Memorization & Remembering & Understanding

MEMORY and MEMORIZATION

They are not the same.

By **MEMORY**, we build up a store of knowledge. We remember things with greater or lesser accuracy, often as descriptions rather than definitions.

Descriptions are folksy, less precise than definitions: e.g. an ellipse is a circle pushed out of shape; a body lighter than water floats; acids attack metals and flesh.

Definitions are found in a dictionary. Its "head words" are implicit questions. Mathematics and science use precise definitions: e.g. a triangle is a plane figure with three sides; the apparent loss of weight of a body in a fluid equals the weight of the fluid displaced; an acid is a proton donor.

MEMORIZATION enables word-for-word memory. It begins about two with nursery rhymes; and is essential for K-9 schooling for tables, spelling, grammar, and usually for precise definitions of technical facts.

A less academically inclined 14-year old declared cheerfully, "I *like* learning things by heart." By memorizing he was equal with more academic peers.

Brighter minds at school and older, maturer minds can manage with less word-for-word recall, though years 10-12 schooling and converts do need to memorize Bible texts, prayers and hymns, but not so much exact catechism answers or prose passages.

MEMORY and UNDERSTANDING

Understandings uses reason to relate facts one to another and upholds Truth, Beauty, Goodness, God. It goes far deeper than facts, **but it cannot function without them.** It depends on much remembering and memorizing, and then aids and abets them.

Memory and understanding are partners, not rivals They are complementary, like opposite sexes in marriage, conjugally bonded, i.e. in syzygy.

REVOLT against MEMORY & MEMORIZATION

Years ago, *some* school teachers did make pupils learn by rote without understanding: "You only need to know it, not to understand it" — often false!

So 'experts' abolished memory and lost understanding. Hence chaos in today's religious education.

As the Irish farmer told a Human Life International priest in the early 1990s:-

In primary school they learn nothing.
In secondary school they discuss it.
At university, they research it.

Gobble-dee-gook can camouflage 0+0+0+... = 0.

Religious memorization is not merely **rote learning** but **learning by heart.** Religion concerns the heart and not just the mind. Believers like to memorize hymns, prayers, Bible texts and doctrinal Questions & Answers (Q&As), because they love God.

Also, education is much more than schooling. As Jacques Barzun said in *The House of Intellect:*

I am a teacher, not an educator. An education is far too vast to be imparted by one person or one institution.

CATECHISMS

Smaller catechisms, cf. *Catholic Family Catechism*, are designed for ease of memorization with short Q&As set out in sense lines like poetry. They are easy to understand, "clear, brief and easily assimilated by all" (cf. my masthead, from *Familiaris Consortio* n. 39 by St John Paul in 1981). In such catechisms, understanding and precise memorization support each other. See *Handouts* nn. 1, 2, 13, 76, 84. for theory and practice.

Medium size catechisms have Q&As but the answers are too long for memorization; e.g. *Compendium of the Catechism of the Catholic Church.*

Big catechisms are usually set out in paragraphs without Q&As: e.g. the *Catechism of the Catholic Church.*

Modern advertising uses the catechism format of Q&A to convey alleged facts with clarity, brevity, and hence with persuasion, and sometimes with jingles or doggerel verse.

BLESSED JOHN HENRY NEWMAN

"Three friends of mine, [Anglican] clergymen, making a tour through Ireland, pedestrians for the day, took a boy of thirteen to be their guide. They amused themselves with putting questions to him on the subject of his religion; and one of them confessed to me on his return that that poor child had put them all to silence. How? Not, of course, by any train of arguments, or refined theological disquisition, but **merely by knowing and understanding the answers in his catechism.**"

The Idea of a University 1852/1854, Image Books 1959, p. 350.

EVALUATING UNDERSTANDING

Understanding is far harder to evaluate than memorization. Filling in slots, with or without a prompt list, is often degenerate and can corrupt teaching and learning, as does teaching geared to exams. It is far preferable to write personalized coherent sentences.

Teachers and lecturers in upper secondary (Years 10-12) and tertiary tuition usually reject regurgitation of their notes — hence the famous sarcasm:

A lecture is the process by which the notes of the lecturer become the notes of the student without passing through the minds of either.

WHAT'S TO BE DONE?

Teachers/lecturers can gauge student attention and understanding by watching their faces. And they hold tutorials, set exams and assign essay topics such as:-

* Explain the New Evangelization in terms of the Christ's Gospel and Vatican II.
* Prepare catechetical notes and plan formation for young disciples getting confirmed at the age of 12.
* Write sample letters for Face Book, emails, newspapers on the Church's vision for marriage and marital morality.
* Plan persuasive talks for a youth who says, "I get nothing out of going to Mass — so I don't go."
* How can we counter the ongoing evils from the religious revolt of the 16ᵗʰ century?
* What Bible texts would you use with a devout Protestant interested in becoming a Catholic?
* Relate other truths of the Faith to Sacramental Confession which are relevant to explaining it.

PLEASE SEND IN MORE SUGGESTIONS.

Learn to USE + - × ÷ and later on to UNDERSTAND them

SUBTRACTION

Subtracting numbers with more than one digit sometimes requires "borrowing" from 10's column:

95	We say 8 from 5 won't go
- 28	so borrow a 1 from the 10's column:
= 67	9 ^{1}5 and now take 8 from 15, get 7
	- 2^1 8 and pay-back the borrowed 1 to
	the 10's column so that 2+1=3,
	and subtract 3 from 9 gives 6:
	= 6̄ 7̄

Some teachers used teach a make-believe of borrowing 1 from the 9. However, this was confusing, because the paying back the borrowed 1 from the tens column is best made by increasing the subtraction on the bottom line, not the top line, by simply adding 1 to what is being subtracted.

Some teachers have further confused pupils by saying to cross out 9 and put 8, then 8 - 2 = 6.

But the wording in the box prompts us to think in terms of a verbal IOU, a loan made without a written record. We pay back a loan by increasing what is to be subtracted. Comments from readers will be welcome.

RECIPROCALS

The reciprocal of a number is one divided by the number. We use reciprocals all the time for sharing things out, like cutting up a cake for a number of people so that each gets an equal share.

If there are two children and one cake, we cut the cake in two and each gets a half, since the reciprocal of 2 is $\frac{1}{2}$; similarly, with three children we cut it into three, and each gets a third, since the reciprocal of 3 is a third, $\frac{1}{3}$ — see *Handouts* n. 92.

THE RECIPROCAL of 81 as a decimal

The reciprocal of 81 is $\frac{1}{81}$ = 0·012345679... in which 012345679 repeats for ever. There is no 8.

We show the repeating decimals with dots over the first and last of the numbers which are repeating, thus 0·0̇12345679̇. Easy way: divide by 9 and then by 9 again (first time $\frac{1}{9}$ = 0·1̇ = 0·1111111111... forever, then divide again).

From REPEATING DECIMAL to FRACTION

Let x = 0·0̇12345679̇ and call this line (1).
Multiply (1) × 1,000,000,000:
1,000,000,000 x = 12,345,679·0̇12345679̇ .... (2)
(the commas to show the millions and thousands).
Line (2) minus (1):
999,999,999 x = 12345679 . . . . . (3)
(the subtraction eliminates the repeating decimal).
Line (3) ÷ 999,999,999 into both sides:
$\therefore$ x = $\frac{12,345,679}{999,999,999}$ . . . . (4)

In (4), multiply numerator & denominator by 81:
12,345,679×9=111,111,111 and 111,111,111×9 = 999,999,999 and this neatly cancels with the new denominator and leaves it as 81.
$\therefore$ x = $\frac{1}{81}$ Q.E.D. *Quod erat demonstrandum*
"What was to be proved" or "Quite Easily Done".

RECIPROCAL of 9 as a series of fractions

$\frac{1}{9}$ = 0·1̇ = 0·1111111111...

= $\frac{1}{10}$ + $\frac{1}{100}$ + $\frac{1}{1000}$ + $\frac{1}{10,000}$ + $\frac{1}{100,000}$ + ... and goes on forever as a converging geometric series.

ROOTS

Square roots and cube roots, etc., are not like reciprocals, for **roots** can be:
(1) whole numbers, e.g. $\sqrt{4}$ = 2 or $\sqrt{9}$ = 3,
(2) decimals such as $\sqrt{0·04}$ = 0·2,
(3) surds (i.e. 'absurd') such as $\sqrt{5}$ = 2·2361... whose decimals go on for ever without repeating.

By contrast, **reciprocals** can be:
(1) decimals of fractions such as $\frac{1}{2}$, = 0·5
(2) repeating decimals of primes 3, 5, 7, 11 etc
(3) repeating decimals of multiples of prime numbers such as 9, 12, 15, etc. See *Handouts* n. 106.

Reflections

MORE IMPORTANT than proving **Pythagoras' Theorem** (see *Handouts* n. 18) is the ability to apply it accurately — it's like compunction, which is better practised than defined. **But better still, to do both!** And if you can prove Pythagoras' Theorem, you'll always remember it. There's no need to learn the proof off rote line-for-line, rather, remember its general outline. Memory & understanding work together, hand in glove. They're partners!

With the **trigonometrical ratios** (*Handouts* n. 19 was not issue till 2010), it's better to understand "why" from the start thus never confusing the ratios.

Calculus must begin with understanding (unfortunately, *Handouts* n. 29 is still incomplete).

IT'S MORE IMPORTANT to **know your religion** than recite it word-for-word. And even more important to practise it, by faith, hope and charity, even if you can't define them. **But better if you can!**

Essential religious formulations are minimal: the **Apostles' Creed, the Seven Sacraments, the Commandments of love and duty,** and the **Prayers.**

See St John Paul's **memorization list** on the back cover of the *Catholic Family Catechism Disciples' Edition.* Scripture and Liturgical texts are part of it, necessary in due measure.

There is a gradation from **Scripture** to **Catechetics, then Apologetics** and **Theology.** The boundaries tend to blur: one merges into the other. Each helps the other, and in both directions.

A **Catholic world-view** helps integrate all branches of knowledge and to remember the details; remembering details helps integration. Thus our Catholic understanding of "science" as knowledge, "philosophy" as wisdom, and theology as "Queen of the sciences".

Catholics say: "I count nothing human alien to me."

Father James Tierney 02 4829 0297