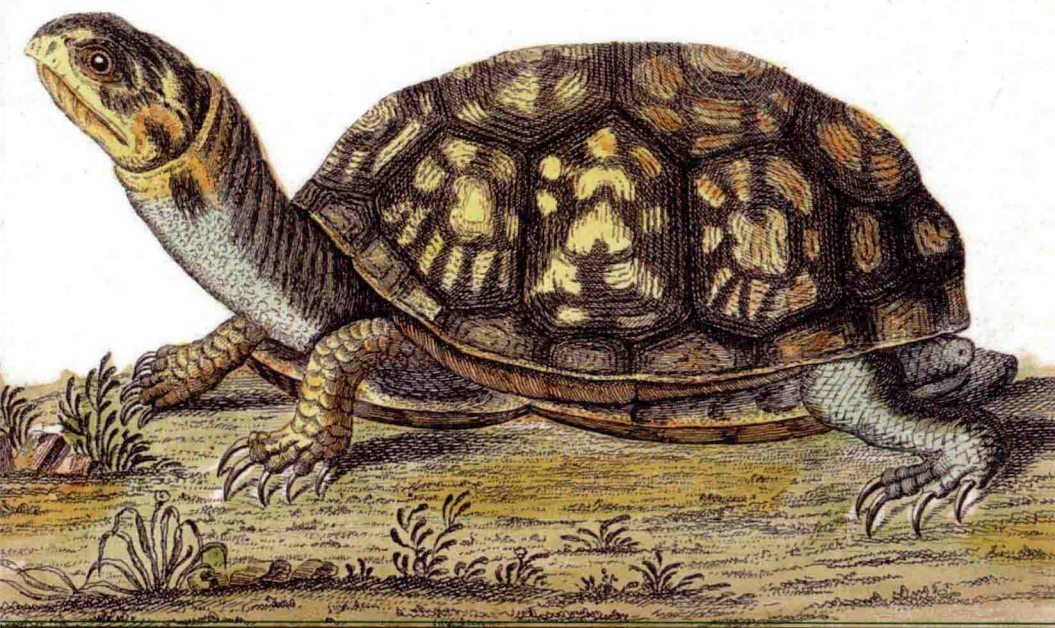


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A BUDGET OF PARADOXES

DE MORGAN

EDITED BY SOPHIA DE MORGAN

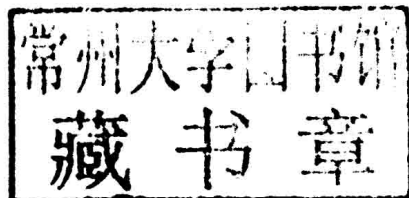


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A Budget of Paradoxes

AUGUSTUS DE MORGAN

EDITED BY SOPHIA DE MORGAN



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A Budget of Paradoxes

An important figure in the development of modern mathematical logic and abstract algebra, Augustus De Morgan (1806–71) was also a witty writer who made a hobby of collecting evidence of paradoxical and illogical thinking from historical sources as well as contemporary pamphlets and periodicals. Based on articles that had appeared in *The Athenaeum* during his lifetime, this work was edited by his widow and published in book form in 1872.

It parades all varieties of crackpot from circle-squarers to inventors of perpetual motion machines, all for the reader's entertainment and education. Filled with anecdotes, personal opinions and 'squibs' of every kind, the book remains enjoyable reading for those who are amused rather than appalled by the human condition. Also reissued in the Cambridge Library Collection are the *Memoir of Augustus De Morgan* (1882), prepared by his wife, and his ambitious *Formal Logic* (1847).

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BUDGET OF PARADOXES.

LONDON: PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
AND PARLIAMENT STREET

A

BUDGET OF PARADOXES.

BY

AUGUSTUS DE MORGAN,

F.R.A.S. & C.P.S.

OF TRINITY COLLEGE, CAMBRIDGE.

[REPRINTED, WITH THE AUTHOR'S ADDITIONS, FROM THE 'ATHENÆUM.']

'Ut agendo surgamus arguendo gustamus.'

PTOCHODOKIARCHUS ANAGRAMMATISTES.

LONDON:
LONGMANS, GREEN, AND CO.
1872.

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EDITOR'S PREFACE.

IT is not without hesitation that I have taken upon myself the editorship of a work left avowedly imperfect by the author, and, from its miscellaneous and discursive character, difficult of completion with due regard to editorial limitations by a less able hand.

Had the author lived to carry out his purpose he would have looked through his Budget again, amplifying and probably rearranging some of its contents. He had collected materials for further illustration of Paradox of the kind treated of in this book; and he meant to write a second part, in which the contradictions and inconsistencies of orthodox learning would have been subjected to the same scrutiny and castigation as heterodox ignorance had already received.

It will be seen that the present volume contains more than the *Athenæum* Budget. Some of the additions formed a Supplement to the original articles. These supplementary paragraphs were, by the author, placed after those to which they respectively referred, being distinguished from the rest of the text by brackets. I have omitted these brackets as useless, except where they were needed to indicate subsequent writing.

Another and a larger portion of the work consists of discussion of matters of contemporary interest, for the Budget was in some degree a receptacle for the author's thoughts on any literary, scientific, or social question. Having grown thus gradually to its present size, the book as it was left was not quite in a fit condition for publication, but the alterations which have been made are slight and few, being in most cases verbal and such as the sense absolutely required, or transpositions of sentences to secure coherence with the rest, in places where the author, in his more recent insertion of them, had overlooked the connexion in which they stood. In no case has the meaning been in any degree modified or interfered with.

One rather large omission must be mentioned here. It is an account of the quarrel between Sir James South and Mr. Troughton on the mounting, &c. of the equatorial telescope at Campden Hill. At some future time when the affair has passed entirely out of the memory of living Astronomers, the appreciative sketch, which is omitted in this edition of the Budget, will be an interesting piece of history and study of character.

A very small portion of Mr. James Smith's circle-squaring has been left out, with a still smaller portion of Mr. De Morgan's answers to that Cyclometrical Paradoxe.

In more than one place repetitions, which would have disappeared under the author's revision, have been allowed to remain, because they could not have been taken away without leaving a hiatus, not easy to fill up without damage to the author's meaning.

I give these explanations in obedience to the rules laid down for the guidance of editors at page 11. If any apology for the fragmentary character of the book be thought necessary, it may be found in the author's own words at page 438.

The publication of the Budget could not have been delayed without lessening the interest attaching to the writer's thoughts upon questions of our own day. I trust that, incomplete as the work is compared with what it might have been, I shall not be held mistaken in giving it to the world. Rather let me hope that it will be welcomed as an old friend returning under great disadvantages, but bringing a pleasant remembrance of the amusement which its weekly appearance in the *Athenæum* gave to both writer and reader.

The Paradoxes are dealt with in chronological order. This will be a guide to the reader, and with the alphabetical Index of Names, &c., will, I trust, obviate all difficulty of reference.

SOPHIA DE MORGAN.

6 MERTON ROAD, PRIMROSE HILL.

Erratum.

Page 40, line 27, *for* Litchfield *read* Lichfield.

A BUDGET OF PARADOXES.

INTRODUCTORY.

IF I had before me a fly and an elephant, having never seen more than one such magnitude of either kind; and if the fly were to endeavour to persuade me that he was larger than the elephant, I might by possibility be placed in a difficulty. The apparently little creature might use such arguments about the effect of distance, and might appeal to such laws of sight and hearing as I, if unlearned in those things, might be unable wholly to reject. But if there were a thousand flies, all buzzing, to appearance, about the great creature; and, to a fly, declaring, each one for himself, that he was bigger than the quadruped; and all giving different and frequently contradictory reasons; and each one despising and opposing the reasons of the others—I should feel quite at my ease. I should certainly say, My little friends, the case of each one of you is destroyed by the rest. I intend to show flies in the swarm, with a few larger animals, for reasons to be given.

In every age of the world there has been an established system, which has been opposed from time to time by isolated and dissentient reformers. The established system has sometimes fallen, slowly and gradually: it has either been upset by the rising influence of some one man, or it has been sapped by gradual change of opinion in the many.

I have insisted on the isolated character of the dissentients, as an element of the *à priori* probabilities of the case. Show me a schism, especially a growing schism, and it is another thing. The homœopathists, for instance, shall be, if any one so think, as

wrong as St. John Long; but an organised opposition, supported by the efforts of many acting in concert, appealing to common arguments and experience, with perpetual succession and a common seal, as the Queen says in the charter, is, be the merit of the schism what it may, a thing wholly different from the case of the isolated opponent in the mode of opposition to it which reason points out.

During the last two centuries and a half, physical knowledge has been gradually made to rest upon a basis which it had not before. It has become *mathematical*. The question now is, not whether this or that hypothesis is better or worse to the pure thought, but whether it accords with observed phenomena in those consequences which can be shown necessarily to follow from it, if it be true. Even in those sciences which are not yet under the dominion of mathematics, and perhaps never will be, a working copy of the mathematical process has been made. This is not known to the followers of those sciences who are not themselves mathematicians, and who very often exalt their horns against the mathematics in consequence. They might as well be squaring the circle, for any sense they show in this particular.

A great many individuals, ever since the rise of the mathematical method, have, each for himself, attacked its direct and indirect consequences. I shall not here stop to point out how the very accuracy of exact science gives better aim than the preceding state of things could give. I shall call each of these persons a *paradoxe*, and his system a *paradox*. I use the word in the old sense: a paradox is something which is apart from general opinion, either in subject-matter, method, or conclusion.

Many of the things brought forward would now be called *crotchets*, which is the nearest word we have to old *paradox*. But there is this difference, that by calling a thing a *crochet* we mean to speak lightly of it; which was not the necessary sense of *paradox*. Thus in the sixteenth century many spoke of the earth's motion as the *paradox of Copernicus*, who held the ingenuity of that theory in very high esteem, and some, I think, who even inclined towards it. In the seventeenth century, the depravation of meaning took place, in England at least. Phillips says paradox is 'a thing which seemeth strange'—here is the old meaning: after a colon, he proceeds—'and absurd, and is contrary to common opinion,' which is an addition due to his own time.

Some of my readers are hardly inclined to think that the word *paradox* could once have had no disparagement in its meaning; still less that persons could have applied it to themselves. I

chance to have met with a case in point against them. It is Spinoza's 'Philosophia Scripturæ Interpres, Exercitatio Paradoxa,' printed anonymously at Eleutheropolis, in 1666. This place was one of several cities in the clouds, to which the cuckoos resorted who were driven away by the other birds; that is, a feigned place of printing, adopted by those who would have caught it if orthodoxy could have caught them. Thus, in 1656, the works of Socinus could only be printed at Irenopolis. The author deserves his self-imposed title, as in the following:—

Quanto sane satius fuisset illam [Trinitatem] pro mysterio non habuisse, et Philosophiæ ope, antequam quod esset statuerent, secundum veræ logices præcepta quid esset cum Cl. Keckermanno investigasse; tanto fervore ac labore in profundissimas speluncas et obscurissimos metaphysicarum speculationum atque fictionum recessus se recipere ut ab adversariorum telis sententiam suam in tuto collocarent. Profecto magnus ille vir . . . dogma illud, quamvis apud theologos eo nomine non multum gratiæ iniverit, ita ex immotis Philosophiæ fundamentis explicat ac demonstrat, ut paucis tantum immutatis, atque additis, nihil amplius animus veritate sincere deditus desiderare possit.

This is properly paradox, though also heterodox. It supposes, contrary to all opinion, orthodox and heterodox, that philosophy can, with slight changes, explain the Athanasian doctrine so as to be at least compatible with orthodoxy. The author would stand almost alone, if not quite; and this is what he meant. I have met with the counter-paradox. I have heard it maintained that the doctrine as it stands, in all its mystery, is *à priori* more likely than any other to have been Revelation, if such a thing were to be; and that it might almost have been predicted.

After looking into books of paradoxes for more than thirty years, and holding conversation with many persons who have written them, and many who might have done so, there is one point on which my mind is fully made up. The manner in which a paradoxer will show himself, as to sense or nonsense, will not depend upon what he maintains, but upon whether he has or has not made a sufficient knowledge of what has been done by others, *especially as to the mode of doing it*, a preliminary to inventing knowledge for himself. That a little knowledge is a dangerous thing is one of the most fallacious of proverbs. A person of small knowledge is in danger of trying to make his *little* do the work of *more*; but a person without any is in more danger of making his *no* knowledge do the work of *some*. Take the speculations on the tides as an instance. Persons with nothing

but a little geometry have certainly exposed themselves in their modes of objecting to results which require the higher mathematics to be known before an independent opinion can be formed on sufficient grounds. But persons with no geometry at all have done the same thing much more completely.

There is a line to be drawn which is constantly put aside in the arguments held by paradoxers in favour of their right to instruct the world. Most persons must, or at least will, like the lady in Cadogan Place,¹ form and express an immense variety of opinions on an immense variety of subjects; and all persons must be their own guides in many things. So far all is well. But there are many who, in carrying the expression of their own opinions beyond the usual tone of private conversation, whether they go no further than attempts at oral proselytism, or whether they commit themselves to the press, do not reflect that they have ceased to stand upon the ground on which their process is defensible. Aspiring to lead *others*, they have never given themselves the fair chance of being first led by *other* others into something better than they can start for themselves; and that they should first do this is what both those classes of others have a fair right to expect. New knowledge, when to any purpose, must come by contemplation of old knowledge, in every matter which concerns thought; mechanical contrivance sometimes, not very often, escapes this rule. All the men who are now called discoverers, in every matter ruled by thought, have been men versed in the minds of their predecessors, and learned in what had been before them. There is not one exception. I do not say that every man has made direct acquaintance with the whole of his mental ancestry; many have, as I may say, only known their grandfathers by the report of their fathers. But even on this point it is remarkable how many of the greatest names in all departments of knowledge have been real antiquaries in their several subjects.

I may cite, among those who have wrought strongly upon opinion or practice in science, Aristotle, Plato, Ptolemy, Euclid, Archimedes, Roger Bacon, Copernicus, Francis Bacon, Ramus, Tycho Brahé, Galileo, Napier, Descartes, Leibnitz, Newton, Locke. I take none but names known out of their fields of work; and all were learned as well as sagacious. I have chosen my instances: if any one will undertake to show a person of little or no knowledge who has established himself in a great matter of pure thought, let him bring forward his man, and we shall see.

This is the true way of putting off those who plague others

¹ Mrs. Wititterly, in *Nicholas Nickleby*.