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John Dee: Consultant to Queen Elizabeth I

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Just a few short weeks before his sudden death in June, Dr. Rutledge presented to the CMI this delightful study of an early government consultant. We are publishing it now as a modest memorial to a gentle and scholarly man who served NSA faithfully and well for more than a quarter of a century.

John Dee, through his long life in the sixteenth century, was a principal advisor to most of the Tudor monarchs of England, and to certain European rulers as well, including the Emperor Rudolph II. As government consultant, he excelled in mathematics, cryptography, natural science, navigation, and library science, and above all in the really rewarding sciences of those days—astrology, alchemy, and psychic phenomena. He was, all by himself, a Rand Corporation for the Tudor government of Elizabeth.

A leading intellectual of the moment, Paul Goodman, is fond of saying that we should return to the university as it was centuries ago—when experts lived in walled university towns and nurtured autonomous professionals, who occasionally sallied forth into the world to raise standards, advise governments, and castigate quackery and fraudulence. But does Goodman realize the extent of government sponsorship of academic scholars in those times? Consider the career of our man Dee. He was financed through sixty years of public service through government funds, yet he was accounted one of the most learned men in Europe in his time. He was offered many academic posts, and became in his seventies the Warden of Manchester College. He lived most of his life, not in a walled university town, but within a few miles of Windsor Castle.

And he lived in a veritable golden age of government consultants. He may seem to you an obscure figure—born in London 440 years ago, in 1527. Yet his name was in Sunday supplements throughout the Western world these last few weeks—an authority for the claim that an illegitimate Welsh prince named Madoc landed at Mobile, Alabama, in the year 1170, and founded a colony of Celtic half-breeds somewhere in our Middle West. (They were still looking for those Welsh-speaking Indians centuries later, when Lewis and Clark went through there.) And in his time, he was known and sought after throughout his world,

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and for a hundred years after his death, in 1608, he was much discussed, as a figure of awesome mystery, great science, and some notoriety.

John Dee grew up in the government service. His father was a sewer in ordinary to Henry VIII. In the last year of his life, Henry VIII founded Trinity College, Cambridge, and young Dee, having been an outstanding scholar at Cambridge, was named a fellow in the new college. It is typical of the government service even then that, although Dee didn't go beyond the MA, he was always called Doctor Dee.

He based his career soundly in mathematics. He achieved fame in this field through exemplary tactics. Having taken the MA at Cambridge, he went abroad for graduate study at Louvain, in the Low Countries. Here he met Mercator, the map-maker, and other academic worthies. He made a collection of books and astronomical instruments. He tutored ambassadors' sons, and developed other contacts useful to a government career. After two years in Louvain, he came to the University of Paris. With 4000 students from all over Europe, it was the cockpit of the European academic world—the Berkeley of his day. In a Europe shaken by reformation, counter-reformation, and a continuing cultural revolution; dazzled by the news of the whole round world developed through just forty years of exploration; involved in one of the bloodiest of all cold wars—between the Catholic and the Protestant blocs—in the midst of all that, Dee, then 22, announced a series of lectures and demonstrations on what do you suppose? On the propositions of Euclid. What charisma he must have had! For the subject turned out to be a good deal more psychedelic than I would have thought. He took the University by storm. His lecture hall was filled to overflowing. And students stood outside the windows in crowds, so that they might see him, even if they couldn't hear him. Dee certainly knew what he was doing when he gained a reputation as a mathematician. He was immediately offered a post at the University of Paris, but he declined.

On returning to England, he was offered a lectureship in mathematical science at Oxford. But this, too, was not what Dee had in mind. His vocation was for the government service, and he was now ready for the application of science. He wrote briefings on cosmology and geology for the use of young King Edward VI, and was retained in the government service at 100 crowns a year, or 25 pounds.

I will digress for a moment on this sum. The whole question of PPBS—of government budgetary procedures—will occupy us somewhat during this sort of senate hearing on Dee's career, and we need to get some feel for it. My learned historian friends have refused to trust me with any figures for what a pound in 1550 might represent in contemporary purchasing power. I'll risk an approximation. Much

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later in his life, Dee said that he could support his household—by that time including five living children and a staff of ten persons, seventeen in all—for 200 pounds a year—and he lived very well indeed. Suppose this is 20,000 dollars. Then 25 pounds, at $100 the pound, would have been about $2500—a modest beginning and not bad for a man in his early twenties who had not, after all, finished his doctorate. Dee, like most people in the government service, spent a good deal of his life seeking appropriations for something. And he often protested that he was poor. But he made out rather well, as we shall see.

He was later given the income—the "living"—of the parish of Upton-upon-Severn (you may know the old church; it's a few miles from Cheltenham). But he had aimed his sights considerably higher. He wanted ultimately to have bishop's rank—or at least a deanship—with a palace or other official residence of his own.

Alas, the young king died, and was succeeded by Queen Mary. Bloody Mary, this was, who had a depressing habit of executing Dee's friends. Dee fell victim to a two-year McCarthy period. He had, as we saw, refused academic appointment (and continued to do so), but he was regarded with that suspicion which attaches to people who are more academically learned than most people in such times, and he ended up in jail. It was charged that a man who knew so much must have got that way through abominable converse with infernal powers. And an accuser was found who said that Dee, a conjuror, had cast a spell on one of his children. This was almost a routine charge.

Dee was finally cleared, but he decided to retreat to a really unexceptionable field for further exercises as a government servant. He addressed to Queen Mary a proposal for the founding of a national library. Young as he was, Dee had already seen the value of collecting things, and he had one of the most remarkable private libraries and collections of astronomical instruments to be found in the hands of any commoner in England. He wanted a national fund to bring together the treasures of the monasteries, destroyed and pillaged throughout England only twenty years before. This is perhaps the most magnanimous, completely ingenuous, project with which Dee's name has been associated, even though it did not succeed. The British Museum was not, in fact, founded for 150 years more.

But here too there was a small sweetener. It was widely believed that fabulous treasures had been buried throughout England by the richer monasteries as their inhabitants fled. He would return to this quest in happier times, and even now he did not hesitate to point out to the impoverished Tudor government that the loot was there.

But Dee probably expected, and certainly got, not much but a hard time form Mary's administration. He had, however, begun a

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flowery correspondence with Princess Elizabeth, and had cast her horoscope. In fact, he continued to play Madame Blavatsky* to most of the important people in England. So it was that when Mary shortly died, and Elizabeth succeeded, in 1558, the new queen gave audience to Dee, promised him handsome preferment, and asked him to name the most auspicious day for her coronation. "Where my brother hath given him a crown," she cried, "I will give him a noble." That is, she doubled his salary on the spot.

Now at thirty, Dee was launched. The favor shown him by Elizabeth endured through all the 45 years of her reign. Although he did not have a deanery, or a bishop's palace, he inherited from his mother a large house at Mortlake, along the river near Wimbledon. Here the Elizabethan pageant flowed past. The Queen was fond of water travel, with regal progress, from her seat at Greenwich, say, to Richmond or Windsor. And she often stopped her procession at Dee's pier. Her seer would be sent for, and he would come out, a tall and personable man, to talk to her. The queen, gaily dressed, with her orange hair glinting in the sun, would ask Dee what secrets of the universe he was now exploring, and would invite him to the palace. Dee had the good sense to remain unmarried until he was fifty years old. To be married, and still serve Elizabeth, the maiden queen, always seemed to involve some loss. Sir Walter Raleigh and others who went ahead and married anyhow, without even asking the Queen's consent, found themselves in very serious trouble.

I suppose you're wondering what Dee was in fact doing, as a government consultant all this time. But you must remember we're talking about the government service. Whatever he did that was significant has no doubt gone into the classified files of Elizabeth's ministers, and from there to complete oblivion. But we do know a great deal about Dee. He realized that one essential technique in the government was to keep your personnel file up to date. He not only did that. He published his, as a sort of memorial and defense of himself, called *A Compendious Rehearsal of John Dee: his dutifull declarations and proofe of the course and race of his studious life, for the space of half a hundred years. . .*

We would give a great deal for this kind of detail on Shakespeare's life. People have been so hungry for knowledge of Shakespeare's life that they have imagined they could read favorite theories of theirs concealed in ciphers in the Shakespearean literature. And of the

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*Helene Petrovna Blavatsky (1831–1891), controversial spiritualist, psychic investigator, founder of the Theosophical Society, and author of *Isis Unveiled*. Revered by some and denounced by others, she had at the time of her death nearly 100,000 followers who still commemorate the day of her passing as "White Lotus Day."

second greatest dramatist of that remarkable period, Christopher Marlowe, we also know very little. And even that we wouldn't know if there hadn't been a little CIA money in his career. When Marlowe proposed, after leaving the University, to go to study as a seminarian at Douay in France, he had some trouble. Douay was known to be a hotbed of anti-English intrigue, quite aside from the fact that Marlowe, an outspoken unbeliever, was a very improbable seminarian; and the university took action to refuse his degree. But the government intervened, because, of course, it wanted him there. Marlowe was not going to Douay to study religion at all. Elizabeth's CIA was run by Walsingham, her secretary of state, and by his cousin, another Walsingham. And when Marlowe died suddenly in 1593—by all odds the greatest dramatist England had yet produced—wretchedly, at the tavern in Deptford, some of Walsingham's operatives were there.

If you had a government career, that is, your history might be preserved. Otherwise, however famous, you might survive only in your printed works, if any.

Our man published a lot. And his *Compendious Rehearsal* provides a detailed resume. But of his actual government service, we know very little. He went from time to time to Europe, and his cover for these trips, at least, we know about. It was during one of these trips that he made his principal contribution to cryptography, as we will see in a moment.

The accommodations on these various TDY's and PCS appointments are worth pausing over. When the likes of us get sent for a couple of years to Europe, we may manage a trip to Italy or Sweden. But Dee, whose correspondence showed him quartered at the pleasant inns and hostelries of his day, such as the Golden Angel in Antwerp, once took a spell of R and R in St. Helena. Now a voyage to St. Helena, in those days, would be comparable to the 8,000-mile trip in Africa—for fact-finding purposes I presume—which a congressman from the Middle West once proudly described to me. This congressman wanted to include some government installations on his itinerary. I doubt if Dee had any comparable excuse for his excursion to the island of St. Helena. It would be very hard to manage anything comparable nowadays in the executive branch, anyway, for it has no Biminis.

But as for the true purpose of most of these trips to Europe, we can only speculate. Elizabeth's enemies, supported by various Catholic powers, wanted to see her assassinated, forced to abdicate, married to a Catholic prince, or, later, driven out of the Low Countries. The cold war saw various lurid incidents in these times—like the massacre of St. Bartholomew in 1572. What of Poland? Could she be claimed for the Reformation, or would she come down as a Catholic state under

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Stephen Batory, her first modern king? Mary Stuart, a center of subversive activity in England, was still alive, although in prison. Dee, as a man with tremendous reputation and wide acquaintance in Europe, may have been useful in reporting or trying to forecast some of these things.

But for one of his visits to Europe, in 1563, the announced purpose of his journey was to have certain learned works of his published in the Low Countries. And Dee certainly did not fail to make his cover convincing. He had his *Monas Hieroglyphica*—the Heiroglyphic Monad—published, with a dedication to the Holy Roman Emperor. The title page of the edition shows Dee presenting this key to universal wisdom to the rather daft Emperor Rudoph II at his court at Pressburg. And indeed Dee did travel to Pressburg to present a copy of his work to the Emperor Rudolph II.

As for the content of this famous hieroglyphic approach to wisdom, to be used mainly by heads of state, I can hardly tell you what it recommends. It has been translated recently into English by a devoted student of astrology, and I have surveyed this translation. But I am really unable to tell you what the secret is.

Well, Queen Elizabeth heard about this book, and she had some problem with it too, although she was fluent in Latin. So she asked Dee to come and instruct her in the meaning of the book. There is no record that he succeeded in enlightening her, but he did have a lot of time in Elizabeth's company at the castle (Windsor, mostly), and he managed to support a good many of his favorite programs that way.

But, aside from the *Monas*, we don't really know what Dee was engaged in for his two-year stay in Antwerp except for one remarkable letter to Cecil, one of the most powerful of the Queen's ministers, soon to be made Lord Treasurer.

He has made contact with a Hungarian nobleman, and from him has obtained a manuscript of Trithemius' *Steganographia*. He has managed to copy half of it, and if he can continue his tutorial and other services to the Hungarian, he thinks he can get the rest of it.

Now this book, he thinks, is virtually priceless. Dee describes it to Cecil in glowing terms: "A boke for your honor or a Prince, so meet, so nedefull and commodious, as in human knowledge none can be meeter or more behovefull. . . . This boke . . . I give unto your Honor as the most precious juell that I have yet of other mens travailes recovered."

It is true that Dee's personnel file shows a letter of commendation for this tour of duty, so that the discovery of a manuscript of this notorious work was perhaps considered a research project of some value to the government. At any rate, the letter says that Dee's time beyond the seas was well bestowed. Indeed, on his return to England he was

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at last promised a deanship—but the appointment went to somebody else.

What would have been the significance to Trithemius' treatise to the British government? Since this is our main documentation of Dee's involvement as a cryptologist, we should try to fit this treatise into history.

The book was notorious, I just now pointed out. Trithemius, the Abbot of Spanheim, began to write it in the year 1500, and he sent a partial copy of it to a clerical friend in another religious establishment. But unknown to Trithemius, his friend had died. His friend's abbot opened the correspondence, and he was appalled. "Secret writings," he read, "will reveal secrets not found by ordinary means." And there was more.

In order to send a secret message, you make an image of a planetary angel, speak the message over it at a moment determined by complicated astrological calculations, wrap the image up with an image of the addressee, and bury the images. This network of planetary angels could always be used for messages—and even for thought transference.

Cryptography, even of this heavenly sort, was not just a means of disguising messages; it was the medium through which intelligence from the spirit world might be transmitted. The secrets of the universe—the philosopher's stone, the elixir of life—might be received in a heavenly cipher, like the obscure oracles of Delphi.

The abbot denounced Trithemius as a conjuror, trafficking with spirits, and he lost his clearance. Although he stopped all work on the *Steganographia*, the manuscript of it appears to have circulated as an underground classic for nearly a century until Dee copied it in 1563. It was finally published in Frankfurt, near the end of Dee's life, in 1606.

It was, you see, the supernatural context of the *Steganography* which attracted attention. Heads of state—or adventurers of all sorts—could be persuaded that secrets of the future, hidden in the stars, and the marvelous formulae for prolonging life and for converting base metals into gold were knowable—and might be revealed by the supernal powers in *cipher*.

It is hard perhaps to realize, but rational and wholly illusory notions like this could and did exist in the 16th Century scientific mind. Even Copernicus did not disbelieve in astrology. There were two gates to the other world. There was a gate of horn, through which came the rational finding which would lead to our times, and an extraordinary perception of the nature of man and his world. But there was also a gate of ivory, through which dreams and illusions came.

Trithemius did have some interesting cryptographic ideas. He gives some examples of enciphered messages in the *Steganography*,

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although he does not give the keys and tables. Presumably he was looking for a patron or other market for those. In another book he shows how the systems work, and he is, for his time, quite up-to-date. The late Fifteenth Century had seen the development of the principle that monoalphabetic substitution (as practiced by Roger Bacon, for example) would not do, that variation, even from letter to letter, was necessary and quite feasible. Alberti's manuscript of 1470 describes a cipher wheel which would provide this variation.

Trithemius accomplished the variation in another way, explained in his *Polygraphia,* written in 1508, after he presumably got his clearance back. This book makes no claims for penetrating unearthly secrets, and it was in print long before Dee took so much trouble to obtain the earlier, banned work. Mr. Friedman, *in his Lectures,* says that he doesn't see how such a system as Trithemius proposed can be practically used. And it would be somewhat difficult.

I'll take a moment to explain the system. At this time invocations

L I B E R I

A Deus	A Clemens
B Creator	B Clementissimus
C Conditor	C Pius
D Opifex	D Pijssimus
E Dominus	E Magnus
F Dominator	F Excelsus
G Consolator	G Maximus
H Arbiter	H Optimus
I Iudex	I Sapientissimus
K Illuminator	K Invisibilis
L Illustrator	L Immortalis
M Rector	M Aeternus
N Rex	N Sempiternus
O Imperator	O Gloriosus
P Gubernator	P Fortissimus
Q Factor	Q Sanctissimus
R Fabricator	R Incomprehensibilis
S Conservator	S Omnipotens
T Redemptor	T Pacificus
V Auctor	V Misericors
X Princeps	X Misericordissimus
Y Pastor	Y Cunctipotens
Z Moderator	Z Magnificus
w Salvator	w Excellentissimus

Plate 1.

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of the deity were quite common: the attributes of the Deity, His beneficent intentions toward mankind, the qualities of his justice and compassion, were routinely described, in prefatory epistles to books, in pious passages in learned works—*Creator omnipotens* would begin many a paragraph in a manuscript of those times, whatever its subject—and on tombstones. The formulas for such expressions, mostly in Latin, were so familiar that one has the impression that they were not really read for what they said, but rather as an ingratiating flourish of rhetoric.

At any rate, there was considerable verbal variation in the expression of these pious tributes, and in what must be some sort of unexampled tour de force, Trithemius wrote a passage of this description 384 words long, and devised 24 variant words (or sometimes phrases) for each of the 384. At any position in the cycle of 384 you could select any of the 24 variants, and the resulting running text would still make some sort of sense.

A Deus
A clemens
A creans
A coelos
A impendat
A omnibus
A vitam
A permansuram
A sanctis
A coelis

Plate 2.

In order to encipher a message, one word for each letter, you should pick a sentence or sentences from Trithemius' set of 384 tables that would have about as many words as there are letters in your message, and begin. You would come up with something like the following:

G Consolator
E magnus
T cernens

L terrena
O offerat
S exquirentibus
T claritatem

X interminabilem

Plate 3.

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P Misericordia
E excelsi
R Imperatoris
D credentibus
I ferventissime
T diligenda
A multis

G admonitionibus
E miserrimos
T operatores

L adhortatur
O divitias
S fidem
T regis

X humanorum
X aspernari :

Plate 4.

I don't know if anybody tried to use these tables of Trithemius. Trithemius' claim was that the very presence of a secret message need not be suspected. You can imagine some courier, riding frantically from one unit of a marauding duke's army in Italy, say, to headquarters, and his being captured by the other side. Say it was between Florence and Pisa, in one of their many wars. And his captors would look in his papers and find this apparently pious message: *May our benign creator lead the suppliant souls of this Earth into life everlasting.* "You were riding so fast with this message? Oh, come on!" And they'd probably put him to the torture anyway.

That was Trithemius' principal cipher system. And it did exemplify the principle that the alphabet should be changed from letter to letter of the message. A little later, we will see an example of John Dee's own ciphering, and I'm afraid there is no evidence that he himself understood the importance of polyalphabetic substitution.

Dee had now, as he became forty and grew in reputation and influence, written a good many reports and briefings, some of which had been printed, and survive. A tremendous amount of what Dee wrote, whether printed or not, has survived in his manuscript leavings. But the two great pillars of his wisdom—the *Monas* and the manuscript of Trithemius' *Steganography*—are books which to the ordinary reader

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make no sense, or at best a faintly scandalous sense. His reputation, that is, was based on formulations which only he could understand, and which he apparently would have had difficulty communicating in plain terms—even to Queen Elizabeth.

Having now reached this safe pinnacle of omniscience—he knows what he's doing even if nobody can understand him—he now stakes out the fields of his competence. In a remarkable preface written for the first English translation of Euclid, in 1570, he covers the field.* He celebrates the glories of mathematics (and he himself is accounted one of the foremost mathematicians of Europe). As Plato said, and he quotes, "It lifts the heart above the heavens by invisible lines, and by its immortal beams melteth the reflection of light incomprehensible, and so procureth joy and perfection unspeakable." I particularly like that "light incomprehensible." He recounts the mechanical marvels of his age—the images projected in air by a perspective glass, an insect made of iron which was made to fly about the room at Nuremberg. He hints of marvels yet to be discovered; he compares his lonely role of misunderstood scientist to that of Socrates, or Trithemius, or Roger Bacon. He denounces his enemies and detractors in heroic fashion, for the notion persisted in some quarters that Dee was a conjuror and a charlatan.

Although his powers and stature as a consultant were now assured at court, and indeed throughout Europe, he needed to identify himself with the principal problems of his government. Now if you had to find equivalents to nuclear proliferation and the war on poverty in Elizabethan times, you would no doubt come up with the navy, and with gold. The navy was very big in those times. People like Sir Walter Raleigh were setting out in vessels that looked like the *Golden Hind,* and were seizing Spanish vessels laden with gold on the high seas, or they were sailing incredible voyages to find passage to the fabled wealth of the East. When Raleigh went for the treasure of some such mirage as the Seven Cities of Cibola, and came back with only a potato and a pipe of tobacco, his sovereign was not exactly pleased. Dee didn't do much better, but he tried. He made all sorts of far-reaching proposals for improving the navy, and getting the gold. In a quite remarkable letter to Lord Burleigh in 1574 he proposes a search for precious ores and buried treasure throughout the island. Dee has studied the disposition of buried treasures from the monasteries for twenty years, and he wants to be licensed to seek the treasure, and of course, to share it with the Lord Chancellor. There is also a strong

*Morton Kupperman owns a rare copy of this Euclid, with Dee's preface, which is a sort of extended job description.

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implication that he can *divine* the presence of hidden precious ores. This seed fell on fertile ground. Burleigh believed to his dying day that Dee would somehow find the gold, and balance the precarious national budget.

As for the navy, he wrote and published in a handsome volume his *General and Rare Memorials pertayning to the Perfect Art of Navigation.* Rare it certainly was, for Dee controlled its distribution. What he was getting at, apparently, was the creation of a Coast Guard, which would secure the realm, provide valuable naval experience for thousands of men, and chart the tides and depths of all the coast of England. In preparing this work, Dee had learned the value of classifying government proposals. He virtually classified his book "Official Use Only," and sent copies only to important members of the government. The result is that this has been called "the rarest printed book in England." Thus Dee established himself as a principal state planner for the Navy and for the acquisition of gold.

And for the final episode of Dee's career we'll have time for, gold became ultimately the compelling object. In 1581 he writes in his diary, "I had sight in Chrystallo offered me, and I saw." And so began Dee's remarkable transactions with the spirit world. He had had a scrying glass for some time, really a highly polished piece of cannel coal, still preserved in the British Museum, which, like our Smithsonian, is among other things something of a national attic. But Dee couldn't see much in it. A young man named Kelley supplied the lack.

Dee was now, in the 1580's, in his own dangerous fifties. He had not, after all, got the deanship. He had just married, and I doubt if his stars told him he was going to have *eleven* children. He had read most of the alchemical and astrological literature of his time, and had written some of it. But no really rewarding discoveries came his way. When he saw a shape in the glass, he reckoned that somebody out there was trying to tell him something. He couldn't hear it, but there were those who could. And hereafter, most that passes in the life of John Dee passes from the gate of ivory, not the gate of horn.

Edward Kelley, alias Talbot, a young man of uncertain origins, exposed in the pillory in Lancashire as a convicted forger, still wanted for an unsavory grave-robbing episode, came to the master at Mortlake to discuss transactions with spirits. He was taken into the room where Dee kept a crystal and promptly saw and conversed with archangels. Soon Dee and Kelley were supplied with an exquisite quartz ball. Kelley said it had been brought by one of the angels; it also is still preserved in the British Museum. In this, and from this, crystal, a remarkable procession of girls, women, and stately men made their

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appearance, spoke sometimes in English and sometimes in a strange tongue, and—above all—communicated the heavenly cipher system. This was a collection of squares filled with letters, a few figures, and some strange characters, typically 49 by 49 cells. Dee copied them all down, and called some of them the *Claves Angelicae,* the angelic keys.

How do we know all this? The circumstances are curious. Nearly half a century after Dee's death a young couple were shopping in a Georgetown sort of area in Seventeenth Century London. The wife was delighted at finding a splendid old oak chest with brass corners. They bought it and took it home, and, many years after, were about to move it to another part of their house when they heard a rattling and rustling inside, although it appeared to be empty. A little exploration showed them that there was a hidden drawer, inside, under the till, and they forced it open. There were the earliest of John Dee's books of mysteries—*libri mysteriorum*—all in his hand, or sometimes in Kelley's. These books provide a continuous coverage of Dee's conversations with the spirit world from near the beginning of the 1580's until nearly the end of Dee's life in 1608.

A good part of these transactions were published by a seventeenth century divine, Dr. Meric Casaubon, half a century after Dee's death, under the following title: *A True and Faithful Relation of What passed for many yeeres Between Dr. John Dee (A Mathematician of Great Fame in Queen Elizabeth and King James their Reignes) and Some Spirits: Tending (had it Succeeded) to a General Alteration of most States and Kingdomes in the World . . ..* Casaubon himself thought that Dee was deluded by Kelley and by his spirits, but that Dee himself remained a dedicated scientist. And if I seem to be a little less convinced of Dee's complete seriousness in all this, it is just that I can't take the books of mysteries so seriously as Casaubon did. (He was a contemporary of Sir Thomas Browne, a learned man who certainly believed in spirits.)

Casaubon himself dismisses the tables and prints only a sample. The Irish divine's shrewd summary is worth reading: "There were many Tables or Schemes at the end of the Book, containing Letters, a. b. c. etc., disposed into little squares, with an inscription over each Table in that unknown Character (before spoken of) expressed in usual letters how it should be read." Casaubon explained then that it was a useless expense to print the tables, for nobody could read then anyway. "For first, Dr. Dee himself though he took a great deal of pains to understand the Mystery of them, and had great hopes given him from time to time to reap the benefit (himself complains of it in more than one place) of his toilsome work and long patience, yet it never came to anything; and if he made nothing of them (to benefit himself thereby) what hopes had we?"

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Casaubon goes on to give a general opinion of all such cryptographic revelations. "Besides we may judge of these Tables, and all this mystery of Letters, by what we have seen in others of the same kind. Johannes Trithemius was a man that was supposed by most to have dealt with spirits a long time, and to have been instructed by them in some of those secrets that he pretends unto by his Books . . . .

Trithemius we speak of, his *Polygraphy*, he set out in his lifetime dedicated to the then Emperor. He tells the World of the greatest wonders to be done by it, that ever were heard of: all Wisdom and Arts, all Languages, Eloquence, and what not, included in it. But I never heard of any man that could make anything of it, or reaped any benefit in any kind; which I think is the reason that his *Steganography* mentioned and promised in this first work was so long after his death before it was printed. It was expected it would have given some light to the first; but neither of that, nor of this latter, could anything, that ever I could hear, be made by any man."

And Casaubon mentions Vigenère, too: "Vigenère . . . . who in his old age was grown himself very Cabalistical . . . . doth plainly profess he could make nothing of it."

And I'm afraid there isn't anything much more we can add to that rather devastating summary of Dee's pretensions to "better living through cryptology." But some were not persuaded. A man named Robert Hooke, a hundred years after Dee's death, thought that the tables concealed enciphered messages of great political importance for Dee's times.

Since Casaubon did not print most of these heavenly cipher tables, I went to the British Museum and looked at them myself. Certainly there was no system that I could discover in the arrangements of letters. The few squares in Kelley's hand, however, show a childish job of randomization, with alphabets written in diagonally, and in reverse, or in circular patterns, and clearly, I thought, inscribed in haste. Perhaps when Kelley recited the letters he produced a better job of scrambling.

There is even a remarkable passage in which Dee attempts to read out a message from the tables, being instructed—through Kelley I suppose—by one of the angels.

From these mystic and potent squares, charms could be extracted. The first customers Dee and Kelley have at Mortlake appear to be quite ordinary people. For one client, one Isabel Lister, a woman bedeviled and talking of suicide, Murifri, one of the angelic familiars, instructs Dee to make a charm, taking the letters of the woman's name from one of the angelic keys, the seventh, and writing the numbers corresponding to these letters as row-column coordinates on a leaden circle, and so on—the usual mumbo jumbo. But shortly a customer of

much greater status appears—Count Albert Laski of Poland. He visits the British court, and is watched carefully by Elizabeth's ministers. He may become the next king of Poland. But he makes also many visits to Mortlake, for he is broke, and he too needs gold.

For him, the heavenly messages can be deciphered, and they are much more circumstantial. Dee records in his *Book of Mysteries* a monoalphabetic substitution alphabet, with cipher equivalents looking rather arcane, and based more or less on adaptations of the Greek alphabet (Dee always wrote, whether in English or in Latin, in Greek characters in the *Book of Mysteries* when he didn't want Kelley to read what he had written). He gives what purports to be a Latin version of Laski's illustrious lineage, deciphered from a text in this alphabet. I'm afraid that this is the only specimen of Dee's functioning as a cryptographer that I have seen, and it doesn't do him very much credit. Certainly it reveals no awareness of the importance of variation, as in Trithemius' *Polygraphia*.

Count Laski is enchanted by the *angelic* promises of sponsorship for his pretensions to the throne of Poland, and for finding the golden formula of alchemy. Quite suddenly Dee and Kelley and their household leave Mortlake at night and sail for Poland in a ship provided by Laski. I don't know what Elizabeth's government thought of this move; but they knew about it. Perhaps they wanted Laski watched.

The next few years become a brilliant blur of tomfoolery. Kelley becomes very tired of the whole business of receiving cipher squares from the angels—that is, of inventing them. Dee pays him only 50 pounds a year, say, $5000. He declares that he will be a medium no more.

He produces instead some red and white powder, and makes gold. Soon he is Dr. Edward Kelley, and presently he is Sir Edward Kelley, having been knighted by Rudolph of Bohemia, who is now quite mad. After a brief period of glory and luxury, Sir Edward is jailed by his mad imperial patron, and dies, so the story goes, trying to escape. He is still in his 30's.

But Dee has somehow stayed clear of the alchemical business. He receives many letters from Burleigh, the Lord Chancellor, begging for some of this gold. Just enough to support Elizabeth's navy for the summer, for the Armada is coming. But all Elizabeth ever got out of Kelley's gold was a warming pan, in the cover of which was a small circle of gold, said to have been transmuted by Kelley's powder from the base original metal.

In the period of Kelley's splendor, Dee was quite eclipsed, and was ordered to leave Cracow, where he then was, as an undesirable. One would think that, with no reputation and no gold, Dee would have reached the very depths of his career.

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But not in this, the golden age of government consultants. He was liberally patronized. He was offered an overwhelming fee—£2000 a year—to become chief adviser to the Emperor of Russia—an offer he had the good sense not to take literally. And when he left Poland, in a stately progress with three carriages, making handsome gifts along the way, being received by university rectors and by noblemen at their estates, he spent, as he records in his diary, in the five weeks of his travel to Bremen, about $80,000 (by my reckoning)—or four year's salary.

I leave Dee now, to you, and to posterity. But I would point this final moral from his long career as a government servant. At Bremen, where he is writing despatches to the British government, he returns to a field that no doubt has stood him in good stead all these many years—forsaking gold, and the navy, he writes a routine intelligence report. England is now virtually occupying the Low Countries, and he writes to Walsingham his soundings on local reactions to British rule. His conclusion is very succinct: they don't like us—or, as Dee says, "Their minds are getting alienated from us." On this firm ground of intelligence he resumes his government service at Mortlake and in England, and was finally created Warden of Manchester College. He died in the fullness of his years, in spite of his best efforts accounted a conjuror, but remembered by many as a learned man and certainly one of the most splendid of all government consultants. It was a year or so after Dee's death that Shakespeare put upon the stage another famous conjuror, dismissing his conjured spectacle:

> "Our revels now are ended. These our actors,
> As I foretold you, were all spirits, and
> Are melted into air, into thin air:
> And, like the baseless fabric of this vision,
> The cloud-capp'd towers, the gorgeous palaces,
> The solemn temples, the great globe itself,
> Yea, all which it inherit, shall dissolve,
> And, like this insubstantial pageant faded,
> Leave not a rack behind."
>
> *The Tempest, Act IV, Sc. 1*

Perhaps he was thinking of John Dee.