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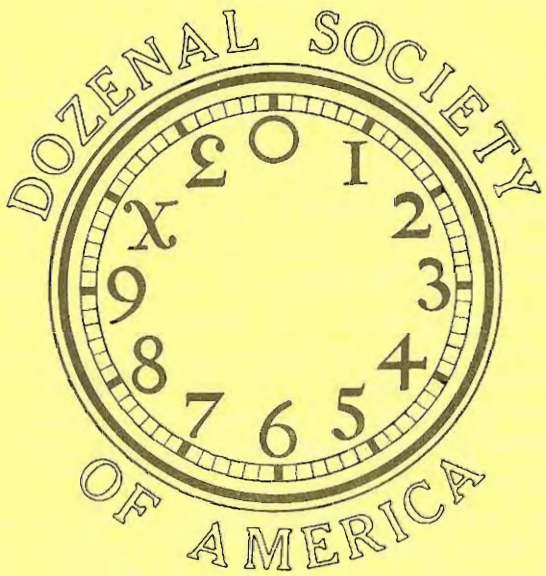
Whole Number 47 *Volume 28, Number 2*

Summer 1983



THE DOZENAL SOCIETY OF AMERICA

c/o Math Department
Nassau Community College
Garden City, LI, NY 11530

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THE DOZENAL SOCIETY OF AMERICA

(Formerly: The Duodecimal Society of America)

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

Membership dues are $6.00 for one year. Student membership is $3.00 per year.

The Duodecimal Bulletin is an official publication of the DOZENAL SOCIETY OF AMERICA, Inc., c/o Math Department, Nassau Community College, Garden City, LI, NY 11530.

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The Duodecimal Bulletin

Whole Number 47 *Volume 28, No. 2*
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IN THIS ISSUE

IN MEMORIAM -- Kingsland Camp 1893 - 1983

by Gene Zirkel[1]

Kingsland Camp, DSA member number *, died on April 24, 1983. He had been the last surviving member with a single digit membership number, one of the first dozen people to join our fledgling Society back in the 1940's.

I was a college student when I first met "K.C." Camp at one of our annual meetings in New York City. His tall, lean frame impressed me as he addressed those present on the subject of one of his pet projects -- a dozenal slide rule. As an amateur astronomer, he had already written the book, Our World in Space and Time (the revised edition of which was published by Vantage Press in 1975) and had produced a planisphere, a device to help the amateur observer locate the stars. Now he was trying to produce a duodecimal slide rule for our members. This was back in the 1950's, before the proliferation of hand-held calculators, and the slide rule was important for astronomers and other scientists who had to perform lengthy calculations.

Charles Bagley, Ralph Beard (rear), Henry Churchman and Kingsland Camp at the 1968 Annual Meeting in Chicago.

K.C.'s health failed before he was able to market his dozenal slide rule, but our late President, Tom Linton, did eventually bring the dream to fruition. (In the absence of a base twelve calculator, the slide rule which they produced is still quite useful.)

Professionally, K.C. was an actuary. He was employed by Equitable Life, and was in charge of their Mathematics Bureau. In addition to his book on the stars, he wrote more than a half-dozen articles for the journal Transactions of the Actuarial Society of America. Many of these articles were reprinted in booklet form.

Born in Newark, NJ, on October 7, 1893, K.C. was pre-deceased by one brother, and leaves no "family" other than the many friends he made both in and out of our Society over the years. He was educated at Rutgers, class of 1913, and Columbia School of Law, and was a world traveler.

After joining the DSA in 1945, he served on the Board of Directors for two and a half dozen years, from 1948 to 1978. He was elected the fourth President of the DSA, succeeding Ralph Beard in 1955. In 1960, he retired as President and Charles Bagley succeeded him. Three years later, he was called upon to serve our Society again as Chairman of the Board, succeeding F. Emerson Andrews.

K.C. Camp chairs the 1967 Annual Meeting in Council Bluffs, Iowa.

Continued.....

IN MEMORIAM -- KINGSLAND CAMP

He retired as Chairman in 1970 and was given the title Chairman Emeritus, the only person the Society so honored. He was again succeeded in that office by Charlie Bagley. He was chosen as the recipient of the Society's Annual Award in 1970, and was the only person to receive that award in the dozen years from 1968 to 1980.

K.C. died at the Florence Nightingale Nursing Home in New York City, where he had lived since 1978.

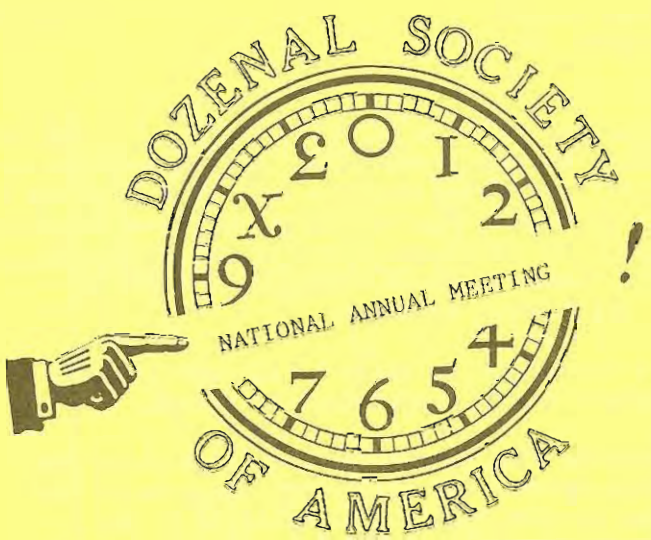
---

1. *We are indebted to Kingsland Camp's close friend, John Mills of New York City, for many of the details in this obituary.*

- Ralph Beard, Founder of the DSA

THE DOZENAL SOCIETY OF AMERICA

will hold its



at

Nassau Community College
Garden City, New York

on

Friday to Sunday, October 14th to 16th, 1983

(That's October 12 to 14; 1193 for Dodekaphiles)

For information or participation, contact:

Professor Gene Zirkel
Nassau Community College
Garden City, LI, NY 11530

(516) 222-7611
(516) 669-0273

A FURTHER WORD ON CALENDAR REFORM

A. Adler Hirsch
Shreveport, LA 71105

In the Duodecimal Bulletin of Fall, 1982, p.11, Jean Kelly suggested that an even gross number of years should be considered for the decalation interval in a calendar in lieu of the contemporarily appropriate Natural Decalation Period (Nadep) of 128 years. Despite the Society's predelection toward dozenals such a move would be unsuitable for several reasons:

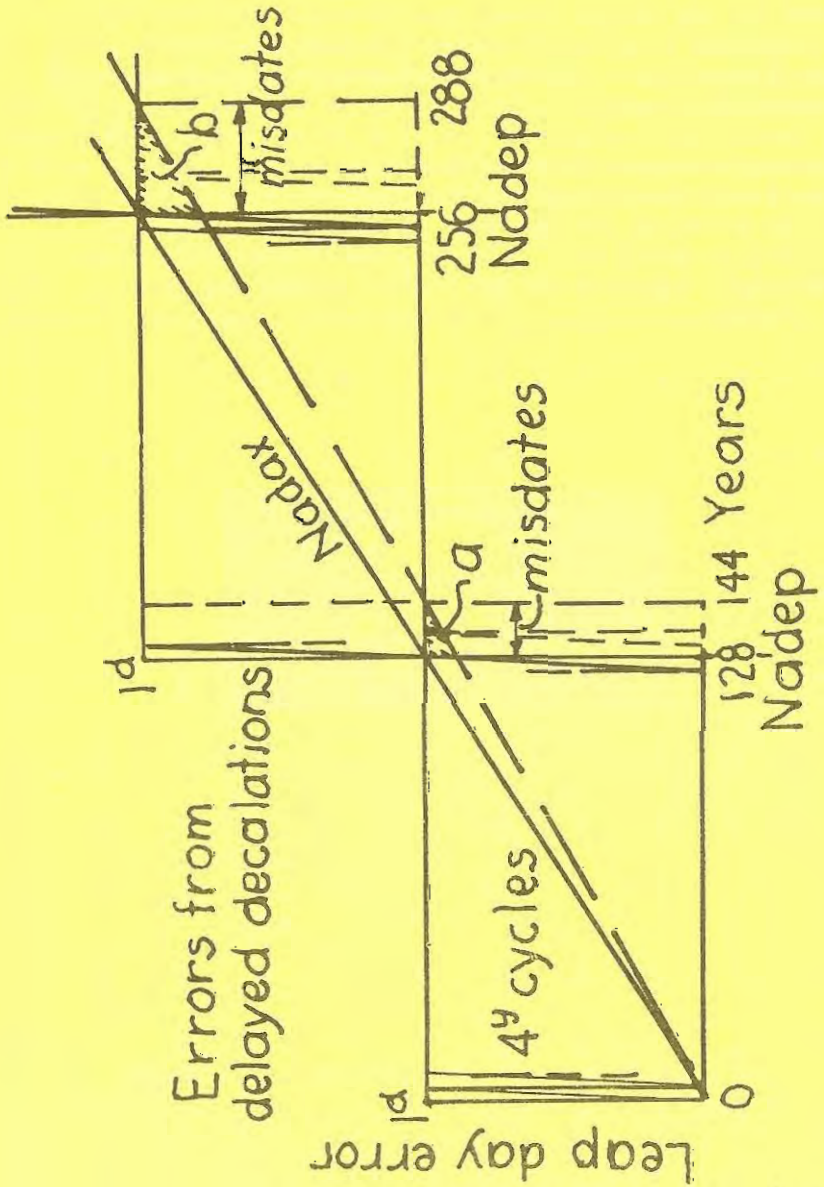
Basically a forced fit to Radix 12 in such a manner cannot supplant values established by Nature.

The accompanying diagram graphically illustrates the relationships between the structural elements of the calendar and how its accuracy is impaired by any changes not in strict conformity with Nature. Leap year cycles are represented by spurs having heights of one day then dropping vertically on leap day to the baseline. Thirty-two such spurs comprise the current Natural Decalation Period (Nadep) of 128 years; the final spur instead of dropping to the baseline straightens to a continuous ascent on account of the decalation to the following Nadep above.

Similar relations hold throughout this second Nadep, thence after it to a third Nadep, etc. The diagonal labelled Nadax, the Natural Decalation Axis, shows by its altitude above its prevailing baseline, the error, or more accurately the difference from the baseline; the baseline actually being the element in error, since it represents a year's length of 365.25 days, whereas the Nadep represents the rounded value of 365.2422 days.

When a decalation period of 144 years is assumed its corresponding diagonal lies underneath the Nadax and, instead of passing directly through the corners of the rectangular envelopes, cuts triangularly into the second Nadep. The horizontal base of this triangle, a, marks the duration of the error, one day late,

Figure 1:

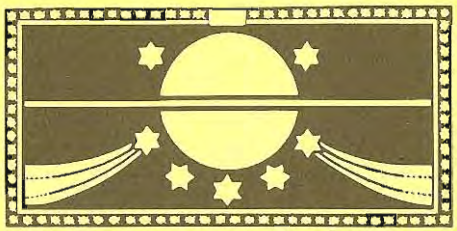


Continued....

A FURTHER WORD ON CALENDAR REFORM, Continued

lasting for 144 - 128 = 16 years. As can be seen at the end of the second Nadep, the duration of error has been doubled; b. After 128/16 = 8 Nadeps the errors become 2 days late. After N such groups the calendar reaches N days late.

As time progresses the slow shrinkage in the length of the year causes progressively smaller Nadeps, so that the error of the 144-year decalation increases. The 128-year Nadep will hold only until year 4136 when it should be replaced by 124 years. Times and time both change.



Are your dues paid? Why not mail that check today?

TERMINAL DIGITS OF $MN(M^2 + N^2)$ IN THE DUODECIMAL SYSTEM

Charles W. Trigg
San Diego, California

If M and N are integers, the units' digit of $P = MN(M^2 + N^2)$ is dependent upon the units' digits of its three factors. Let the units' digits of P, M, N be p, m, n respectively. When either m or n is 0, p is 0. Otherwise, the values of p form the following square array which is symmetrical with respect to its central digit, 0, and to each of its diagonals.

n \ m	1	2	3	4	5	6	7	8	9	*	#
1	2	*	6	8	*	6	2	4	6	2	*
2	*	8	6	4	2	0	*	8	6	4	2
3	6	6	6	0	6	6	6	0	6	6	6
4	8	4	0	8	4	0	8	4	0	8	4
5	*	2	6	4	2	6	*	8	6	*	2
6	6	0	6	0	6	0	6	0	6	0	6
7	2	*	6	8	*	6	2	4	6	2	*
8	4	8	0	4	8	0	4	8	0	4	8
9	6	6	6	0	6	6	6	0	6	6	6
*	2	4	6	8	*	0	2	4	6	8	*
#	*	2	6	4	2	6	*	8	6	*	2

Continued.....

TERMINAL DIGITS OF $MN(M^2 + N^2)$, Continued

All of the elements in the array are even. As can be seen from the following tabulation, the array is dominated by 0 and one-half do:

Element:	0	2	4	6	8	*	Total
Frequency:	15	14	12	36	14	14	*1

The array is divided into four 5-by-5 quadrants by a column and row consisting of alternating 0's and 6's. Each of these quadrants in turn is divided into four 2-by-2 quadrants by identical columns and rows consisting of four 6's and a 0. The units' digits of the sums of the four elements in each of the 2-by-2 quadrants form the symmetrical array

6 0 0 6

0 6 6 0

0 6 6 0

6 0 0 6

The following statements about rows apply to the columns of the array also:

1. Rows equidistant from the middle row are mutual reverses;

2. In each row, elements equidistant from the middle sum to 0 or do;

3. An arithmetic progression is said to be cyclic if its units' digits repeat, as is the case in rows 2 and * where the common differences are - 2 and 2, respectively. Rows 4, 6, and 8 also are cyclic arithmetic progressions (A.P.), with common differences of 8, 6, and 4, respectively;

Continued.....

TERMINAL DIGITS OF $MN(M^2 + N^2)$, Continued

4. Odd numbered rows which have n's differing by 6 are identical. In row 1, the alternate elements form cyclic A.P.'s 2, 6, *, 2, 6, * and *, 8, 6, 4, 2, where the common differences are 4 and - 2, respectively. In row 5, the common differences of the alternate element progressions are - 4 and 2.

Note that in cyclic arithmetic progressions where only the units' digits are considered (i.e., each sum is reduced modulo do), common differences of - a and (do - a) produce the same progression. Thus common differences - 2 and 8 are equivalent, as are - 4 and 8.

NUMBER BASES IN SCIENCE FICTION

" ...George noticed for the first time that he (the "Overlord" Rashaverak) had two opposed thumbs, with five fingers between them. I'd hate to do arithmetic, George thought to himself, in a system based on fourteen."

From Childhood's End by Arthur C. Clarke, Chapter 7, page 83. Published by Ballantine, New York, 1953. (Or pages 79 and 80 in the Harcourt, Brace & World edition)

-Sent in by Richard D. Erlich,
Member SFRA

Do any of our readers know of some other science fiction stories using different number bases? Please write and let us know about them.

BOOK REVIEW

by Gene Zirkel

THE BIBLE DATES ITSELF

Written and published by:
Arthur Earle
45 Tulip Circle
Southampton, PA. 18966

I come to this book about numbers in the Bible as both a math teacher and a believer. However, it is in the former capacity that I write. It would take some one more qualified than I am to comment on the possible interpretations of the symbols that the Biblical authors used for designating numbers, some exegete who knows the nuances of the ancient Biblical languages.

However, as a mathematician I find that Earle has done an excellent job of interpreting the astounding ages found in the Book of Genesis. Essentially he constructs a logical theory that the Biblical writers were using some forms of a base seven notation, and we all know how often the mystical number seven appears in Scriptures. He provides plausible explanations of numbers that even vary in different places in the Bible itself. I enjoyed the logic of his explanation concerning the passage in Genesis 31:41 where Jacob worked for two seven year periods for Laban and then says that he worked for twenty years (14 for your two daughters and 6 for your flock.) Could this be a later "correction" by redactor who now counted in tens and was confused by the "discrepancy?"

Earle goes well past the simple problem of ages into the problem of the Biblical events and an aligning of these events with our secular histories.

As a teacher, I find the ideas presented here to be a great source of interesting problems -

If portions of the Bible are written in base seven then:
How old was Adam (130) when Seth was born?
How old was Isaac (40) when he wed Rebekah?
How old was Joseph (110) when he died?
How long was Solomon a Judge (20 years)?

BOOK REVIEW, Continued

The author's section on Dice Numbers and the invention of zero was particularly interesting. Did our ancestors record large numbers with dice (much like some fancy desk calendars do today)? This use of six non-zero digits would of course easily lead us into a seven base number system.

All in all, I enjoyed the book very much and I am sure that I will be using Biblical examples in my math classes from now on. —

AN EXCURSION IN NUMBERS CONTINUES TO SPREAD
THE DOZENAL WORD

Our most popular piece of literature is still F. Emerson Andrews' Excursion In Numbers. We recently had to have another supply reprinted. In keeping with past-president Linton's ideas, this one was done in color on a nice light green stock.

Although we do not have accurate records, this must be about printing number 16;.

Since one copy of the Excursion will be sent free to any interested person, why not have a copy sent to that friend or colleague who last asked you a question about dozenals?

—

WHO WE ARE

This is the first in a series of articles about the leaders of our Society and of the Dozenal movement.

Dr. Anton Glaser is a member of our Board of Directors, Class of 1985. Born in Worms-on-the-Rhine, Germany, Dr. Glaser is the author of History of Binary and Other Nondecimal Numeration (Tomash Publishers, Box 49613, LA, CA). It was his research into the background of various number systems for his doctoral dissertation that first led him to our Society.

Having joined the Society in 1966 as member number 1##, Tony gave a very interesting presentation at our Annual Meeting in 1979 highlighting the development of various number systems. He was elected to the Board at that meeting and was re-elected in 1982.

Tony received his doctorate from Temple University in 1969 and is presently the Chairman of the Mathematics Department at Pennsylvania State University (Ogontz Campus), where he leads a department of one-half dozen full timers and more than two dozen part-timers.

Dr. Anton Glaser, a Director of the DSA, is Chairman of the Mathematics Department at the Pennsylvania State University, Ogontz Campus.

WHO WE ARE, Continued

In addition to his mathematical interests, Dr. Glaser enjoys calligraphy, singing tenor in his church choir, Pascal programming, square dancing and reading the works of Eric Hoffer and B. Traven, though not necessarily in that order. He has submitted an article for publication to our British counterpart, The Dozenal Journal, published by the DSGB.

OUR NEW MAILING LABELS

Our membership list and our mailing list have now been computerized thanks to Mike Massa, a student at Nassau Community College. He wrote a program in PASCAL that runs on an Apple II computer.

If you receive our BULLETIN regularly, please proof read your mailing label. It should contain your name, your DSA number if any, and the letters H, L, F, or S if you are either an Honorary member, a Life member, a Fellow of the Society or a Student member.

If there are any misspellings or mistakes, please let us know (or it will remain wrong permanently).

If you would like a copy of our current membership/mailing list, please ask. (A donation to the Society would be appreciated.)

Oxford University Press

Professor Gene Zirkel
Nassau Community College
Garden City, New York 11530

Dear Professor Zirkel:

Dr. Burchfield has asked me to reply to your letter of 11 January about the word octothorpe.

It is a fascinating question that you ask, but we cannot shed much light on it. The Washington Post of 31 August 1982 carried an article on the symbol and its names (page B12). I quote:

'According to Bell System literature, it has been called an "octothorpe" ever since touch-tones were introduced some 15 years ago... But Ma Bell is silent as to why "octothorpe" was chosen, where it came from and what name the symbol might have had before 1967. Nor does Ma explain why a prefix meaning "eight" was chosen rather than a prefix meaning "nine".'

It goes on to mention other names: a delimeter (? an error for 'delimiter'), a cross of Lorraine, a crunch; it does not mention the name by which several people here know it, a hash. It is not clear whether Bell have been asked directly, or whether the information has been gleaned from Bell literature.

Continued.....

OXFORD DICTIONARIES REPLY, Continued

The octo- is obvious enough. I can do no more than guess at thorpe - perhaps Mr. Thorpe was someone connected with the touch-tone telephones, or an executive at Bell.

If ever you find the explanation, do let us know.

Yours sincerely,

A. M. Hughes
Senior Editor (Science)
Oxford University Press
The Oxford Dictionaries
Oxford, England
OX I 3LD

We'll be *very disappointed* if you're not with us for the DSA Annual Meeting -- October 14 - 16, 1983 in New York.

Call (516) 669-0273 for further information.

METRIC MADNESS

by Gene Zirkel

(Thoughts gathered while perusing the back cover of an old black and white copy book)

Ancient peoples invented measures
To count and weigh and split their treasures
Gallons, minutes, grains and rods
Pennyweights, stones, pecks and yards

Acres, cords, tons: long and short
Gills and pints to measure port
So their endeavors helped create
Ways to capture length and weight

A fathom became a half dozen feet
Sixty drops to a dram they'd mete
A gross square inches to a square foot seemed meet
With two-twelve degrees to measure the heat

Yards they divided up by three
Pounds by twelve and sixteen too
Bushels by four, and quarts by eight
Days by twelve in groups of two

Twelve inches placed they in a foot
So thirds and fourths would bring a smile
One fourth of a gallon was called a quart
One third of a league was named a mile

Continued.....

METRIC MADNESS, Continued

Weeks by seven were divided
Degrees by sixty they decided
Halves and dozens did abound
But no division by ten was found

The pound they divided in half and then
In half and then in half again
So sixteen ounces make one pound
But never, never was ten to be found

Our ancestors with two hands born
To count on their fingers did not scorn
But when it came to measure and weigh
They found ten wanting (By two did you say?)

Are we so smart, smarter then they
That we can throw their lessons away
Should we forsake our inch and pound
Not 'til some better reason is found

The metric madmen try to sway
Their arguments before us lay
Yet not one nation did they convince
To freely surrender dozen or inch

The only way they had a chance
Even in their mother, France
Was to pass a law, make it a crime
To count by nature all but time.

WHY?

HEXADECIMAL DIGITS

People in the field of computers who work in base sixteen use the letters A through F for the digits ten through fifteen. Since "A" can sound like "8", and "E" can be mistaken for "3", errors sometimes occur -- for example, causing 6A to be confused with 68 when spoken.

To prevent this error, the letters A to F are often called by the following names:

Able,

Baker,

Charlie,

Dog,

Easy, and

Fox.

Thus, the numeral 4E is pronounced "four-easy", and no confusion occurs. —

COUNTING ON YOUR FINGERS

There is an interesting discussion of duodecimals, including how to use your thumb to count up to twelve on the dozen phalanges of the other four fingers on one hand, on page 4 of S. V. Fomin's Number Systems, University of Chicago Press, 1974. —

OUR SPECIAL MEMBERS

As far as we know, the Society has installed the following as either Honorary Members, Life Members, or Fellows of the Society:

Kingsland Camp	*;	New York	LF
Henry C. Churchman	72;	Iowa	LF
William C. Schumacher	84;	New Jersey	F
I.S. Colonna Valevsky	#7;	Brazil	HF
B.A.M. Moon	1*7;	New Zealand	HF
R.B. Carnaghan	259;	England	H

—

Have you written a letter to some local newspaper or to a newsletter extolling the advantages of Base Twelve? Remember to mention that free literature is available from the Society.

DOZENAL JOTTINGS. . . . . .

News from or about the dozenal activities of members and friends. . . . . .

A. ADLER HIRSCH writes from Shreveport, LA:

Q. Why do dozenalists explode in anger less frequently than decimalists?

A. Because it takes them longer to count to 10 (!). . . . . .

On Tuesday evening, May 20; GENE ZIRKEL traveled to Oceanside, NY where he was the featured speaker at the annual Awards Presentation Ceremony of the Nassau County (LI) Junior Math League. The audience of about a gross and a half consisted of the young people receiving awards and their parents. The topic of Gene's presentation was dozenal counting and measurement.....In the Mathematics

Continued.....

One copy of our newly-reprinted Excursion in Numbers will be sent free to any interested person. Why not have a copy sent to that friend or colleague who last asked you a question about dozenals?

and Computer Science Department at Nassau Community College (Garden City, LI, NY), the following DSA members have recently received promotions: ALICE BERRIDGE and CARMINE DESANTO (DSA Secretary) to Full Professors, and TONY SCORDATO (DSA Chairman of the Board) to Assistant Professor. Congratulations to all!.....We received the following letter from BARRY V. KISSANE of the Department of Education at the University of Western Australia in Nedlands:
Dear Sir: My February, 1983 edition of The Mathematics Teacher has just appeared and I note with interest your advertisement on page 100. I would be delighted to receive a free copy of "An Excursion in Numbers"....
P.S. In the circumstances, page 100 seems an unfortunate choice, doesn't it!!.....

end

If you've been promoted, started a new job, made a speech, written an article, or in any way furthered the cause of dozenals, please let us know for later renderings of DOZENAL JOTTINGS.....Thank you!

The following are available from the Society

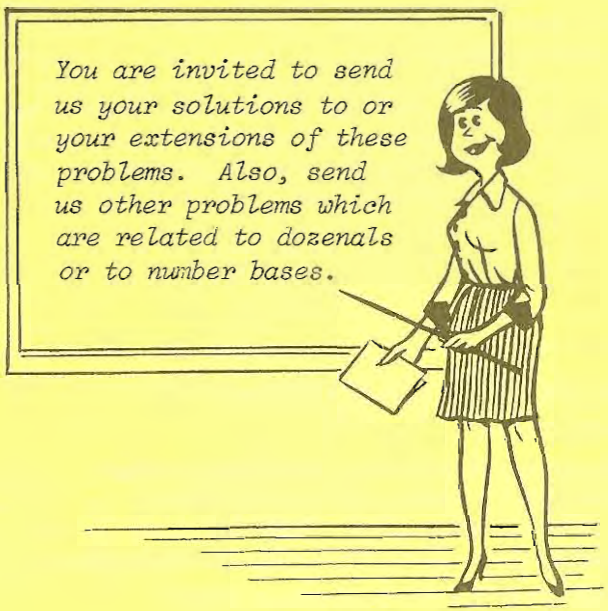
1. Our brochure (free)
2. "An Excursion In Numbers" by F. Emerson Andrews. Reprinted from the *Atlantic Monthly*, Oct. 1934. (Single copies free. Bulk orders 40¢ each)
3. *Manual of the Dozen System* by George S. Terry ($1;00)
4. *New Numbers* by F. Emerson Andrews ($10;00)
5. *Douze: Notre Dix Futur* by Jean Essig in French ($10;00)
6. Dozenal Slide rule, designed by Tom Linton ($3;00)
7. Back issues of the *Duodecimal Bulletin* (as available) 1944 to present ($2;00 each)

PUZZLE CORNER

Charles H. Brittain, 119, of Maryland sends us this challenge:

12330; = 2 (12330.)

What other dozenal numbers are exactly twice as large as their decimal counterparts expressed in the same (or corresponding) numerals?



PUZZLE CORNER

Solution to Twelve Twelves (p. 21, Winter 1983):

The missing number is 30.

The series consists of the number twelve expressed in different bases from twelve to one. The missing number is twelve expressed in base four.

FOUR FOURS REVISITED

The problem we brought up in this Bulletin vol. 27, no. 2, p.19 (Summer 1982) and also vol. 27, no. 3, p.16 (Fall 1982) also appeared in vol. 2, no. 1, p. 13 (April 1946), vol. 4, no. 1, p. 8 (March 1948), and vol. 4, no. 2, p. 48 (Oct. 1948).

Do you have an idea to share with our members? Why not submit an article to the Bulletin?

We'd love to see you at the Dozenal Society of America's Annual Meeting --

Friday through Sunday, October 14 through 16, 1983, at Nassau Community College, Garden City, Long Island, New York.

Call (516) 669-0273 for further information.

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, man'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 accomodated 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.

In a related development, man awoke to the fact that different number bases could be used, and as early as 1585, Simon Stevin stated that the duodecimal base was to be preferred to the base ten.

The parallel seems tenable. The notation of the dozen base better accomodates 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, that base should be used which is the most advantageous, and best suited to the work involved. We expect that duodecimals will 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.

COUNTING IN DOZENS

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*	#	*10*
one	two	three	four	five	six	seven	eight	nine	dek	el	do

Our common number system is decimal—based on 10. The dozen system uses twelve as the base, which is written *10*, and is called *do*, for dozen. The quantity *one gross* is written *100*, and is called *gro*. *1000* is called *mo*, representing the meg-gross, or great-gross.

In our customary counting, the places in our numbers represent successive powers of ten; that is, in 365, the 5 applies to units, the 6 applies to tens, and the 3 applies to tens-of-tens, or hundreds. Place value is even more important in dozenal counting. For example, *265* represents 5 units, 6 dozen, and 2 dozen-dozen, or gross. This number would be called *2 gro 6 do 5*, and by a coincidence, represents the same quantity normally expressed as 365.

We use a semicolon as a unit point, thus two and one-half is written 2;6.

Place value is the whole key to dozenal arithmetic. Observe the following additions, remembering that we add up to a dozen before carrying one.

94	*136*	Five ft. nine in.	*5;9′*
31	*694*	Three ft. two in.	*3;2′*
96	*3#2*	Two ft. eight in.	*2;8′*
19#	*1000*	Eleven ft. seven in.	*#;7′*

You will not have to learn the dozenal multiplication tables since you already know the 12-times table. Mentally convert the quantities into dozens, and set them down. For example, 7 times 9 is 63, *which is* 5 dozen and 3; so set down *53*. Using this *"which is"* step, you will be able to multiply and divide dozenal numbers without referring to the dozenal multiplication table.

Conversion of small quantities is obvious. By simple inspection, if you are 35 years old, dozenally you are only *2#*, which is two dozen and eleven. For larger numbers, keep dividing by 12, and the successive remainders are the desired dozenal numbers.

$12\overline{)365}$
$12\overline{)30} + 5$
$12\overline{)2} + 6$
$0 + 2$ Answer: *265*

Dozenal numbers may be converted to decimal numbers by setting down the units figure, adding to it 12 times the second figure, plus 12^2 (or 144) times the third figure, plus 12^3 (or 1728) times the fourth figure, and so on as far as needed. Or, to use a method corresponding to the illustration, keep dividing by *, and the successive remainders are the desired decimal number.

Fractions may be similarly converted by using successive multiplications, instead of divisions, by 12 or *.

For more detailed information see *Manual of the Dozen System* ($1;00).

DETACH HERE

We extend an invitation to membership in our society.
Dues are only $6 per year; the only requirement is a constructive interest.

Application for Admission to the Dozenal Society of America

Name _____
LAST FIRST MIDDLE

Mailing Address (for DSA items) _____

_____
(See below for alternate address)

Date & Place of Birth _____

College _____ Degrees _____

Business or Profession _____

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Annual Dues $6.00

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School _____

Address _____

Year & Math Class _____

Instructor _____ Dept. _____

Other Society Memberships _____

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Alternate Address (indicate whether home, office, school, other)

_____

_____

_____

Signed _____ Date _____

My interest in duodecimals arose from _____

_____

_____

Use space below to indicate special duodecimal interests, comments, and other suggestions:

Mail to:
Dozenal Society of America
c/o Math Department
Nassau Community College
Garden City, LI, NY 11530