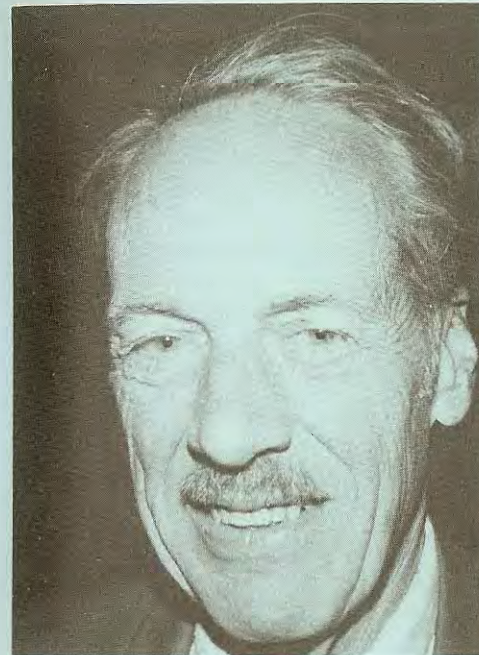


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THE DUODECIMAL BULLETIN

49;



JAMISON
HANDY
WINS DSA
ANNUAL
AWARD,
Page 14



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



Volume 29;
Number 1;
Winter 1984
1194;

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 \$9.00 (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 1984

John Earnest	Freeport, NY
Dudley George	Vashon, WA
Jamison Handy, Jr.	Pacific Palisades, CA
James Malone (Treasurer)	Lynbrook, NY

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Dr. Angelo Scordato (Chairman)	Valley Stream, NY
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Class of 1986

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



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. Years ago, as you can see from our seal, we used X and O. Both X and * are pronounced "dek". The symbols # and O are pronounced "el".

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

The Duodecimal Bulletin

Whole Number Four Dozen Nine

Volume 29; Number 1;

Winter 1194;

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Patricia McCormick Zirkel, *Editor*
Editorial Office:
6 Brancatelli Court
West Islip, New York 11795

FROM THE PRESIDENT

*The 1983 Annual Meeting
was a cause for celebration.*

by Gene Zirkel

"This was the best meeting I ever attended."

"We had a wonderful time."

"Great meeting!"

"A lot accomplished and a lot of fun."

"I'm glad I came."

"See you next year."

These were some of the comments heard at the John Peel Restaurant after the banquet which ended our recent Annual Meeting. If you weren't there, you missed a good time with good people. As the spouse of one member remarked, "I was pleased to find out that you weren't associating with strange people!"

Pardon me if I sound euphoric, but I can't help feeling elated, as our Society just held its biggest and best Annual Meeting in over a dozen years. Membership has been growing apace with interest in our activities, and I was able to report to those present that the DSA had responded to over one-and-one-half gross requests for literature since our previous meeting. It seems that an information-hungry public is more than ever interested in receiving "An Excursion in Numbers" and the Duodecimal Bulletin.

These publications remain the two most important facets in our task of educating people about dozenal counting. A few years ago, with the Bulletin temporarily suspended, and interest in the DSA apparently on the wane, we seemed to be in decline as a Society. However, with recent publicity efforts, increased membership and a renewed journal, we are obviously on the move once again. Our new members have also brought in some fresh ideas and we welcome this influx of new blood into the DSA.

FROM THE PRESIDENT, *Continued*

The gathering just held reminded me of the crowds the Society attracted during the fifties at meetings held in New York City. Nine directors were in attendance, together with interested and active new members and stalwart dozers of long standing. The only regret of those attending was the knowledge that more of you weren't with us sharing our excitement. From the social gathering on Friday evening, through the reports, the elections, the discussions and speeches, up to the closing banquet, all of us had a pleasant and rewarding time.

Why not plan now to attend your 1984 Annual Meeting?

It will begin, appropriately enough, on Friday, the TWELFTH of October, 1984, and continue through Saturday, the thirteenth. See you then!



(L-R) Walter Berkmann, Jamison Handy, Pat Zirkel, Tony Scordato, James Malone, Gene Zirkel, Carmine DeSanto and Dudley George were among the DSA Directors present at the 1983 Annual Meeting.

DOZENAL SOCIETY OF AMERICA

Minutes of the Annual Meeting

Saturday, October 15, 1983
Nassau Community College
Garden City, NY 11530

The meeting was opened at 10:00 A.M. by President Gene Zirkel.

In attendance were:

Board Members:

Charles S. Bagley (proxy)	NM	Class of 1983
Carmine DeSanto	NY	1985
Dudley George	WA	1984
Jamison Handy, Jr.	CA	1984
James Malone	NY	1984
Dr. Angelo Scordato	NY	1985
Gene Zirkel	NY	1983
Patricia Zirkel	NY	1985

Members:

Walter Berkmann	CT
Alice Berridge	NY
Victor Gany	NY
Dr. John Impagliazzo	NY
Fred Newhall	NY

I Approval of Minutes:

The Minutes of the 1982 Annual Meeting were approved as submitted.

II Treasurer's Report by James Malone

The Society is in a good financial position. Between October 30, 1982 and October 14, 1983, assets totaled \$3225.19 and expenditures totaled \$3034.11, with a total of \$191.08 carried forward. The DSA holds 70.153 shares of AT&T Common and a \$12008.00 CD with a maturity date of 10/17/83. Between \$1500.00 and \$2000.00 will be

1983 ANNUAL MEETING, Continued

converted to cash (checking) for on-going expenses, with the rest being re-invested in a CD at the current interest rate of approximately 10%.

III Editor's Report by Pat Zirkel

Three 32-page issues of The Duodecimal Bulletin have an average cost of \$400.00 each for printing, yielding an average yearly printing bill of \$1200.00. Additional costs are for secretarial time, supplies and typesetting (which is kept to a minimum).

Volume 28 was printed on Canary stock, and successive volumes will be printed on different colored stock, until a three year cycle of colors is established.

Members were invited to submit material for publication. Articles on number bases in general, or on dozens, are appropriate as are lesson plans on these or related topics. Photographs of past Society events are welcome, as are any graphics relating to number bases or dozens.

Members were requested to send in any professional news such as publications, promotions, guest speaking or lecturing engagements, awards received, etc. for "Dozenal Jottings".

The Editor invited suggestions from those present with regard to the design of the front cover of the Bulletin with an eye toward using the cover to highlight important articles, events, etc.

Many members present expressed the concern that the Bulletin should remain easily identifiable from issue to issue.

Gene Zirkel proposed the following resolution: The Bulletin cover should be designed so that the center section can be used to publicize important events or to highlight an article (at the discretion of the Editor) with the basic format of the cover

continued

remaining substantially the same from issue to issue. The resolution was seconded and passed.

J. Handy proposed that the whole number of the issue be printed more prominently on the cover as part of this new design with, perhaps, an explanation of same being included in smaller type. This resolution was also seconded and passed.

The Editor is searching for a Problem Editor to be responsible for the "Puzzle Corner". Anyone interested in doing this, or anyone who has suggestions about this feature, should contact the Editor.

Carmine DeSanto indicated that he would speak to Richard Silvestri of Nassau Community College about creating a crossword puzzle on dozenals for a future issue of the Bulletin. (Mr. Silvestri has published many crossword puzzles in the NY Times)

IV President's Report by Gene Zirkel

Gene remarked that Vic Gany became the dozenth member in attendance at the Annual Meeting. This is the first time in a dozen years that we have had a large number of voting members at an Annual Meeting.

Gene asked those present for discussion on the following membership categories: Life Membership, Honorary Membership and Fellow of the Society.

Tony Scordato indicated that the old By-Laws defined a Life Membership in terms of a large monetary contribution to the Society. Discussion ensued as to the size of an appropriate contribution, but was suspended pending action of the Board on Article 4.4 of the By-Laws.

It was determined that a non-member of the DSA who, in some way, furthers the aims of the Society may be designated as an Honorary Member by the DSA Board.

Likewise, the title Fellow of the Society may be conferred by the Board on any DSA member who in some way significantly furthers the aims of the Society.

V Report of the Nominating Committee

The following were nominated as the Class of 1986 of the DSA Board of Directors:

Walter Berkmann	CT
Dr. John Impagliazzo	NY
Robert R. McPherson	FL
Gene Zirkel	NY

The following slate of officers was nominated from among present or proposed Board Members:

Chairman of the Board	Dr. Angelo Scordato	1985
President	Gene Zirkel	1986
Vice-President	Patricia Zirkel	1985
Treasurer	James Malone	1984
Secretary	Dr. John Impagliazzo	1986

The nominations were accepted by the membership and the Board of Directors, Class of 1986, was elected for a three year term.

VI The Meeting of the Board of Directors

As is our custom, the Annual Meeting was briefly adjourned while the new Board of Directors met. This meeting was chaired by Dr. Angelo Scordato.

The Board quickly elected the proposed slate of Officers without opposition.

The Board voted, apropos of discussion during the President's Report, that DSA Membership ranks will include the categories of Student Member, Member, Life Member and Fellow.

continued

1983 ANNUAL MEETING, *Continued*

Also apropos of the same previous discussion, the Board deleted Article 4.4 of the By-Laws and replaced this section with:

"The dues will be set by the membership at the Annual Meeting."

The Annual Meeting was then reconvened under the Chairmanship of President Gene Zirkel.

continued



(L-R, front) Pat Zirkel, John Impagliazzo, Alice Berridge.
(Rear) Gene Zirkel, Fred Newhall, Walter Berkmann, Vic Gany, Tony Scordato and Dudley George pause during the recently-held DSA Annual Meeting of 1983.

1983 ANNUAL MEETING, *Continued*

VII New Business

1. Dues

Gene made a motion to increase the DSA dues from \$6.00 to \$9.00 (U.S. Dollars) for the calendar year 1984, and to \$12.00 per calendar year as of January, 1985, with the option that membership may be renewed for up to three years prior to December 1, 1984 at \$9.00 per calendar year. Student dues will remain at \$3.00 per calendar year. Life Membership will be available at a cost of \$144.00. The motion was seconded and passed.

2. Volunteers

President Zirkel asked for volunteers to review books. Anyone who is interested should contact him at Nassau Community College. Tony Scordato volunteered to distribute our Bulletin to libraries in New York, Long Island, etc., as did Walter Berkmann for Connecticut. Gene is also looking for someone to help update the Society's files. Please contact him if you're interested.

3. Miscellaneous

Gene reminded all the Board members to submit a biographical sketch to Pat Zirkel for the Bulletin. He also expressed our thanks to Tony Scordato for serving on the Constitution Committee, Alice Berridge for accepting the position of Chairing the Organizing Committee for the 1984 Annual Meeting, Pat Zirkel for an outstanding job as Editor, Carmine DeSanto for serving as Secretary last year and James Malone for an excellent job as Treasurer.

4. Constitution

Tony Scordato reported that the new DSA Constitution is written and will be reproduced in time for the next Annual Meeting.

continued

1983 ANNUAL MEETING, Continued

The meeting adjourned at 12:21 P.M. for Lunch, during which the DSA Annual Award was presented to Jamison Handy, Jr., by Tony Scordato. (See article, page 14;)

The meeting was resumed at 2:10 P.M.

VII New Business, Continued5. 1984 Annual Meeting

Gene invited discussion as to the date of the next Annual Meeting. The consensus of the group was for an October date exclusive of the Columbus Day weekend.

Resolution: The next DSA Annual Meeting will be held on October 12 and 13, 1984. The place of meeting and format will be the same.

The motion was seconded and passed. Alice Berridge has graciously volunteered to handle the arrangements.

VIII Presentation, by Gene Zirkel

Gene gave a most interesting presentation on the topic of mathematical precision. He pointed out that a duodecimal fraction is more precise than a decimal fraction with the same number of significant digits, and he developed some guidelines for how many significant digits should be retained when converting a fraction into base twelve. His talk will be reprinted in a future issue of the Bulletin.

Discussion

1. Several interesting questions were raised by J. Handy with regard to the use of the method of computation outlined by Gene.
2. R. McPherson raised the topic of notation in a previous letter to Gene. χ and \mathcal{E} had been traditional, while it was agreed circa 1975 that * and # could be used. However, # is not common in Britain. Additionally, some adding machines and

1983 ANNUAL MEETING, Continued

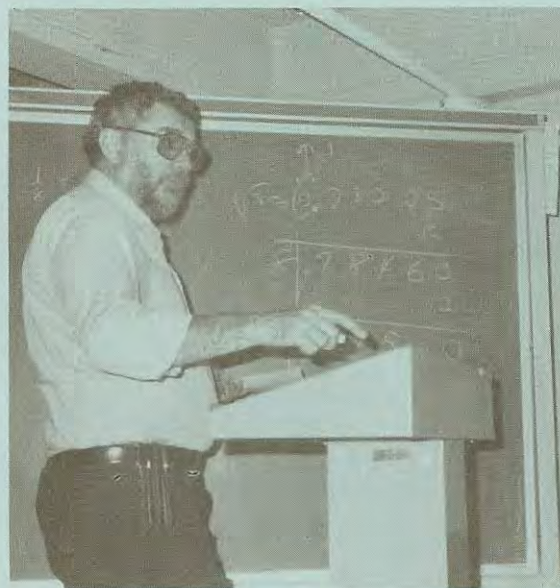
calculators mark "total" with * and indicate "not add" with #. In light of this, should we not return to χ and \mathcal{E} ?

Discussion ensued regarding the British use of \mathcal{Z} and \mathcal{E} .

The consensus of the group was that * and # should continue to be used for publication, while diversity is encouraged in general. χ and \mathcal{E} , and * and # are the two most popular conventions. * and # are preferred for publication since these are standard on U.S. typewriters.

3. J. Handy raised the topic of dozenal calculators, indicating that in the past several DSA members had owned custom-made calculators, or adding machines, which were capable of doing dozenal calculations.

W. Berkmann said that he knows someone who will make a circuit board, if supplied with the proper art work. This can be pursued individually by interested members.



Gene Zirkel emphasizes a point during his presentation on mathematical precision and duodecimal fractions.

continued

1983 ANNUAL MEETING, Continued

The meeting was adjourned at 3:45 P.M. with an invitation by Gene to members to visit the Dozenal Archives and the DSA Library collection, both of which are housed at Nassau Community College.

Respectfully submitted,

*Carmine DeSanto
Secretary (Outgoing)*

After these visits, several members took the opportunity to drop in on Long Island's famous "Cradle of Aviation" Museum, which is adjacent to the campus.



A large number of members, with spouses and guests, re-grouped for a festive banquet at the John Peel Room in Westbury, NY, later in the evening. This was the largest such banquet in recent memory and was enjoyed by all.

NEW DUES

You recently received a letter concerning our mailing list and noting the DSA's new dues policy. Dues are:

\$ 9.00 (US) for the calendar year 1984, which will become 12.00 (US) per calendar year on January 1, 1985.

You may pre-pay for one, two or three years (1984, 1985 and 1986) at the low rate of only \$9.00 per year up to December 1, 1984 only.

A LIFE membership is currently available for \$144.00, and Student dues are still \$3.00.

Please pay your dues today. Whether or not you are a dues-paying member, please don't forget to return the letter if you wish to remain on our mailing list. —



Members and guests relax following the Annual Banquet. —

ANNUAL AWARD PRESENTATION

At an informal luncheon attended by over a dozen DSA members, Tony Scordato made the following presentation to a surprised Jamison Handy:

"As you know the purpose of our Society is to conduct research and further public interest in dozenal mathematics and its applications. As a Society, we have had several levels of membership over the years---from aspirant through senior member to Fellow. However, one special honor has been reserved for those who have contributed in a major way to the literature, application or the enjoyment of the duodecimal system. This is the DSA's Annual Award.

The Board and Officers of the Society, after due deliberation, have this year selected one of our members for this distinguished honor. This award goes to a man who over many years has contributed to the aims and goals of the Society through his work on the Bulletin, "Dozenal Doings", and in a variety of other activities --- Jamison Handy!



Tony Scordato presents the 1983 Annual Award to Jamison Handy for his long and diversified service to the DSA.

ANNUAL AWARD, Continued

The text of the Award is as follows:

*The Annual Award
of the
Dozenal Society of America
is given to
Jamison Handy, Jr.
in recognition of his devotion to the Society
and to its ideals,
and for his service
as a Member of the Board of Directors,
as Editor of the Duodecimal Bulletin,
as Founder and Editor of "Dozenal Doings",
And for his many years of active participation
in the work of the Society.*

*Presented with Gratitude
By the Board of Directors*

1193;

1983

MEMBERSHIP LISTS

Thanks to a request by our Treasurer, Jim Malone, our Membership List has now been computerized. Lists are available to members who need them.

DUODECIMAL PRIMES

Charles W. Trigg
San Diego, California

Every integer >4 has one of the forms $6k$, $6k+1$, $6k+2$, $6k+3$, $6k+4$, or $6k+5$. Each of these forms, except $6k+1$ and $6k+5$, obviously is composite. Consequently, a prime integer must have one of the forms $6k \pm 1$. Thus, in the duodecimal system, primes terminate in 6 ± 1 or 10 ± 1 ; that is, in 5, 7, 1, or #. It follows that no duodecimal prime >4 can end in 3, 9, or any even digit.

The first 60 duodecimal primes are sequentially tabulated in Table 1. The frequencies of the various terminal digits follow the digits in parentheses: 1(15), 2(1), 3(1), 5(19), 7(18), and #(18). Seven of the primes are palindromes, namely: 11, 111, 131, 141, 171, 181, and 1#1.

The symbols representing three of these primes, 25, 81, and 225, represent squares in the decimal system. Also, 27 and 125 represent cubes. The 15 underlined symbols also represent primes in the decimal system. The 19 symbols, 2, 3, 5, 7, 15, 27, 35, 37, 45, 51, 57, 75, 107, 111, 117, 131, 141, 145, 147, 225, and 255, also represent primes in base eight.

continued



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

DUODECIMAL PRIMES, Continued

Table 1. Duodecimal Primes

1.	<u>2</u>	17.	57	31.	111	47.	195
2.	<u>3</u>	18.	5#	32.	117	48.	19#
3.	<u>5</u>	19.	<u>61</u>	33.	11#	49.	1*5
4.	<u>7</u>	1*.	<u>67</u>	34.	125	4*.	1*7
5.	#	1#.	6#	35.	12#	4#.	1#1
6.	<u>11</u>	20.	75	36.	<u>131</u>	50.	1#5
7.	15	21.	81	37.	13#	51.	1#7
8.	<u>17</u>	22.	85	38.	141	52.	205
9.	1#	23.	87	39.	145	53.	217
.	25	24.	8#	3.	147	54.	21#
#.	27	25.	91	3#.	<u>157</u>	55.	221
10.	<u>31</u>	26.	95	40.	<u>167</u>	56.	225
11.	35	27.	*7	41.	16#	57.	237
12.	<u>37</u>	28.	*#	42.	171	58.	<u>241</u>
13.	3#	29.	#5	43.	175	59.	24#
14.	45	2*.	#7	44.	17#	5*.	<u>251</u>
15.	4#	2#.	105	45.	<u>181</u>	5#.	255
16.	51	30.	<u>107</u>	46.	18#	60.	25#

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

Born in do one gro fourdo three (1143;), Mr. McPherson was educated in the public schools of Gainesville (1149; - 1159;) the University of Florida when it was educational (B.E.E., 1160;), M.I.T. (S.M. in E.E., 1167;), The University of Michigan (116X; - 1179;), and the University of Florida (1179; —). In 1149; he was puzzled by the break at nine required by the rules of arithmetic which he was being taught. The first systematic number was evidently thirteen, yet the systematic role was played by ten, for no useful reason. In 1158; or 1159; he learned that there were people who believed that twelve was a better number base than ten.

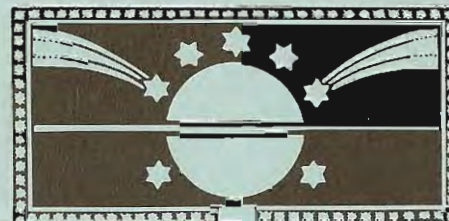
In do one gro fivedo el, after much exposure to metric system propaganda at the University of Florida, he read The Reverse Notation by J. Halcro Johnston, and then first realized what was wrong with the metric system - it was based on ten and used Arabic numerals without questioning their quality and suitability for the job of representing number and serving as a vehicle for computation within the applications of measurement made by human beings.

Mr. McPherson served in the U.S.N.R. (1160; - 1173;) and has been employed by the University of Florida (1162; - 1164;), M.I.T. (1164; - 1166;), Melpar, Inc. (1167; - 1169;) and the University of Michigan (116X; - 1174;). He founded the McPherson Laboratory for the use of the Hindu-Arabic-American Base - Twelve Numerals in do one gro sevendo nine and has supervised the computer programming operations of this laboratory, currently as a Non-paid Laboratory Inhabitant, Computing Laboratory, College of Business Administration, Univ. of Florida.

A member of the DSA for almost 3 dozen years, Mr. McPherson, member number 4#, was nominated by Tom Linton and subsequently elected to our Board of Directors at the Boulder, Colorado Annual Meeting a dozen and a half years ago. He has served faithfully on the Board ever since hosting the Society's Annual Meeting in Jacksonville, Florida just 9 years ago.

His interests in computers led him to write, "Exhibits of a Computer Program" published in this Bulletin, volume 1#, number 2, page 42.

He is also a member of I.E.E.E., The Society of the Sigma Xi, and Sigma Tau. —



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)

ORIENTAL DOZENS

Arthur Whillock (262;) of the DSCB sent us some pages from Measures, Weights and Moneys of all Nations by W.S.B. Woolhouse, published in 1890.

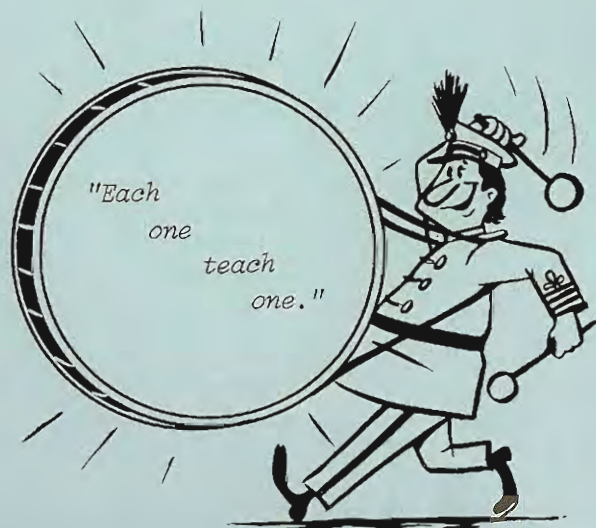
It includes the following:

China: The Pu or pace is about 66" and 360 Pu = a Li (about 660 yards). Also, 24 Chu = a Liang (1½ oz. av.)

Japan: 6 Shaku = a Ken (5.9653 feet)
60 Ken = a Chō (357.9163 feet)
36 Chō = a Ri (4295 yards or 2.4403 miles)

Of course, these were all given in base ten. We would write:

260 Pu = a Li
20 Chu = a Liang
50 Ken = a Chō, and
30 Chō = a Ri.



DOZENAL JOTTINGS.....

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

DON HAMMOND writes from Great Britain that their Schools Mathematics Project is due to phase out any number-base work from its syllabus and from all its exams in the near future. He writes: "They have always seen the threat to decimals inherent in such arithmetic -- as does the government here -- and are now determined to stamp out the remaining opposition. To illustrate the extent of official decimalization here, I may quote a Sunday morning TV programme for school pupils in which the presenter actually said: '...we don't bother with fractions any more -- they are obsolete, like Roman numerals, and equally useless.'".....RITA GILLIGAN, member number 252, writes in response to "An Unambiguous Notation" in our last issue, that perhaps Standard Unit or SU could be used to indicate the base. Thus, instead of writing $14_{12} = 16_{10} = 10000_2$ as D'14' = A'16' = B'10000', she suggests that we write SU12,'14' = SU10,'16' = SU2,'10000'. This gives the advantage of our not having to remember the codes for the various bases, but the disadvantage that SU10 is still somewhat ambiguous -- i.e., in what base is 10 expressed?.....EUGENE YEE, a student from Whitestone, NY, pointed out that the Roman abacus used decimals for integers but dozenals for fractions. He discovered this in Florian Cajori's A History of Mathematics. The seven left-most wires or grooves on the Roman abacus used four beads below the bar and one bead above the bar to indicate numbers from 0 to 9. These could be used to count from 0 to 9,999,999 in decimals. However, the eighth wire was used to express fractions and they used five beads below the bar to indicate the duodecimal fractions 0/10; 1/10; 2/10;... #/10. The ninth wire was divided into three parts and was used to indicate 1/20; 1/40; 1/60; and 2/60;. That is, each of the unit fractions 1/2, 1/3, 1/4, and 1/6 times 1/10;. Apparently, they didn't consider it important to have 1/5 of 1/10; even though five was one-half of their base! It would seem that our ancestors knew that while base ten might be adequate for use with whole numbers, base twelve was

continued....

DOZENAL JOTTINGS.....

easier to use when it came to fractions. Thanks, Eugene.....
 GENE ZIRKEL recently wrote to the American Metric Journal
 (a publication which prints both sides of the metric story)
 with a suggestion for an article. Their reply, from
 ROBERT A. HOPKINS, included the following: "Every single
 country including purists like South Africa modify and
 change (the SI) to conform with their own political and
 technical requirements. There is not one exception. The
 problem in doing a chart or breakdown is finding all the
 places each country varies. The automobile industry in
 France departs from the SI in several places. Manufacturers
 of household and kitchen utensils change something else but
 conform with the SI where the auto people vary. The schools
 teach it one way and the aircraft designers and government
 use it another. It changes with each industry and country --
 even in Russia. Japan and other Asian nations mix metric
 with inch/pound. Almost every country uses some inch standards
 and refuses to observe the same units, symbols and practice
 used by others...Many government offices deny there are
 modifications within their country. They have agreed to
 follow the SI and cannot afford to admit they don't".....
 Thanks are in order to GEORGE ZIRKEL, 253; for labeling,
 folding and inserting dek dozen letters requesting dues
 payment. (By the way, have you paid your dues yet?).....
 As of November, our newest member was number 284; Professor
 KATHLEEN McKIERNAN. We also enrolled two fifth graders from
 Acton, Massachusetts recently -- ANDE DRAKE and TODD CARLEY.
 Welcome one and all!.....Why not invite a friend or a
 colleague to join the DSA?.....

end



Remember - your gift to the DSA is tax
 deductible.

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 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.

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 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 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 measurements. 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'
<u>96</u>	<u>3#2</u>	<u>Two ft. eight in.</u>	<u>2;8'</u>
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 $12 \overline{) 365}$ is two dozen and eleven. For larger numbers, $12 \overline{) 30} + 5$ keep dividing by 12, and the successive remainders are the desired dozenal numbers. $12 \overline{) 2} + 6$
 $0 + 2$ 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 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 \$9 (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 _____

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Annual Dues \$9.00 (US)

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

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School _____

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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

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