clattering,
Flirting and chattering,
Bend the proud heroes that fight for the crown;
Dancing cotillions,
Cutting civilians,
These are the joys of a garrison town.

Little reck we of you black-coated laity;
Forty to one upon rouge against noir;
On soldiers we lavish our favors and gaiety,
For the rest we leave them to feel despair,
Odious vulgarity,
Reckless barbarity,
We have for such canaille as these but a frown;
While flirting with fusiliers,
Smiling on grenadiers --
These are the joys of a garrison town.

Mayor Jane

"When I was in high school, my friends and I started up this hokey annual event called the Spring Festival were 40 adolescent humanoids would invade the Croxton Common and run silly events like an egg and spoon race and piggy back fights and speech making contests. As a matter of ritual, we'd invade the mayor's office about a week before the big day and present him or her with a hand-lettered invitation resting on a tassled cushion while ace guitarist Doug Moore played a musical fanfare on the kazoo. It was all a big joke...we never expected the Mayor to come, you understand.

         But Mayor Jane always did. The first year she showed up we were paralysed. Even the speechmaker were speechless as we all stood around, wondering, "what do you do with a mayor?" Piggy back fights would be too rough. A sack race would lack all dignity, Red Rover would probably be lethal. She wasn't interested in giving a speech and her presence made us too nervous to deliver ours. She consented to run the egg and spoon and while she made it to the finish line without any accidents, she didn't win any ribbons.

         The next year we were better prepared for her presence. We broke into two teams, sent the leaders up a maple tree and from ;there they conduced the moves for a life size game of chess...Mayor Jane graciously accepted the post of White Queen and donned an old moth-balled

cape and a cardboard crown as her costume...Not just any mayor would go out like that and goof around with a pack of adolescent lugs....

Early Government

As is still common in our rural districts, it was the practise of the inhabitants to lend mutual help when any 'raising' was to take place, or any heavy work to be done. On such occasions there was regular turn-out of the able-bodied. Neighbourly and friendly feelings prevailed in the little community, and its isolated position compelled the people to discover social enjoyment in each other's company. Strangers, as was to be expected. were more freely welcomed to hospitality tan in out day. and on leaving they departed on their journey with the impression that Londoners in this corner of creation were a right-hearted wort of people. For a few years there was a small class of rather rough inhabitants, lumberers and labourers, who,. on Saturday night, would occasionally indulge in a fight among themselves; but with this exception, the place was orderly, decent, and agreeable. Indeed, to take Col,. Askin's opinion -- an opinion that seemed to tickle that worthy old settler amazingly -- The people were happy among themselves until responsible government came, when the rule was introduced -- every man for himself!"

Bank Mergers

Of course banks want to merge. Whenever a merger is proposed, it is because it would be cost effective, and increase profit. Profit, of course always has to be at the expense of someone. With computerization and the Internet, their capacity to do business has outstripped the need for many of their employees. Why? because their business has changed. Their business is no longer customer service. It is the money market, and investing. Billions of "dollars" of virtual money fly around the world, and none of it changes hands. Their business does not require homeowner mortgages, and personal loans. These are in fact a nuisance to the big banks.
    Solution? Let them merge. Keep Canada's currency as an international currency. It will be the virtual money. Start a new currency, a currency of the people, between the people of Canada, something that is already done in the barter system, so it would in a way be "codifying" the barter system. Start a new bank. With people, with paper changing hands.

The Maple Leaf Forever

In days of yore
From Britain's shore
Wolfe the dauntless hero came
And planted firm Britannia's flag
On Canada's fair domain

Here may it wave
Our boast and pride
And join in love forever
The thistle, shamrock, rose entwine
The Maple Leaf forever

Amused in London At Last

When upon the mighty Thames we first did come to light
Little did we look for wealth or fame
Up and down the avenues we searched all day and night
Hoping to fulfill our single aim

To be amused in London
Amused in London
Amused in London...
At last

When the weighty matters of the state become too much
The colonies afford a place of ease
So bring the smaller carriage for it bears the common touch
Let it well be known we will be pleased

To be amused in London
Amused in London
Amused in London...

Amused in London
Amused in London
Amused in London...
At last

Canada's Leaders of Reform:

Louis Joseph Papineau 1786- 1871
Robert Baldwin 1804 - 1858
Joseph Howe 1804 - 1873

Louis Joseph Papineau 1786- 1871

Papineau was a Canadian rebel and politician. He was born in Montreal on October 6, 1786, the son of Joseph Papineau who was a notary and member of the House of Assembly of Lower Canada & his wife. Louis was educated at the Seminary of Quebec and was called to the Bar on May 19, 1810.

On June 18, 1808, he was elected a member of the House of Assembly for the County of Kent. He became Speaker of the House in 1815 and was already realized as the leader of the French Canadian Party. In December 1820,he was appointed to the Executive Council, but as he didn't have much influence on it, he resigned in 1823. That year he was unsuccessful in protesting to England on behalf of French Canadians against the projected union of Upper and Lower Canada. The aim of the aim of the French Canadian Opposition, then, was to get financial and constitutional reforms. Matters came to a climax when the Legislative Assembly of Lower Canada refused supplies and Papineau arranged for action with Mackenzie of Upper Canada.

In 1835, Lord Gasford, the new Governor of Lower Canada, was told by the London Cabinet to look into the grievances of the French Canadians. However, the attitude of the Opposition didn't change, and March of 1937, the Governor was told to reject the demand for constitutional reform and to apply public funds in his control to the purposes of government. In June, a warning proclamation by the Governor was answered by a series of violent speeches by Louis Papineau, who in August, was deprived of his commission in the militia. Realizing that he couldn't get what he wanted peacefully, he resorted to threats which made many of his supporters turn 'traitor'. However, many still encouraged him in his rebellion.

On October 23, 1837, delegates from the six counties of Lower Canada came to a meeting at St. Charles, Quebec, and decided to put resistance to the government by force of arms. Papineau was also present at the meeting. In November, they made plans for a general stampede at Montreal, and on the seventh, Papineau's house was sacked and a fight broke out between the 'Constitutionals', and the 'Son's of Liberty'.

In the middle of the month, Colonel Gore was told to arrest Papineau and the main leaders for high treason. On November 22, armed men resisted the troops at Saint Denis and fights broke out. On the eve of the outbreak, Papineau fled, and on December 1, 1837, a proclamation declared him a rebel and put a price on his head. Papineau found shelter in the United States through the fighting. When rebellions broke out in 1838, only twelve rebels were executed; the others were deported by Lord Durham [*John George Lambton, Earl of Durham b. 1792. Lord Durham was one of the earliest advocates of political and popular reform and was ever foremost to aid the cause of the oppressed.* [1]] As in Papineau's own words, "the patriots of this city would have avenged the massacre, but they were so poor and so badly trained and organized that they were not fit to meet the regular troops." It seems that Papineau may have been intriguing to bring about intervention by the U.S., perhaps with the view to annexation. The smallest success at Montreal or Toronto would have induced the American government, in spite of the President, to support the movement.

If Papineau's ambitions were intervention and annexation, then it would be inconsistent to see his services to his countrymen as those of a true patriot, since the independence of the French Canadians could not have been gotten under the U.S. Constitution.

From 1829-1847, Papineau lived in France. In 1847 he was given a general pardon and in spite of the Proclamation of 1838, in which Lord Durham threatened him with death if he returned to Canada, he was now admitted with the benefit of the pardon. He returned to Canada when the two provinces were joined, and he became a member of the Lower House. He demanded "the independence of Canada, for the Canadians need never expect justice from England, and to submit to her would be an eternal disgrace." When he did not get the redivision of Upper and Lower Canada, he retired to private life in 1854. He died at Montebello, Quebec on September 24, 1871.

1. Representative Canadians. George Rose Ed. Rose Publishing Co. Toronto 1886. P.262

Robert Baldwin 1804 - 1858

Robert Baldwin was a Canadian statesman and joint leader of the 'Great Minority', 1848-1851, which established the principle of responsible, or cabinet, government in British North America. Baldwin was born at York (Toronto) on May 12, 1804. He was the son of William Warren Baldwin (1775-1844; County of York, Ireland), a government lawyer, physician, and politician. In 1829-1830 Robert Baldwin was elected the Liberal candidate for the Upper Canada Assembly for York.

William Lyon Mackenzie wrote "*Our earnest wish is that the election of Mr. Baldwin may prove to the world that the Capitol of Upper Canada has burst her fetters and followed the praiseworthy example of her sister city, Quebec.*" [2] In 1836 he was nominated to the Executive Council but within a month he and the whole council resigned. He was a Reformer but disapproved of the Rebellion of 1837-38. On the Union of Upper and Lower Canada, he became a member of the Executive Council (1841) under Lord Sydenham, but he soon resigned on the question of responsible government, and having been elected to represent Hastings in the Assembly, went into the Opposition.

In 1842 he formed, under Sir Charles Bagot (1781-1843) [who, in 1843 set to work to ascertain the political condition of the new country and see if the Liberal Party had any grounds for the complaints which they had been persistently making]; a largely Liberal administration with Louis Lafontaine (1807-1864), which held office until nine of the ten Ministers resigned in 1843, after a quarrel with Bagot's successor, Sir Charles Metcalfe.[3] At the general election which followed, the Governor General was kept by a narrow majority, but in 1848, the Liberals were again returned to power, and Baldwin and Lafontaine formed their second administration under Lord Elgin (James Bruce, Earl of Elgin, Baron of Kinloss 1811-1861), which embodied the principle of responsible government, and carried numerous important reforms, including the freeing from sectarian control of the University of Toronto and the introduction of an effective municipal self-government in Upper Canada.

Internal disagreements began to appear in the Liberal Party. In 1851, Baldwin resigned after an attempt to abolish the Court of Chancery of Upper Canada, whose constitution was due to a measure introduced by Baldwin in 1849. Though the attempt was defeated, it was supported by a majority of representatives from Upper Canada. On seeking reelecting in York, he declined to give any pledge on the question of the Clergy Reserves; he was defeated and retired to private life, devoting himself to bringing about a better understanding between English and French inhabitants of Canada. In 1858, the Liberal - Conservative Party, formed in 1854 by a coalition, tried to bring Baldwin out as a candidate for the Upper house, which was elective at that date, but although he had broken with the advanced reformers, he could not approve of the tactics of their opponents and refused to stand. He died on December 9, 1858 in Toronto.

2. Representative Canadians. George Rose Ed. Rose Publishing Co. Toronto 1886. P. 33

3. Representative Canadians. George Rose Ed. Rose Publishing Co. Toronto 1886. P. 248

Joseph Howe 1804 - 1873

Joseph Howe was a Canadian statesman and champion of responsible government for Nova Scotia. He did not want Confederation. When Confederation was accomplished, the 'broken down' politician was made to see that he could be loyal to his province, by accepting the inevitable and making the best of the 'new order of things', by Sir John A. Macdonald (1815-)[4]. He was born in Halifax, Nova Scotia on December 3, 1804. He was the son of John Howe (1752-1835), a United Empire Loyalist from Boston, Massachusetts. His father was the King's Printer and Post Master General for the Maritimes.

In 1817, Howe learned the printing business in Halifax at the Gazette. The paper was owned by his younger brother, John. In 1827, Joseph Howe started the *Acadian*, a weekly non-political journal but sold it soon afterwards and bought the *NovaScotian*, which became a leading newspaper of British North America. He was also a part proprietor of the *Weekly Chronicle*. He was also a successfully published poet.[5] In 1835 he published an article that local oligarchists could not tolerate. He successfully defended himself at trial in 1836. Because of his triumph and new stature, he was elected a member from Halifax in the Provincial Assembly.

He spent the next two years travelling through Europe and when he returned, jumped back in to politics. During the next twelve years his demands for responsible government for Nova Scotia brought him into conflict with the Lieutenant governor, Lord Falkland, whom he forced to resign. In 1851, he became Provincial Secretary. In 1850, he was sent to England on behalf of the Intercontinental Railway. In 1854 he resigned from the Provincial Cabinet and was appointed Chief Commissioner of Railways. In 1860 - 1863 he Premier of Nova Scotia. In 1873 he was appointed Lieutenant Governor of Nova Scotia but passed away a few weeks later on June 1st.

4. Representative Canadians. George Rose Ed. Rose Publishing Co. Toronto 1886. P. 176

5. Ibid

REPORT

EXPERIMENTS

ON

PRESSURE IN FLUIDS

Catherine Inculet
Physics 24B
February 20, 1976

ABSTRACT

Using the pressure laws in fluids, three series of
experiments (Exercises I → III) were carried out to
determine: I) M, the mechanical advantage, and e, the
efficiency of a hydraulic lift with an ideal M of 3.574;
II) ρ_{Hg}, the density of mercury; and III) ρ_{blood}, the
density of blood. Over the experimental ranges it was
found that

I) $M = 3.33 - \dfrac{833}{m_2}$ where m_2 is the mass
used to lift another
mass

II) $\rho_{Hg} = 13.7 \times 10^3 \ kg/m^3 \pm 6\%$

III) $\rho_{blood} = 1.28 \times 10^3 \ kg/m^3 \pm 30\%$

In Exercises I and II, it was found that the frictional
forces between the pistons and the syringe walls must be
taken into account when their value relative to the external
forces is significant. Exercise III, in addition to the
measurement of the blood pressure, provides an insight into
the local changes in blood pressure depending on the
elevation of the particular point relative to the rest of
the human body.

TABLE OF CONTENTS

SYMBOLS AND UNITS

d	inside diameter	cm
e	efficiency	
F	force	N
g	acceleration of gravity	ms^{-2}
h	height	m
P	pressure	Nm^{-2} (Pascal)
S	area	m^2
ρ	liquid density	$kg\ m^{-3}$

OBJECTIVES

The purpose of the experiments was to demonstrate and apply some of the pressure laws in fluids to:

1) The operation of a hydraulic lift (Pascal's Law)

2) The measurement of the density of mercury

3) The determination of the density of blood.

INTRODUCTION

It has been shown that in a fluid at rest under the
force of gravity the pressure is the same anywhere at a
given depth. The pressure at this depth depends on

1) The gravity field

2) The density of the fluid

3) The atmospheric pressure above the liquid
surface

4) The height of the liquid column above the
given point.

Pressure, defined as the force per unit area, is
considered to work in any direction and is measured in
newtons/square metre (Pascal). It is important to note that
regarding the depth of the liquid (see #4 above) the shape
of the vessel does not influence the pressure as long as
there is a continuum of liquid to the surface.

In the experiments presented in this report, the
hydraulic lift demonstrates the concept of pressure and
corresponding forces (pressure x area) in liquids, the
measurement of the density of mercury involves pressure in
two fluids (air and mercury), and the determination of the

blood density emphasizes the change in pressure due to the height of the liquid column above a given point.

THEORY

Assuming, as in Figure I, a liquid of density ρ in equilibrium in a container with one end open to the atmospheric pressure P_o. The pressure P_a at a point "a" at depth h_B from the liquid surface may be calculated by the formula

$$P_a = P_o + h_B \rho g \qquad (1)$$

The pressure at the same point "a" may be also calculated in terms of the mass m on the piston R or the gas pressure P. If P is the gas pressure produced by the piston, and assuming negligible friction✓

$$P = P_o + \frac{mg}{A} \qquad (2)$$

and

$$P_a = P + h_A \rho g \qquad (3)$$

Any surface having all of its points at the same height h_B will be subjected to a force.

$$F = P_a \times S \qquad (4)$$

All of the experiments presented make use of the above four formulae. In addition, the theory of the hydraulic lift involves the definition of mechanical advantage and efficiency.
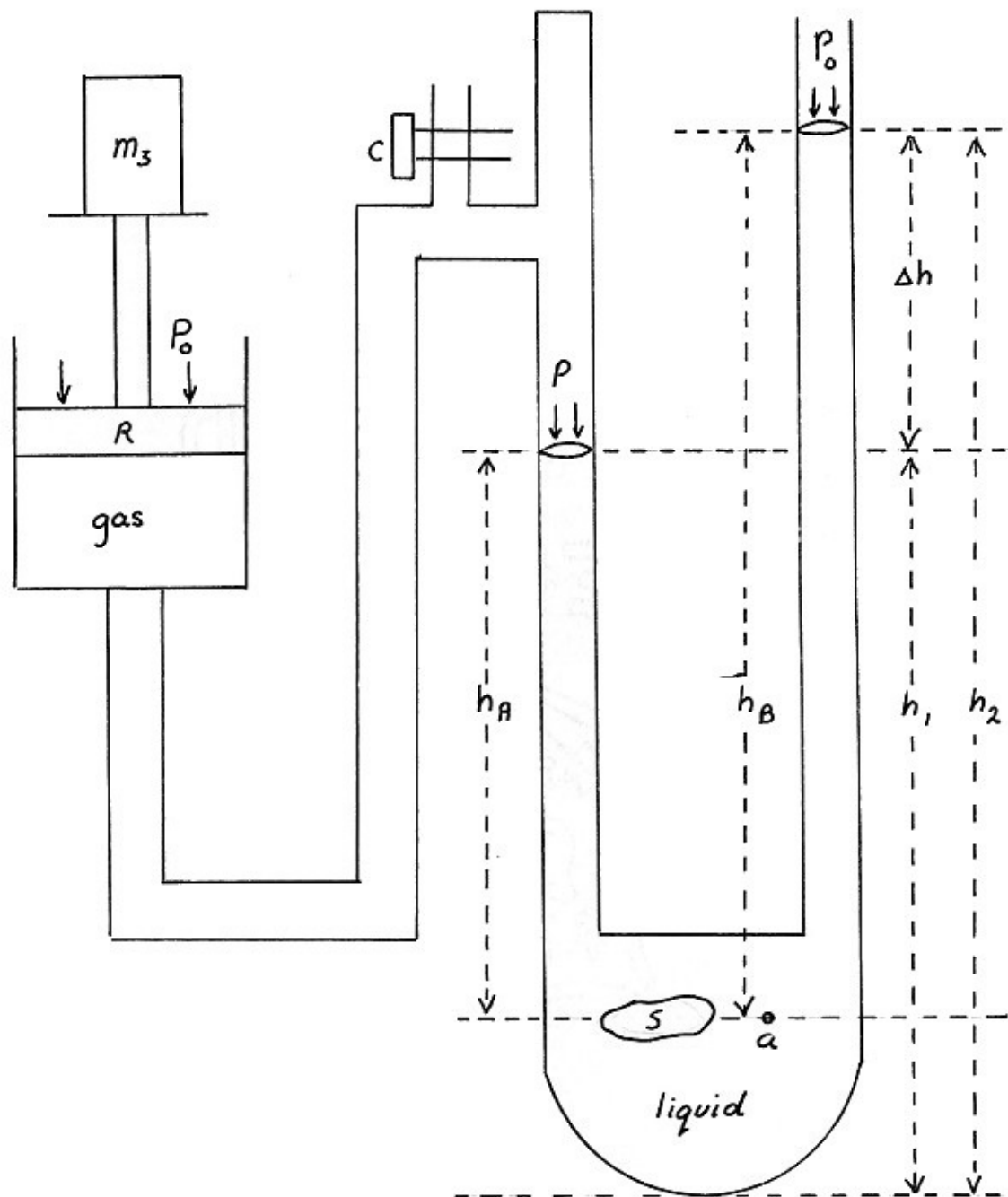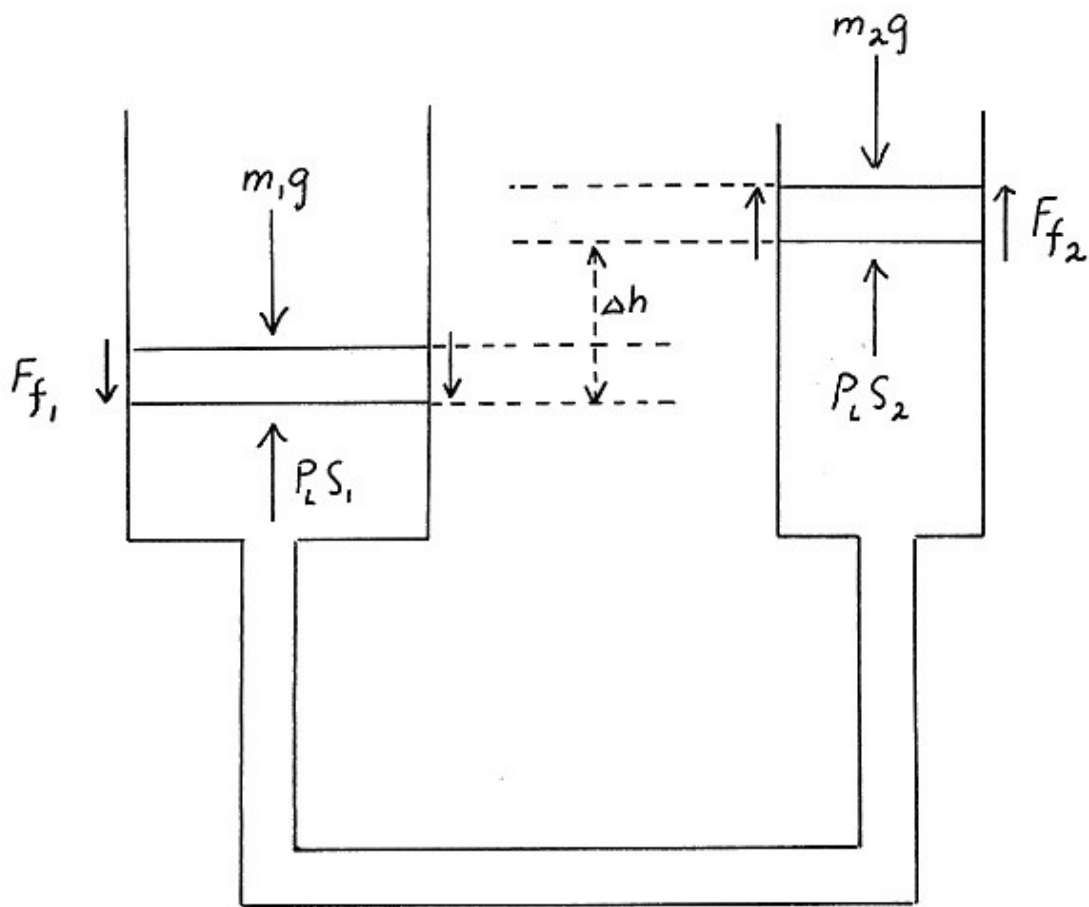
FIGURE I

P_L is liquid pressure

F_{f_1} is friction force at the moment when the piston starts to move upwards

F_{f_2} is friction force at the moment when the piston starts to move downwards

S_1 and S_2 are piston areas

FIGURE II

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Referring to Figure II, if it is assumed that the two pistons and the liquid are in equilibrium moving with uniform velocity

$$m_1g + F_{f_1} + P_oS_1 = P_LS_1 + P_oS_1 \qquad (5)$$

$$m_2g + \Delta h\rho gS_2 + P_oS_2 = P_LS_2 + F_{f_2} + P_oS_2 \qquad (6)$$

Δh, the difference in the heights of the pistons, represents one of the errors of measurement. During the experiments, Δh was in the order of a few centimetres. This difference in terms of pressure is considered negligible relative to the weight values added.

e.g. For a Δh of 5 cm, the added mass is only 1.47 cm^2 x 5 g cm^{-2} = 7.37 g.

In case of an ideal lifting system with negligible friction forces F_{f_1} and F_{f_2} and negligible Δh, the two formulae become

$$m_1g = P_LS_1 \qquad (7)$$

$$m_2g = P_LS_2 \qquad (8)$$

therefore

$$\frac{m_1}{m_2} = \frac{S_1}{S_2} = M \qquad (9)$$

The above ratio, designated by M is defined as the ideal mechanical advantage. The ratio of the two forces m_1g/m_2g, which is a measure of the amplification of the force, is defined as the actual mechanical advantage. From formulae (5)

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and (6) one can see that the actual mechanical advantage is expressed by

$$\frac{m_1 g}{m_2 g} = \frac{P_L S_1 - F_{f_1}}{(P_L - \rho g \Delta h) S_2 + F_{f_2}} \tag{10}$$

and therefore dependent on the frictional forces of the pistons and on the pressure difference.

The efficiency of the hydraulic lift is defined as the ratio of the actual mechanical advantage to the ideal mechanical advantage, as such

$$e = \frac{m_1/m_2}{S_1/S_2} \tag{11}$$

It is obvious that when the friction forces and Δh are zero the efficiency is equal to 100%.

In Exercise II, considering Figure I and equations (1), (2) and (3), one can write

$$P_a = P_o + \frac{mg}{A} + h_A \rho g = P_o + h_B \rho g$$

hence

$$\frac{mg}{A} = (h_B - h_A) \rho g$$

and

$$h_B - h_A = \Delta h = \frac{1}{\rho A} \times m \tag{12}$$

$\frac{\Delta y}{\Delta x} = \frac{1}{\rho A}$ is the slope of the curve $\Delta h = f(m)$ therefore

$$\rho_{Hg} = \frac{1}{A \frac{\Delta y}{\Delta x}}$$

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In Exercise III, by expressing that the blood pressure difference between the two arm positions

$$\Delta P_{blood} = \rho_{blood} \, g \, \Delta h_{blood}$$

is equal to the pressure difference measured by the sphygmomanometer

$$\Delta P_{Hg} = \rho_{Hg} \, g \, \Delta h_{Hg}$$

one finds that

$$\rho_{blood} = \frac{\rho_{Hg} \, \Delta h_{Hg}}{\Delta h_{blood}} \qquad (13)$$

EXPERIMENTAL METHOD

Hydraulic Lift

Referring to Figure II, after measuring the inside diameters with the vernier calipers the two syringes were filled with water and the pistons were put in, making sure that there was no air left under the piston. The large piston was put in first, half way down and the small piston was then pushed in about 3 cm. A total mass m_2 was added in increments of 50 g to the small syringe until the plunger moved steadily downwards following a slight push but otherwise remained at rest. Four different masses m_1 were then added to the large syringe and a similar procedure was used to determine the corresponding m_2 masses which were required to lift the mass m_1 without acceleration.

Density of Mercury

The apparatus is shown in Figure I. It consists essentially of a U-tube containing mercury connected by tubing to a syringe on which masses m_3 could be added. The mercury level difference Δh was measured by means of a ruler. Prior to the experiment, the inside diameters were measured using vernier calipers and the pressure in the apparatus was

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equalized to atmospheric pressure by opening clamp C. The plunger was placed half way up the syringe prior to closing the clamp. A 500 g mass was put on the plunger. The plunger descended, and the levels h_1 and h_2 were measured. Five other similar experiments were performed by adding increments of 100 g masses on to the plunger, and the corresponding h_1 and h_2 heights were recorded. Care was taken to have the plunger move downwards only to minimize friction errors.

Density of Blood

The apparatus consists of a sphygmomanometer. The subject held one arm flexed to 90° with the biceps at the level of the heart. The pressure cuff and air bag was wrapped around the biceps and the stethoscope applied to the anti-cubital space over the brachial artery. The air pressure was raised to about 135 mm Hg which stopped the artery blood flow. The valve was then opened just enough to allow the pressure to decrease at a steady rate for accurate determination of the systolic pressure. The systolic pressure was found and recorded three times. This entire experiment was repeated with the subject's forearm at ear level and the distance between the middle of the pressure cuff in the two positions was measured using a ruler.

EXPERIMENTAL RESULTS AND DISCUSSION

Hydraulic Lift

Table I shows the results together with the calculated values for the actual and ideal mechanical advantage as well as efficiencies. The inside diameters were $d_1 = 2.59$ cm $\pm$ 0.01 cm and $d_2 = 1.37$ cm $\pm$ 0.01 cm. The results have also been plotted in Graph I. Because the efficiency is proportional to the actual mechanical advantage, the same curve with a different scale for the ordinate axis represents both quantities.

Over the experimental range, it is apparent that m_1 expressed in terms of m_2 is a straight line. By taking an arbitrary point and the measured slope one finds

$$m_1 = 3.33\ m_2 - 833 \qquad (14)$$

Hence the equation of the actual mechanical advantage is

$$M = \frac{m_1 g}{m_2 g} = \frac{m_1}{m_2} = 3.33 - \frac{833}{m_2} \qquad (15)$$

Assuming that equation (14) is valid beyond the experimental range, as m_2 increases the actual mechanical advantage will tend towards a maximum value of 3.33. This maximum value is slightly smaller than the ideal mechanical advantage

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TABLE I

Experiment No.	m_1 g ± .5%	m_2 g ± .5%	$M = \dfrac{m_1}{m_2}$ ± 1%	$M_i = \dfrac{S_1}{S_2}$ theoretical ± 2%	M_i experimental	e ± 3%
I	0	250	0	3.574	3.33	0
II	500	400	1.250	3.574	3.33	0.350
III	1000	550	1.818	3.574	3.33	0.509
IV	2000	850	2.353	3.574	3.33	0.658
V	3000	1150	2.609	3.574	3.33	0.730

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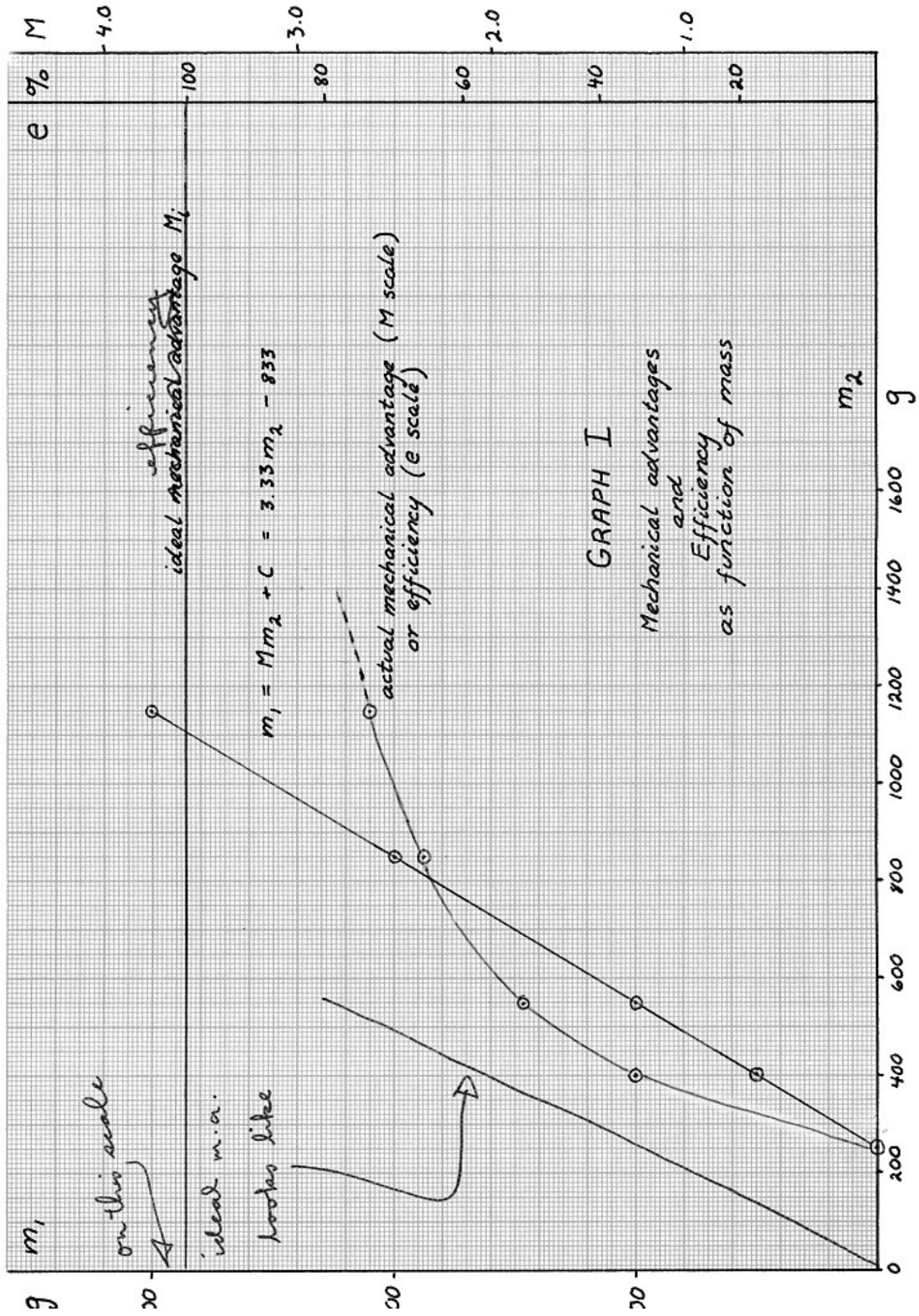
GRAPH I

Mechanical advantages
and
Efficiency
as function of mass

$m_1 = Mm_2 + C = 3.33 m_2 - 833$

ideal mechanical advantage M_i

efficiency

actual mechanical advantage (M scale)
or efficiency (e scale)

m_1 on this scale

ideal m.a.

looks like

calculated as the ratio of the two syringe cross-sectional areas.

$$\frac{S_1}{S_2} = 3.57 \pm 2\%$$

A qualitative explanation of the difference may be found by analyzing friction and pressure difference parameters in the theoretical equation for the actual mechanical advantage. If one assumes that the frictional forces F_{f_1} and F_{f_2} and the pressure differential Δh remain constant, one can find

$$\frac{m_1}{m_2} = \lim_{P_L \to \infty} M = \lim_{\substack{P_L \to \infty \\ (m_1 \to \infty) \\ (m_2 \to \infty)}} \frac{P_L S_1 - F_{f_1}}{P_L S_2 + F_{f_2} - \rho g \Delta h \, S_2} = \frac{S_1}{S_2}$$

$$= \text{ideal mechanical advantage}$$

The frictional forces between the piston and the syringe very likely vary with the pressure P_L and therefore

$$\lim_{\substack{P_L \to \infty \\ m_1 \to \infty \\ m_2 \to \infty}} M \neq \frac{S_1}{S_2}$$

The frictional forces also explain why the line $m_1 = f(m_2)$ does not pass through the origin. In the initial test the $m_2 = 250$ g mass was fully balanced by the frictional forces while $m_1 = 0$. Referring to equation (10) when $m_1 = 0$, the internal pressure $P_L = \dfrac{F_{f_1}}{S_1}$.

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Density of Mercury

The results are presented in Table II together with the calculated values of Δh. In Graph II, Δh is plotted against the mass m. As the mass increases, the slope of the curve increases tending towards a straight line. Similarly to the hydraulic lift, as the mass value increases the frictional forces become negligible and hence the slope becomes closer to the true value. Using the slope of the line for the largest value of m, $\frac{\Delta y}{\Delta x} = 0.214$ m kg^{-1} ± 6% and hence $\rho = 13.7 \times 10^3$ kg/m^3 ± 6%.

Density of Blood

The results are tabulated in Table III. Using formula (13), the density of blood is found to be 1.28×10^3 kg m^3 ± 30%.

TABLE II

Experiment No.	mass g ± 0.5%	h_1 cm ± 0.1 cm	h_2 cm ± 0.1 cm	Δh cm ± 0.2 cm	d inside dia. of syringe cm ± .01 cm
I	0	16.9	16.9	0	2.08
II	500	11.8	22.0	10.2	2.08
III	600	11.4	22.4	11.0	2.08
IV	700	10.5	23.3	12.8	2.08
V	800	9.3	24.5	15.2	2.08
VI	900	8.2	25.6	17.4	2.08
VII	1000	7.2	26.6	19.4	2.08