

Cambridge University Press
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Edited by Lisa Jardine and Michael Silverthorne
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The Great Renewal

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These are
the thoughts of
Francis Verulam,
and this is the
method which he designed for himself:
he believed
that present and future generations
would be better off
if he made it known to them.

He became aware that the human intellect is the source of its own problems, and makes no sensible and appropriate use of the very real aids which are within man's power; the consequence is a deeply layered ignorance of nature, and as a result of this ignorance, innumerable deprivations. He therefore judged that he must make every effort to find a way by which the relation between the mind and nature could be wholly restored or at least considerably improved. But there was simply no hope that errors which have grown powerful with age and which are likely to remain powerful for ever would (if the mind were left to itself) correct themselves of their own accord one by one, either from the native force of the understanding or with the help and assistance of logic. The reason is that the first notions of things which the mind accepts, keeps and accumulates (and which are the source of everything else), are faulty and confused and abstracted from things without care; and in its secondary and other notions there is no less passion and inconsistency. The consequence is that the general human reason which we bring to bear on the inquiry into nature is not well founded and properly constructed; it is like a magnificent palace without a foundation. Men admire and celebrate the false powers of the mind, but miss and lose the real powers they could have (if the proper assistance were used and if the mind itself were more compliant towards nature and did not recklessly insult it). The only course remaining was to try the thing again from the start with better means, and make a general Renewal of the sciences and arts and of all human learning, beginning from correct foundations. This might seem, on approach, to be something illimitably vast and beyond mortal strength, and yet in the treatment, will be found to be sane and sensible, more so than what has been done in the past. For one can see an end to it. Whereas in what is currently done in the sciences, there is a kind of giddiness, a perpetual agitation and going in a circle. He is also very

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aware of the solitude in which this experiment moves, and how hard, how unbelievably difficult, it is to get people to believe in it. Nevertheless he felt that he should not fail himself or abandon his subject without attempting to travel the only road open to the human mind. For it is better to make a beginning of a thing which has a chance of an end, than to get caught up in things which have no end, in perpetual struggle and exertion. These ways of thought are analogous in some way to the two legendary paths of action: the one is steep and difficult at the beginning but ends in the open; the other, at first glance easy and downhill, leads to impassable, precipitous places.¹ He could not be sure when such things would occur to anyone again in the future; he was particularly moved by the argument that he had not so far found anyone who had applied his mind to similar thoughts; and therefore he decided to give to the public the first parts that he had been able to complete. His haste was not due to ambition but to anxiety; if in the human way of things, anything should happen to him, there would still be extant an outline and plan of the thing which he had conceived in his mind; there would still exist also some indication of his genuine concern for the good of the human race. Certainly he regarded every other ambition as lower than the work that he had in hand. For either the matter in question is nothing, or it is so important that it should rightly be content with itself and not seek any external reward.

¹ The reference is to the 'choice of Heracles' told in e.g. Xenophon, *Memorabilia*, II.21.

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To our most serene
 and powerful
 Prince and Lord,

James

by the Grace of God
 King of Great Britain, France and Ireland,
 Defender of the Faith, etc.²

Most serene and powerful King,

Your Majesty may perhaps charge me with theft for stealing from your affairs the time I needed for this work. I have no answer. One cannot restore time; unless perhaps the time which I took from your affairs may redound to the memory of your name and the honour of your age, if this work has any value. It is certainly quite new; a totally new kind of thing; though drawn from a very old model, namely the world itself, and the nature of things and of the mind. Certainly I myself (I frankly confess) am accustomed to regard this work as a birth of time rather than of intelligence. The only wonder is that the beginning of the thing and such a powerful suspicion of opinions so long prevalent could have entered anyone's mind. The rest follows freely. But undoubtedly chance (as we say) and a certain fortuitous element plays a role in what men think no less than in what they do or say. By this chance of which I speak, I mean that if there is any good in these things which I bring, it will be imputed to the immense mercy and goodness of God and to the happiness of your times: as I have served you in my life with the sincerest devotion, so after my death I may perhaps ensure that your age will shine to posterity, by the lighting of this new torch in the dark days of philosophy. And this Regeneration and Renewal of the sciences is rightly due to the times of the wisest and most learned of all kings. I would add a petition, not unworthy of your Majesty, and most closely related to our present subject. It is that as you rival Solomon³ in so many things, in gravity of judgement, in the peace of your kingdom, in the largeness of your heart, and finally in the remarkable variety of books which you have composed, you would emulate that same king in another way, by taking steps to ensure that a Natural and Experimental History be

² James I reigned 1603–25. Francis Bacon served him in various high ministerial positions which culminated in a term as Lord Chancellor 1618–21.

³ King of the ancient Hebrews (c. 937–932 BC); the wisdom of Solomon is proverbial.

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built up and completed: the true, strict history (without philological questions) which is the path to the foundation of philosophy, and which we shall describe in its place. So that at last, after so many ages of the world, philosophy and the sciences may no longer float in the air, but rest upon the solid foundations of every kind of experience properly considered. I have supplied the Instrument;⁴ but the material must be sought in things themselves. May the Great and Good God long preserve your Majesty from harm.

*Your Serene Majesty's
 most faithful and
 devoted Servant,*

FRANCIS VERULAM,
 CHANCELLOR

⁴ 'Instrument' translates *Organum* (= Greek *Organon*) as in Bacon's title *Novum Organum*, which is literally 'The New Instrument'.

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Francis
 Verulam

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Preface

On the state of the sciences, that it is neither prosperous nor far advanced;
 and that a quite different way must be opened up for the human
 intellect than men have known in the past, and
 new aids devised, so that
 the mind may exercise
 its right over nature.

Men seem to me to have no good sense of either their resources or their power; but to exaggerate the former and underrate the latter. Hence, either they put an insane value on the arts which they already have and look no further or, undervaluing themselves, they waste their power on trifles and fail to try it out on things which go to the heart of the matter. And so they are like fatal pillars of Hercules⁵ to the sciences; for they are not stirred by the desire or the hope of going further. Belief in abundance is among the greatest causes of poverty; because of confidence in the present, real aids for the future are neglected. It is therefore not merely useful but quite essential that at the very outset of our work (without hesitation or pretence) we rid ourselves of this excess of veneration and regard, with a useful warning that men should not exaggerate or celebrate their abundance and its usefulness. For if you look closely at the wide range of books which are the boast of the arts and sciences, you will frequently find innumerable repetitions of the same thing, different in manner of treatment but anticipated in content, so that things which at first glance seem to be numerous are found on examination to be few. One must also speak plainly about usefulness, and say that the wisdom which we have drawn in particular from the Greeks seems to be a kind of childish stage of science, and to have the child's characteristic of being all too ready to talk, but too weak and immature to produce anything. For it is fertile in controversies, and feeble in results. The story of Scylla seems to fit the current state of letters exactly: she showed the face and visage of a virgin, but barking monsters clothed

⁵ *Columnae* (pillars) seems to allude to the engraving on the title page of the edition of 1620, and to refer to the Pillars of Hercules, beyond which men had not dared to sail hitherto. Cf. Plato, *Timaeus* 24D ff on the pillars of Hercules and Atlantis.

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and clung to her loins.⁶ Similarly, the sciences to which we are accustomed have certain bland and specious generalities, but when we get to particulars (which are like the generative parts), so that they may bring forth fruit and works from themselves, disputes and scrappy controversies start up, and that is where it ends and that is all the fruit they have to show. Besides, if such sciences were not a completely dead thing, it seems very unlikely that we would have the situation we have had for many centuries, that the sciences are almost stopped in their tracks, and show no developments worthy of the human race. Very often indeed not only does an assertion remain a mere assertion but a question remains a mere question, not resolved by discussion, but fixed and augmented; and the whole tradition of the disciplines presents us with a series of masters and pupils, not a succession of discoverers and disciples who make notable improvements to the discoveries. In the mechanical arts we see the opposite situation. They grow and improve every day as if they breathed some vital breeze. In their first authors they usually appear crude, clumsy almost, and ungainly, but later they acquire new powers and a kind of elegance, to the point that men's desires and ambitions change and fail more swiftly than these arts reach their peak of perfection. By contrast, philosophy and the intellectual sciences are, like statues, admired and venerated but not improved. Moreover they are sometimes at their best in their earliest author and then decline. For after men have joined a sect and committed themselves (like obsequious courtiers) to one man's opinion, they add no distinction to the sciences themselves, but act like servants in courting and adorning their authors. Let no one maintain that the sciences have grown little by little and now have reached a certain condition, and now at last (like runners who have finished the race) have found their final homes in the works of a few authors, and now that nothing better can be discovered, it remains only to adorn and cultivate what has already been discovered. We could wish that it were so. But a more correct and truthful account of the matter is that these appropriations of the sciences⁷ are simply a result of the confidence of a few men and the idleness and inertia of the rest. For after the sciences had been perhaps carefully cultivated and developed in some areas, by chance there arose a person, daring in character, who was accepted and followed because he had a summary kind of method; in appearance he gave the art a form, but in reality he corrupted the labours of the older

⁶ For this portrait of Scylla see Ovid, *Metamorphoses*, XIII.732–3.

⁷ 'this appropriating of the sciences' (Ellis)

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investigators. Yet it is a delight to posterity, because of the handy usefulness of his work and their disgust and impatience with new inquiry. And if anyone is attracted by ancient consensus and the judgement of time (so to speak), he should realise that he is relying on a very deceptive and feeble method. For we are mostly ignorant of what has become known and been published in the sciences and arts in different centuries and other places, and much more ignorant of what has been tried by individuals and discussed in private. So neither the births nor the abortions of time are extant in the public record. Nor should we attach much value to consensus itself and its longevity. There may be many kinds of political state, but there is only one state of the sciences, and it is a popular state and always will be. And among the people the kinds of learning which are most popular are those which are either controversial and combative or attractive and empty, that is, those which ensnare and those which seduce assent. This is surely why the greatest geniuses in every age have suffered violence; while men of uncommon intellect and understanding, simply to preserve their reputation, have submitted themselves to the judgement of time and the multitude. For this reason, if profound thoughts have occasionally flared up, they have soon been blown on by the winds of common opinion and put out. The result is that Time like a river has brought down to us the light things that float on the surface, and has sunk what is weighty and solid. Even those authors who have assumed a kind of dictatorship in the sciences and make pronouncements about things with so much confidence, take to complaining when they recover their senses from time to time about the subtlety of nature, the depths of truth, the obscurity of things, the complexity of causes, and the weakness of human understanding; yet they are no more modest in this, since they prefer to blame the common condition of man and nature rather than admit their own incapacity. In fact their usual habit, when some art fails to deliver something, is to declare the thing impossible on the basis of the same art. An art cannot be condemned when it is itself both the advocate and the judge; and so the issue is to save ignorance from disgrace. This then, more or less, is the condition of the traditional and received kinds of learning: barren of results, full of questions; slow and feeble in improvement; claiming perfection in the whole, but very imperfect in the parts; popular in choice and suspect to the authors themselves, and therefore wrapped up and presented with a variety of devices. Even those who have set out to learn for themselves and to commit themselves to the sciences and extend their limits, have not dared to abandon the received

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sciences completely or to seek the sources of things. They think they have achieved something important if they insert and add something of their own, prudently reflecting that in assenting they preserve their modesty and in adding they keep their freedom. But in being respectful of opinions and habits, these middle ways that people praise result in great losses for the sciences. For you can hardly admire an author and at the same time go beyond him. It is like water; it ascends no higher than its starting point. And so such men make some emendations but little progress; they improve existing learning but do not progress to anything new. There have also been men who with greater daring have thought that everything was new with them, and have relied on the strength of their genius to flatten and destroy everything that went before, and so made room for themselves and their opinions. They have not achieved much for all their noise; for what they tried to do was not to augment philosophy and the arts in fact and effect, but only to cause a change in belief and transfer the leadership of opinion to themselves; with very little profit, since among opposite errors, the causes of erring are almost the same. Those who have had sufficient spirit to want other men to join their inquiries, because they were not enslaved to their own or to other people's dogmas but favoured freedom, have doubtless been honest in intention, but they have been ineffective in practice. For they seem to have followed only probable reasoning, and are carried round and round in a whirlpool of arguments, and take all the power out of their investigation by their undisciplined licence in raising questions. There has been no one who has spent an adequate amount of time on things themselves and on experience. And some again who have committed themselves to the waves of experience, making themselves almost mechanics, still practise a kind of aimless investigation in experience itself, since even they do not work by fixed rules. In fact most of them have set themselves some petty tasks, thinking it a great achievement to make a single discovery; a design as inept as it is modest. It is impossible to make a thorough and successful inquiry into the nature of a thing in the thing itself; after a tedious variety of experiments he finds no end but only further lines of investigation. Then again, one should particularly notice that every effort expended on experience right from the beginning has sought to obtain certain specific results and to get them fast and directly; it has sought (I repeat) profitable, not illuminating, experiments; failing to imitate God's order, who on the first day created only light, and devoted a whole day to it; and produced on that day no material effects, moving on to these only

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on subsequent days. But those who have assigned the highest functions to logic and have thought to fashion the most powerful assistants to the sciences out of logic, have well and truly seen that the unaided human understanding really has to be distrusted. However, the medicine is much worse than the disease; and not without its own problems. For the logic now in use, though very properly applied to civil questions and the arts which consist of discussion and opinion, still falls a long way short of the subtlety of nature; and in grasping at what it cannot hold, has succeeded in establishing and fixing errors rather than in opening up the way to truth.

And so, to summarise what I have said, neither a man's own efforts nor his trust in another's seems so far to have worked for men in the sciences; especially as there is little help to be got from the demonstrations and experiments so far known. The fabric of the universe, its structure, to the mind observing it, is like a labyrinth, where on all sides the path is so often uncertain, the resemblance of a thing or a sign is deceptive, and the twists and turns of natures are so oblique and intricate. One must travel always through the forests of experience and particular things, in the uncertain light of the senses, which is sometimes shining and sometimes hidden. Moreover those who offer to guide one on the way are also lost in the labyrinth and simply add to the number who have gone astray. In such difficult circumstances, one cannot count on the unaided power of men's judgement; one cannot count on succeeding by chance. Even supreme intelligence or unlimited throws of the dice could not overcome the difficulties. We need a thread to guide our steps; and the whole road, right from the first perceptions of sense, has to be made with a sure method. This should not be taken to imply that nothing at all has been achieved in so many centuries, with so much effort. Nor do we complain of the discoveries that have been made. Certainly in the things that were within the range of their intelligence and abstract thinking, the ancients acquitted themselves admirably. But just as in previous centuries when men set their course in sailing simply by observations of the stars, they were certainly able to follow the shores of the old continent and cross some relatively small inland seas, but before the ocean could be crossed and the territories of the new world revealed, it was necessary to have a knowledge of the nautical compass as a more reliable and certain guide. By the same reasoning exactly, the discoveries that have so far been made in the arts and sciences are of the kind that could be found out by use, thought, observation and argument,