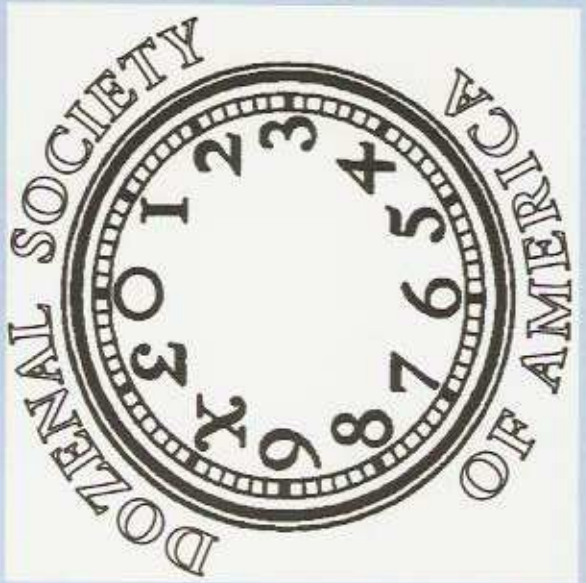
THE DUODECIMAL BULLETIN



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THE DOZENAL SOCIETY OF AMERICA
c/o Math Department
Nassau Community College
Garden City, New York 11530-6793

FOUNDED 1160;(1944.)

✧ Tribute to MS DSA page 4 ✧

THE DOZENAL SOCIETY OF AMERICA

(Formerly: The Duodecimal Society of America)

is a voluntary, non profit, educational corporation, organized for the conduct of research and education of the public in the use of base twelve in numeration, mathematics, weights & measures, & other branches of pure & applied science.

Membership dues are $12 (US) for one calendar year. Student Membership is $3 (US) per year, and a life Membership is $144 (US).

The Duodecimal Bulletin is an official publication of the DOZENAL SOCIETY OF AMERICA, INC., % Math Department, Nassau Community College, Garden City, LI, NY 11530-6793.

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THE DUODECIMAL BULLETIN

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Volume Four Dozen Five

Number 2;

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IN THIS ISSUE

PRESIDENT'S MESSAGE

In this issue, we continue to commemorate the five dozenth anniversary of both our Society and our Bulletin. As art of that celebration we include a classic article from a past Bulletin: *An Ideal Number Base.* (Page 6)

In addition, I am including the following testimonial to one of our most dedicated members, **Professor Alice Berridge**, who was forced to resign for reason of her health.

Jay L. Schiffman

□ □ □

Our former Treasurer, Professor Alice Berridge, suffered a heart attack last December followed by a disabling stroke. She has resigned and we are very grateful for her many years of dedicated service to our Society.

ALICE BERRIDGE: MS DSA

Alice joined the DSA becoming member number 25~~X~~ in 1982. In 1990 she was elected to the **Board of Directors**, a position she has held until the present, having been reelected to another 3 year term at our most recent Annual Meeting.

Elected Offices Held by Alice:

1990 & 1991 she served as **Vice President**
1992 as both **Vice President & Secretary**
1993 to 1995 as both **Secretary & Treasurer**
1996 to 2004 as **Treasurer** (while helping the new Secretary)

In 2002 Alice was deservedly the recipient of the **Ralph Beard Annual Award** as we "gratefully acknowledged" her "outstanding dedication & devotion as an advocate of Dozenal Counting & Measuring & for her many years of service to our Society as a Director, as Vice President, as Secretary & as Treasurer. In addition, her countless hours of service to Dozenal Committees."

She was elected to the **Nominating Committee** in 1992, a committee that she chaired from that time to the present.

In addition she has served for many years on both the **Annual Meeting Committee** which she chaired and the **Awards Committee.**

Alice with husband Edmund

When people list the great names in the annals of the *Dozenal Society of America* such as Ralph Beard, F Emerson Andrews, George Terry, Tom Linton, Fred Newhall and others, they will certainly recall Alice Berridge. We wish her a full recovery and ask God to bless her.

IN ALICE'S HONOR:

Over the years we have honored Alice a few times. In addition to the Annual Award mentioned above, on one occasion we gave her a dozenal clock. At another time we made her a Fellow of our Society. Recently we sent her a small gift as a token of our gratitude for all that she has done.

Upon learning of this, some members expressed the desire to have a more personal part in thanking her for all that she has done, and they have sent a donation to the DSA in her honor. We are very grateful to those members. I cannot think of anything which would please her more. ✱

AN IDEAL NUMERICAL BASE

by Nina McClelland

CONTINUING OUR REPRINTING OF EARLY ARTICLES IN A 2 YEAR CELEBRATION OF OUR ANNIVERSARIES WE OFFER THIS ARTICLE FROM VOLUME 4, NUMBER 1, MARCH 1948.

Miss McClelland is *a freshman, majoring in mathematics, at the University of Toledo. She submitted the following as a term paper, and* it *was called* to *our attention through the kindness of Professor Wayne Dancer, Head of the Mathematics Department.*

Ever since the beginning of civilization, ten has been used as a numerical base by many of the tribes of man. Undoubtedly the reason for this is that God gave us ten fingers on which we have learned to count. It is interesting to ponder just what we would have done if, instead of ten flexible fingers, we had been given just two inarticulate stumps. If any number system would develop at all in this case, it would most likely be one in which two was used as the base.

"WHICH OF ALL THE NUMBERS KNOWN TO US WOULD BE THE VERY BEST TO USE AS A BASE FOR OUR NUMBER SYSTEM?"

Now let us suppose that we are starting an entirely new civilization. One of the many problems that would eventually confront us is, "Which of all the numbers known to us would be the very best to use as a base for our number system?" Well, I'm sure that one essential characteristic we would want in our ideal number system would be simple form; that is, we would want it to have only a small number of different symbols; and, in it, we would want only relatively few figures to be required to express large quantities. The basic mathematical processes of addition, subtraction, multiplication, and division should be easily obtainable; and, of course, we would have to be able to represent exactly any conceivable quantity.

With these characteristics in mind, let us look at our present system with ten as its base. Today this system is used universally by the Eskimo, who still counts on his fingers, and by the mathematician, who makes important calculations on the slide rule. Actually, however, this ten-system is making mathematics much more complicated than it needs to be; for example, ten has only two factors besides itself and one, these two factors being two and five. Two is extremely important and is used very often, it's true, but what about three and four,. which are also used a great deal? As the base of a percentage system it's quite ridiculous; because it's impossible to divide the whole, one hundred, by three, six, seven; eight, nine, eleven, or twelve parts without involving fractions. One great

mathematician argued that ten was God-sent from Mount Sinai, because we were given just *Ten* Commandments; but the reply of another equally great mathematician to this argument was that, in the *New Testament,* there were *twelve* apostles.

Of course we can't overlook eleven in our search for an ideal base number. It would serve in a very unique way when fractions were involved because it is prime; and with a prime base, all fractions would be irreducible. In this system, though, all fractions except the elevenths and their multiples would be just repeating decimals.

If, in the first place, we had found all the factors of every number from one to one hundred, that is, all the factors except one and the number itself, we would have found that the lowest number containing four factors is twelve, containing six factors is two times twelve, seven factors is three times twelve, eight, is four times twelve, ten, is five times twelve, and so on; so that we would have known

CHART I
The Twelve System

1	2	3	4	5	6	7	8	9	✳	#	10
11	12	13	14	15	16	17	18	19	1✳	1#	20
21	22	23	24	25	26	27	28	29	2✳	2#	30
31	32	33	34	35	36	37	38	39	3✳	3#	40
41	42	43	44	45	46	47	48	49	4✳	4#	50
51	52	53	54	55	56	57	58	59	5✳	5#	60
61	62	63	64	65	66	67	68	69	6✳	6#	70
71	72	73	74	75	76	77	78	79	7✳	7#	80
81	82	83	84	85	86	87	88	89	8✳	8#	90
91	92	93	94	95	96	97	98	99	9✳	9#	✳0
✳1	✳2	✳3	✳4	✳5	✳6	✳7	✳8	✳9	✳✳	✳#	]0
#1	#2	#3	#4	#5	#6	#7	#8	#9	#✳	##	100

immediately that our ideal base lay somewhere in the twelve-series. Upon further investigation, then, we find that, of this twelve series, twelve itself would make the best base, because it is used more often in computations than any other number that is small enough to be used as a base.

Since it is necessary to have as many separate symbols in our new number system as the number used as the base, we will need to adopt twelve symbols. We can use the same first nine symbols in our new system as we use in our present system, but we will need to find others to take the place of our ten, eleven, and twelve. If we would use ✳, dek, for our present ten, #, el, for our present eleven, and *10*, do, for our present twelve our number system would look like that which I have illustrated in Chart I, and would be pronounced one (1), two (2), three (3), four (4), five (5), six (6), seven (7), eight (8), nine (9), dek *(✳)*, el (#), do *(10)*, do-one (11), do-two (12), do-three (13), do-four (14), do-five (15), do-six (16), do-seven (17), do-eight (18), do-nine (19), do-dek *(1✳)*, do-el

CHART II
Complete Multiplication Table, Base Twelve

1	2	3	4	5	6	7	8	9	✳	#	10
2	4	6	8	✳	10	12	14	16	18	1✳	20
3	6	9	10	13	16	19	20	23	26	29	30
4	8	10	14	18	20	24	28	30	34	38	40
5	✳	13	18	21	26	2#	34	39	42	47	50
6	10	16	20	26	30	36	40	46	50	56	60
7	12	19	24	2#	36	41	48	53	5✳	65	70
8	14	20	28	34	40	48	54	60	68	74	80
9	16	23	30	39	46	53	60	69	76	83	90
✳	18	26	34	42	50	5✳	68	76	84	92	✳0
#	1✳	29	38	47	56	65	74	83	92	✳1	#0
10	20	30	40	50	60	70	80	90	✳0	#0	100

(1#), twodo *(20)* , and so on. Then *30* would be pronounced threedo; *90*, ninedo; ✳0, dekdo; #, eldo; and *100*, gro.

One very important thing we must remember when we use our new system is that the number *10* no longer means one ten and no units, but one twelve and no units; therefore 12 now means one twelve and two units, or our present 14. 58 now means five twelves and eight units, or our present 68, etc. If we remember this principle, we can easily proceed with the fundamental mathematical processes. Addition and subtraction problems are worked the same as we work them in our ordinary arithmetic. If we want to add 36, 49, and 20, our answer will be *✳3*. If we want to subtract 19 from 22, we will get 5, and 144 from 396 will leave us 252. I have illustrated our new multiplication table in Chart II. Looking at the chart, we can see that if we multiply 6 by 7, we will arrive at 36 for our answer; or, multiplying 7 by #, we will get 65. Division, then, will be just the opposite of multiplication. Dividing 698 by ✳, we will get 82; and 5#✳90 divided by 10 will give us 5#✳9.

If we were to look once again at our entire present number system. we would find that some parts of it are much better than others. As a matter of fact, our measuring system uses twelve as a base, so one-half, one-third, one-fourth, or one-sixth of a foot may be had in even inches; and our yard, which is a multiple of twelve, may be divided evenly into two, three, four, six, nine, twelve, or eighteen parts. Our time is also well divided. Our twenty-four hour day is divided into two parts of twelve hours each; so we may work in shifts of an even two, three, four, six, eight, or twelve hours each.

Perhaps the most useful invention in mathematics since the zero is the decimal point. The ten system is quite poor for the use of decimals, because many numbers have remainders that are infinitely long; so they can never be expressed with complete accuracy as decimals. Duodecimals are usually more accurate than decimals, even when they are both carried out to the same number of places; dozenals are usually simpler too. They are particularly good for expressing the smaller fractions, which are most frequently used: (1/2=0;6, 1/3=0;4, 1/4=0;3, 1/6=0;2, 1/8=0;16, 1/9=0;14, etc.). A percentage system based on one hundred forty-four as the whole would be able to express more accurately many more of our much used fractions than our present system with one hundred as its whole can express; for example, 1/3 would equal an even 40%, 2/3, an even 80%, 1/4, 30%, 3/4, 90%, and so on.

If a base of twelve were adopted, much of the drudgery of mathematics would disappear, for all calculations could be made with much simpler figures.

Therefore, I believe it would be a good idea to change - gradually, of course - our numerical system with the base of ten, to this easier system with the base of twelve. Just what method should be used to make this change is debatable. Possibly, if duodecimals were introduced to school children in the form of mental exercises, enough could be learned about them so that when the masses of people finally did learn of their value and decided to change to this more sensible numerical system, some of those who learned them in school as children could immediately begin using them to advantage in business accounts, and others could help to educate the masses in their newly acquired mathematical system. It's true that, if the change were made today, the present generation would have quite a difficult time adjusting itself to the use of this new system, but wouldn't these present day sacrifices be worth-while if we were to make mathematics so much easier for the future generations? I think they would be; but, sadly enough, we must realize that man bases his life on his experiences and habits rather than on his own power of reasoning, so he will probably continue to count on his fingers for the rest of his days on earth. ✹

⬡ ⬡

SCIENCE FICTION?

Anne Nonimus

A recent TV show about the study of *homoeosis* and *homoeotic genes* at the Cold Spring Harbor Laboratory in NY mentioned six fingered people.

These homoeotic genes are responsible for the placement of body parts. They see that arms go on shoulders and fingers go on hands and they sometimes cause a sixth finger to appear on people's hands.

In addition, certain animals have the ability to regenerate lost body parts. Starfish are a well known example of this. Some starfish have been known to regenerate all 5 arms! This regeneration is controlled by these same genes.

Research among house flies at the CSHL shows that these genes are very similar in all species. Given these facts, is it possible that sometime in the future we will be able to provide people with six fingers on each hand and thus make arithmetic that much easier? ✹

WHENCE THE OCTOTHORPE (#)?

A search on the web led to **www.hyperdictionary.com/dictionary/** which defines 'octothorpe' as 'hash'. [This reminds me of a 'hashmark'. -Ed.]

It also led to **http://www.sigtel.com/tel_tech_octothorpe.html** Which produced the following:

WHAT THE ####?

You call it 'hash', 'gate' or 'square'. The Americans call it the 'pound' sign but the technical name in information technology circles is **octothorpe**. The following article contributed to Usenet on the Internet by Ralph Carlsen explains where the name 'octothorpe' really came from. Over to Ralph...

I am sending this to you because, as you will see, there are very few people who could know this story. The reason I am writing at this time is because I volunteered for the AT&T Lay-Off package after 34 years of service at Bell Labs so I may not be around much longer. -Ralph Carlsen

THE REAL SOURCE OF THE WORD 'OCTOTHORPE'

First, where did the symbols * and # come from? In about 1961 when DTMF dials were still in development, two Bell Labs guys in data communications engineering (Link Rice and Jack Soderberg) toured the USA talking to people who were thinking about telephone access to computers. They asked about possible applications, and what symbols should be used on two keys that would be used exclusively for data applications. The primary result was that the symbols should be something available on all standard typewriter keyboards. The * and # were selected as a result of this study, and people did not expect to use those keys for voice services. The Bell System in those days did not look internationally to see if this was a good choice for foreign countries.

*Where did the symbols * and # come from?*

Then in the early 1960s Bell Labs developed the 101 ESS (Electronic Switching System, a pioneer electronic exchange) which was the first stored program controlled switching system (it was a PBX). One of the first installations was at the Mayo Clinic. This PBX had lots of modern features (Call Forwarding, Speed Calling, Directed Call Pickup, etc.), some of which were activated by using the # sign.

A Bell Labs supervisor DON MACPHERSON went to the Mayo Clinic just before cut-over to train the doctors and staff on how to use the new features on this state of the art switching system. During one of his lectures he felt the need to come up with a word to describe the # symbol. Don also liked to add humour to his work. His thought process which took place while at the Mayo Clinic doing lectures was as follows:

> # There are eight points on the symbol so 'OCTO' should be part of the name.
>
> # We need a few more letters or another syllable to make a noun, so what should that be? (Don MacPherson at this point in his life was active in a group that was trying to get JIM THORPE's Olympic medals returned from Sweden) The phrase THORPE would be unique, and people would not suspect he was making the word up if he called it an 'OCTOTHORPE'.

So Don Macpherson began using the term Octothorpe to describe the # symbol in his lectures. When he returned to Bell Labs in Holmdel NJ, he told us what he had done, and began using the term Octothorpe in memos and letters. The term was picked up by other Bell Labs people and used mostly for the fun of it. Some of the documents which used the term Octothorpe found their way to Bell Operating Companies and other public places. Over the years, Don and I have enjoyed seeing the term Octothorpe appear in documents from many different sources.

Don MacPherson retired about eight years ago, and I will be retiring in about six weeks. These are, of course, my remembrances and are not any official statement of AT&T or the subsequent companies.

And another item spotted on the Internet...

There is a CCITT (now ITU-T) specification for the * and # keys on the phone. BT generally follow such specifications. You would be amazed how difficult it is companies to follow them when you are just an engineer and are having to deal with marketing types. (How many phones have un-crossed zeros on the display?)

Indeed, it is the same specification that ensures all phones have 1 2 3 at the top and * 0 # at the bottom (don't nit-pick about non 3 x 4 keypads, they are covered also).

The specification is ITU-T E.161 3.2.2 :-

The * is to be known as "star" or equivalent in other languages. It is a six pointed star, with 60 degree angles, and orientated such as to have a horizontal line.

The # is to be known as a "square" or the most commonly used equivalent term in other languages. This symbol shall consist of four lines of equal length forming two pairs of parallel lines. One pair is horizontal while the other is vertical or inclined to the right at an angle of 80 degrees. It will be seen that the two pairs of lines overlap. The ratio a/b, where *a* is the overlap and *b* is the length of the lines, shall be between 0.08 and 0.18.

The preferred values are In Europe, 90 degrees, a/b=0.08 In North America, 80 degrees, a/b close to the upper limit of 0.18. So BT is quite correct, and it has nothing to do with ignoring the Americans. -Adrian Kennard

John Moynihan in Australia adds: I downloaded ITU-T E.161 from Geneva (issued 05/95) and my copy of para 3.2.2 now says simply:-

> "The symbol will be known as the star (in italics) or the equivalent in other languages."

i.e. no mention of ' six pointed. ' However it says that (the button) "should have a shape easily identified as the general shape shown in Figure 2." Figure 2 is a 6 pointed symbol. I'm not up on nitty gritty of hardware, but the current Telecom/Telstra button is 8 pointed.

✸

△ △ △ △

A Puzzle: Pat asks Sal to write down the first 3 dozen integers:
1; 2; 3; ...; 29; 2↊; 2#; 30;
and then without letting her see what he was doing to recite all but one of them slowly in any order, crossing them off one by one. She asks him to pause about 6 or so seconds between each integer. He would now have one remaining number.

Pat then says to him, when you have finished I will tell you the number you left out without my having written anything down.

How does she do it? For the answer see page 1 dozen 5. ✸

INTERNAL CODES

[Thanks to a suggestion by Board Member Bob McPherson]

Many ID numbers such as those found on drivers licenses, credit cards, bar codes contain internal checks such that many fraudulent numbers can be spotted as invalid.

For example ISBN and ISSN numbers for books and periodicals contain the following code: If one numbers the positions of the digits from right to left, then the sum of the products is congruent to zero modulo eleven. (That is, the sum is divisible by eleven.)

Thus the ISBN number for *TGM*, Tom Pendlebury's excellent work on metrology, is 0 9502724 1 8. Thus we have:

digit	0	9	5	0	2	7	2	4	1	8
position	10	9	8	7	6	5	4	3	2	1
products	0	81	40	0	12	35	8	12	2	8
remainders	0	4	-4	0	1	2	-3	1	2	-3

And the sum of this last row is zero.

Puzzle #1: Show that the ISSN number on the cover of this *Bulletin* is valid.

Puzzle #2: The last digit is called a *check digit*. What check digit should follow a 5 digit ISSN number beginning with 1234_?

Puzzle #3: Can an ISSN check digit always be concatenated to the end of every number?

Puzzle #4: Is it possible to change just one digit of a valid ISSN number to obtain another valid number? (Hint: Think outside the box.)

Puzzle #5: How could we alter this coding system to work in dozenals?

Answers: see page 2 dozen 1.

THREE-VALUED LOGIC,
TERNARY COMPUTERS & MONEY

Gene Kelly with the help of Andrew Denny

[A FRIEND SENT ME THIS LINK, ABOUT 'TERNARY' MONEY (I.E. COINS AND NOTES IN MULTIPLES OF THREES). IT'S VERY INTERESTING.
BEST REGDS,
ANDREW DENNY
AYLSHAM, NORFOLK

HTTP://WWW.WHERESGEORGE.COM/PF_MAIN6/MESSAGES/1061939226_32148.HTML]

The above note sent me to an interesting website on the topics of multivalued logics, especially ternary and quarternary logics, computers based not on binary devices but on ternary and quarternary devices and the side topic of ternary money.

If we can economically build computers founded on base three or base four, can we build a true dozenal computer? Some computers use Binary Coded Decimal or BCD to simulate base dek (ten) arithmetic. These machines valuable when one wants to avoid "rounding off", such as when dealing with money. Could we use a 3-4 combo to create a true dozenal machine?

Among the interesting items I discovered at this site was the claim that a ternary coinage system would reduce the number of coins we needed to carry in our pockets. Coins valued at 1¢, 3¢, 9¢, 27¢ and 81¢ and bills for $2.43, $7.29, $21.87, $65.61, $196.83, etc. would simplify our purchases.

You and the storekeeper only need 1 of each coin or bill each to make a purchase of any amount. For example a purchase of 99¢ can be bought with 81¢ + 27¢ or $1.08 and the store keeper gives 9¢ in change.

That is, the claim is equivalent to asserting that every positive integer can be expressed as the sum and/or difference of unique powers of 3, that is each power is used at most once.

For example, the first few integers can be expressed as follows:

1 = 1 2 = 3 -1 3 = 3	4 = 3 + 1 5 = 9 -3 -1 6 = 9 - 3	7 = 9 - 3 + 1 8 = 9 - 1 9 = 9	10 = 9 + 1 11 = 9 + 3 - 1 12 = 9 + 3	13 = 9 + 3 + 1 14 = 9 + 6 - 1 15 = 9 + 6

IN FOR A POUND

by Martin Delgado

[*Mail*, Sunday 29 August 2004]

Jubilant traders have discovered a legal loophole which could scupper Government plans to abolish the imperial system of weights and measures.

Shops around the country are now preparing to put themselves beyond the reach of the law by turning themselves into private clubs.

The clubs ask shoppers to make a nominal donation to join and are then able to sell in pounds and ounces, apparently without breaking the law.

Enforcement officers have visited at least one store operating in this way but have taken no action against it.

The rebels could make it impossible for Ministers to meet their target of falling into line with European regulations by totally abolishing imperial measures in shops before the end of 2009.

One of the rebels, Peter Halstead, runs a fishmonger's in the Hertfordshire village of Codicote.

"It's right for Britain and my customers"

He explained yesterday how the system works: "If someone new comes in, we explain we are selling only in pounds and ounces and that, if they want to be served, they have to join our Imperial Club.

"They have to put 1p in a charity box - which gives them life membership - and write their names and addresses in a book. They are then given a registration number - normally the last three digits of their telephone number - which they quote each time they make a purchase."

The shop already has more than 1,000 loyal 'members' on its roll, with customers coming from miles around to support its stance.

Mr Halstead, 54, said enforcement officers had visited his store and quizzed him about his club but had not taken any action against him.

He has run Gemini Fish Supplies for 16 years and told yesterday how he converted to metric when the law originally changed - but switched back after just three months.

He said: "Many of our customers are quite elderly and we realised more than half of them didn't understand the new system.

"It was wrong to ban imperial measures at a stroke and alienate so much of the population.

"How can you appreciate the intrinsic value of what you're buying unless you understand the system by which the goods are weighed and measured?"

Mr Halstead said some customers were taken aback when he asked them to join the Imperial Club.

He said: "They think we're doing it for a laugh. But when we explain it to them, they always join. The only exception was a chap last week who was an ardent pro-European. He said we were fundamentalists and accused us of refusing to serve him, which wasn't true.

"When the inspectors came we told them about the club and they wrote it all down but we've heard nothing. Unless someone tells us it's illegal, we're going to carry on. I am taking a stand because I believe it's the right thing to do for Britain and for my customers.'

Metric Association chairman Robin Paice said last night: "It is essential to consumer protection that everybody understands and uses the same system of weights and measures.

"This possible loophole in the law only adds to the existing confusion and mess of British weights and measures."

But Neil Herron, of the Metric Martyrs Defence Fund, said he would encourage supporters to follow Mr Halstead's example.

"This could spread around the country. It would be a fantastic legal challenge if they tried to prosecute private members' clubs," he said. ✹

○ ○

Answer from page 1 dozen 1

The sum of the these 3 dozen numbers is (1 + 30;) × 30;/2 = 31; × 16; = 476; hence if Pat adds them up and obtains say 470, the missing number is 476 - 470 or 6. In fact, she can ignore the first digit in sums greater the ##. In that case her sum would be 70 and the answer 76 - 70 or 6. Why not try it on a friend? ✹

MINUTES OF THE ANNUAL BOARD & MEMBERSHIP MEETINGS

Saturday, 2; October 11#0 (October 2, 2004)
Babylon, NY

BOARD OF DIRECTORS MEETING

Gene Zirkel convened the meeting at 10:45 A.M.

The minutes of the meeting of 4; October 11Ж#; (October 4, 2003) were approved as published in *The Bulletin.*

The Nominating Committee (A. Berridge, J. Schiffman, and Pat Zirkel) presented the following slate of officers. A motion was made and seconded and the following persons were elected unanimously:

Board Chair: Gene Zirkel	President: Jay Schiffman
Vice President: John Earnest	Secretary: Christina D'Aiello
Treasurer: Alice Berridge	

Appointments were made to the following DSA Committees:

Annual Meeting Committee: Alice Berridge and Gene Zirkel
Awards Committee: Gene Zirkel, Patricia Zirkel, Alice Berridge and Jay Schiffman. Volunteers to these committees are always welcome.

The following appointment was also made:

Parliamentarian to the Board Chair: Christina D'Aiello

In addition, Jay Schiffman and Gene Zirkel were reappointed as editor and associate editor respectively of *The Duodecimal Bulletin.*

Other Business of the Board:

In consideration of his efforts, especially with our web site, the Board unanimously resolved that Dr. John Impagliazzo of Hofstra University be proclaimed a Fellow of our Society.

The next Board Meeting is scheduled for Saturday, 1; October 11#1; (October 1, 2005.) at Nassau Community College, Garden City, NY.

The Board Meeting was adjourned at 11:50.

ANNUAL MEMBERSHIP MEETING

President Jay Schiffman convened the meeting at Noon.

The minutes of the meeting of 4; October 11Ж#; (October 4, 2003) were approved as published in *The Bulletin.*

The Nominating Committee (A. Berridge, J. Schiffman, and Pat Zirkel) proposed the following slate of Board members for the class of 11#3;(2007.). A motion was made and seconded and the following were elected unanimously:

Alice Berridge, Dr. John Impagliazzo, Rob Roy McPherson & Gene Zirkel

Christina D'Aiello was appointed Parliamentarian to the President:

Treasurer's report:

Alice presented Income Statements for the years 11#0; and 11Ж#; for comparison, as well as Membership lists for last year and a listing of current members from the recent membership drive. A second pitch for membership will be made soon. The checking account balance as of 2; October 11#0 was $480;($672.). She pointed out that three *Bulletins* were paid for in this accounting period. Her report indicated that dues received for 11Ж#; - 11#0; were $470; ($660.). She will provide a list of all holdings of the DSA with proper contact information. Copies will be sent directly to all Board members.

A. Berridge, J. Schiffman, and Pat Zirkel were elected to the Nominating Committee

Members agreed that *The Bulletin* will continue to be published in two issues per annum. The appearance of it will be streamlined. Gene and Jay will meet in December and also in February to lay it out. Jay will contact personnel at Rowan University for help in facilitating the publication.

Members discussed the status of the Website. No updating has occurred at the site and there is trouble accessing some of its features. Members suggested last October that current material ought to appear regularly on the site; perhaps a "Puzzle of the Month" and/or other math tidbits would be appropriate. We would like to see the membership application appear on the site and hope that the number of "hits" to the site can be recorded. Publication of future meeting times and places could be very useful. This extra material should be updated monthly to be current and viable. We would like to set up the arrangement on the site:

"Not a DSA member? Never been a DSA member? Get a one-year free membership to DSA. Click here." Gene will contact Christine D'Aiello, Chris Harvey, John Earnest and John Impagliazzo to ask for advice as to how to proceed. It was agreed that we may have to contract and pay for this job. We will press to have the job accomplished before the end of this year.

Members discussed the status of the Dozenal Library Collection at Nassau Community College. We agreed to investigate whether it is functioning probably by making specific requests from the Library. The next step will be to catalogue all the items stored at that site. Gene, Jay and Alice will meet around 10:00 AM on Saturday, December 4, 11#0; to do the job. Gene and Jay will meet later in the day to work out publishing details.

On a lighter note we were pleased to learn of the birth of Andrew Joseph (AJ) D'Aiello, new son of our Secretary Christina. Andrew will become our newest, and youngest Society member!

The next Annual Meeting of The Dozenal Society of America is scheduled for 10:30 A.M. on Saturday, October 1, 11#1;(2005.) at Nassau Community College, Garden City, Long Island, NY.

The meeting was adjourned at 3:30 PM.

Jay Schiffman then addressed the group on *THE MOST APPEALING INTEGER, TWELVE — Five Dozen Intriguing Ideas Where Dozens Play a Role*, a fitting topic at this meeting which commemorates the Society's five dozen years. His lecture used examples from measurement, number theory, algebra, general knowledge and graph theory. Listeners were interested and intrigued by the variety of his examples.

Respectfully submitted,
Christina K. D'Aiello, Secretary, Alice Berridge, Treasurer*

ADDENDUM Sadly we report that Alice suffered a heart attack and a stroke in December and has resigned her offices of Treasurer, Board Member, and elected member of the Nominating Committee which she chaired. She has also withdrawn from the Meeting Committee which she chaired and the Awards Committee. When one notices the number of times Alice's name appears in our minutes, you realize that we will need about a half dozen people to fill her shoes.

Jay Schiffman was elected interim Treasurer on 17 December. *

Mail Bag

From: John, BWMA
To: DSA
Subject: lb/oz weighing machines - possible legal challenge
Date: Monday, August 16, 2004 4:01 PM

Dear Supporters,

LACORS, the advisory body for Trading Standards, has recently issued guidelines on dealing with errant traders who won't "go metric". Please remember to keep eyes peeled for shopkeepers and traders using lb/oz weighing machines. Forward to us via this email address the names and contact details of any you see. BWMA wishes to write to them, offering our support in the event of visits by Trading Standards officers.

According to the Divisional Court ruling, the collection of parking fines is illegal

A crack has appeared in the Divisional Court judgment. This ruled that some Acts are "constitutional" and over-rule later Acts (ie the European Communities Act 1972, requiring metric, over-rides the Weights and Measures Act 1985, allowing lb/oz). The only way a Constitutional Act can be repealed is if the later Act actually refers to it, and states expressly in its text that it is repealing it (as opposed to implied repeal).

One of the Acts described in the Divisional Court's judgment as "constitutional" is the Bill of Rights Act 1689. This makes the issuing of fines illegal, unless and until they have been imposed by a Court. Modern Acts of Parliament (eg the 1991 Road Traffic Act) allow for the collection of fines outside of courts (eg parking fines demanded through the post). According to the Divisional Court ruling, the collection of parking fines is illegal, since the Bill of Rights Act takes precedence.

Since local authorities and government relies on such fines for much of their revenue, this implication could cause them some problems.

Any UK resident on this list who gets a parking fine (or any other type of fine), and who would like to help BWMA ask some awkward questions, please notify us before paying the fine.

Thank you,
John, BWMA

***

Dear Prof. Zirkel,

I'm still playing with dozenal systems and have come up with the best distance standard since the French Revolution. Starting with the obvious reform of dividing a circle into 144° and each degree into 144 minutes, you end up with 20,736 minutes in a circle (our current system has 21,600: practically the same).

Now wouldn't a convenient unit of distance be that number of units circling the Earth at the equator? As it turns out, this new length is almost exactly 1.2 miles (1.20088 to six figures), meaning 1/12 of this new mile - call it a "Nile" since it's Newer and Longer (like the river) - is within inches of equaling 1/10 of an old mile.

One Nile would also be the same as one nautical mile (another 'n') by definition, so we wouldn't have that annoying conversion to make any more. It also would not require a big adjustment for conceptualizing distance; besides being close enough to an old mile, it's also very close to 2 kilometers.

So I'm ready to convert the world - when do we start?!

Happily,
Jeff Wells
Equatorial diameter / 144^2 =
24901.55/20736 = 1.200884934
0;1 newt ≈ 0.1 miles

***

If only we had twelve fingers and toes!

1	2	3	4
5	6	7	8
9	Ⅹ	#	10

Actually, look at the underside of your right hand, you will see twelve pads, between the joints, on your four fingers. Imagine, or write, a 1 on the top pad of your little finger, a 2 on the top pad of your ring finger, a 3 on the top pad of you middle finger, and a 4 on the top pad of your index finger. Now go back and put a 5 on the middle pad of your little finger, continuing with all the twelve numbers, finishing with a 10 on the bottom pad of your index finger. Now you can count on you hand, even using your thumb to touch each pad as you count to 10 in base twelve!

I use these to represent the twelve numbers.

1,2,3,4,5,6,7,8,9,ᘔ,Ɛ, 10.

Note that all the numbers can be written in the seven-stroke digital style. I call the tenth "deck" and the eleventh "brad". Also I call 10 "doz".

Timothy Travis

PS I called it brad because it looks like a brad or staple and also, I call *dek zero*, "deka" (dek-a), and *brad zero* works well as "brada" (brae-da).

I pronounce "doz" like Roz, the lady's nickname.

Timothy

[Editor's Note: Tim says that he sometimes uses D for deck and B for brad when typing: 1,2,3,4,5,6,7,8,9,D,B,10.] ✹

△ △ △ △

The DSA does NOT endorse any particular symbols for the digits ten and eleven. For uniformity in publications we use Cap X with strikeout (Ⅹ) for ten and the octothorpe (#) for eleven. Whatever symbols are used, the numbers commonly called "ten", "eleven" and "twelve" are"dek", "el" and "do" (pronounced *dough*) in the duodecimal system.

When it is not clear from the context whether a numeral is a decimal or a dozenal, we use a period as a unit point for base ten and a semi-colon, or Humphrey point, as a unit point for base twelve. Thus

$\frac{1}{2} = 0.5 = 0;6$

$\frac{1}{3} = 0.3333... = 0;4$ $\qquad$ $\frac{2}{3} = 0.6666... = 0;8$

$\frac{1}{4} = 0.25 = 0;3$ $\qquad$ $\frac{3}{4} = 0.75 = 0;9$

$\frac{1}{8} = 0.125 = 0;18$ etc.

TEACHER ARRESTED AT AIRPORT

Submitted simultaneously by Dr Ted Labow, Member No. 364
& also by Karen Ryan

At a NY airport, a teacher was arrested trying to board a flight while in possession of a ruler, a protractor, a setsquare, a slide rule, & a calculator.

At a morning press conference, the Attorney General said he believes the man is a member of the notorious *Al-gebra* movement. He is being charged with carrying Weapons of Math Instruction.

"*Al-gebra* is a fearsome cult," the AG said. "They desire average solutions by means & extremes & sometimes go off on tangents in a search of absolute value. They use secret code names like *x* & *y* & refer to themselves as *unknowns*, but we know they belong to a common denominator of the axis of medieval evil with coordinates in every country.

More fingers & toes

"As the Greek philanderer Isosceles used to say, there are 3 sides to every triangle," the AG declared.

Asked to comment, The President said, "If God had wanted us to have better Weapons of Math Instruction, **He would have given us more fingers & toes.**"

"I am gratified that our government has given us a sine that it is intent on protracting us from these math-dogs who are willing to disintegrate us with calculus disregard. Murky statisticians love to inflict plane on every sphere of influence," the President said, adding: "Under the circumferences, we must differentiate their root, make our point, & draw the line."

The President warned, "These Weapons of Math Instruction have the potential to decimal everything in their math on a scale never before seen unless we become exponents of a Higher Power & begin to factor in random facts of vertex." The AG said, "As our Great Leader would say, read my ellipse. Here is one principle that he is uncertainty of: although they continue to multiply, their days are numbered as the hypotenuse tightens around their necks."

PS - The fearsome cult of Al Gebra is indeed of Iraqi origin. The first manual for the operatives was titled *Al Jabr* & published in Baghdad.

(NOTE: By historical accounts, this last sentence is true. Both the word "algebra" & the math "algebra" eventuated from a work concerning quadratics written by a guy in Baghdad in Babylonian times.) ●

Solutions

Answers from Page 1 Dozen 2

PUZZLE #1:

digit	0	0	4	6	0	8	2	6
position	8	7	6	5	4	3	2	1
products	0	0	24	30	0	24	4	6
remainders	0	0	2	-3	0	2	4	6

And the sum of the last row is 11 which is divisible by 11.

PUZZLE #2:

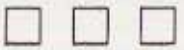
digit	1	2	3	4	d
position	5	4	3	2	1
products	5	8	9	8	d
remainders	5	-3	-2	-3	d

And 5 - 3 - 2 - 3 + d = 0 yields -3 + d = 0 or d = 3

PUZZLE #3: Yes. The sum of the products of any digits when divided by 11 will leave a remainder of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or 0. Thus the last digit would be 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, or 0.

PUZZLE #4: In base ten the answer is no. Changing one digit produces an invalid number. In base twelve, however, one could change 0 into # and vice versa.

PUZZLE #5: We could use a dozen and one instead of eleven. ●



Is Harry Potter a Dodekaphile?

A recent web search accidentally uncovered two sites of interest:

www.mugglenet.com/books/12s.shtml and *www.metric.sucks.com.*

This latter includes, among other things, "*Read a Fascinating Essay!*" ●

WHY CHANGE?

This same question was probably rife in Europe between the years 1000 and 1500, when the new Hindu-Arabic numerals were slowly making their inching progress in displacing the comfortable and familiar Roman numerals then universally used.

Yet, although it took D years, and despite much opposition--("Who needs a symbol for nothing?")--the new notation did come into popular use. Released from the drag of Roman notation, people's thinking leapt forward dramatically, and mathematicians discovered a new dimension in mathematical symbolism. Working with Hindu-Arabic numeration, they found that the new system better accommodated mathematical statements and facilitated the working out of ideas. Re-examining their fundamental concepts of numbers, they made advances in arithmetic, algebra, logarithms, analytic geometry and calculus, and thus contributed to the explosion of human thought which later became known as the Renaissance. Then, in a related development, people awoke to the fact that different number bases could be used.

A parallel to today seems tenable. The notation of the dozen base better accommodates mathematical statement and facilitates ideation. It, too, is a step forward in numerical symbolism. The factorable base is preferred for the very same advantages which led the carpenter to divide the foot into twelve inches, the baker and the grocer (one who deals in *grosses*) to sell in dozens, the chemist and the jeweler to subdivide the Troy pound into twelve ounces. And yet, this is accomplished by such simple means that students in the primary grades can tell why they are better. Literally, the decimal base is unsatis**FACTOR**y because it has **NOT ENOUGH FACTORS**.

Then should we change? Yes, but no change should be forced, and we urge no mandated change. All the world counts in tens. But people of understanding should learn to use duodecimals to facilitate their thinking, their computations and their measurings. Base twelve should be man's second mathematical language. It should be taught in all the schools. In any operation, the most advantageous base should be used, the one best suited to the task at hand. (Similar to computer scientists use of binary, hexadecimal or octal - whichever is most convenient.) If this were done, duodecimals would progressively earn their way into general popularity because they simplify the all-important problem of the correlation of weights and measures, the expansion of fractions (1/3 = 0;4) and give an advantage in calculations involving time and our twelve-month calendar. Perhaps by the year 2000, (or maybe by 1200; which is 14; years later!) duodecimals may be the more popular base. But then no change need be made, because people will already be using the more convenient base.

If "playing with numbers" has sometimes fascinated you, if the idea of experimenting with a new number base seems intriguing, if you think you might like to be one of the adventurers along new trails in a science which some have erroneously thought staid and established and without new trails, then whether you are a professor of mathematics of international reputation, or merely an interested pedestrian who can add and subtract, multiply and divide, your membership in the Society may prove mutually profitable, and is most cordially invited ✹

DETACH--HERE--OR--PHOTOCOPY

YOU ARE INVITED TO JOIN THE DOZENAL SOCIETY OF AMERICA

The only requirement is a constructive interest in duodecimals

Name _____ /__/__
Last First Middle Date

Mailing Address (including full 9 digit ZIP code)

_____

_____

_____

Phone: Home _____ Business _____

Fax _____ E-mail _____

Business or Profession _____

Annual Dues ..... Twelve Dollars (US)
Life ..... One Gross Dollars (US)
Student (Enter data below) ..... Three Dollars (US)
(A limited number of free memberships are available to students)

School _____

Address _____

Year & Math Class _____

Instructor _____ Dept. _____

College Degrees _____

Other Society Memberships _____

To facilitate communication do you grant permission for your name, address & phones to be furnished to other members of our Society?
Yes: ___ No: ___

Please include on a separate sheet your particular duodecimal interests, comments, and other suggestions.

Mail to: Dozenal Society of America
c/o Math Department
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