

PRINCIPLES AND METHODS OF OBSCURANTISM

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The tendency of scientific language to become obscure, jargon-like and acronymic coupled with 'researchmanship' (the art of conducting and publishing research without actually doing it) leads to a catastrophic deluge of insignificant and redundant publications. This communication, in the true spirit of Journal of Irreproducible Results, presents some typical examples of obscurantism and researchmanship culled from actual scientific literature in the fields of natural sciences and medicine.

Introduction

With the explosive growth of science and its fragmentation into many fields of specialization, there is a growing tendency in the scientific language to become obscure, jargon-like and acronymic. Simple things in science are often expressed in so many complicated and polysyllabic words. This technique is known under the name of obscurantism, and sometimes it seems to have become a goal in itself. It is not enough to confuse the reader by obscurantism. One has to know what it is that one intends to confuse the reader about.

There are two general methods of obscurantism. One the *verbal* is widely used in medical, social, psychological, anthropological sciences, while the other *mathematical* has many followers in the mathematical, physical, chemical, engineering fields. Since most concepts of science are relatively simple (once you understand them) any ambitious scientist must, in self defence, prevent his colleagues from discovering that his ideas are simple too; if he can write his published contributions obscurely (and uninterestingly enough) no one will attempt to read them, but all will genuflect in awe before such erudition. Much research fits the description—that 'it suffers from perfervid super-exuberance of assertive volubility accompanied by a concomitant irresponsibility of deductive ratiocination'.

'With the narcissism of small boys who expect to be liked even when their faces are unwashed, some authors prepare their papers for the scientific journals in the belief that truth will always reveal itself from the most disorderly string of words. From here it is only a short step to the conclusion that outstanding truth can surmount great obscurity, and so to the belief that obscurity in a paper is actually a mark of virtue'.¹

'We see bewildered youngsters composing research projects like abstract paintings: picking some colorful and fashionable words from recent literature and then reshuffling and recombining them into another conglomerate, yielding a stew of data, both undigested and undigestible. We see narrow specialists lavishing their pet techniques on reconfirming in yet another dozen ways what has already been superabundantly established to everybody's satisfaction'.²

Mathmanship

How can a plain garden scientist aspire to couch his thoughts in lofty sublimities of obscurantism? The easiest and most obvious step is to introduce mathematical symbols. When proper mathematical symbols are used the results will impress all but mathematicians, but they won't squeal because they don't

understand the few words of basic English that precede the avalanche of signs.

Let us now consider the following equation:

$$1 + 1 = 2. \quad (1)$$

Anyone who knows elementary mathematics is acquainted with

$$\ln e = 1 \quad (2)$$

$$\text{and } \sin^2 x + \cos^2 x = 1 \quad (3)$$

as well as that

$$\sum_{n=0}^{\infty} \frac{1}{2^n} = 2 \quad (4)$$

Using the above equations one can re-write equation (1) as follows:

$$\ln e + (\sin^2 x + \cos^2 x) = \sum_{n=0}^{\infty} \frac{1}{2^n} \quad (5)$$

but since

$$1 = \cosh y \cdot \sqrt{1 - \tanh^2 y} \quad (6)$$

and

$$e = \lim_{z \rightarrow \infty} \left(1 + \frac{1}{z}\right)^z \quad (7)$$

therefore

$$\ln \lim_{z \rightarrow \infty} \left(1 + \frac{1}{z}\right)^z + (\sin^2 x + \cos^2 x) = \sum_{n=0}^{\infty} \frac{\cosh y \cdot \sqrt{1 - \tanh^2 y}}{2^n}$$

which is of course a much more elegant way of saying that $1 + 1 = 2$.

One of other rudimentary practices is to slip in a wrong letter say δ instead δ .³ Even placing an exponent on the wrong side of the bracket will do wonders. One can also throw the reader off the scent temporarily by making him think he knows what the letters you used mean. For example, everybody knows what *pi* (π) stands for, so anyone will automatically multiply by 3.1416, until he discovers that pi meant osmotic pressure. Another nice letter is F which can be used not only for any unspecified brand of free energy, but also for fluorine, force, friction, Faradays, of a function of something or another.

An interesting example is the equation

$$\int_e^x = f(u)^n$$

which is very baffling for mathematically minded readers but clearly and simply means 'sex is fun'.

One excellent device to disrupt one's strain of thought is to use footnotes. When one therefore writes P* (to represent a pressure difference or radioactive phosphorus) the reader starts looking for a footnote, which is not there but in the meantime he has trouble to find the place he was reading and wonders what this P* is.

One of very successful techniques of obscurantism is to leave out one of two pages of calculations and substitute the word 'hence' followed by a colon. Some more ruthless authors use instead of 'hence', 'obviously' which succeeds not only in frustrating the reader but also giving him an acute inferiority complex.

Verbal Obscurantism

As to the verbal school of obscurantism, the best way to describe this

method is to show you some examples as documented in the scientific literature, but first let me present some commonly used phrases and their true meaning⁴:

<i>Text</i>	<i>Meaning</i>
<i>Introduction</i>	
It has been long known that . . .	I haven't bothered to look up the original reference
Of great theoretical and practical importance	Interesting to me
While it has not been possible to provide definite answers to these questions . . .	The experiments did not work out but I figured I could at least get a publication out of it
<i>Methods</i>	
Three of the samples were chosen for detailed study	The results on the others didn't make sense and were ignored
Double blind method was used	The subject does not know what he is getting, the nurse doesn't know what she is giving (and the investigator doesn't know what he is doing)
<i>Results</i>	
Typical results are shown	The best results are shown
. . . as good as could be expected considering the approximation made in the analysis	non-existent
<i>Discussion</i>	
It is suggested that	I think
It is generally believed that	A couple of other blokes think so too
It might be argued that	I have such a good answer to this objection that I shall now raise it
Correct within an order of magnitude	Wrong
It is hoped that this work will stimulate further work in the field	This paper isn't very good, but neither are any of the others on this miserable subject
<i>Acknowledgement</i> ⁵	
'I wish to thank Dr. Lester who not only suggested most of the experiments herein but greatly helped in their interpretation, and A. S. Bottorf and B. Fravel for their excellent assistance in performing these experiments	Fravel and Bottorf did the experiments and Lester explained what they meant
Once we have this general idea let us examine actual examples of verbal obscuratationism as published in scientific literature:	
Engineering:	
<i>'Hazards of the Road'</i> ⁶	
'Would the public interest be better served were a statutory obligation placed on both road authorities and manufacturers of motor vehicles so that a claim to damage might lie, where an accident could be shown to have occurred due	

to some feature of the road or the vehicle which, while not such as might fairly be described as a defect in construction of the road or the vehicle, was nevertheless a contributing cause in the ultimate damage or injury which reasonable foresight, applied against the background of the facts and technical knowledge might have avoided?

Effect of a resisting couple on the rotational motion of a rigid body. 'The proposition is as follows: An external couple applied for a discrete time to a rigid body about its instantaneous axis of rotation in the sense opposing its rotation tends to cause that axis to approach the axis of greatest moment'.⁷

We find the following mathematical definitions of life and death:

'The theorem itself suggests that there may be a nonprobabilistic proof to the effect that a totally positive semigroup of matrices may be used to define a completely additive measure in the space of continuous functions and the continuous state space analogue of this assertion'.⁸

Neurophysiology gives us the following:

'By this mechanism (release of feedback chemical transmitter such as gamma amino butyric acid in the brain) there is achieved a temporary differentiation of synapses on a particular postsynaptic neuronal element, there being an increased probability of subsequent activation over that existing before the postsynaptic depolarization for those synapses in which the postsynaptic activity has been preceded by presynaptic activity or coincided with it, and a decreased probability for those synapses in which presynaptic activity had not occurred'.⁹

A very delightful example of official language we find in the following taken from Weights & Measures Act in the United Kingdom¹⁰:

'Every letter in any such words, apart from the initial letter of such words, shall be of such size that the smallest rectangle capable of enclosing each letter of every such word shall not be less than 9/16th of the area of the smallest rectangle capable of enclosing the largest letter, apart from initial letters, in any word of more than one letter appearing on any label on that container'.

An excellent quotation taken from Quarterly Review of Biology dealing with a disease of trees (crown-gall) is as follows¹¹:

'A change elicited by an affect or effect or by an affectant in the affectee is a passive or active response affect or response effect. If it counters the affect or the affectant which elicits it, it is an active counter-affect or counter-effect. If it is an active counter affect or effect, it is a counter active affect or effect, i.e., a reaction in the strict sense of the term as used by pathologists'.

These examples will certainly suffice as an illustration of obscuratationism as actually encountered in literature.

I should like here to add a few examples of statements published which deserve presentation here:

'Case 69, last known to be dying of lymphoma 1½ years after biopsy is considered for purposes of this discussion to be dead'.¹²

'It is obvious that one site of exit is the lower end of the alimentary tract'.¹³

'The death of Dr. A. P. Meijklejohn who helped in the preparation of the first edition, must have added greatly to the work of the two authors'.¹⁴

Principles of Preparation of Papers for Publication

It is customary, when writing papers for publication, to include the following parts: Title, Introduction, Methods, Results, Discussion, Summary, Acknowledgements.

Title: The choice of the title is a very crucial process, since the choice of words composing it will affect its being mentioned by abstracting services. Choice of subject itself is also important. However, artifacts with controls make the best articles.

Introduction: One way to write introduction is simply to state what the experiment is all about and make prediction about the outcome. If all predictions are confirmed, however, a doubt is cast upon the researcher, because older men know it never happens. It is best therefore to select a prediction of minimum import and have this prediction fail. Sophisticated authors do not write simple introductions. They use 'striptease technique', i.e., they keep the problem a secret from the reader until the very last paragraph, some even keep it secret for ever.

Methods: As to methods, if this section is to be clear it must be orderly and systematic. To achieve this one should not tell what really happened. As to problems in spelling difficult words, it is enough to look up Thorndike and Barnhart. If the word is not there 95 per cent of the scientific audience won't know anyway how to spell the word.

Results: In Results one simply rearranges the procedure section where one said what was planned to do.

Graphs: Well designed graphs help the understanding of the text. It is advisable to prepare them on a 2 sq. ft. paper and use templates for letters not larger than $\frac{1}{2}$ in. When the figures are then reduced in size for publication the data are well obscured. The units and abscissae and ordinates may change from graph to graph; the method of constructing graphs should also change with the development of the subject. One can force the experimental results to give straight line relationship by using log log, or probit paper. One particularly elegant method for obtaining desired correlation when correlation coefficient scattergrams come out at 0.00 with a distribution shaped like a cake with raisins, is to use a 'correlation paper', as advocated by Rudin¹⁵. Pearson's r 's of any desired degree of magnitude can be obtained.

Discussion: In discussion one repeats the predictions made in the introduction and describes the importance of the work in broad generic terms without getting down to facts. If our experiment has any merit whatsoever, somebody might do it better. One should therefore use the alibi-in: advance technique by describing how you would do the experiment if you were to do it over. Even if you have done only one experiment you can greatly augment your data by several pages of description of the results you would have obtained had you done a long series of related experiments. Clarity is achieved by describing the experiments that were not done instead of those that were, because the imaginary experiments are made in integrated and orderly manner which is seldom achieved in the lab.

Summary should be shorter than the manuscript. It will serve as an abstract for abstractors abstracting summaries for abstracting journals.

The Acknowledgement should be honest¹⁷: The author had very little to do with this research. The idea was stolen from Dr. A., the experimental design was proposed by my statistical consultant Dr. B., the experiments were performed by Mr. C. and Miss D., the data were processed by our computing centre, and the paper was completely rewritten by Editor of Journal . . . , on the basis of extensive notes and suggestions made by Consulting Editor whose name was inadvertently left off the masthead of the journal of . . .

Nothing Like Science

To end this paper I should like to offer some data which I should call the romantic side of science. These papers published in a variety of journals and if one is not a member of the profession in which they are nurtured and published, one reads only the titles in current contents, extremely intriguing ideas

come to one's mind. What would you think for instance of the following genuine titles:

'Heat and mass transfer in a turbulent bed contractor'.¹⁸

'The fecundity of witches in the Firth of Clyde'.¹⁹

'Human double cross over'.²⁰

'An accident associated with the use of artificial vagina'.²¹

'Swelling properties of human smooth muscle with special reference to age related variations'.²²

'The role of punishment in the aetiology and continuance of alcohol drinking in rats'.²³

'An instance of the pitfalls prevalent in graveyard research'.²⁴

'Operations research in the bath tub and other applications'.²⁵

'Embodied and disembodied technical progress in the constant elasticity of substitution production function'.²⁶

'First successful captive breeding of the Great Bastard at West Berlin Zoo'.²⁷

'The effect of breathing 15–21 per cent and 100 per cent oxygen on the shivering response of nude human subjects at 10 degrees C'.²⁸

A very evocative combination of author's name and the title of his paper is: 'A sociosexual behavioral abnormality in the dog resembling Oedipus complex in man' appropriately studied by W. M. Fox.²⁹

References:

- (1) *New Scientist*, 311, 1962.
- (2) P. Weiss, *Science*, 136, 1962.
- (3) *American Scientist*, 46, 1958.
- (4) *Journal of Irreproducible Results*, 9, 1960.
- (5) *Journal of Biological Chemistry*, 240, 1965.
- (6) *Nature*, 195, 1962.
- (7) *Nature*, 187, 1956.
- (8) *Proceedings of the National Academy of Science*, 45, 1959.
- (9) Neuroscience Research Programme, 2/3, 1964.
- (10) Weights and Measures Act, Board of Trade, 1963.
- (11) *Quarterly Review of Biology*, 30, 1955.
- (12) *Cancer*, 16, 1963.
- (13) Lectures—Scientific Basis of Medicine, 7, 1957/8.
- (14) 'Human nutrition and dietetics', *Lancet*, Aug. 17, 1963.
- (15) *Journal of Irreproducible Results*, 12, 1963.
- (16) *Kinetic Basis of Molecular Biology*, Chap. 8, Figs. 8–10, 8–11, John Wiley, 1954.
- (17) *Journal Comp. Physiology and Psychology*, 55, 1962.
- (18) *Chemical Engineering Progress*, 60, 1964.
- (19) *Journal of the Marine Biological Association*, 43, 1963.
- (20) *Nature*, 195, 1962.
- (21) *Cornell Vet.*, 38, 1948.
- (22) *Exp. Cell Research*, 22, 1961.
- (23) *Behaviour Research and Therapy*, 5, 1967.
- (24) *Biometrics*, 19, 1963.
- (25) *American Statistician*, Oct. 1967.
- (26) *Review of Economics and Statistics*, 47, 1965.
- (27) *Zoo Yearbook*, 5, 1965.
- (28) *Canadian Journal of Physiology and Pharmacy*, 44, 1966.
- (29) *Journal of the American Veterinary Medical Association*, 144, 1964.