COUNTING IN DOZENS

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

Our common number system is decimal - based on ten. 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.

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	*3Ɛ2*	Two ft. eight in.	*2;8'*
19Ɛ	*1000*	Eleven ft. seven in.	*Ɛ;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 *2Ɛ*, which is two dozen and eleven. For larger numbers, keep dividing by 12, and the successive remainders are the desired dozenal numbers.

```
12 ) 365
  12 ) 30  + 5
    12 ) 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 X, and the successive remainders are the desired decimal number.

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

Numerical Progression

1	One		
10	Do	*;1*	Edo
100	Gro	*;01*	Egro
1,000	Mo	*;001*	Emo
10,000	Do-mo	*;000,1*	Edo-mo
100,000	Gro-mo	*;000,01*	Egro-mo
1,000,000	Bi-mo	*;000,001*	Ebi-mo
1,000,000,000	Tri-mo	and so on.	

Multiplication Table

1	2	3	4	5	6	7	8	9	X	Ɛ
2	4	6	8	X	10	12	14	16	18	1X
3	6	9	10	13	16	19	20	23	26	29
4	8	10	14	18	20	24	28	30	34	38
5	X	13	18	21	26	2Ɛ	34	39	42	47
6	10	16	20	26	30	36	40	46	50	56
7	12	19	24	2Ɛ	36	41	48	53	5X	65
8	14	20	28	34	40	48	54	60	68	74
9	16	23	30	39	46	53	60	69	76	83
X	18	26	34	42	50	5X	68	76	84	92
Ɛ	1X	29	38	47	56	65	74	83	92	X1

The Duodecimal Bulletin

Whole Number 26

Volume *13*, No. *1*
August 1959 (*1172*)

THE DUODECIMAL SOCIETY OF AMERICA

20 Carlton Place ~ ~ ~ ~ ~ Staten Island 4, N. Y.

THE DUODECIMAL SOCIETY OF AMERICA

is a voluntary nonprofit organization 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.

Full membership with voting privileges requires the passing of elementary tests in the performance of twelve-base arithmetic. The lessons and examinations are free to those whose entrance applications are accepted. Remittance of $6, covering initiation fee ($3) and one year's dues ($3), must accompany applications.

The Duodecimal Bulletin is the official publication of the Duodecimal Society of America, Inc., 20 Carlton Place, Staten Island 4, New York. F. Emerson Andrews, Chairman of the Board of Directors. Kingsland Camp, President. Ralph H. Beard, Editor. Separate subscriptions $2.00 a year, 50¢ a copy.

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The Duodecimal Bulletin

All figures in italics are duodecimal.

MEETING OF THE BOARD
AND
ANNUAL MEETING
28 MAY 1959

Our meetings were held this year in the Carnegie Endowment International Center, 345 E. 46th St., New York City. This is at the corner of 46th St. and United Nations Plaza, just across the street from U. N. Headquarters. The Center was established to facilitate the operations of non-profit organizations concerned with international affairs and human welfare. Since the U. N., and especially UNESCO will become increasingly important to the Society, it is hoped that our use of the Center will foster the growth of our mutual relations and co-operation.

The reports of our officers record a year of continued progress. The schools have increased their requests for our literature. This is now listed in six of the national guides for mathematics teachers. There have been two issue of the Duodecimal Bulletin, and over 5000 sets of our material have been distributed.

The interest in duodecimals among Esperantists is evidenced by a gift from an anonymous donor of $100 for the joint promotion of Esperanto and duodecimals. President Doneis, of the Esperanto League for North America, agreed with us, after reviewing how this might best be applied, that the entire donation should be used for the preparation and distribution of an Esperanto edition of An Excursion in Numbers, Mr. Andrews' popular pamphlet. This new Ekskurso en Nombroj supplements our previous leaflet, Antipatio al Aritmetiko, and we are also preparing an Esperanto version of our Society's folder. We expect an active response from the announcement of these new publications in the Esperanto journals.

Esperanto is quickly and easily learned because of its simplicity and complete regularity. It makes neighbors of all the world, and our members are urged to learn this attractive language to help the growth of duodecimal interest among all peoples. Esperantists are active correspondents, - Americans are insatiate travelers, - and our more intimate acquaintance will be mutually profitable.

The report of Treasurer Humphrey shows expenditures for the year of $2060 against receipts of $1230, which included donations of $860. Therefore, again, we were forced to draw on our Endowment Fund to meet the costs of our operations.

This is a matter of grave concern. Every effort is made to keep our undertakings within practical limits. But we have accepted the responsibility of meeting the public demand for information about duodecimals. Our budgets amount to about $20 per member. It would not be practical to expect that dues in this range would permit us to develop the desired growth in membership. Already, the major part of our expenses is supplied by the donations of a small group of devoted members, and we gratefully acknowledge our great debt to them. We have considered the establishment of special grades of membership with higher dues, - but this does not seem advisable until we have many more members than now. Thus, we have to ask that more of our members support our work by additional gifts to the extent they find possible. Our financial basis is sound, but we must increase our receipts to balance our current expenses.

The death of our fellow-director, Lewis Carl Seelbach, on September 30th, 1958 is a loss that will long be felt. He left his property to the Society, and his extensive library to Ralph Beard, - eventually to become the library of the Society. His residence in Buffalo has now been sold, and Beard, as executor, estimates the estate to increase our Endowment Fund by about $9000.

The Seelbach Library is now housed in the top floor of 20 Carlton Place, and the books have been roughly classified as they were shelved. It is not planned to catalog the books at this time, but satisfactory reclassification will require several years. There is a wide range of subject, with concentrations in religion, accounting, mathematics and Esperanto. Material of no value to our purposes will be gradually disposed of, and further material will be acquired where there is now scant representation, as in science.

It gives us great pleasure to be able to announce the formation of the Duodecimal Society of Great Britain, with about seven members and a small treasury. Its Executive Secretary is Brian R. Bishop, 106, Leigham Court Drive, Leigh-on-Sea, Essex, England. The modest literature of the society, modeled on ours, will be amplified as means permit. We extend heartiest welcome and good wishes to our companion society. It already has our eager co-operation.

The year has been notable in the extensive travels of our officers: Mr. Andrews to Australia, New Zealand, China, Japan, and the islands of the Pacific, - Mr. Camp and Mr. Humphrey through the western states. Their trips have profited the Society in many new friends, increased duodecimal activity, and valuable publicity.

The circular duodecimal slide-rules so well produced by Tom Linton, have met with little demand beyond the initial sales. We had priced them at $10, but we have decided to make the price $5 in order to get the remaining rules into hands that will use them, and thus stimulate the demand for a more refined version of the rule. Tom Linton has also worked with Jamison Handy, Jr., to produce a standard data sheet for the Society, to facilitate the reproduction and distribution of sets of such reference data among the active dozeners. Blank sheets will be supplied on request.

The Annual Meeting of the membership convened at 8:30 P.M., in the Terrace Lounge of the Center. It was a warm, clear, moonlit evening, and the view from the Terrace of the East River, Long Island Sound and the United Nations buildings was movingly beautiful. President Camp had the officers deliver their report as detailed above. On the recommendation of the Nominating Committee, the Directors of the Class of 1959 were re-elected as the Class of 1962, with the addition of Charles S. Bagley, 1314 Ohio Ave., Alamogordo, New Mexico. The Nominating Committee was asked to continue as the Nominating Committee for 1960.

On a motion by Mr. Andrews, the following resolution was formally adopted:

Whereas Lewis Carl Seelbach died of a heart attack September 30th, 1958; and

Whereas Mr. Seelbach has been a valued member of this Society since 1944, the year in which it was incorporated, and recently a member of its Board of Directors;

The Society wishes to express its sense of loss and to record its appreciation of his long and significant service to the Society, and to duodecimal counting.

The Society wishes to record also its deep appreciation of the fact that Mr. Seelbach made the Society the principal beneficiary in his will.

The gift included cash and property which will be of great benefit to us in the years ahead, and will serve as a lasting remembrance of his membership among us.

Be it further moved that a copy of this minute be transmitted to the close members of his family, and to the Occidental Lodge, #766, Free and Accepted Masons, of which he was a Life Member.

It has been planned that Henry C. Churchman would deliver the talk of the evening on his "Doremic Dimensions". However Mr. Churchman was unavoidably prevented from attending the meeting, and Mr. Beard gave a resume of Mr. Churchman's paper on the subject, which appears elsewhere in this issue. Thereafter, our official business being finished, the meeting dissolvèd into complete informality with the serving of the refreshments, and all became absorbed in the shifting friendly discussions we so much enjoy.

WILLS AND BEQUESTS

The Society acknowledges gratefully the receipt of a substantial cash payment from the estate of Lewis Carl Seelbach, who bequeathed to us the residue of his modest estate so that an interest that occupied much of the flagging energies of his later years might be further aided after his departure.

The purposes of the Society are of long range. They will require many years for their accomplishment. If we are to make substantial progress, permanent headquarters will be needed for the Society - manned by a small paid staff of excellent ability.

It has occurred to us that others, in addition to Mr. Seelbach, may wish to participate in the longer future of the Society. They may provide in their wills that the Society shall have a share of what they can't take with them. This desire can be embodied in a simple paragraph:-
"I give and bequeath to the Duodecimal Society of America, Inc., (a New York corporation), ..."

Because of the tax-exempt status granted to the Society, bequests and contributions are deductible in computing the net amounts subject to federal taxes.

Reprint from THE OREGONIAN, SUNDAY, APRIL 19, 1959

5 TIMES 5 TO EQUAL 21—UNDER PLAN SPONSORED BY SOCIETY FOR BASE OF 12

If man had had six fingers, Kingsland Camp (left), president of the Duodecimal Society of America, would have had no problem. We'd all be counting by 12s, which he and other society member believe a better numerical base than 10. Fred E. Miller, Portland member of the society, loaned a finger to help demonstrate the point.

Things would have been a lot better for the mathematicians of the world if man had started out as a six-fingered, six-toed creature in the view of Kingsland Camp, a New Yorker who visited in Portland Friday and Saturday.

Camp is not alone in his view, for he is national president of the Duodecimal Society of America — an organization dedicated to the task of replacing the common decimal numerical system, based originally on the 10 fingers on which man did his first counting, with a system based on 12.

To people who feel as Camp does — and there are many mathematicians and engineers who do — 12 is simply and logically a better number to work from than 10. There are a number of reasons, the most apparent of which is the divisibility of the dozen. Twelve can be divided evenly by twice as many numbers as 10.

Camp, profesionally an insurance actuary and "somewhat of a mathematician," explained the benefits of "dozenal arithmetic" as he sat on a davenport in the home of Fred E.Miller, 3122 SE 73rd Ave., a telephone company engineer who has become interested in the duodecimal system.

Dozen Most Natural

"It is one of the most natural things in the world to work on the basis of 12 rather than 10," said Camp. "Grocers have found it so for centuries. Eggs are sold by the dozen. They used to sell things by the gross - a dozen dozen. And by the way, that's how we get the word 'grocer.' From gross. They used the dozen because there are four ways to divide it. How would you sell a third of 10 eggs?"

Continued use in the English speaking world of a system of linear measurements based on 12—the inch, the foot and the yard—was noted by Camp as another indication of the natural utility of the duodecimal system.

In most of Europe the arbitrary metric system based on 10 and its multiples is in use, but Camp maintains that even Napoleon, under whose regime it was put in effect, didn't like it.

To achieve the 12-based system, the Duodecimalians have transplanted the figure 10 to the place 12 used to be (to retain the essential zero symbol) and given it the new name of "do" (for dozen). The old 10 becomes X, pronounced "dek" and the old 11 becomes a sort of script E named "el." Then 11 (now one dozen and one) is the old 13.

A complete arithmetical system has been devised. In dozenal arithmetic they add to a dozen before carrying one.

3 Times 4 Equals 10

The multiplication tables might throw you at first. Two times two is still four. But 3 times 4 equals 10 (one dozen) and 5 times 5 equals 21 (two dozen and one).

For people whose age is beginning to scare them every time they have to mention it, the duodecimal system could be a great boon. Jack Benny's 39 would become 33 (three dozen and three).

More and more engineers and scientists are becoming interested in dozenal arithmetic, said Camp. "Those of us who frequently have to divide by thirds and fourths are most interested," interjected Miller.

Please turn to page 8

THE SCIENTIFIC SELECTION OF UNITS

by Thomas M. O'Neill
5911 Goliad, Dallas 6, Tex.

The same principle should apply to the choice of basic units, as prompts our preference for duodecimal arithmetic - facility in calculation.

For example, we of the Duodecimal Society are almost all agreed on a basic measure of distance that happens to exceed only slightly the current nautical mile. *10 000** (do mo) such duodecimal miles equals the circumference of the earth. Then, treating the earth as a perfect sphere, spherical trigonometry with duodecimal angles and functions will give any distance on earth in duodecimal miles directly, by merely pointing off places. With a result reckoned in degrees however, it is necessary to multiply by sixty to find it in nautical miles, or by sixty-nine to find it in land miles.

The above illustration purposely overlooks the earth's true shape, a slightly oblate spheroid. Should we prescribe the equatorial, the polar, or some intermediate circumference as a basis for our duodecimal mile? For most practical purposes this does not matter, but if a particular one of them would be easier to use in the involved formulas based on the spheroid, that one should be selected, since it would facilitate calculation.

As an illustration from the field of chemistry, take a table giving the atomic weight and the isotopic mass for each of 177 substances. By present practice the unit of isotopic mass is so chosen that for 146 items in the table, it is only a very small fraction less than the atomic weight, which is always an integer. This makes it necessary, in calculating isotopic mass in chemical formulas, to do multiplication by a number of factors that teem with 8's and 9's; in duodecimals the same factors would be full of *X*'s and *Ɛ*'s, of course.

Obviously it would be better to assign a somewhat smaller basic unit of isotopic mass and have the corresponding figures for the different substances come out as small fractions greater than the corresponding atomic weights.

A unit is proposed that leaves only five substances with isotopic mass less than atomic weight; the rest are nearly all slightly in excess. This unit is called the "mun" unit; ("u" as in Esperanto, pronounced like *moon* in English).

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**10,000* is the duodecimal equivalent of the decimal 20 736, while 360 x 60 = 21 600, the decimal number of nautical miles around the earth at the equator; duodecimally, that value is *10 600*.

Whether or not we adopt this name, we would certainly do well to adopt this basic unit of isotopic mass in our duodecimal tables. It would further our case in the scientific world.

Now consider elementary physics. It would be desirable to assign gravity under standard conditions a value of unity to simplify many calculations. Take up first the components of this value. Let a day be 1 Tag, (the German word), and *0.000 01* day be 1 Taf; this is slightly over a third of a second as we now measure time. Then call *0.001* duodecimal mile, 1 space measure, - equivalent to 46.55 in. or 118 cm. Then the acceleration by gravity is 1 space measure per taf per taf. (Corresponding with 32.172 ft. per sec per sec.)

The "mun", the unit of isotopic mass is defined above. Let 10^{10} of such units be the standard unit of mass, (call it 1 "d-mun"), for practical economic transactions. At sea-level gravity values, this comes to about .598 (*.72*) pounds, called 1 "fe", (as in Santa Fe). The work done in lifting this unit weight 1 space measure is called 1 fe-space measure, (or fe-sm), as we would speak of a "foot-pound".

Thus, relating our units of length and time to arrive at a "unity" value for gravitation would tremendously simplify the calculations that pervade so much of our scientific work. This simplicity would even render mental estimation of the resultant values possible.

Summarized by Kingsland Camp

5 TIMES 5 EQUAL 21

(Continued from page 6)

Hope Springs Eternal

Aware that it will take a little bit of doing to supplant a system as ingrained as the decimal numerical system, Camp says the Duodecimalians haven't lost heart.

"It's no more drastic a change than the change that was made from the old Roman numerals. Once it was against the law through most of Europe to use Arabic numerals and the positional notation made possible by the zero symbol. But it won out. Merchants used to do their arithmetic in the backroom and then translate the answers into the legal Roman numerals."

Camp has been unhappy because newspaper articles usually "spoof" the society and never tell where it is located.

So if anybody wants to know more about what the boys in the backroom will have, the address of the Duodecimal Society of America is 20 Carlton Place, Staten Island 4, N.Y.

EXERCISE IN ARITHMETIC

by F. Emerson Andrews

The Professor was teaching the Aspirant the simple operations in duodecimals.

"Now," said the Professor, "we will try a few tricks in ordinary division. Set down any three-digit duodecimal number, "but don't let me see it."

The Aspirant set down *823*; but you are invited to set down a quite different number, which the Professor really can't see.

"Now make that a six-digit number by repeating the same three digits."

The Aspirant now had *823,823*; set down your own different one.

"Now I'd be willing to take a small wager that this number which I've not seen, is evenly divisible by *7*."

The Aspirant tried it: *823,823* ÷ *7* = *120,639*. (Does your number also divide evenly by *7*?)

"Well, you were lucky," said the Aspirant. "It does divide evenly. But after all *7* is one of the lower primes in the duodecimal system, as in ordinary arithmetic, and you had exactly one chance in seven of being right."

"If that's how you feel about it," said the Professor, "I'll let you take another number in the same way, and this time I'll take a much larger divisor--also a prime, if you wish--and if I'm wrong, you get a dollar; if I'm right, you contribute a dollar to the Duodecimal Society treasury."

"It's a deal," said the Aspirant. "You can be lucky once, but not twice in a row."

The Aspirant set down another very tricky three-digit number, and doubled it into six as before; but this time we are not revealing his number. Make your own.

"I haven't seen your number," said the Professor, "but it is evenly divisible by--let's see--let's say, *17*."

(Try your number.)

"Thank you," said the Professor, gathering up the dollar "The Society will be glad to have this contribution. Are you still unconvinced?"

"You *could* have been lucky twice," said the Aspirant, "though certainly the chances are against it. Maybe there's some trick in 12-system counting and a six-digit number."

"Perhaps," said the Professor. "Would you like to pick a four-digit number, expand it to eight digits in the same way, and gamble once again? I'll tell you what: this time I'll put my divisor on this slip of paper before you even set your own number down, so I can't possibly know your number. Is that fair?"

"Done!" said the Aspirant. "And how about two dollars on this one, so I can get my money back?"

"Two dollars, if I lose, out of my own pocket," said the Professor. "And if I win, your two goes to the Society. Now I've put my divisor on this slip of paper. Put down your number."

The Aspirant put down a four-digit number, and you are invited to do so; he doubled it into eight digits by repeating the original number. Then he opened up the Professor's slip. It read, *175*.

"Thank you," said the Professor, gathering in the two dollars.

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If you can't figure out why the Professor was so lucky, turn to Page 12.

BOOK REVIEW

DUODECIMAL BOOK with TABLES, by L. A. Poulden, 2nd Edition, Cleaver-Hume Press Ltd., London, 1959. 320 p. 15 s. 1st Edition 1951.

This excellent manual of the multiplication tables for computations in feet, inches, and successive twelfths, - expressed in the decimal notation, - has earned its way among the surveyors, architects, builders and engineers in England, where the continued use of the duodecimal relation between pence and shillings has influenced a greater use of computations in feet, inches and fractions of an inch than is current in America.

Even in America, where some similar practice is found in certain trades and industries, this manual will have practical value, and will aid to eliminate error. For such use, the tables are clear and comprehensive. The directions given for their application are simply stated to facilitate general use.

The tables, which absorb all but the first tenth of the book, are finely indexed.

Ralph H. Beard.

The Duodecimal Society

of Great Britain

106, Leigham Court Drive, Leigh-on-Sea, Essex

The new banner above was unfurled to the British skies as the letterhead of our new British companion in the work of educating the world in the use of dozenals in April 1959.

In many ways, England, "the mother of parliaments," is also the mother of duodecimals. Many British names illumine the long roll of those who have recognized the superiority of the dozen, - and Britain has been the outstanding opponent of decimalization for many generations.

Both England and America suffer from inadequate integration of their standards of measure. Only two practical remedies are available for them:

(P) The weak adoption of the French metric system, with its inescapable confinement into only partial systemization, and to a stultifying system of numbers; - or

(Q) The stimulating choice of re-basing their numbers upon the ideal Dozen, and, - by modifying their fine, naturally-evolved standards of measure only slightly, - establish the consummate dozenal metric system, with its relaxing flexibility and complete applicability to all measurement.

There is a creeping contagion in the world for conforming to the decimal base in currency and measures. Only energetic initiative and purposed organization can halt it. Lazy minds and limited visions must be awakened to the new freedom and expanded horizons of the dozen system.

This is a difficult undertaking. But an undaunted group of our British cousins have taken it on. They have now "put their foot in the road" that leads to a brighter tomorrow for all men.

Blow the Whistles! Ring the Bells! Dance in the Street! We hail their coming into the fine comradeship of the pugnacious pioneers who fight for the new freedom of mind and method.

FUN FOR METRIC DECIMAL ENTHUSIASTS

by Jamison Handy, Jr.

The fundamental "cgs" (centimeter-gram-second) and the "mks" (meter-kilogram-second) systems of decimal metric units, differ in order of magnitude. The first appears most used in "pure" scientific work, and the latter, wherein the magnitudes of many derived units are more convenient for practical work, is more often used for engineering in the metric system. (An exception to both is metric mechanical drawings, where it has been found that errors due to confusing units and decimal points are minimized by having all dimensions in millimeters, whether a locomotive or a watch part.)

The amusing point to note is that the only common unit in magnitude is not even "metric" at all in the sense that it is derived in some decadal manner from some more fundamental natural or arbitrary standard. The second (as a measurement of time) is defined as 1/86,400 part of the mean solar day, and is identical to the time unit used in U.S. customary or English system of units. Perhaps it is a pity that it wasn't taken as 1/100,000 part of a day, or ten "microdays" for metric usage, but nevertheless the customary second did survive in acceptance as the fundamental unit of time. This unanimity with plenty of inertia should discourage any serious proposal to change it. When finer divisions of time than the second are required, metric derivatives are used, viz:

1 millisecond = .001 seconds

1 microsecond = .000,001 seconds

However, I haven't heard even the most ardent metric enthusiast build up the opposite direction, where:

1 kilosecond = 16 minutes, 40 sec.

1 megasecond = 11 days, 13 hours, 46 min. & 40 sec.

So, just for fun, when one of us runs into a super-decimal enthusiast, don't argue with him. Have fun by showing you are adaptable and can even overdo going his way.

Examples:

If you have a scientific minded boss who allows you fifteen minutes for a coffee break or time out, ask if you can have a kilosecond....a convenient word to have at your tongue-tip when you want an extra minute and two thirds.

Don't ask for a week off; ask for a megasecond! I can hardly think of a more convenient compact word when what you really mean is 11½ days, with an hour and three quarters, plus an extra minute and two thirds to boot.

If you are on the other side of the fence, and a fellow wants two weeks, and you don't wish to allow that much, give him a megasecond. This is still more generous and more specific than ten days!

Extract from LIPS—KITH, A WORLD LANGUAGE

by Joseph Scarisbrick, 1919

. . . If the world today were about to scrap its current method of calculating, with a view to making a fresh start under better conditions, it is certain that the new scale of notation would no longer be decimal, but duodecimal. So marked is the superiority of the latter, at any rate for modern peoples who are civilized and know something of the properties of numbers, that to furnish proof of its superiority is superfluous.

There is reason to believe that the Jews, early in their racial history, used the numerical base twelve, and not ten, as we do. Difficulties connected with reconciling scriptural chronologies will apparently never be surmounted until full allowance is made for the difference of numerical bases employed long ago by Jew and Gentile respectively. Among the changes wrought in Israel and Judah, in their exile of the 8th and 9th centuries, B.C., which brought them into prolonged and close contact with alien races and systems of thought, it is probable that their change of numeral scale from twelve must be included.

A duodecimal scale would be superior to one that is decimal. It would be a little harder to use, but its figures would be fewer. Many numbers which are fractional in our scale of ten, would be whole numbers in one of twelve, and while ten is divisible only by 2 and 5, twelve divides by 2, 3, 4, and 6, the divisors being increased 100% but the scale only 20%.

(submitted by Brian R. Bishop)

EXERCISE IN ARITHMETIC

(Continued from page Ӿ)

The Professor couldn't miss. He knew that creating a six-digit number by repeating the first three digits is the same as multiplying the original three-digit number by *1,000* and adding the original number, or actually, original number x *1,001*. Now it happens that *1,001* is divisible evenly by *7, 11, 17*, and their multiples, such as *77, Ɛ1, 187*, and *1,001* itself. So *any* number the Aspirant chose would be divisible by any of those factors.

As for the eight-digit number, it happens that *10,001* is evenly divisible by *75* and *175*.

For ten-system mathematicians, the same trick is available for three-digit numbers expanded to six if you remember that 1,001 is decimally divisible by 7, 11, and 13.

DOREMIC DIMENSIONS

(Continued from page 24)

40045.6286208 kilometers precisely. This assumed length of a great circle is not wholly unrealistic, a meridian great circle of the earth being presently estimated as equal to 40009.15 km. and the equatorial great circle having a value of 40076.59 kilometers.

Its desirability may be questioned but the existence of a great circle of the earth equal to 40,045,628,620,800 microns can not be doubted. It is the length of one dominaire dimension, and the equal of *f38 000 000;0* units. It should be a strange welcome indeed if it were accepted without objection. Nonetheless, its dozenal fractions may be found in "le naire arc," the fut, the metron, the palm, the foot, the inch, and the millimeter. It is doubtful that the atmosphere in which we breathe and which surrounds the earth can be said to be more universal.

DOREMIC DIMENSIONS

by Henry C. Churchman

Dimension is possibly the oldest thing in all creation. Some two dozen gross or regroup years ago it was being said among descendants of Abraham (later gathered so beautifully in Proverbs *8;1Ӿ-2Ɛ)*: "I was present when with a certain law and compass He enclosed the depths; when He established the sky above, and poised the fountains of waters;" and, again, "I was set up from eternity, and of old, before the earth was made; the depths were not as yet, and I was already conceived; neither had the fountains of waters as yet sprung out; the mountains with their huge bulk had not as yet been established; before the hills I was brought forth; He had not yet made the rivers, nor the earth, nor the poles of the world."

Only with establishment of the depths came a need for dimension, then perhaps tension, temperature, etc., and, eventually, time began with the movement of this earth through some small portion of the depths, governed by natural laws which we are still trying to fathom, to probe, to learn from facts determined in the geophysical year just ended, *1171;00-1172;00*. Decimally, we say 1957-1958, of our common era.

Here I speak of only three of the dozens of diverse systems of terrestrial dimension either living, long perished, or yet unborn. One of these imitates the length of a king's foot (and is not a king's foot), another imitates a meridian quarter circle of the earth (and is not a meridian quarter circle), and the third *assumes* a great circle of the earth precisely equal to 40,045,628,620,800 microns and called one dominaire dimension.

Possible Classifications of Dimension

Let us first indulge in a short review of common metric and dometric terminology as employed to describe dimensions in the world of today.

The common dofut scales (see p. *1Ӿ*) might be considered as included among the common dometric terms, since they are dozenal divisions and multiples of the popular denominate number dimensions of foot, inch, and line.

Other common dometric dimensions, without question, are the dozenal divisions of the common yard and palm.

In one effort at classification we might group in the popular or common scales of dimension all extensions of the meter, yard, foot, and any other existing denominate number dimension normally using either decimal or dometric terminology; and in the scientist's scales of dimension only those terms which bring into reality for future use the dozenal base divisions and subdivisions of a great circle of the earth known as a dominaire dimension.

The scientist's dimension scales require not only a knowledge of duodecimal arithmetic but comprehend new dozenal dimensions and nomenclature (of which the doremic nomenclature is one expression).(1)

In the metric and in certain of the dometric common systems we may find stems to denote a type of measurement (meter, liter, gram, fut, gal, pound, etc.), to which are attached prefixes to indicate the quantity (such as centimeter, hectoliter, kilogram, dofut, regal, edopound, etc.). Similarly, in the dometric scientists scales we use stems to denote type of measurement (naire, metron, die, etc.), while prefixes are attached to indicate the quantity (such as minaire, dometron, credie, etc.).

Another possible classification which may prove helpful would group universal terrestrial dimensions by decimal and dometric terminology, and subdivide the dometric terms between the common and the scientist's (the current and the future) scales.

CURRENT APPROACH

Decimal Systems
Common Foot Dimension

The U.S. common foot dimension and 30.48 centimeters are equal in this paper. Three feet are equal to one common yard, and, in terms of the meter, 91.44 centimeters precisely.

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(1) For not unlike, yet independent, published thought by others see Jean Essig's DOUZE NOTRE DIX FUTUR, Dunod, Paris, 1955, Annex No.5 Unites de longueur, 1 duodecimal duodecimeter (compare 1 edominaire arc) equals 0.93 dm plus, 1 duodecimal meter (see 1 eminaire arc) equals 1.11 m plus, 1 duodecimal kilometer (1 naire arc or mile) equals 1.9 km plus. Also see Horatio W. Hallwright, DUODECIMAL BULLETIN July 1956, page 6, A Duodecimal Notation, 1 domotree (compare 1/2 naire arc or mile) equals 3168 feet, 1 gromotree (see 1/2 edonaire arc) equals 264 feet. Also see Charles S. Bagley, DUODECIMAL BULLETIN August 1958, page 2X, Redivivus Reckoning. 1 navinaut equals *f3800;0* and its decimal equivalent equals 6336 feet.

The foot scale employs no prefixes but uses a different stem word for each step above or below the foot. It is older than any one of the other scales here discussed. Although its length has varied slightly from one to another early English reign (and even in our own day), this dimensional system predates the metric scales by a dozen and more centuries and had its origin without doubt in the twelve inches (uncia) brought in by the Romans during their occupation of Britain.

The foot is equally useful in carpentry, in architecture, and in surveying and map making. Over the years it has gradually tied in with the rod, the acre, the furlong and the section of land, in farming and surveying; and 6080 feet is commonly used as the length of the nautical mile.

Decimal Foot Scale

12 lines equal one inch.
12 inches equal one foot.
12 feet equal one dofut.

3 feet equal one yard.
220 yards equal one furlong.
8 furlongs equal one statute mile.

16½ feet equal one rod.
4 rods equal one chain.
80 chains equal one statute mile.

320 rods equal one statute mile.
1760 yards equal one statute mile.
5280 feet equal one statute mile.

6080 feet equal one nautical mile.

6336 feet equal one naire mile.
2112 yards equal one naire mile.
384 rods equal one naire mile.
96 chains equal one naire mile.

In the ordinary yardstick, or foot rule, the inch is commonly divided into fourths, eighths, and sixteenths. Among surveyors, metrologists, etc., the inch and the foot are sometimes broken down into ten or one hundred equal parts. And among machinists and others requiring micrometer dimensions, the inch has been divided into its ten thousand or ten million equal parts.

There is no law against taking the foot or the inch and dividing it into its ten million equal parts. Equally, it is no breach of law to multiply or to divide the foot or the inch by any power of twelve, plus or minus, In fact the dofut scale (see below) does just that, to achieve precise fractions by decimal method equal to two-thirds, one-half, one-third, one-fourth, one-sixth, nine-twelfths, four-thirds, etc.

Common Meter Dimensions

The stem word to denote dimension in the common metric system of measurement is called one meter, which was once said to equal 39.37 U.S. standard inches. One U.S. standard inch is equal to 2.54 centimeters precisely, where any reference is made in this paper to an inch or to a centimeter. And 100 centimeters equal the meter.

The common metric system is associated with a decimal base division of a supposed one-quarter of a meridian great circle of the earth. That distance was said to equal 10,000,000 meters when the system was set up, but was some 2,288 meters (more than two kilometers) short. The metric system today, for sake of stability, ignores the error; but the end result is that the French meter possesses no greater natural or inherent stability than the English foot. Nevertheless its empirical value is great.

Prefixes to be attached to this stem word and which describe decimetric quantities are, for general use, as follows:

myria	10 000	units
kilo	1 000	
hecto	100	
deka	10	
	1	unit
deci	1/10	part
centi	1/100	
milli	1/1000	

In the decimetric system, we conceive a length of one millimeter to be equal to 1/1000 part of one meter. We understand the length described as one kilometer to be the equal of 1000 meters.

This system, if it were nothing else, is so simple it should be forever praiseworthy, except for its inherent inability to subdivide a circle. That constitutional defect, I believe, will one day choke off its breath, and the decimal systems of measurement will be taught only in the backward areas of the earth where people eschew footwear. The only constitutional amendment possible would appear to be the elimination of decimals. In other words, the decimetric system is marked. Nevertheless, do not come running for shovels to bury the dead, for no person now living, I venture to say, will see the end of the decimal system of arithmetic, nor will it drop dead, like one with a heart affliction, at an international conference.

Dometric Systems of Dimension

For many generations, perhaps, the decimal and the duodecimal systems of arithmetic must live side by side, and only future historians will be able to say in what regroup of years the dozenal system became dominant and manufacturers ceased to produce decimal adding machines. The date of this change is unknown to you and to me, but its arrival, I believe, is as certain as the assessment of death and taxes upon all humanity and all human activities.

The age in which tradesmen outgrew the binary system of mental arithmetic, in which they divided a group of like objects in two equal parts or shares by counting "own", "to you", "own", "to you", which later became "one", "two", as they advanced into a quinary system; and the age in which they began counting upon their ten fingers (oh how modern must have been their modest feelings); all of this is lost in history. What, therefore, leads us to believe that decimals are the ultimate system of counting? Ten minutes of *thinking*, one little eredie of time (equal to a coffee break) devoted to the exercise of our reasoning powers, should persuade us that if bakers and producemen and other merchants find it more convenient to bunch units by the dozen, why shouldn't mathematicians? Are all mathematicians herd-bound, old fashioned Hapsburgs, who still refuse to experiment and to advocate an improved method of reckoning? If that were so, many heads would roll; but most mathematicians are more alert to progress than in many other sciences. I rather think it is their freedom to teach which is limited.

The balance of this paper points out several ways in which to advance. In the meantime let us honor all bakers and producemen and soft drink distributors already using dozens in our time. Their common sense is outstanding, like a rainbow in the sky to announce the end of a period.

Common Palm Scales

Based entirely upon duodecimal divisions, the common palm dimension is equal to one-twelfth part of the common yard. In comparison with other units of measurement we might find that one yard is equal to three feet and that 2112 yards are the equal of one naire arc, or 1.9312128 kilometers, or *f3800;0* (three-do-eight refut) units, or 6336 feet (see below).

The dozenal palm scale is quite as simple as the decimal foot scale and no prefixes are employed here, either. It is primarily a cabinetmakers rule, in which the skilled artisan is held to an error tolerance of between one and three karls.

Palm Scale

12 karls equal one quan (¼ inch), 6.35 mm.
12 quans equal one palm (3 inches), 7.62 cm.
12 palms equal one yard (36 inches), 9.144 dm.
2112 yards equal one air mile (6336 feet), 1931.2128 m.

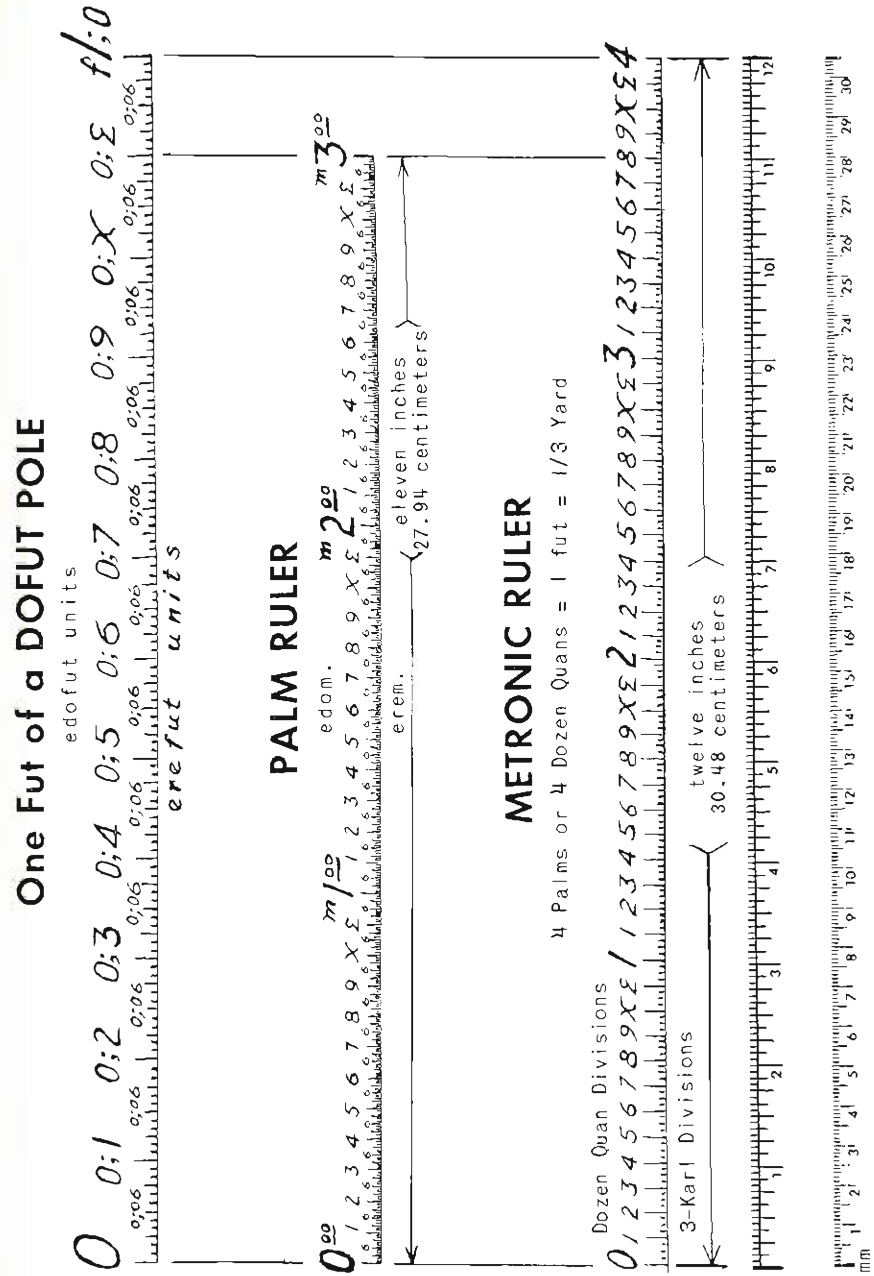
Elsewhere (p. 22) in this paper you will find a dimensional representation of the common palm ruler. Observe that each palm is the precise length of three inches (7.62 centimeters), how each quan is the equal of one-quarter inch, and how each length of three karls is the very length of one-sixteenth part of one inch. A dozen, dozen, dozen karls equal 36 decimal inches or one common yard. A half millimeter and one karl are nearly equals.

The only difference between a common palmstick of one yard length and a common yardstick lies in the method of numbering. The common yardstick is based upon a decimal numeration, while the common palmstick divisions are based upon a duodecimal system of numeration. But whatever you can measure in terms of the common yardstick you can measure and express more quickly and economically in terms of the common palmstick. And where the one describes dimension in terms of feet, inches, or one-sixteenths of an inch, the other describes dimension in terms of the palm, the quan, and the karl--utilizing one arithmetical base throughout. A 6-karl segment is the same length as one-eighth part of an inch. A 3-karl segment equals one-sixteenth inch.

It was a transcendent step in the struggle between decimal and duodecimal systems of dimension when the common palmstick was conceived. It answers for all time any doubt that you can measure in duodecimal numeration whatever you can measure in decimals, and more conveniently, too. No cabinetmaker should experience any difficulty in transposing from one yard to twelve palms or back to yards, or feet, or inches.

Common Dofut Scales

The same simple procedure used to describe metric dimensions, and their increase or decrease in value by the employment of quantity prefixes, is followed in the common dofut scales. Here the stem word to describe dimension may be called a fut. A fut, by definition, is precisely equal to 30.48 centimeters. And a fut is likewise equal to 4 palms of the dometric common palm scales described above. Fut is both singular and plural in meaning.



Prefixes which, for general use, describe the common fut quantities and the value which each represents, are shown in the dofut dimension table below.

From the dofut dimension table it is apparent that when we use the term "dofut" (shown *f10;00* or simply *f10* when its true meaning is known to all) we conceive a length equal to one dozen fut units, four dozen palms, four common yards, or two fathoms. The half-dofut (*f6*) equals one common yard. We understand the dimension described as one edofut to be the equal of one-dozenth part of one fut unit, or the equal of one common inch (2.54 cm). Three edofut (*f0;3*) equal one palm.

Dofut Table

Dimension (f) Symbol in Common Dofut Scale

Dozenal Value		Dozenal Symbols	Common Value		Decimal Value
1 bimifut,	shown	*f1 000 000;0,*	equals one dozen^6	or	2 985 984 feet
1 remifut,		*f100 000;0,*	dozen^5		248 832 "
1 domifut,		*f10 000;0,*	dozen^4		20 736 "
1 mifut,		*f1 000;0,*	dozen^3		1 728 "
1 refut,		*f100;0,*	dozen^2		144 "
1 dofut,		*f10;0,*	dozen^1		12 "
1 fut,		*f1;0,*	dozen^0 (30.48cm.)		1 foot
1 edofut,		*f0;1,*	dozen^{-1}		1/12 "
1 erefut,		*f0;01,*	dozen^{-2}		1/144 "
1 emifut,		*f0;001,*	dozen^{-3}		1/1728 "
1 edomifut		*f0;0001,*	dozen^{-4}		1/20736 "
1 eremifut		*f0;00001,*	dozen^{-5}		1/248832 "
1 ebimifut		*f0;000001,*	dozen^{-6}		1/2985984 "

One great circle of the earth, in terms of the common fut, is equal to three-do-eight (three dozen and eight) bimifut, shown in symbols as *f38 000 000;0,* units. This great circle is the precise length of what has been elsewhere described as one dominaire dimension. A meridian great circle of the earth is less than that length. The equatorial great circle is more, since the earth is not a perfect sphere.

So much, for common dimensions, decimal or dozenal. Now let us look to the future.

IMMEDIATE FUTURE

With such suitable dozenal dimension scales as the common palmstick and the common dofut pole or staff available, why is another dimension scale required in dozenal arithmetic? With the karl, the quan, and the palm units of measurement suitable for use of the cabinetmaker, and with the dofut, half-dofut, and quarter-dofut, and their dozenal multiples

and divisions, available to mechanics, machinists (1 etrimifut is shorter than 1/400,000,000 fraction of one inch in decimal notation), architects, builders, and geodetic uses generally, why should doremitarians be burdened with an additional scale of dimensions called the dometric scientists dimensions?

The answer is simple and quite obvious. Initially, in teaching duodecimal arithmetic, without any further act of any local, national, or international legislative body, it is more practicable to take the known, currently used, common denominate number dimensions, such as the yard, the foot, the palm, the inch, and then by duodecimal terms of quantity to multiply or divide these known and long established empirical dimensions.

This process appears the more reasonable when we consider that, in decimal arithmetic, our foot is already subdivided into a dozen equal parts, each described as the inch; and the inch dimension is in turn divided into a dozen equal parts, each part described as a line. Thus, one is not confronted with the necessity of grasping a new duodecimal system of arithmetic and simultaneously applying duodecimal terms to strange and heretofore unknown dimensions. Men are never so likely to settle a question rightly as when they discuss it freely. No government can interfere in a free discussion except by making it less free. If we would depend upon governments for our conveniences we should have none.

Let us digress further. When the metric system of measurements was adopted (and equally when America adopted the dollar decimal monetary system), the people were confronted with a necessity to learn theretofore quite foreign terms or stems, but they counted them in the old familiar steps of decimal increase and decrease. A duodecimal system of scales was considered by learned Frenchmen and rejected at that time on the broad ground that the people were not familiar with a duodecimal system of numeration and had no approved, common, single digit to represent dix (ten) or onze (eleven).

In monetary reform India, Australia, and Britain today are weighing the very same imponderables.

During the past two dozen years (possibly a quarter of a century) a considerable number of duodecimalists by common agreement have adopted and are using the single dozenal symbol of dek (X) for ten or dix and the single dozenal symbol of el (Ɛ) for eleven or onze. In addition, they have exhibited considerable fortitude and tenacity in standing by and retaining these two simple symbols, so that we (the writer, among others, privately uses other symbols for ten and eleven) might say X and Ɛ are beginning to achieve that show of stability among the general public which is absolutely necessary BEFORE people, in general, will adopt and begin using the common dozenal dimension scales.

Therefore, the single symbols which we know as $\mathcal{X}$ and $\mathcal{E}$, and which we call dek and el, or ten and eleven, or dix and onze, are become, from a worldly viewpoint, perhaps the most precious practical symbols within the knowledge of man. It is scarcely important what we call them, but it is supremely important that these symbols remain constant, unchangeable, and immutable. Each year they achieve greater stability, and only their stability will insure greater advancement in the use of dozenal weights and measures.

Just as our forefathers, both in metric and nometric areas, learned new stems but counted them in the old familiar decimal steps, so like reasoning today might dictate that we retain our old familiar yard, foot, palm, and inch dimensions while learning to multiply and to divide these known units of length by a dozenal system of arithmetic and nomenclature.

In the opinion of many friends of duodecimal arithmetic the common things like Centigrade (the Bagley temperature scale in duodecimals is much more realistic) and Fahrenheit scales as now graduated, and their increase and decrease from their own zero temperature, no less than the yard, palm, foot, and inch must serve as our common dometric terms for perhaps several dozens of years immediately before us, while we learn to add and multiply and express these familiar terms not in tens, hundreds, thousands, but by dozens, gross, and dozen gross. It is suggested by this writer quite frankly, therefore, that only the dometric common measurements (such as palm, dofut, dogal, dopound) be furnished to those persons initially meeting a dozenal system of arithmetic, especially children in the grades.

REMOTE FUTURE

For those happy souls advanced in duodecimal arithmetic, let us initiate the beginning of careful consideration to be given a universal terrestrial dimension unit based upon an assumed great circle of the earth. Let this arbitrary dimension be divided and subdivided into equal dozenal parts down to a unit somewhere between the length of one nautical mile and, perhaps, two kilometers of distance (6336 feet has been suggested)[2] and let this unit in turn be divided and subdivided into equal dozenal parts down to a unit somewhere

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(2) See two independently conceived separate papers in THE DUODECIMAL BULLETIN, August 1958, pages $\mathcal{X}$ and $2\mathcal{X}$, advocating 6336 feet as one navinaut and 6336 feet as one naire mile or arc.

between the English palm (3 inches) and the hand (4 inches), both of which have universally proven to be quite convenient as units of measurement from time immemorial. We see the counterparts of the palm and the hand dimensions in the French 75 millimeter gun and the 105 mm. howitzer. Accepted in principle by Frenchmen, observe how in practice neither of these weapons is made equal to an even 100 millimeters or 1 decimeter. Frenchmen today still incline toward the palm and the hand dimensions.

The prefixes of quantity in the scientists dimension scales (see Doremic Quantity Prefixes below) to be used with suitable stems, are the same as in the common dofut scales. Thus, we may become familiar with these prefixes in the common dozenal scales and continue to employ them in the scientists scales later.

Doremic Quantity Prefixes

bimi,	equal to the	sixth	power of one dozen,	$10;^{6}$
remi,		fifth		$10;^{5}$
domi,		fourth		$10;^{4}$
mi,		third		$10;^{3}$
re,		second		$10;^{2}$
do,		first		$10;^{1}$
unit,		zero		$10;^{0}$
edo,	equal to minus	first		$10;^{-1}$
ere,		second		$10;^{-2}$
emi,		third		$10;^{-3}$
edomi,		fourth		$10;^{-4}$
eremi,		fifth		$10;^{-5}$
ebimi,		sixth		$10;^{-6}$

Observe that "e" is the initial letter of every minus-power prefix, in listing these doremic quantities. Thus, bimi is the positive sixth power, while ebimi is the minus sixth power, of any descriptive stem. And one domi multiplied by one edomi cancels out with a zero power or one unit. For instance, $10;^{4} \cdot 10;^{-4}$ equals $10;^{4-4}$, which equals $10;^{0}$, which equals 1.

Doremic Scientists Naire Division

In the doremic scientists system of terrestrial measurement the stem word to denote prime dimension is called a "naire" mile or arc, which is precisely equal to 1.9312128 kilometers or *f3800;0* or 6336 (each foot equal to 30.48 centimeters).

It is quite simple to transpose from the common fut to the scientists dominaire dimension. One dozen, dozen, dozen, dozenth part of *f38 000 000;0* units is the equivalent of *f3800;0* (3 mifut plus 8 refut, or three-do-eight refut) units. And *f3800;0* units are equal to one naire arc, the precise distance of 6336 feet, each foot equal to 30.48 cm. For the benefit of metric areas, we may multiply 30.48 cm. by 6336 and obtain 1931.2128 meters as the precise length of a naire arc or air mile.

Let it be said at this point that we are not so much concerned here with determination of the precise measurement of the circumference of a perfect spherical earth as with a simple correlation of the inch, palm, foot, and meter with each other and with the doremic units of the naire arc and the dometron (see below). Any precise measurement of the circumference of the earth attempted today might be proven false tomorrow, but the dominaire dimension, by its definition, remains undisturbed in its relation to the meter and to an inch (equal to 2.54 centimeters), a palm, a fut, and a dometron (1.1176 meters), world without end.

Please note in such correlation the constantly recurring three humphrey eight (*3;8*). For example

$3;8 \cdot 10;^7$ fut (three humphrey eight times the seventh power of one dozen fut units) is equal to one dominaire dimension.
3;8 (3-2/3) palms equal three metrons.
3;8 (3-2/3) fut " one dometron.
3;8 (3-2/3) mifut " one naire arc or air mile.

Also please note that 6336 feet equal a dozen times the length of one-tenth of the land statute mile (which English-speaking peoples may fully retain). Since one-tenth (528 feet) of a statute mile is, in turn, capable of division into a dozen equal parts, each part equal to 44 feet, and, since 44 feet are capable of division into a dozen equal aliquot parts, each part equal to 44 inches, we may subdivide 6336 feet again and again into a dozen equal aliquot parts down to a unit of measurement equal to 44 lines or three and two-thirds inches. Later in this paper a further reference will be made to this dimension which is somewhat smaller than an English hand and somewhat larger than one English palm.

Now if 6336 feet be taken as the new geophysical or air mile, here called one naire arc to distinguish it from both the land mile and the nautical mile, then a dozenth part of an air mile is the equal of one-tenth land mile, which is the smallest unit of distance measured on most American automobile speedometers. And 6336 feet multiplied by twelve^4 (a dozen raised to the fourth power) is equal to *f38 000 000;0*

units, or, decimally, 131,383,296 feet, which unit of length is described dozenally as one dominaire dimension or arc.

Table of Naire Arc Dimensions

Dimension (N) Symbol in Scientists Naire Arc Scale

Dozenal Value		Dozenal Symbols		Dofut Value		Decimal Value	
1 dominaire	arc, shown	*N10 000;0,*	equals	*f38 000 000;0,*	or	131 383 296	ft.
1 minaire	" "	*N1 000;0,*	"	*f3 800 000;0,*	"	10 948 608	"
1 renaire	" "	*N100;0,*	"	*f380 000;0,*	"	912 384	"
1 donaire	" "	*N10;0,*	"	*f38 000;0,*	"	76 032	"
1 naire	" "	*N1;0,*	"	*f3 800;0,*	"	6 336	"
1 edonaire	" "	*N0;1,*	"	*f380;0,*	"	528	"
1 erenaire	" "	*N0;01,*	"	*f38;0,*	"	44	"
1 eminaire	" "	*N0;001,*	"	*f3;8,*	"	44	in.
1 edominaire	" "	*N0;0001,*	"	*f0;38,*	"	44	"

Since one edonaire arc (one-twelfth of an "air" mile) is equal to one-tenth of one land, statute mile, it follows that a town 6 statute miles from a given crossroad lies sixty edonaire arcs away; and sixty edonaire arcs divided by twelve transpose into 5 naire arcs or 5 air miles of distance.

So, if your automobile speedometer indicates that you have driven 172.8 statute miles today, then it is equally possible that you have driven 1728 edonaire arcs, or 144 naire miles, twelve donaire arcs, or one renaire arc.

And had you flown at a given altitude so far as one renaire arc today along a great circle of the earth, that is to say, neither deviating to your right nor to your left but always pushing straight ahead, you would have traveled decimally 1/144 part of a great circle around the earth. Even if you had followed one of the earlier approved interstate highways laid out along some latitudinal circle, one might say that you had traveled the *equal* of that distance.

Doremic Scientists Dometron Scale

If *f38 000 000;0* units are equal to one great circle of the earth and if we multiply that sum by one dozen^{-4} (decimally, 1/20736 part), we find a length described as *f3800;0* (three-do-eight refut) units or one domimetron (see Dometron Table). Speaking decimally, *f3800;0* are the equal of 6336 feet or one air mile or one naire arc.

Now if we multiply *f3800;0* by one dozen^{-4} (by moving the unit point four places to our left) we find the sum of *f0;38* (three-do-eight erefut) units, a dimension equal to three and two-thirds common inches or one edominaire arc. It is this linear measurement (3-2/3 inches) which is here designated the metronic terrestrial dimension unit.

Stated another way, one metron multiplied by twelve^8 (a dozen raised to the eighth power) is equal to one dominaire dimension or *f38 000 000;0* units, the length of one great circle of the earth. Equally, one edomimetron unit (1/20736 part of one metron) multiplied by twelve^{12} (twelve raised to the twelfth power, or *10;*^{10}) is equal to one dominaire dimension. The metron, like the naire arc, is duodecimally related quite definitely to the same great circle of the earth.

Now, if one metron is equal to *f0;38* (three-do-eight erefut) units or 3-2/3 inches, then one dometron should equal *f3;8* (three fut humphrey eight or three and two-thirds fut) units, or, decimally, forty-four common inches. One dometron is the equal of one eminaire arc. And in common metric terms it is equal to 1.1176 meters precisely.(3)

All comparisons in this paper assume the common fut or foot to be equal to 30.48 centimeters, and the common inch to equal 2.54 centimeters.

Dometron Table

Dimension (m) Symbol in Scientists Dometron Scale

Dozenal Value		Dozenal Symbols		Dofut Value		Naire Arc Value		Metric Values
1 domimetron,	shown	*m10000;0*,	equals	*f3800;0*,	or	1 naire arc,	or	1.9312128 km.
1 mimetron	"	*m1000;0*,	"	*f380;0*,	"	1 edonaire arc,	"	1.609344 hm.
1 remetron,	"	*m100;0*,	"	*f38;0*,	"	1 erenaire	"	1.34112 dam.
1 dometron,	"	*m10;0*,	"	*f3;8*,	"	1 eminaire	"	1.1176 m.
1 metron,	"	*m1;0*,	"	*f0;38*,	"	1 edominaire	"	0.93133..dm.
1 edometron,	"	*m0;1*,	"	*f0;038*,	"	1 ereminaire	"	0.77611..cm.
1 eremetron,	"	*m0;01*,	"	*f0;0038*,	"	1 ebiminaire	"	0.61343..mm.
1 emimetron,	"	*m0;001*,	"	*f0;00038*,	"	1 edobiminaire	"	0.05111..mm.
1 edomimetron,	"	*m0;0001*,	"	*f0;000038*,	"	1 erebiminaire	"	0.00425..mm.
1 eremimetron,	"	*m0;00001*,	"	*f0;0000038*,	"	1 etriminaire	"	0.00042..mm.

Thus, the English-speaking peoples setting a little firmer in mutual agreement upon their empirical dimensions might exemplify an indelible mark of comradeship with present statutory French

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(3) If the radius of the earth's orbit is 149 trillion (149 times 10^9) meters, and if one dometron is accepted as the equal of 1.1176 meters, then that distance (149,000,000,000 divided by 1.1176) is roughly equal to 133.3 trillion dometrons, decimally. This may be dozenally expressed as roughly *21;X* times *10;*^{9} dom. (two-do-one-humphrey-dek times the ninth power of a dozen dometrons). Or, again decimally, it may be called 25-5/6 times the ninth power of a dozen dometrons.

dimension scales. In turn, neither English nor French dimensions will be forced to move an indeterminate number of decimal or doremic places to the right of the unit point in striving vainly to reach an exact relationship between meter and foot units otherwise so elusive. Also, we may thus correlate the palm, fut, meter, dometron, and naire arc (an air mile) with a great circle of the earth described as the dominaire dimension and all of its dozenal fractions in the terminal geophysical year of *1172;0*. The empirical English foot, here once again microscopically modified, might well last out the earth's span of time. One sometimes stoops to conquer, even in a technical age.

The dometron scale is not so "foreign" or impractical as English-speaking peoples might at first suspect from its appearance. For instance, the commom letterhead in the United States is 8-1/2 by 11 inches. This is, decimally, 36 edometrons long and quite close to 27-5/6 edoms. wide, which is, dozenally, 3 by nearly 2-1/3 metrons. The U.S. governmental letterheads tend to limit the width to 8 inches. If we should standardize government and business letterheads at 8-1/4 inches for all, that width might be designated 2-1/4 metrons wide precisely.

In the construction of houses and office buildings, a unit of dimension 44 inches in length (one dometron) is perhaps better suited to accommodate the mobility of people than is the present 36 inches of length or width--a 36-inch shower-stall, for instance, seems to reach out to snap one's elbow or knee, whereas the little extra width means so much to humanity--a full dometron.

Two dometrons equal 7-1/3 feet, and three dometrons equal exactly eleven feet (*fƐ;0*, in the common dofut scale). Also note that 2 metrons equal 7-1/3 inches, and three metrons equal eleven inches (*f0;Ɛ*, eleven edofut in the dofut table). Two edometrons equal 7-1/3 lines, and three edometrons equal eleven lines, eleven erefut (*f0;0Ɛ*) or eleven-twelfths of one inch.

No one in the English-speaking world need throw up his hands in despair, and, for that matter, no one in the metric world. A gear containing 254 (or 127) teeth automatically converts from 2.54 centimeters to 1 inch. A conversion gear ratio may be applied also to change from inch to dometron or eminaire, since 44 inches equal one dometron or one eminaire precisely.

If one great circle of the earth, decimally, equals 131,383,296 feet and if one foot is said to equal 30.48 centimeters, then this great circle of the earth is equal to

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