

THE DUODECIMAL BULLETIN 61;



DSA members and guests relax at the Banquet following the 1988 Annual Meeting.

See page 4;



DOZENAL SOCIETY OF AMERICA
c/o Math Department
Nassau Community College
Garden City, LI, NY 11530



Volume 32;
Number 1;
Winter 1989
1199;

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 \$12.00 (US) for one calendar year. Student membership is \$3.00 per year, and a Life membership is \$144.00 (US).

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.

BOARD OF DIRECTORS OF THE DOZENAL SOCIETY OF AMERICA

Class of 1989

Walter Berkmann	Norwalk, CT
Dr. John Impagliazzo	Island Park, NY
Robert R. McPherson	Gainesville, FL
Gene Zirkel (Vice President)	West Islip, NY

Class of 1990

Dudley George	Palo Alto, CA
Jamison Handy, Jr.	Pacific Palisades, CA
James Malone	Lynbrook, NY
Fred Newhall (President)	Smithtown, NY

Class of 1991

Anthony Catania (Treasurer)	Seaford, NY
Carmine DeSanto	Merrick, NY
Dr. Angelo Scordato (Chair)	Valley Stream, NY
Dr. Patricia McCormick Zirkel	West Islip, NY

Other Officers:

Larry Aufiero (Secretary)
Dr. Patricia McCormick Zirkel (Editor)
Jamison Handy, Jr. (Associate Editor)

THE DUODECIMAL BULLETIN



Whole Number Six Dozen One

Volume 32; Number 1;

Winter 1199;

FOUNDED
1944

IN THIS ISSUE

ANNUAL MEETING OF 1988 (1198;)	4;
FROM THE EDITOR	5
MEMBERSHIP REACHES THREE GROSS	11
SEVEN SEGMENT SYMBOLS	12
ADDENDA TO INDEX -- VOLUMES 2* - 31; (Whole Number 58;)	13
MY IDEAS A.A. Paquette	17
RALPH BEARD MEMORIAL AWARD	1*
DOZENAL JOTTINGS	20
ARE YOU IN THE GREEN?	21
NEXT ISSUE	24

Editorial Office:

6 Brancatelli Court
West Islip, NY 11795
(516) 669-0273

DOZENAL SOCIETY OF AMERICA

MINUTES OF THE ANNUAL MEETING - 1198;

Saturday, October 15, 1988
Nassau Community College
Garden City, New York 11530

Twelfth Floor - Tower

I BOARD OF DIRECTORS MEETING

Fred Newhall opened the meeting at 10:25 a.m. He spoke of how the concepts of dozenals might one day "take off" and become part of our lives just as computers and fiber optics have done. There have been many revolutionary changes in technology just within the past forty years. As an efficient number system, dozenals could help us in our current economic struggle by perhaps leading to better communications which would help to raise our balance of trade.

The following Board Members were present:

Jamison Handy
Dr. John Impagliazzo
James Malone
Fred Newhall
Dr. Angelo Scordato
Gene Zirkel
Patricia Zirkel

The DSA does NOT endorse any particular symbols for the digits ten and eleven. For uniformity in publications we use the asterisk (*) for ten and the octothorpe (#) for eleven. Whatever symbols are used, the numbers commonly called "ten", "eleven" and "twelve" are pronounced "dek", "el" and "do" 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 the semi-colon, or Humphrey point, as a unit point for base twelve. Thus $1/2 = 0.5 = 0;6$.

1988 ANNUAL MEETING, Continued

The Nominating Committee (J. Malone, L. Aufiero, A. Catania) presented the Committee's proposed slate of Officers for the coming year:

Board Chair	Dr. Angelo Scordato
President	Fred Newhall
Vice President	Gene Zirkel
Secretary	Larry Aufiero
Treasurer	Anthony Catania

The Slate was elected unanimously.

The following Committee appointments for 1988-1989 were made by the Board:

Annual Meeting Committee:

Barbran Smith, Chair
Larry Aufiero
Anthony Catania

Continued . . .

THIS IS YOUR WINTER ISSUE! --From the Editor

Although you are probably reading this in June, the current issue of the *Duodecimal Bulletin* is the Winter issue, usually published in January-February.

I was unable to adhere to my usual schedule of publication earlier this year as I was finishing my doctoral dissertation. I did complete the work, and my Ph.D. was officially awarded on May 20, 1989. So now it's back to Dozenal work!

As you read this *Bulletin*, I am working on the Spring-Summer issue, which you will receive shortly. The Fall 1989 *Bulletin* should be published on schedule in September.

1988 ANNUAL MEETING, Continued

Finance Committee:

Patricia Zirkel, Chair
 Larry Aufiero
 Anthony Catania
 Dudley George
 James Malone
 Anthony Razziano
 Dr. Angelo Scordato

Awards Committee:

Dr. Angelo Scordato, Chair
 Dr. John Impagliazzo
 James Malone
 Patricia Zirkel

Video Committee:

Alice Berridge, Chair
 Carmine DeSanto

Parliamentarian: Patricia Zirkel

Editor: Patricia Zirkel

Reviewers of Articles for the *Bulletin*:

Anthony Catania
 Dr. John Impagliazzo
 Kathleen McKiernan
 Fred Newhall
 Barbran Smith
 Gene Zirkel

Continued . . .

1988 ANNUAL MEETING, Continued

II ANNUAL MEMBERSHIP MEETING

The Membership Meeting was called to order by outgoing President Gene Zirkel at approximately 11 a.m.

In addition to the Board Members listed above, the following Members were present for all or part of the remainder of the day's activities:

Larry Aufiero
 Alice Berridge
 Anthony Catania
 Vera Handy
 Dr. John Impagliazzo
 Kay McKiernan
 Anthony Razziano
 Barbran Smith

Continued . . .



*Fred Newhall and outgoing President Gene Zirkel
 prepare to call the 1988 DSA Annual Meeting to order.*

1988 ANNUAL MEETING, Continued

The motion was made and seconded to accept the Minutes of the 1987 Annual Meeting as published in the *Bulletin*. So voted.

REPORTS OF OFFICERS:President's Report - Gene Zirkel

Gene welcomed all to the 1988 Annual Meeting, and reported greetings received from Eugene Scifres and Dudley George.

In addition: There have been 7 new members since the 1987 Annual Meeting; the Society continues to grow at a steady rate.

Gene also described how he uses the Paul Rapoport Dozenal Clock in his classroom to help his students understand number bases.

As outgoing President, Gene requested the Finance Committee to give some direction to the incoming Annual Meeting Committee with regard to the cost of these events in the future.

Gene explained that he is resigning as Society President (a post he has held for a number of years) in order to allow others to assume leadership roles within a viable Society structure. Gene thanked the Board of Directors for helping the Society to remain strong and healthy.

Treasurer's Report - James Malone

Interest income and dues income have both declined in 1988. As a result monies were withdrawn from paper assets to keep up with operating expenses. Because of this and because of the decline of stock prices in general, the total assets of the Society have declined somewhat to approximately \$17,000.00. Some of this decline is due to market fluctuation, but the decline in dues income was referred to the Finance Committee, augmented by Anthony Catania and Larry Aufiero. A full Treasurer's report was submitted and accepted.

1988 ANNUAL MEETING, Continued

It was decided that the Treasurer (A. Catania, incoming) is automatically a member of the Finance Committee. In addition, one of the areas of responsibility for the Finance Committee going forward is to be maintenance of an up-to-date membership list and determination of procedures for collection of dues.

Editor's Report - Patricia Zirkel

The *Duodecimal Bulletin* continues to be published on a thrice yearly basis. However, publication of the Winter 1989 issue will be delayed due to other professional commitments of the Editor.

The cost of printing has increased from approximately \$465.00 per issue in 1987 to approximately \$508.00 per issue in 1988. Additional monies were spent on supplies, including an upgraded printer which will enhance the print quality of our *Bulletin*.

Thanks were extended to the following:

To our tireless reviewers for prompt and painstaking critical analysis of articles submitted to the *Bulletin*: Kay McKiernan, Fred Newhall, Gene Zirkel, Barbran Smith, Tony Catania, and John Impagliazzo.

To the outgoing Nominating Committee: James Malone, Larry Aufiero and Tony Catania for a timely response concerning a slate of Officers for 1988-89, a slate for the Board of Directors' Class of 1991, and a proposal for a Nominating Committee for 1988-89 -- all for publication in the September *Bulletin*, prior to this Annual Meeting.

Continued . . .

Why not give some of our literature to a friend? Brochures, *Excursions* and *Bulletins* are available.

1988 ANNUAL MEETING, Continued

To the outgoing Annual Meeting Committee: Barbran Smith, Tony Catania and Alice Berridge for a timely response concerning information on the current Annual Meeting for publication in the same *Bulletin*.

Papers on any topic dealing with dozens, or with number bases in general are invited for the *Bulletin*. We are currently in a good, but not overwhelming, position regarding papers submitted.

An Index to Volumes 2* to 31; will be forthcoming. The Constitution and By-Laws of the Society will also be published in some form.

REPORTS OF COMMITTEES:

Annual Meeting Committee - Barbran Smith, Anthony Catania and Alice Berridge

Anthony Catania reported on the very positive feedback he received from those who attended the dinner and show on Friday evening. All present joined in thanking the Committee for a job well done!

Nominating Committee - James Malone, Larry Aufiero and Anthony Catania

The following slate was proposed for the Board of Directors, Class of 1991:

Anthony Catania	Seaford, NY
Carmine DeSanto	Merrick, NY
Dr. Angelo Scordato	Valley Stream, NY
Patricia McCormick Zirkel	West Islip, NY

The slate was elected unanimously.

1988 ANNUAL MEETING, Continued

The Committee also proposed the following persons as the Nominating Committee for the coming year:

James Malone
Larry Aufiero
Anthony Catania

So carried.

Awards Committee - Tony Scordato, John Impagliazzo and James Malone

For her outstanding work as Editor of the *Duodecimal Bulletin*, Patricia Zirkel was presented with the Ralph H. Beard Memorial Award (formerly known as the Annual Award).

(See the related article in this Issue concerning the award.)

NEW BUSINESS

The DSA Annual Meeting for 1989 was voted to be Friday, October 13 and Saturday, October 14, 1989.

The meeting was adjourned shortly before 1:00 p.m. as luncheon reservations had been made at a nearby restaurant.

Respectfully submitted,

Larry Aufiero,
Secretary

Continued . . .

1988 ANNUAL MEETING, Continued

AFTERNOON PRESENTATIONS



Fred Newhall, *The Nu-Age World Calendar*. Fred proposed a new calendar, containing a dozen months in each year. (Fred's presentation will be published in a future issue of the *Bulletin*.)



Dr. John Impagliazzo, *Music, Scales and Dozens*. John spoke on the affinity between music and mathematics, and demonstrated the harmonious tonal qualities of notes, octave notes, fifths and the ratios of various scales. (John's paper will be published in a future issue of the *Bulletin*.)

1988 ANNUAL MEETING, Continued



Jamison Handy completed the afternoon with a brief presentation on the ratios of the harmonics of a pipe organ.

End

MEMBERSHIP REACHES THREE GROSS!

Our congratulations Frances Metallo who is member number 300; - THREE GROSS! And our thanks to Jay Schiffman who recruited her. Jay and Frances both teach mathematics at Jersey City State College, in Jersey City, NJ. Jay, a frequent contributor to our BULLETIN, will be the guest speaker at our Annual meeting this Fall.

End

SEVEN SEGMENT SYMBOLS FOR DEK AND EL

When Dr Paul Rapoport designed the Dozenal Clock he chose

$\begin{array}{c} / \\ _ \\ / \end{array}$ and $\begin{array}{c} / \\ _ \\ _ \end{array}$

for dek and el respectively. They might be described as a Breur chair and an inverted F.

When the Zirkels ordered a clock, they chose

$\begin{array}{c} / \\ / \\ / \end{array}$ and $\begin{array}{c} / \\ _ \\ _ \end{array}$

which looked more like the traditional Dwiggin's script X and E.

At our recent annual meeting, Jux Handy produced a Sixty Memory Pocket Tone Dialer manufactured by Radio Shack which uses an asterisk (*) and an octothorpe (#) on the keyboard, but uses

$\begin{array}{c} / \\ _ \\ / \end{array}$ and $\begin{array}{c} / \\ / \\ / \end{array}$

for the seven segment displays.

What do you prefer?

End

INDEX OF THE DUODECIMAL BULLETIN -- Whole Number 58;

Fred Newhall apologizes for having omitted *Bulletin* Number 58; Volume 30; Number 3 from the INDEX OF THE DUODECIMAL BULLETINS Number 60; Volume 31; Number 4. Please remove this centerfold and add it to Whole Number 60;.

INDEX OF ARTICLES AND BOOKS

An Accuracy Scale	Fred Newhall	30.3.9
Application for Admission (Inside back cover)		
Cinderella Dek-El-Do	Henry Churchman	30.3.20
Counting in Dozens (Inside cover of each bulletin)		
Dec and El		30.3.1*
Dozenal Jottings		30.3.19
Impossible		30.3.1*
Nude Numbers	Roberto A. Ribas	30.3.13
Schedule of the Annual Meeting - - 1197;1987		30.3.4
Strangers	Dean Koontz	30.3.19
A Subroutine to Convert from Base Ten to Base Twelve		
	Regina DeBonis	30.3.16
A Subroutine to Convert from Base Twelve to Base Ten		
	Brian Doherty	30.3.14
Two Subroutines for Base Conversion		
	Brian Doherty and Regina DeBonis	30.3.14
Why Change? (Inside cover of each bulletin)		

INDEX OF NAMES AND ORGANIZATIONS

Bell, Ma	30.3.1*
Berkmann, Walter	30.3.2,6
Berridge, Prof. Alice	30.3.4,6,7,12
Catania, Prof. Anthony	30.3.4,6,7
Churchman, Henry Clarence	30.3.1*,20
Cinderella	30.3.20
Cray, Seymore	30.3.1*
DeBonis, Regina	30.3.16
DeSanto, Prof. Carmine	30.3.2
Doherty, Brian	30.3.14
Dozenal Society of America	30.3.1*

Continued . . .

INDEX, WHOLE NUMBER 58; Continued

Dozenal Society of Great Britain	30.3.19,1*
Dozenal Society of Great Britain Journal	30.3.19
Dwiggins, William Addison	30.3.1*
George, Dudley	30.3.2,4,6,7,1#
George, Kay	30.3.1#
Glaser, Dr. Anton	30.3.2
Gray, Nelson	30.3.14
Hammond, Donald	30.3.19
Handy, Jamison, Jr.	30.3.2
Humphrey, Herbert Kay	30.3.1#
Impagliazzo, Dr. John	30.3.2,4,5,6
Journal of Recreational Mathematics	30.3.13
Katagiri, Yoshinao	30.3.13
Koontz, Dean	30.3.19
Malone, Prof. James	30.3.2,5,6
Mathematics Teacher	30.3.1*
McMaster University	30.3.19
McPherson, Robert R.	30.3.2
Newhall, Frederick A.	30.3.2,5,7,9
Pentagon, The	30.3.10
Radio Manufacturers Association	30.3.*,#
Rapoport, Dr. Paul	30.3.19
Razziano, Prof. Anthony	30.3.6,12
Razziano, Margo	30.3.12
Ribas, Roberto A.	30.3.13
RMA, see Radio -	
Scifres, Eugene M.	30.3.1*
Scordato, Dr. Angelo	30.3.2,6
Smith, Barbran	30.3.6,12
Valevski, Dr. Igor V. Colonna	30.3.19
Watrin, Rev. Father Joachim	30.3.1#
Zirkel, Prof. Gene	30.3.2,5,6,8,1#
Zirkel, Patricia McCormick	30.3.2,6,1#

INDEX OF SUBJECTS

Accuracy Scale	30.3.9,*
Annual Meeting	30.3.4,9
Asterisk (*)	30.3.1*
Astronomical Unit	30.3.9
Bank	30.3.10
Base	30.3.11,14,16,19

INDEX, WHOLE NUMBER 58; Continued

Bell	30.3.1*
Bit, Drill	30.3.10
Brochure	30.3.12
Clock	30.3.10,19,20
Computer	30.3.14,16,1#
Constitution	30.3.8
Conversion of Bases	30.3.14,16
Decade	30.3.*
Degree of a Nude Number	30.3.12
Dek (*)	30.3.9,1*
Do	30.3.*
Do-decade	30.3.*
Dozenal Scale	30.3.9
Drill Bits	30.3.10
El (#)	30.3.9,1*
Electron Microscope	30.3.*
Foot	30.3.9,*
Fortran	30.3.14,16
Gage	30.3.10
Golden Rule	30.3.9
Gro	30.3.*
Hour	30.3.10,19
Inch	30.3.9
Kilo	30.3.*
Light Year	30.3.9
Meg	30.3.*
Micron	30.3.9
Microscope, Electron	30.3.*
Micron	30.3.9
Mil	30.3.9
Mile	30.3.9
Money	30.3.10
Nail Sizes	30.3.10
Nude Numbers	30.3.11
Octothorpe (#)	30.3.1*
Panda	30.3.12
Penny	30.3.10
Poem	30.3.20
RMA Values	30.3.*,#
Rod	30.3.9

Continued . . .

INDEX, WHOLE NUMBER 58; Continued

Rule	30.3.9
Scale	30.3.9
Screw Sizes	30.3.10
Second	30.3.19
Snowflake	30.3.1*
Speedometer	30.3.10
Telephone	30.3.1*
Thermometer	30.3.10
WATFIV	30.3.14,16
Wire Sizes	30.3.10
Yard	30.3.9
Year, Light	30.3.9

End

02/14/89 by Fred Newhall

What prime number is the product of three distinct integers which are consecutive terms in an arithmetic progression?

-R.M. McPherson

MY IDEAS

A.A. Paquette
White Rock, B.C.
Canada

Before I discovered the existence of The Dozenal Society of America, I had begun to play with base twelve (base onty) counting on my own. Its properties intrigued me; and having now been a member of the Dozenal Society for several years, and having compared my notes to the discoveries of others that have been made available to me as a result of my membership in the Dozenal Society, I have reduced those discoveries (if they are that) to about a half a dozen. I'd like to share them with you.

The written symbols that I derived were essentially those of the Society. The symbols for 1 to 9 were the same; ten was a reversed 7; eleven was a reversed 3; and twelve was a 'one-zero' or 10.

My verbal symbols are, however, different. My thinking was in terms of implementation in the English Speaking public at large, and I see implementation as requiring simplification which to me meant keeping the verbal symbols consistent and with as little change as possible from the existing base ten verbal symbols. On those premises, 1 to 9 are pronounced as they are in base ten. Ten is simply pronounced 'ten.' Eleven is shortened to 'el.' Twelve is pronounced 'onty.' The 'ON' is taken from 'one' and 'TY' from the 'ty' in twenty, thirty, etc. 'ON' is pronounced as the word 'on' and 'TY' as the 'ty' in twenty, thirty, etc.

Counting further with those verbal symbols is simply counting onty-one, onty-two, onty-three...onty-ten, onty-el, twenty...twenty-ten, twenty-el, thirty...ninety-ten, ninety-el, tenty, tenty-one, tenty-two...tenty-ten, tenty-el, elty, elty-one...elty-ten, elty-el, one hundred. I made no change to the written or verbal symbol of '100' or 'one hundred.'

I found that it was easy to teach children to count to 'onty' on their fingers. Some say we have five fingers on each hand. I have always seen it as four fingers and a

Continued . . .

MY IDEAS, Continued

thumb opposite to those four fingers. In each finger there are three joints and there are three joints in the thumb.

With that framework I can count in threes up to onty on my four fingers, or I can count in fours up to onty. I can then store three sets of onties on the three joints of my thumb, one on my wrist, one on the palm of my hand and the sixth onty on my four fingers in whole or in part. I can transfer six onties to the other hand if need be. In all I can count to one hundred using one hand only, while using the fingers of the other hand to carry out the counting process.

In geometry I defined onty degrees of angle as being an angle of an equilateral triangle. There are therefore thirty (base onty) degrees in the three interior angles of an equilateral triangle. By definition there are onty seconds of angle in a minute of angle and onty minutes of angle in a degree of angle. By extrapolation there are sixty (base onty) degrees in a circle and one hundred (base onty) degrees in a sphere.

In solid geometry there are four equilateral triangles to the surface of a tetrahedron, and the sum of the interior angles of such a tetrahedron is 100 (base onty) degrees.

The first onty numbers of the Fibonacci series are: 1, 1, 2, 3, 5, 8, 11, 19, 27, 47, 75, 100. Notice that the ontieth number is 100. The Fibonacci series of numbers has relevance in art and the very structure and organization of many living things.

In measurement I started with the dimensions of building materials for homes. A sheet of plywood is 4' x 8'. Starting with the 8' length and dividing that by onty, I derived a new definition for a foot. One foot would be equivalent to the old 8". All larger and smaller units of linear measure would be but extrapolations by multiplying or dividing by onty. At this time I have no verbal symbols for those linear units, but the existing verbal symbols should be used as much as possible even if there is not actual equivalence to the existing 'foot-mile' linear measure.

MY IDEAS, Continued

I also discovered that if you list the positive integers in onty columns as

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
etc. . .											

all prime numbers other than two and three fell in the first, fifth, seventh and eltieth columns and that all squares of numbers fell in the first, fourth, ninth and ontieth columns.

I hope that these ideas will inspire some other Dozenalists to share their particular insights with all of us.

What do you think?

End

14;24;15; -- OR -- THERE'S SAFETY IN NUMBERS

I don't need to remember the combination to my lock, nor do I have to hide it. I leave it out in the open, in full view. This, of course, is not very dangerous because I write it in duodecimals!

-GZ

EDITOR WINS AWARD

In the Fall of 1981, the DSA began publishing the *Duodecimal Bulletin* after a hiatus of several years. The engineer of that revival was Pat Zirkel, who took on the project at the suggestion of her husband, then-President Gene Zirkel, who may be called the revitalized *Bulletin's* architect. Pat has continued to publish the *Bulletin* on a tri-annual basis since that time. For those efforts the Awards Committee of the Dozenal Society of America presented her with the Ralph Beard Memorial Award at the 1988 Annual Meeting of the Society.

It will be recalled that the Ralph Beard Memorial Award is the former Annual Award under a new name. The change of name was instituted at the 1987 Annual Meeting of the Society, and Pat's award is the first to be presented under the new title.



Incoming DSA Board Chair Dr. Angelo Scordato presents the Ralph Beard Memorial Award (formerly known as the Annual Award) to Pat Zirkel, Editor of the *Duodecimal Bulletin*.

AWARD, Continued

The text of the award is as follows:

The Ralph Beard Memorial Award

of the

Dozenal Society of America

Is Hereby Presented to

Patricia Zirkel

Member Number 251;

Fellow Of the Society

For Her Outstanding Efforts in Reviving and Regularly
Publishing the Society's Journal,

The *Duodecimal Bulletin*.

Under Her Editorship, the *Bulletin* Has Become A
Scholarly and Informative Medium that Continues and
Extends the Goals of the Society Throughout the World.

Her Contributions to the Society Extend Far Beyond
Her Extensive Work With the *Bulletin*.
Her Unstinting Efforts as

Vice-President, 1982 - 1986

Board Member, 1982 - 1988, and

Parliamentarian to Both the Board and the Society

Are Just Highlights of Her Many Faceted Contributions.

In Appreciation For These and Many Other Accolades
She So Richly Deserves, the Board of Directors Grants
To the Present Editor, this Annual Award Named in Honor
Of the Founding Editor of the *Duodecimal Bulletin*.

1988

1198;

End

DOZENAL JOTTINGS

. . . from members and friends . . . News of Dozens
and Dozenalists. . .

EDITH ANDREWS (Mrs. F. Emerson Andrews) passed away on December 15, 1988. The Society deeply regrets the passing of a warm friend and loyal champion of Dozenal ideas. . .

PAUL RAPOPORT (Canada) wrote of ongoing plans back in September: "I plan to work on programming both a tutorial and a quiz for dozenal arithmetic. This is not difficult now, given the state of microcomputers. I wonder whether anyone else has done such items already? (If so, this might -- or might not -- save me some trouble!) Later, in October, Paul wrote again that he had started the tutorial program: "As the project is for the Apple Macintosh microcomputer, it carries a lot of visual clues and possibilities.

	1	2	3	4	5	6	7	8	<input checked="" type="checkbox"/>	◀	Ⓜ	10
1	60											
2												
3												
4												
5												
6												
7												
<input checked="" type="checkbox"/>												
9												
◀												
Ⓜ												
10												

Choose one:
(at any time) Decimal Dozenal

Clear

Choose one:
(at any time)



DOZENAL JOTTINGS, Continued

"On this screen we have simply a combination addition/multiplication, decimal/dozenal table. You can do all kinds of things with it, such as make (intelligent) guesses at answers and see if you're right, learn the correct answers to the various operation, e.g. dozenal multiplication (which is of course the most interesting of the four), and compare them". . .

DON HAMMOND wrote from England to warn us Americans: "It may be time that the DSA made an effort to get a message to US citizens via your newspapers. According to the Daily Mail over here, in a report from their US correspondent (Dermot Purgavie): '...under provisions hidden in the new (US) Trade Bill...metric measurement has been designated as the official system for US trade and commerce. All government agencies will be required to adopt it by 1992 <<to put us on an equal footing with our trading partners and to encourage the national conversion to a metric standard>> . . .' Note that word: 'hidden'. You are being bamboozled by your own government . . . into going metric without the chance to debate the matter." . . .

Continued . . .

ARE YOU IN THE GREEN???

Are you "in the Green?" If your mailing label is marked in green, your dues have been paid for 1989. If not, your tax-deductible check for \$12, payable to the Dozenal Society of America, will put you in the green today.

A few members are also in arrears for past dues. If you are unsure of your status, you can still get "in the green" by paying your present dues. We will provide your arrears figure upon request.

Thanks for getting "in the Green!"

End

DOZENAL JOTTINGS, Continued

Meanwhile, also in England, ARTHUR WHILLOCK has been involved in an exchange of correspondence with ANNE, COUNTESS ATTLEE (widow of past Prime Minister Clement Attlee) regarding decimal metric system. Lady Attlee is the Director of the British "Metric Sense Campaign," while Arthur has been advising her as to the wisdom of base twelve computation. . . .

JERRY BROST (Gainesville, FL) advises us as to the availability of a new software tutorial called Bases Other Than 10. "It is directed toward a 7th to 9th grade level and teaches bases 2, 5, 12 and 16. It covers conversions, multiplication, division, addition and subtraction. Unfortunately, it does not allow you to perform any computations other than the practice problems in the tutorial. It is available in IBM/PC, Apple, and Amiga versions. The programs cost between \$30 and \$40, depending on which machine you use. They may be obtained from:

Queue, Inc.
562 Boston Avenue
Bridgeport, CT 06610
1-800-232-2224

H.C.O. STEELE writes from New Zealand that at age 86 he still keeps up his interest in the Dozenal System as much as possible

Several members sent donations along with their dues! Thanks are due in return to CHARLES F. MARSCHNER (FL), EUGENE SCIFRES (CO), GEORGE S. CUNNINGHAM (ME) and JAY SCHIFFMAN (NJ)

Welcome back to member number 150; STAN BUMPUS of Livermore, CA who recently rejoined the Society. He saw the Society's address in a registry of society listings for all of the U.S., and claims that he never really left in heart. "I use the duodecimal base with a deck of cards minus the kings but plus a joker to pick the numbers I need (randomly) for the California lottery. The possible numbers span 1 to 49." . . .

DOZENAL JOTTINGS, Continued

Welcome also to new members:

- 2#9 HARI KUCHIBHOTLA of La Jolla, CA
- 2#* DAVID HANKIN of Brooklyn, NY
- 2## CATE ANDREWS of Pittsburg, PA. Cate is the daughter-in-law of the late Edith Andrews, mentioned above.
- 300 FRANCES METALLO, a member of the Math Department at Jersey City State College, NJ
- 301 Professor JOHN C. PETERSON, University of Maine, Orono, ME

End

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*, October 1934. (Free)
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. (\$4;00 each)

COMING IN THE NEXT ISSUE . . .

Whole Number 62; June/July, 1989

FUNDAMENTAL OPERATIONS IN THE DUODECIMAL SYSTEM -- Part II

*Jay Schiffman
Jersey City State College
Jersey City, NJ*

. . . And other items of dozenal interest!

Watch for it!

A PUZZLE

Gene Scifres sent us this little gem. We would be happy to publish a solution if you have one.

Find a procedure which will generate a set of integers each of which CANNOT be partitioned into four non-zero square numbers.

Examples: The current year 1199; CAN be so partitioned for

$$36^2 + 4^2 + 4^2 + 5^2 = 1199;$$

The number 2540; CANNOT be so partitioned.

Can anyone solve Gene's teaser?

End

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 unsatisfactory 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.

$$\begin{array}{r}
 12 \overline{) 365} \\
 \underline{12} \\
 30 \\
 \underline{12} \\
 18 \\
 \underline{12} \\
 6 \\
 \underline{0} \\
 0 + 2 \text{ Answer: } 265
 \end{array}$$

Dozenal numbers may be converted to decimal numbers by setting down the units figure, adding to it 12 times the second figure, plus 12² (or 144) times the third figure, plus 12³ (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).

We extend an invitation to membership in our society.
 dues are only \$12 (US) per calendar 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)

Telephone: Home _____ Business _____

Date & Place of Birth _____

College _____ Degrees _____

Business or Profession _____

Annual Dues \$12.00 (US)

Student (Enter data below) \$3.00 (US)

Life \$144.00 (US)

School _____

Address _____

Year & Math Class _____

Instructor _____ Dept. _____

Other Society Memberships _____

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, or attach a separate sheet:

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

DETACH HERE -- OR PHOTOCOPY