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THE NEW ORGANON

[英] Francis Bacon（培根）著

外语教学与研究出版社
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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

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.

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 Solomon[3] 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; the wisdom of Solomon is proverbial.

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'.

Francis
Verulam

The Great Renewal

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 Hercules[5] 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.

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 sciences[7] 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

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

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,

in that they are closely connected with the senses and common notions; but before one can sail to the more remote and secret places of nature, it is absolutely essential to introduce a better and more perfect use and application of the mind and understanding.

For ourselves, swayed by the eternal love of truth, we have committed ourselves to uncertain, rough and solitary ways, and relying and resting on God's help, we have fortified our mind against violent attacks from the armed forces of opinion, and against our own internal hesitations and scruples, the dark mists and clouds and fantasies of things flying all around us; so that at the end we may be able to provide more reliable and secure directions[8] for present and future generations. If we have had any success in this, the method that opened the way for us was certainly a true and proper humiliation of the human spirit. For all those before us who have devoted themselves to the discovery of arts have simply cast a brief glance at things and examples and experience, and then called on their own spirits to give them oracles, as if discovery were no more than conjuring up a new idea. But we stay faithfully and constantly with things, and abstract our minds no further from them than is necessary for the images and rays of things to come into focus (as in the case of sight), and therefore little is left to the power and excellence of the intelligence. And as we use humility in discovery, we have followed it also in teaching. And we do not attempt to claim or impose a spurious dignity on our discoveries either by triumphs in refutation or by appeals to antiquity or by any usurpation of authority or even by taking refuge in obscurity; it would not be difficult to do this kind of thing if one were trying to glorify his own name rather than enlighten the minds of others. We have not planned (I say) or laid any attack or ambush for men's judgements; we bring them into the presence of things themselves and their connections, so that they may see what they have, what they may question, and what they may add and contribute to the common stock. If we have too readily believed anything, if we have fallen asleep or not paid enough attention, or given up on the way and stopped the inquiry too soon, we still present things plainly and clearly. Hence our mistakes may be noted and removed before they infect the body of science too deeply; and anyone else may easily and readily take over our labours. In this way we believe that we have made for ever a true and lawful

[8] *indicia*: cf. the full Latin title of the *New Organon*: *Novum Organum, sive Indicia vera de interpretatione naturae*, i.e. 'The New Instrument, or True Directions for the Interpretation of Nature'.

marriage between the empirical and the rational faculties (whose sad and unhappy divorce and separation have caused all the trouble in the human family).

And therefore, since these things are not under our control, at the outset of our work we offer the most humble and fervent prayers to God the Father, God the Word and God the Spirit, that mindful of the afflictions of mankind and of the pilgrimage of life in which we pass few days and evil, they may deign to endow the human family through our hands with new mercies. We also humbly pray that the human may not overshadow the divine, and that from the revelation of the ways of sense and the brighter burning of the natural light, the darkness of unbelief in the face of the mysteries of God may not arise in our hearts. Rather we pray that from a clear understanding, purged of fantasy and vanity, yet subject still to the oracles of God and wholly committed to them, we may give to faith all that belongs to faith. And finally we pray that when we have extracted from knowledge the poison infused by the serpent which swells and inflates the human mind, we may not be wise with too high or too great a wisdom, but may cultivate the truth in all charity.

Our prayers done, we turn to men and offer some salutary advice and make some reasonable requests. First we advise (as we have prayed) that men may restrain their sense within their duty, so far as the things of God are concerned. For sense (like the sun) opens up the face of the terrestrial globe and closes and obscures the globe of heaven. And then we warn men not to err in the opposite direction as they avoid this evil; which will certainly happen if they believe that any part of the inquiry into nature is forbidden by an interdict. The pure and immaculate natural knowledge by which Adam assigned appropriate names to things did not give opportunity or occasion for the Fall. The method and mode of temptation in fact was the ambitious and demanding desire for moral knowledge, by which to discriminate good from evil, to the end that Man might turn away from God and give laws to himself. About the sciences which observe nature the sacred philosopher declares that 'the Glory of God is to conceal a thing, but the glory of a king is to find out a thing',[9] just as if the divine nature delighted in the innocent and amusing children's game in which they hide themselves purposely in order to be found; and has coopted the human mind to join this game in his kindness and goodness towards men. Finally,

[9] Proverbs 25:2; the phrase is quoted again at *New Organon*, I.129, in a slightly different form.

we want all and everyone to be advised to reflect on the true ends of knowledge:[10] not to seek it for amusement or for dispute, or to look down on others, or for profit or for fame or for power or any such inferior ends, but for the uses and benefits of life, and to improve and conduct it in charity. For the angels fell because of an appetite for power; and men fell because of an appetite for knowledge; but charity knows no bounds; and has never brought angel or man into danger.

The requests we make are as follows. Nothing for ourselves personally, but about what we are doing, we ask that men think of it not as an opinion but as a work, and hold it for certain that we are laying the foundations not of a sect or of a dogma, but of human progress and empowerment. And then that they would give their own real interests a chance, and put off the zeal and prejudice of beliefs and think of the common good; then, freed from obstacles and mistaken notions of the way, and equipped with our helps and assistance, we would ask them to undertake their share of the labours that remain. And we ask them to be of good hope; and not imagine or conceive of our *Renewal* as something infinite and superhuman, when in fact it is the end of unending error, and the right goal, and accepts the limitations of mortality and humanity, since it does not expect that the thing can be completely finished in the course of one lifetime, but provides for successors; and finally that it seeks knowledge not (arrogantly) in the tiny cells of human intelligence but humbly in the wider world. For the most part empty things are very big, solid things are very dense and take up little space. Finally, it seems, we must also request (just in case anyone means to be unfair to us, which would imperil the project itself) that men determine how far, on the basis of what we are compelled to say (if we are to be consistent), they may believe they have the right to have an opinion or to express a view about our teachings; for we reject (in an inquiry into nature) all that hasty human reasoning, based on preconceptions,[11] which abstracts from things carelessly and more quickly than it should, as a vague, unstable procedure, badly devised. And I cannot be arraigned to stand trial under a procedure which is itself on trial.

[10] *scientia*

[11] *anticipantem*: see 1.26 on 'anticipations of nature'.

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