

THE ROAD TO SCIENCE FICTION #1

From Gilgamesh to Wells



Edited by James Gunn



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Experience, Experiment, and the Battle for Men's Minds

The battle for human understanding that had been waged by Roger Bacon in the thirteenth century still was in progress by the seventeenth century when another Bacon set out to destroy old errors and establish a new system of understanding based on observation and experiment.

Francis Bacon (1561–1626) studied law, entered the legal bureaucracy under Queen Elizabeth, and rose to the peak of his profession (like his utopian predecessor, Thomas More), becoming Lord Chancellor under James I. After three years, however, he was accused of taking bribes, confessed to corruption and neglect, and spent his last five years in retirement.

His success in the realm of ideas was more lasting. Empiricism, the philosophical doctrine that all knowledge comes from experience was not a new concept with Bacon; the sixteenth-century Swiss alchemist Paracelsus already had stressed the importance of empiricism in contrast to a dependence on the authority of Galen and other classical physicians. Bacon's contribution was an emphasis on controlled and repeated experiments, carefully coordinated, and directed and focused by theory.

In his *Novum Organum* (1620), or *The New Instrument of Learning*, Bacon set out to completely reconstruct human learning, first attacking those ideas that delude, mislead, and bewilder humanity, which he called Idols, and then setting forth his own way to truth. *The New Atlantis* (1627) is his never-completed utopian vision of an island where the scientific method has been perfected, laboratories have been built to explore natural phenomena, and the discoveries of science have been turned to the service of a better life for the people, though the scientists assume the responsibility for deciding which discoveries are released and which are kept secret.

The high point of *The New Atlantis* is the description of Salomon's House (or Solomon, who was reputed to have been the wisest man of antiquity). It sounds very much like a modern research university or laboratory. Perhaps because Bacon's vision of a helpful science was unsullied by political theory, his concepts were more quickly implemented than that of the social scientists. Within thirty years, the Philosophical Society was formed in England for the study of natural phenomena and the discussion of scientific data and theory; in 1662, this was chartered as the Royal Society, a scientific organization that still exists and still is involved in the original goals set forth by Bacon.

Bacon has been called the father of the scientific method.

From The New Atlantis

by Francis Bacon

We sailed from Peru, where we had continued by the space of one whole year, for China and Japan, by the South Sea, taking with us victuals for twelve months; and had good winds from the east, though soft and weak, for five months' space and more. But then the wind came about, and settled in the west for many days, so as we could make little or no way, and were sometimes in purpose to turn back. But then again there arose strong and great winds from the south, with a point east; which carried us up, for all that we could do, towards the north: by which time our victuals failed us, though we had made good spare of them. So that finding ourselves, in the midst of the greatest wilderness of waters in the world, without victual, we gave ourselves for lost men, and prepared for death. Yet we did lift up our hearts and voices to God above, who showeth His wonders in the deep; beseeching Him of his mercy, that as in the beginning He discovered the face of the deep, and brought forth dry land, so He would now discover land to us, that we might not perish. And it came to pass, that the next day about evening we saw

within a keening before us, towards the north, as it were thick clouds, which did put us in some hope of land: knowing how that part of the South Sea was utterly unknown: and might have islands or continents, that hitherto were not come to light. Wherefore we bent our course thither, where we saw the appearance of land, all that night: and in the dawning of next day, we might plainly discern that it was a land flat to our sight, and full of bosage, which made it show the more dark. And after an hour and a half's sailing, we entered into a good haven, being the port of a fair city. Not great indeed, but well built, and that gave a pleasant view from the sea. And we thinking every minute long till we were on land, came close to the shore and offered to land. But straightways we saw divers of the people, with bastons in their hands, as it were forbidding us to land: yet without any cries or fierceness, but only as warning us off, by signs that they made. Whereupon being not a little discomfited, we were advising with ourselves what we should do. During which time there made forth to us a small boat, with about eight persons in it, whereof one of them had in his hand a tipstaff of a yellow cane, tipped at both ends with blue, who made aboard our ship, without any show of distrust at all. And when he saw one of our number present himself somewhat afore the rest, he drew forth a little scroll of parchment (somewhat yellower than our parchment, and shining like the leaves of writing tables, but otherwise soft and flexible), and delivered it to our foremost man. In which scroll were written in ancient Hebrew, and in ancient Greek, and in good Latin of the school, and in Spanish these words: "Land ye not, none of you, and provide to be gone from this coast within sixteen days, except you have further time given you; meanwhile, if you want fresh water, or victual, or help for your sick, or that your ship needeth repair, write down your wants, and you shall have that which belongeth to mercy." This scroll was signed with a stamp of cherubim's wings, not spread, but hanging downwards; and by them a cross. This being delivered, the officer returned, and left only a servant with us to receive our answer. Consulting hereupon amongst ourselves, we were much perplexed. The denial of landing, and hasty warning us away, troubled us much: on the other side, to find that the people had languages, and were so full of humanity, did comfort us not a little. And above all, the sign of the cross to that instrument, was to us a great rejoicing, and as it

were a certain presage of good. Our answer was in the Spanish tongue, "That for our ship, it was well; for we had rather met with calms and contrary winds, than any tempests. For our sick, they were many, and in very ill case; so that if they were not permitted to land, they ran in danger of their lives." Our other wants we set down in particular, adding, "That we had some little store of merchandise, which if it pleased them to deal for, it might supply our wants, without being chargeable unto them." We offered some reward in pistolets unto the servant, and a piece of crimson velvet to be presented to the officer; but the servant took them not, nor would scarce look upon them; and so left us, and went back in another little boat which was sent for him.

About three hours after we had despatched our answer there came towards us a person (as it seemed) of a place. He had on him a gown with wide sleeves, of a kind of water chamolet, of an excellent azure colour, far more glossy than ours: his under apparel was green, and so was his hat, being in the form of a turban, daintily made, and not so huge as the Turkish turbans; and the locks of his hair came down below the brims of it. A reverend man was he to behold. He came in a boat, gilt in some part of it, with four persons more only in that boat; and was followed by another boat, wherein were some twenty. When he was come within a flight-shot of our ship, signs were made to us that we should send forth some to meet him upon the water, which we presently did in our ship-boat, sending the principal man amongst us save one, and four of our number with him. When we were come within six yards of their boat, they called to us to stay, and not to approach farther, which we did. And thereupon the man, whom I before described, stood up, and with a loud voice in Spanish, asked, "Are ye Christians?" We answered, "We were"; fearing the less, because of the cross we had seen in the subscription. At which answer the said person lift up his right hand towards heaven, and drew it softly to his mouth (which is the gesture they use, when they thank God), and then said: "If ye will swear, all of you; by the merits of the Saviour, that ye are no pirates; nor have shed blood, lawfully nor unlawfully, within forty days past; you may have license to come on land." We said, "We were all ready to take that oath." Whereupon one of those that were with him, being (as it seemed) a notary, made an entry of this act. Which done, another of the atten-

dants of the great person, which was with him in the same boat, after his lord had spoken a little to him, said aloud: "My lord would have you know, that it is not of pride, or greatness, that he cometh not aboard your ship: but for that, in your answer, you declare that you have many sick amongst you, he was warned by the conservator of health of the city that he should keep a distance." We bowed ourselves towards him, and answered: "We were his humble servants; and accounted for great honour and singular humanity towards us, that which was already done: but hoped well, that the nature of the sickness of our men was not infectious." So he returned; and a while after came the notary to us aboard our ship; holding in his hand a fruit of that country, like an orange, but of colour between orange-tawny and scarlet: which cast a most excellent odour. He used it (as it seemed) for a preservative against infection. He gave us our oath, "By the name of Jesus, and His merits"; and after told us, that the next day by six of the clock in the morning, we should be sent to, and brought to the strangers' house (so he called it), where we should be accommodated of things, both for our whole and for our sick. So he left us; and when we offered him some pistolets, he smiling, said, "He must not be twice paid for one labour": meaning (as I take it) that he had salary sufficient of the state for his service. For (as I after learned) they call an officer that taketh rewards twice-paid.

The next morning early, there came to us the same officer that came to us at first with his cane, and told us: "He came to conduct us to the strangers' house: and that he had prevented the hour, because we might have the whole day before us for our business. For (said he) if you will follow my advice, there shall first go with me some few of you, and see the place, and how it may be made convenient for you: and then you may send for your sick, and the rest of your number, which ye will bring on land." We thanked him, and said, "That his care which he took of desolate strangers, God would reward." And so six of us went on land with him; and when we were on land, he went before us, and turned to us, and said, "He was but our servant, and our guide." He led us through three fair streets; and all the way we went there were gathered some people on both sides, standing in a row; but in so civil a fashion, as if it had been, not to wonder at us, but to welcome us; and divers of them, as we passed by them, put their arms a little abroad, which is their gesture when

they bid any welcome. The strangers' house is a fair and spacious house, built of brick, of somewhat a bluer colour than our brick; and with handsome windows, some of glass, some of a kind of cambric oiled. He brought us first into a fair parlour above stairs, and then asked us, "What number of persons we were? and how many sick?" We answered, "We were in all (sick and whole) one and fifty persons, whereof our sick were seventeen." He desired us to have patience a little, and to stay till he came back to us, which was about an hour after; and then he led us to see the chambers which were provided for us, being in number nineteen. They having cast it (as it seemeth) that four of those chambers, which were better than the rest, might receive four of the principal men of our company; and lodge them alone by themselves; and the other fifteen chambers were to lodge us, two and two together. The chambers were handsome and cheerful chambers, and furnished civilly. Then he led us to a long gallery, like a dorture, where he showed us all along the one side (for the other side was but wall and window) seventeen cells, very neat ones, having partitions of cedar wood. Which gallery and cells, being in all forty (many more than we needed), were instituted as an infirmary for sick persons. And he told us withal, that as any of our sick waxed well, he might be removed from his cell to a chamber: for which purpose there were set forth ten spare chambers, besides the number we spake of before. This done, he brought us back to the parlour, and lifting up his cane a little (as they do when they give any charge or command), said to us, "Ye are to know that the custom of the land requireth, that after this day and to-morrow (which we give you for removing your people from your ship), you are to keep within doors for three days. But let it not trouble you, nor do not think yourselves restrained, but rather left to your rest and ease. You shall want nothing; and there are six of our people appointed to attend you for any business you may have abroad." We gave him thanks with all affection and respect, and said, "God surely is manifested in this land." We offered him also twenty pistolets; but he smiled, and only said: "What? Twice paid!" And so he left us. Soon after our dinner was served in; which was right good viands, both for bread and meat: better than any collegiate diet that I have known in Europe. We had also drink of three sorts, all wholesome and good; wine of the grape; a drink of grain, such as is with us our ale, but

more clear; and a kind of cider made of a fruit of that country; a wonderful pleasing and refreshing drink. Besides, there were brought in to us great store of those scarlet oranges for our sick; which (they said) were an assured remedy for sickness taken at sea. There was given us also a box of small grey or whitish pills, which they wished our sick should take, one of the pills every night before sleep; which (they said) would hasten their recovery. The next day, after that our trouble of carriage and removing of our men and goods out of our ship was somewhat settled and quiet, I thought good to call our company together, and when they were assembled, said unto them, "My dear friends, let us know ourselves, and how it standeth with us. We are men cast on land, as Jonas was out of the whale's belly, when we were as buried in the deep; and now we are on land, we are but between death and life, for we are beyond both the old world and the new; and whether ever we shall see Europe, God only knoweth. It is a kind of miracle hath brought us hither, and it must be little less that shall bring us hence. Therefore in regard of our deliverance past, and our danger present and to come, let us look up to God, and every man reform his own ways. Besides we are come here amongst a Christian people, full of piety and humanity. Let us not bring that confusion of face upon ourselves, as to show our vices or unworthiness before them. Yet there is more, for they have by commandment (though in form of courtesy) cloistered us within these walls for three days; who knoweth whether it be not to take some taste of our manners and conditions? And if they find them bad, to banish us straightways; if good, to give us further time. For these men that they have given us for attendance, may withal have an eye upon us. Therefore, for God's love, and as we love the weal of our souls and bodies, let us so behave ourselves, as we may be at peace with God, and may find grace in the eyes of this people." Our company with one voice thanked me for my good admonition, and promised me to live soberly and civilly, and without giving any the least occasion of offence. So we spent our three days joyfully, and without care, in expectation what would be done with us when they were expired. During which time, we had every hour joy of the amendment of our sick, who thought themselves cast into some divine pool of healing, they mended so kindly and so fast.

The morrow after our three days were past, there came to

us a new man, that we had not seen before, clothed in blue as the former was, save that his turban was white with a small red cross on the top. He had also a tippet of fine linen. At his coming in, he did bend to us a little, and put his arms abroad. We of our parts saluted him in a very lowly and submissive manner; as looking that from him we should receive sentence of life or death. He desired to speak with some few of us. Whereupon six of us only stayed, and the rest avoided the room. He said, "I am by office governor of this house of strangers, and by vocation I am a Christian priest; and therefore am come to you, to offer you my service, both as strangers, and chiefly as Christians. Some things I may tell you, which I think you will not be unwilling to hear. The state hath given you license to stay on land for the space of six weeks: and let it not trouble you, if your occasions ask further time, for the law in this point is not precise; and I do not doubt, but myself shall be able to obtain for you such further time as shall be convenient. Ye shall also understand, that the strangers' house is at this time rich, and much beforehand; for it hath laid up revenue these thirty-seven years: for so long it is since any stranger arrived in this part; and therefore take ye no care; the state will defray you all the time you stay. Neither shall you stay one day the less for that. As for any merchandise you have brought, ye shall be well used, and have your return, either in merchandise or in gold and silver: for to us it is all one. And if you have any other request to make, hide it not; for ye shall find we will not make your countenance to fall by the answer ye shall receive. Only this I must tell you, that none of you must go above a karan (that is with them a mile and a half) from the walls of the city, without special leave." We answered, after we had looked a while upon one another, admiring this gracious and parent-like usage, that we could not tell what to say, for we wanted words to express our thanks; and his noble free offers left us nothing to ask. It seemed to us, that we had before us a picture of our salvation in heaven; for we that were a while since in the jaws of death, were now brought into a place where we found nothing but consolations. For the commandment laid upon us, we would not fail to obey it, though it was impossible but our hearts should be inflamed to tread further upon this happy and holy ground. We added, that our tongues should first cleave to the roofs of our mouths, ere we should forget, either this reverend person, or this whole na-

tion, in our prayers. We also most humbly besought him to accept of us as his true servants, by as just a right as ever men on earth were bounden; laying and presenting both our persons and all we had at his feet. He said, he was a priest, and looked for a priest's reward; which was our brotherly love, and the good of our souls and bodies. So he went from us, not without tears of tenderness in his eyes, and left us also confused with joy and kindness, saying amongst ourselves, that we were come into a land of angels, which did appear to us daily, and prevent us with comforts, which we thought not of, much less expected.

The next day, about ten of the clock, the governor came to us again, and after salutations, said familiarly, that he was come to visit us; and called for a chair, and sat him down; and we being some ten of us (the rest were of the meaner sort, or else gone abroad), sat down with him; and when we were set, he began thus: "We of this island of Bensalem (for so they called it in their language) have this: that by means of our solitary situation, and of the laws of secrecy, which we have for our travellers, and our rare admission of strangers; we know well most part of the habitable world, and are ourselves unknown. Therefore because he that knoweth least is fittest to ask questions, it is more reason, for the entertainment of the time, that ye ask me questions, than that I ask you." We answered, that we humbly thanked him, that he would give us leave so to do. And that we conceived by the taste we had already, that there was no worldly thing on earth more worthy to be known than the state of that happy land. But above all (we said) since that we were met from the several ends of the world, and hoped assuredly that we should meet one day in the kingdom of heaven (for that we were both parts Christians), we desired to know (in respect that land was so remote, and so divided by vast and unknown seas from the land where our Saviour walked on earth) who was the apostle of that nation, and how it was converted to the faith? It appeared in his face, that he took great contentment in this our question; he said, "Ye knit my heart to you, by asking this question in the first place: for it showeth that you first seek the kingdom of heaven: and I shall gladly, and briefly, satisfy your demand.

"About twenty years after the ascension of our Saviour it came to pass, that there was seen by the people of Renfusa (a city upon the eastern coast of our island, within sight, the

night was cloudy and calm), as it might be some mile in the sea, a great pillar of light; not sharp, but in form of a column, or cylinder, rising from the sea, a great way up towards heaven; and on the top of it was seen a large cross of light, more bright and resplendent than the body of the pillar. Upon which so strange a spectacle, the people of the city gathered apace together upon the sands, to wonder; and so after put themselves into a number of small boats to go nearer to this marvellous sight. But when the boats were come within about sixty yards of the pillar, they found themselves all bound, and could go no further, yet so as they might move to go about, but might not approach nearer; so as the boats stood all as in a theatre, beholding this light, as an heavenly sign. It so fell out, that there was in one of the boats one of the wise men of the Society of Salomon's House; which house or college, my good brethren, is the very eye of this kingdom, who having a while attentively and devoutly viewed and contemplated this pillar and cross, fell down upon his face; and then raised himself upon his knees, and lifting up his hands to heaven, made his prayers in this manner:

"Lord God of heaven and earth; thou hast vouchsafed of thy grace, to those of our order to know thy works of creation, and true secrets of them; and to discern (as far as appertaineth to the generations of men) between divine miracles, works of Nature, works of art and impostures, and illusions of all sorts. I do here acknowledge and testify before this people, that the thing we now see before our eyes, is thy finger, and a true miracle. And forasmuch as we learn in our books, that thou never workest miracles, but to a divine and excellent end (for the laws of Nature are thine own laws, and thou exceedest them not but upon great cause), we most humbly beseech thee to prosper this great sign, and to give us the interpretation and use of it in mercy; which thou dost in some part secretly promise, by sending it unto us."

"When he had made his prayer, he presently found the boat he was in movable and unbound; whereas all the rest remained still fast; and taking that for an assurance of leave to approach, he caused the boat to be softly and with silence rowed towards the pillar; but ere he came near it, the pillar and cross of light broke up, and cast itself abroad, as it were into a firmament of many stars, which also vanished soon after, and there was nothing left to be seen but a small ark, or

chest of cedar, dry and not wet at all with water, though it swam; and in the fore-end of it, which was towards him, grew a small green branch of palm; and when the wise man had taken it with all reverence into his boat, it opened of itself, and there were found in it a book and a letter, both written in fine parchment, and wrapped in sindons of linen. The book contained all the canonical books of the Old and New Testament, according as you have them (for we know well what the churches with you receive), and the Apocalypse itself; and some other books of the New Testament, which were not at that time written, were nevertheless in the book. And for the letter, it was in these words:

"I Bartholomew, a servant of the Highest, and apostle of Jesus Christ, was warned by an angel that appeared to me in a vision of glory, that I should commit this ark to the floods of the sea. Therefore I do testify and declare unto that people where God shall ordain this ark to come to land, that in the same day is come unto them salvation and peace, and goodwill from the Father, and from the Lord Jesus."

"There was also in both these writings, as well the book as the letter, wrought a great miracle, conform to that of the apostles, in the original gift of tongues. For there being at that time, in this land, Hebrews, Persians, and Indians, besides the natives, every one read upon the book and letter, as if they had been written in his own language. And thus was this land saved from infidelity (as the remain of the old world was from water) by an ark, through the apostolical and miraculous evangelism of St. Bartholomew." And here he paused, and a messenger came, and called him forth from us. So this was all that passed in that conference.

The next day, the same governor came again to us, immediately after dinner, and excused himself, saying, "That the day before he was called from us somewhat abruptly, but now he would make us amends, and spend time with us, if we held his company and conference agreeable." We answered, that we held it so agreeable and pleasing to us, as we forgot both dangers past, and fears to come, for the time we heard him speak; and that we thought an hour spent with him was worth years of our former life. He bowed himself a little to us, and after we were set again, he said, "Well, the questions are on your part." One of our number said, after a little pause, that there was a matter we were no less desirous to know than fearful to ask, lest we might presume too far.

But encouraged by his rare humanity towards us (that could scarce think ourselves strangers, being his vowed and professed servants), we would take the hardness to propound it; humbly beseeching him, if he thought it not fit to be answered, that he would pardon it, though he rejected it. We said, we well observed those his words, which he formerly spake, that this happy island, where we now stood, was known to few, and yet knew most of the nations of the world, which we found to be true, considering they had the languages of Europe, and knew much of our state and business; and yet we in Europe (notwithstanding all the remote discoveries and navigations of this last age) never heard any of the least inkling or glimpse of this island. . . .

"There reigned in this island, about 1,900 years ago, a king, whose memory of all others we most adore; not superstitiously, but as a divine instrument, though a mortal man: his name was Salomona; and we esteem him as the lawgiver of our nation. This king had a large heart, inscrutable for good; and was wholly bent to make his kingdom and people happy. He therefore taking into consideration how sufficient and substantive this land was, to maintain itself without any aid at all of the foreigner; being 5,000 miles in circuit, and of rare fertility of soil, in the greatest part thereof; and finding also the shipping of this country might be plentifully set on work, both by fishing and by transportations from port to port, and likewise by sailing unto some small islands that are not far from us, and are under the crown and laws of this state; and recalling into his memory the happy and flourishing estate wherein this land then was, so as it might be a thousand ways altered to the worse, but scarce any one way to the better; though nothing wanted to his noble and heroical intentions, but only (as far as human foresight might reach) to give perpetuity to that which was in his time so happily established, therefore amongst his other fundamental laws of this kingdom he did ordain the interdicts and prohibitions which we have touching entrance of strangers; which at that time (though it was after the calamity of America) was frequent; doubting novelties and commixture of manners. It is true, the like law against the admission of strangers without license is an ancient law in the kingdom of China, and yet continued in use. But there it is a poor thing; and hath made them a curious, ignorant, fearful foolish nation. But our lawgiver made his law of another temper. For first, he hath

preserved all points of humanity, in taking order and making provision for the relief of strangers distressed; whereof you have tasted." At which speech (as reason was) we all rose up, and bowed ourselves. He went on: "That king also still desiring to join humanity and policy together; and thinking it against humanity, to detain strangers here against their wills; and against policy, that they should return, and discover their knowledge of this estate, he took this course; he did ordain, that of the strangers that should be permitted to land, as many at all times might depart as many as would; but as many as would stay, should have very good conditions, and means to live from the state. Wherein he saw so far, that now in so many ages since the prohibition, we have memory not of one ship that ever returned, and but of thirteen persons only, at several times, that chose to return in our bottoms. What those few that returned may have reported abroad, I know not. But you must think, whatsoever they have said, could be taken where they came but for a dream. Now for our travelling from hence into parts abroad, our lawgiver thought fit altogether to restrain it. So is it not in China. For the Chinese sail where they will, or can; which showeth, that their law of keeping out strangers is a law of pusillanimity and fear. But this restraint of ours hath one only exception, which is admirable; preserving the good which cometh by communicating with strangers, and avoiding the hurt: and I will now open it to you. And here I shall seem a little to digress, but you will by-and-by find it pertinent. Ye shall understand, my dear friends, that amongst the excellent acts of that king, one above all hath the pre-eminence. It was the erection and institution of an order, or society, which we call Salomon's House; the noblest foundation, as we think, that ever was upon the earth, and the lantern of this kingdom. It is dedicated to the study of the works and creatures of God. Some think it beareth the founder's name a little corrupted, as if it should be Solomon's House. But the records write it as it is spoken. So as I take it to be denominate of the king of Hebrews, which is famous with you, and no strangers to us; for we have some parts of his works which with you are lost; namely, that natural history which he wrote of all plants, from the cedar of Libanus to the moss that groweth out of the wall; and of all things that have life and motion. This maketh me think that our king finding himself to symbolize, in many things, with that king of the Hebrews, which lived many years

before him, honoured him with the title of this foundation. And I am rather induced to be of this opinion, for that I find in ancient records, this order or society is sometimes called Solomon's House, and sometimes the College of the Six Days' Works; whereby I am satisfied that our excellent king had learned from the Hebrews that God had created the world, and all that therein is, within six days: and therefore he instituted that house, for the finding out of the true nature of all things, whereby God might have the more glory in the workmanship of them, and men the more fruit in their use of them, did give it also that second name. But now to come to our present purpose. When the king had forbidden to all his people navigation into any part that was not under his crown, he made nevertheless this ordinance: that every twelve years there should be set forth out of this kingdom, two ships, appointed to several voyages; that in either of these ships there should be a mission of three of the fellows or brethren of Salomon's House, whose errand was only to give us knowledge of the affairs and state of those countries to which they were designed; and especially of the sciences, arts, manufactures, and inventions of all the world; and withal to bring unto us books, instruments, and patterns in every kind: that the ships, after they had landed the brethren, should return; and that the brethren should stay abroad till the new mission, the ships are not otherwise fraught than with store of victuals, and good quantity of treasure to remain with the brethren, for the buying of such things, and rewarding of such persons, as they should think fit. Now for me to tell you how the vulgar sort of mariners are contained from being discovered at land, and how they that must be put on shore for any time, colour themselves under the names of other nations, and to what places these voyages have been designed; and what places of rendezvous are appointed for the new missions, and the like circumstances of the practice, I may not do it, neither is it much to your desire. But thus you see we maintain a trade, not for gold, silver, or jewels, nor for silks, nor for spices, nor any other commodity of matter; but only for God's first creature, which was light; to have light, I say, of the growth of all parts of the world." . . .

Three days after the Jew came to me again, and said, "Ye are happy men; for the father of Salomon's House taketh knowledge of your being here, and commanded me to tell

you, that he will admit all your company to his presence, and have private conference with one of you, that ye shall choose; and for this hath appointed the next day after tomorrow. And because he meaneth to give you his blessing, he hath appointed it in the forenoon." We came at our day and hour, and I was chosen by my fellows for the private access. We found him in a fair chamber, richly hanged, and carpeted under foot, without any degrees to the state; he was set upon a low throne richly adorned, and a rich cloth of state over his head of blue satin embroidered. He was alone, save that he had two pages of honour, on either hand one, finely attired in white. His under garments were the like that we saw him wear in the chariot; but instead of his gown, he had on him a mantle with a cape, of the same fine black, fastened about him. When we came in, as we were taught, we bowed low at our first entrance; and when we were come near his chair, he stood up, holding forth his hand ungloved, and in posture of blessing; and we every one of us stooped down, and kissed the end of his tippet. That done, the rest departed, and I remained. Then he warned the pages forth of the room, and caused me to sit down beside him, and spake to me thus in the Spanish tongue:

"God bless thee, my son; I will give thee the greatest jewel I have. For I will impart unto thee, for the love of God and men, a relation of the true state of Salomon's House. Son, to make you know the true state of Salomon's House, I will keep this order. First, I will set forth unto you the end of our foundation. Secondly, the preparations and instruments we have for our works. Thirdly, the several employments and functions whereto our fellows are assigned. And fourthly, the ordinances and rites which we observe.

"The end of our foundation is the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire, to the effecting of all things possible.

"The preparations and instruments are these. We have large and deep caves of several depths; the deepest are sunk 600 fathoms; and some of them are digged and made under great hills and mountains; so that if you reckon together the depth of the hill, and the depth of the cave, they are, some of them, above three miles deep. For we find that the depth of an hill, and the depth of a cave from the flat, is the same thing; both remote alike from the sun and heaven's beams, and from the open air. These caves we call the lower region.

And we use them for all coagulations, indurations, refrigerations, and conservations of bodies. We use them likewise for the imitation of natural mines and the producing also of new artificial metals, by compositions and materials which we use and lay there for many years. We use them also sometimes (which may seem strange) for curing of some diseases, and for prolongation of life, in some hermits that choose to live there, well accommodated of all things necessary, and indeed live very long; by whom also we learn many things.

"We have burials in several earths, where we put divers cements, as the Chinese do their porcelain. But we have them in greater variety, and some of them more fine. We also have great variety of composts and soils, for the making of the earth fruitful.

"We have high towers, the highest about half a mile in height, and some of them likewise set upon high mountains, so that the vantage of the hill with the tower, is in the highest of them three miles at least. And these places we call the upper region, account the air between the high places and the low, as a middle region. We use these towers, according to their several heights and situations, for insulation, refrigeration, conservation, and for the view of divers meteors—as winds, rain, snow, hail; and some of the fiery meteors also. And upon them, in some places, are dwellings of hermits, whom we visit sometimes, and instruct what to observe.

"We have great lakes, both salt and fresh, whereof we have use for the fish and fowl. We use them also for burials of some natural bodies, for we find a difference in things buried in earth, or in air below the earth, and things buried in water. We have also pools, of which some do strain fresh water out of salt, and others by art do turn fresh water into salt. We have also some rocks in the midst of the sea, and some bays upon the shore for some works, wherein is required the air and vapour of the sea. We have likewise violent streams and cataracts, which serve us for many motions; and likewise engines for multiplying and enforcing of winds to set also on divers motions.

"We have also a number of artificial wells and fountains, made in imitation of the natural sources and baths, as tinted upon vitriol, sulphur, steel, brass, lead, nitre, and other minerals; and again, we have little wells for infusions of many things, where the waters take the virtue quicker and better than in vessels or basins. And amongst them we have a

water, which we call water of Paradise, being by that we do it made very sovereign for health and prolongation of life.

"We have also great and spacious houses, where we imitate and demonstrate meteors—as snow, hail, rain, some artificial rains of bodies, and not of water, thunders, lightnings; also generations of bodies in air—as frogs, flies, and divers others.

"We have also certain chambers, which we call chambers of health, where we qualify the air as we think good and proper for the cure of divers diseases, and preservation of health.

"We have also fair and large baths, of several mixtures, for the cure of diseases, and the restoring of man's body from afection; and others for the confirming of it in strength of sinews, vital parts, and the very juice and substance of the body.

"We have also large and various orchards and gardens, wherein we do not so much respect beauty as variety of ground and soil, proper for divers trees and herbs, and some very spacious, where trees and berries are set, whereof we make divers kinds of drinks, besides the vineyards. In these we practise likewise all conclusions of grafting, and inoculating, as well of wild-trees as fruit-trees, which produceth many effects. And we make by art, in the same orchards and gardens, trees and flowers, to come earlier or later than their seasons, and to come up and bear more speedily than by their natural course they do. We make them also by art greater much than their nature; and their fruit greater and sweeter, and of differing taste, smell, colour, and figure, from their nature. And many of them we so order, as that they become of medicinal use.

"We have also means to make divers plants rise by mixtures of earths without seeds, and likewise to make divers new plants, differing from the vulgar, and to make one tree or plant turn into another.

"We have also parks, and enclosures of all sorts, of beasts and birds; which we use not only for view or rareness, but likewise for dissections and trials, that thereby may take light what may be wrought upon the body of man. Wherein we find many strange effects: as continuing life in them, though divers parts, which you account vital, be perished and taken forth; resuscitating of some that seem dead in appearance, and the like. We try also all poisons, and other medicines upon them, as well of chirurgery as physic. By art likewise

we make them greater or smaller than their kind is, and contrariwise dwarf them and stay their growth; we make them more fruitful and bearing than their kind is, and contrariwise barren and not generative. Also we make them differ in colour, shape, activity, many ways. We find means to make commixtures and copulations of divers kinds, which have produced many new kinds, and them not barren, as the general opinion is. We make a number of kinds of serpents, worms, flies, fishes of putrefaction, whereof some are advanced (in effect) to be perfect creatures, like beasts or birds, and have sexes, and do propagate. Neither do we this by chance, but we know beforehand of what matter and commixture, what kind of those creatures will arise.

"We have also particular pools where we make trials upon fishes, as we have said before of beasts and birds.

"We have also places for breed and generation of those kinds of worms and flies which are of special use; such as are with you your silkworms and bees.

"I will not hold you long with recounting of our brew-houses, bake-houses, and kitchens, where are made divers drinks, breads, and meats, rare and of special effects. Wines we have of grapes, and drinks of other juice, of fruits, of grains, and of roots, and of mixtures with honey, sugar, manna, and fruits dried and decocted; also of the tears or wounding of trees, and of the pulp of canes. And these drinks are of several ages, some to the age or last of forty years. We have drinks also brewed with several herbs, and roots, and spices; yea, with several fleshes, and white-meats; whereof some of the drinks are such as they are in effect meat and drink both, so that divers, especially in age, do desire to live with them with little or no meat or bread. And above all we strive to have drinks of extreme thin parts, to insinuate into the body, and yet without all biting, sharpness, or fretting; in-somuch as some of them put upon the back of your hand, will with a little stay pass through to the palm, and yet taste mild to the mouth. We have also waters, which we ripen in that fashion, as they become nourishing, so that they are indeed excellent drinks, and many will use no other. Bread we have of several grains, roots, and kernels; yea, and some of flesh, and fish, dried; with divers kinds of leavings and seasonings; so that some do extremely move appetites, some do nourish so, as divers do live of them, without any other meat, who live very long. So for meats, we have some of them so

beaten, and made tender, and mortified, yet without all corrupting, as a weak heat of the stomach will turn them into good chylus, as well as a strong heat would meat otherwise prepared. We have some meats also and bread, and drinks, which taken by men, enable them to fast long after; and some other, that used make the very flesh of men's bodies sensibly more hard and tough, and their strength far greater than otherwise it would be.

"We have dispensaries or shops of medicines; wherein you may easily think, if we have such variety of plants, and living creatures, more than you have in Europe (for we know what you have), the simples, drugs, and ingredients of medicines, must likewise be in so much the greater variety. We have them likewise of divers ages, and long fermentations. And for their preparations, we have not only all manner of exquisite distillations, and separations, and especially by gentle heats, and percolations through divers strainers, yea, and substances; but also exact forms of composition, whereby they incorporate almost as they were natural simples.

"We have also divers mechanical arts, which you have not; and stuffs made by them, as papers, linen, silks, tissues, dainty works of feathers of wonderful lustre, excellent dyes, and many others, and shops likewise as well for such as are not brought into vulgar use amongst us, as for those that are. For you must know, that of the things before recited, many of them are grown into use throughout the kingdom, but yet, if they did flow from our invention, we have of them also for patterns and principals.

"We have also furnaces of great diversities, and that keep great diversity of heats; fierce and quick, strong and constant, soft and mild, blown, quiet, dry, moist, and the like. But above all we have heats, in imitation of the sun's and heavenly bodies' heats, that pass divers inequalities, and as it were orbs, progresses, and returns whereby we produce admirable effects. Besides, we have heats of dung, and of bellies and maws of living creatures and of their bloods and bodies, and of hays and herbs laid up moist, of lime unquenched, and such like. Instruments also which generate heat only by motion. And farther, places for strong insulations; and again, places under the earth, which by nature or art yield heat. These divers heats we use, as the nature of the operation which we intend requireth.

"We have also perspective-houses, where we make demon-

strations of all lights and radiations, and of all colours; and out of things uncoloured and transparent, we can represent unto you all several colours, not in rainbows, as it is in gems and prisms, but of themselves single. We represent also all multiplications of light, which we carry to great distance, and make so sharp, as to discern small points and lines. Also all colourations of light: all delusions and deceits of the sight, in figures, magnitudes, motions, colours; all demonstrations of shadows. We find also divers means, yet unknown to you, of producing of light, originally from divers bodies. We procure means of seeing objects afar off, as in the heaven and remote places; and represent things near as afar off, and things afar off as near; making feigned distances. We have also helps for the sight far above spectacles and glasses in use; we have also glasses and means to see small and minute bodies, perfectly and distinctly; as the shapes and colours of small flies and worms, grains, and flaws in gems which cannot otherwise be seen, observations in urine and blood not otherwise to be seen. We make artificial rainbows, halos, and circles about light. We represent also all manner of reflections, refractions, and multiplications of visual beams of objects.

"We have also precious stones, of all kinds, many of them of great beauty and to you unknown; crystals likewise, and glasses of divers kind; and amongst them some of metals vitrified, and other materials, besides those of which you make glass. Also a number of fossils, and imperfect minerals, which you have not. Likewise loadstones of prodigious virtue: and other rare stones, both natural and artificial.

"We have also sound-houses, where we practise and demonstrate all sounds and their generation. We have harmony which you have not, of quarter-sounds and lesser slides of sounds. Divers instruments of music likewise to you unknown, some sweeter than any you have; with bells and rings that are dainty and sweet. We represent small sounds as great and deep, likewise great sounds, extenuate and sharp; we make divers tremblings and warblings of sounds, which in their original are entire. We represent and imitate all articulate sounds and letters, and the voices and notes of beasts and birds. We have certain helps, which set to the ear do further the hearing greatly; we have also divers strange and artificial echoes, reflecting the voice many times, and as it were tossing it; and some that give back the voice louder than it came, some shriller and some deeper; yea, some rendering the voice,

differing in the letters or articulate sound from that they receive. We have all means to convey sounds in trunks and pipes, in strange lines and distances.

"We have also perfume-houses, wherewith we join also practices of taste. We multiply smells which may seem strange: we imitate smells, making all smells to breathe out of other mixtures than those that give them. We make divers imitations of taste likewise, so that they will deceive any man's taste. And in this house we contain also a confiture-house, where we make all sweetmeats, dry and moist, and divers pleasant wines, milks, broths, and salads, far in greater variety than you have.

"We have also engine-houses, where are prepared engines and instruments for all sorts of motions. There we imitate and practise to make swifter motions than any you have, either out of your muskets or any engine that you have; and to make them and multiply them more easily and with small force by wheels and other means, and to make them stronger and more violent than yours are, exceeding your greatest cannons and basilisks. We represent also ordnance and instruments of war and engines of all kinds; and likewise new mixtures and compositions of gunpowder, wild-fires burning in water and unquenchable, also fire-works of all variety, both for pleasure and use. We imitate also flights of birds; we have some degrees of flying in the air. We have ships and boats for going under water and brooking of seas, also swimming-girdles and supporters. We have divers curious clocks and other like motions of return, and some perpetual motions. We imitate also motions of living creatures by images of men, beasts, birds, fishes, and serpents; we have also a great number of other various motions, strange for equality, fineness and subtilty.

"We have also a mathematical-house, where are represented all instruments, as well of geometry as astronomy, exquisitely made.

"We have also houses of deceits of the senses, where we represent all manner of feats of juggling, false apparitions, impostures and illusions, and their fallacies. And surely you will easily believe that we, that have so many things truly natural which induce admiration, could in a world of particulars deceive the senses if we would disguise those things, and labour to make them more miraculous. But we do hate all impostures and lies, insomuch as we have severely forbidden

it to all our fellows, under pain of ignominy and fines, that they do not show any natural work or thing adorned or swelling, but only pure as it is, and without all affectation of strangeness.

"These are, my son, the riches of Salomon's House.

"For the several employments and offices of our fellows, we have twelve that sail into foreign countries under the names of other nations (for our own we conceal), who bring us the books and abstracts, and patterns of experiments of all other parts. These we call merchants of light.

"We have three that collect the experiments which are in all books. These we call depreparators.

"We have three that collect the experiments of all mechanical arts, and also of liberal sciences, and also of practices which are not brought into arts. These we call mystery-men.

"We have three that try new experiments.

"Such as themselves think good. These we call pioneers or miners.

"We have three that draw the experiments of the former four into titles and tables, to give the better light for the drawing of observations and axioms out of them. These we call compilers. We have three that bend themselves, looking into the experiments of their fellows, and cast about how to draw out of them things of use and practice for man's life and knowledge, as well for works as for plain demonstration of causes, means of natural divinations, and the easy and clear discovery of the virtues and parts of bodies. These we call dowry-men or benefactors.

"Then after divers meetings and consults of our whole number, to consider of the former labours and collections, we have three that take care out of them to direct new experiments, of a higher light, more penetrating into Nature than the former. These we call lamps.

"We have three others that do execute the experiment so directed, and report them. These we call inoculators.

"Lastly, we have three that raise the former discoveries by experiments into greater observations, axioms, and aphorisms. These we call intrepeters of Nature.

"We have also, as you must think, novices and apprentices, that the succession of the former employed men do not fail; besides a great number of servants and attendants, men and women. And this we do also: we have consultations, which of the inventions and experiences which we have discovered

shall be published, and which not: and take all an oath of secrecy for the concealing of those which we think fit to keep secret: though some of those we do reveal sometime to the state, and some not.

“For our ordinances and rites, we have two very long and fair galleries: in one of these we place patterns and samples of all manner of the more rare and excellent inventions: in the other we place the statues of all principal inventors. There we have the statue of your Columbus, that discovered the West Indies: also the inventor of shops: your Monk that was the inventor of ordnance and of gunpowder: the inventor of music: the inventor of letters: the inventor of printing: the inventor of observations of astronomy: the inventor of works in metal: the inventor of glass: the inventor of silk of the worm: the inventor of wine: the inventor of corn and bread: the inventor of sugars; and all these by more certain tradition than you have. Then we have divers inventors of our own, of excellent works; which since you have not seen, it were too long to make descriptions of them; and besides, in the right understanding of those descriptions you might easily err. For upon every invention of value we erect a statue to the inventor, and give him a liberal and honourable reward. These statues are some of brass, some of marble and touchstone, some of cedar and other special woods gilt and adorned; some of iron, some of silver, some of gold.

“We have certain hymns and services, which we say daily, of laud and thanks to God for His marvellous works. And forms of prayers, imploring His aid and blessing for the illumination of our labours; and turning them into good and holy uses.

“Lastly, we have circuits or visits, of divers principal cities of the kingdom; where as it cometh to pass we do publish such new profitable inventions as we think good. And we do also declare natural divinations of diseases, plagues, swarms of hurtful creatures, scarcity, tempest, earthquakes, great inundations, comets, temperature of the year, and divers other things; and we give counsel thereupon, what the people shall do for the prevention and remedy of them.”

And when he had said this, he stood up; and I, as I had been taught, knelt down; and he laid his right hand upon my head, and said, “God bless thee, my son, and God bless this relation which I have made. I give thee leave to publish it, for the good of other nations; for we here are in God’s

bosom, a land unknown.” And so he left me; having assigned a value of about two thousand ducats for a bounty to me and my fellows. For they give great largesses, where they come upon all occasions.

THE REST WAS NOT PERFECTED.