

**THE WORKS OF FRANCIS BACON,
VOLUME THE FIFTH,
CONTAINING NOVUM
ORGANUM SCIENTIARUM, VOL.
II**

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FRANCIS BACON

**THE WORKS OF FRANCIS BACON,
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SCIENTIARUM, VOL. II**

THE
WORKS
OF
FRANCIS BACON,

BARON VERULAM, VISCOUNT ST. ALBAN, AND LORD HIGH
CHANCELLOR OF ENGLAND.

VOLUME THE FIFTH.

CONTAINING
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1815.

NOVUM ORGANUM.

PART II.—SECTION II.

THE DOCTRINE OF INSTANCES; OR, THE METHOD OF
EXPEDITING THE INTERPRETATION OF NATURE,
AND THE INVESTIGATION OF FORMS, BY
PREROGATIVE INSTANCES*.

APHORISM XXI.

HAVING thus laid down the tables, that afford the first view of a subject †, and given an

* The doctrine of instances is delivered with great diligence, sagacity, and exactness, in the present section. The design is to shew what are the principal, most material, and essential particulars in every enquiry; or what instances are chiefly to be sought after and regarded, in order to discover the real natures of things, with the greatest certainty and expedition. It is a doctrine of the first importance in the discovery of forms, and for want thereof the philosophical enquiries we generally meet with are but light skirmishes, instead of close grapplings with nature; or, without a metaphor, they have no strong and direct tendency to the discovery of forms, but appear vague, indetermined, and rather amusing than useful.

† That is, in the way of example, and not in the way of rigid and just enquiry, which requires much more industry

example of the method of rejection or exclusion, and a specimen of the fruits, or first dawn of doctrine to be derived from them, we proceed to the other helps of the understanding, in the business of interpreting nature, or forming a true and perfect induction. And, in proposing these helps, we shall, wherever tables are required, proceed upon the foregoing subject of heat* ; but where fewer examples are sufficient, we will occasionally launch into subjects of all kinds, without confounding our enquiry of heat, on the one hand, or confining our doctrine to too scanty bounds, on the other †.

We therefore propose to treat, 1. of prerogative instances ; 2. of the helps of induction ; 3. of the rectification of induction ; 4. of the method of varying enquiries, according to the nature of the subject ; 5. of prerogative natures for enquiry, or what subjects are to be enquired into first, what second ; 6. of the limits of enquiry, or an inventory of all the natures in the

and exactness, after the manner of the Author's enquiry into the subjects of Life and Death, Winds, Condensation, and Rarefaction ; though these also are but a kind of larger examples, and not finished enquiries.

* The tables, for that purpose, being laid down in the preceding section.

† And, in this view, the following Aphorisms will exhibit a little map of the roads for improving all kinds of knowledge.

universe ; 7. of reducing enquiries to practice, or making them subservient to human uses ; 8. of the preliminaries to enquiry ; 9. and lastly, of the ascending and descending scale of Axioms*.

22. Among the prerogative instances for interpreting nature, in the first place come the solitary kind † ; that is, 1. those which exhibit the nature enquired after, in such subjects as have nothing common with others, besides that very nature ; or, 2. those that exhibit the nature en-

* Of these nine general heads, under which the remaining parts of the *Novum Organum* were to have been comprised, no more than the first is prosecuted by the Author. Nor was any thing afterwards published towards executing the rest, though it appears that the whole design was laid from the first, and that, at times, the other parts were gone on with, after the present piece was published. The want of these additional Sections may, perhaps, be in some measure supplied by a close attention to the present Doctrine of Instances. But, in order to render the whole more generally intelligible and useful, it were greatly to be wished that some tolerably qualified person would give an essay upon it, in as familiar a manner as the subject will allow. See Dr. Hook's *Method of Improving Natural Philosophy*.

† Let it be remembered that, with regard to the names of the several kinds of instances hereafter mentioned, the Author had a right to impose them, as the subject was entirely new and untouched. And, doubtless, certain definitions and names are required, where things are to be carefully distinguished.

quired after, in such subjects as are every way similar to others, excepting in that very nature. For it is manifest, that such instances as these will shorten the enquiry, and promote and hasten the exclusion * ; so that a few of them may do the service of many.

For example, 1. if the enquiry be about the nature of colour, solitary instances are prisms, and crystal gems, or glasses, which represent colours, not only in themselves, but also externally upon a wall, &c. Understand the same of dews, &c. For these have nothing in common with the fixed colours of flowers, coloured gems, coloured glass, metals, various woods, &c. besides the colour itself. Whence it may be easily inferred, that colour is nothing more than an alteration in the rays of light, occasioned, in the first case, by different degrees of incidence † ; and, in the second, by the different texture, or structure of the body, and so reflected to the eye. But these instances are solitary, or single, in point of likeness ‡.

* See above, *Table IV. Aph. 18*

† *Viz.* In the prism, glasses, dew, &c. Which kind of instance led the Archbishop of Spalato, Dr. Hook, Mr. Boyle, Sir Isaac Newton, &c. to very considerable discoveries in the subject of colours.

‡ *Viz.* Dissimilar in all respects besides that of colour, in which the solitariness of the instance consists.

(2.) Again, in the same enquiry, the distinct veins of black and white in marble, and the variegation of colours in flowers of the same species, are solitary instances, for the black and white parts of marble, or the spots of white and purple in carnations, agree almost in every respect, except in colour. Whence it is easily collected, that colour does not greatly depend upon the intrinsic nature of the coloured body, but is owing to a somewhat gross, or bare mechanical texture of the parts*. Thus these instances are solitary, in point of difference. And we call both the kinds by one and the same name.

23. In the second place come travelling instances, or those wherein the nature enquired after, travels, or advances to generation, when it was not before in being; or, on the contrary, travels, or tends to destruction, when it was in being before. And, therefore, in either correlative, such instances are always duplicate; or rather one instance, in motion, or passage, is continued to the opposite period†. And instances of this kind not only accelerate and confirm the business of exclusion, but also drive the affirmation, or form itself, into a narrow compass,

* See Mr. Boyle of colours.

† That is, either there is both a generation and destruction, or else one and the same process begins with generation, and ends with destruction.

For the form of the thing must necessarily be somewhat introduced, or abolished, by this transmigration. And though all exclusion promotes and forwards the affirmation, yet this is more directly done in the same subject, than in different ones; for it plainly appears, from all we have said before, that the form discovering itself in one thing, leads to its discovery in all the rest. But the more simple this passage is, the nobler the instance should be esteemed.

Again, these travelling instances are of great use in practice, because, as they exhibit the form joined with an efficient, or privation*, they clearly design, or mark out the practical operation in some cases; whence any easy passage is also afforded to the neighbouring discoveries. There is, however, some danger in these instances, that requires a particular caution; for they may be apt to restrain the form too much to the efficient, and to infect, or at least to tinge the understanding with a false notion of the form, through an apparent mixture of the efficient; whereas the efficient is never more than the vehicle of the form †. But this inconvenience is easily remedied by making a just exclusion ‡.

* See above, Part II. Sect. I. Aph. 1, 4, &c.

† See Part II. Sect. I. Aph. 2, &c.

‡ See Table IV. Aph. 18.