of their journey, Mr. Peterson and one other were left alone in the vehicle, and his fellow-traveller came and sat opposite to him, near the door, and after some remark about the weather, asked, "All well at home?"

"Yes," said Peterson; "yes, thank you."

"Have you thought any more about that matter we were arranging some little time ago?"

The speaker was a senior clerk in an insurance office, and was in the habit of advertising his company at every opportunity. Everybody ought to insure, he used to say, and his was one of the best and oldest offices in the kingdom. His name was Bennett, but, in consequence of this propensity, he had acquired the soubriquet of Benefit. "Old Benefit" was well known, both in the City and in the neighbourhood where he resided; and though the young men to whom his admonitions were chiefly addressed amused themselves at his expense, they all respected him, and many of them listened to his advice, and had reason to be thankful to him for it afterwards. Mr. Peterson had long been intending to effect an insurance upon his own life, and had spoken to "Old Benefit" on the subject, but from one cause or other it had been delayed.

"I wouldn't put it off if I were you," said Mr. Bennett. "I can't, of course, talk to you as I would to a young man, and you know your own business best; but I thought you had made your mind up to it. The papers were filled up and everything ready long ago. You have only got to call and see the doctor and settle it, and then you'll be safe. Why not look in to day?"

"You are quite right," said Mr. Peterson. "I only wish I had had some one like you to urge it upon me when I was younger. It would have been easier to do then. However, I won't put it off any longer. I shall be busy this morning, but I'll call in to-morrow, or this afternoon, if possible."

"This afternoon will be best," said Mr. Bennett. "Make it possible—as far as it rests with yourself, at all events. There will be a Board this afternoon."

"I will," said Mr. Peterson.

"Don't leave it till to-morrow, my dear sir. We know not what a day may bring forth. I don't like the sound of to-morrow."

"I won't," said the other—"I won't if I can help it." And so they parted.

The question of life insurance was one which had weighed heavily on Mr. Peterson's mind for months and years. He had never been able to spare money for the premium. Each year he hoped would bring some increase to his income, or some diminution of casual expenses. He had sometimes argued with himself whether it was not better to spend what he had upon the education of his sons, and to give them a good start in life, than to make a larger provision for them after his death, but the argument had been used rather in the way of consolation for what he had been obliged to leave undone than in serious deliberation as to what he ought to do. His daughter's illness, and the change to a warmer atmosphere in the south of England, which had been recommended for her, had put him to great expense. She, alas! was dead, and would want nothing more from any of them. Then Charley had fallen ill, and this anxiety, coming so soon after the other, had caused them to be more lavish, if possible, in doing everything that could be suggested for his restoration, whether they could afford it or not. Charley was better, and would soon be getting his own living again. But now there was John. He had not put them to much expense while he was a child, thanks to the splendid charity under which he had been brought up and educated; but now he had begun to be a burthen to them, though only, as it was hoped, for a short time. He had such excellent abilities, and had made such good use of them at school, that everybody said it was a shame to keep him in a merchant's office as a common clerk. He had not succeeded in getting one of the great prizes at Christ's Hospital, but it was thought that he might distinguish himself nevertheless at the University, if only they could manage to send him there, and might enter one of the learned professions, and rise to be "somebody." Mr. Peterson and his wife had talked the matter over with much complacency, and the result was that the proposed life insurance had been again postponed, the premium being devoted towards paying the first year's expenses at Cambridge.

Next year promised to be less burdensome, for the young man had gained an exhibition, as we have seen, and fifteen pounds a year was very well to begin with. The promise of his boyhood was being fulfilled, and it would be an immense pleasure and satisfaction to his parents if he should attain to the distinctions which they augured for him, and well worth all the present sacrifices they could make.

Mr. Peterson's look of care passed away from his face as he thought of all this, after he had parted from Mr. Bennett at the door of the insurance office. His step became firmer, and his figure more erect, and his countenance assumed a look of resolution. Yes: all that his wife had said was true. He ought to have a higher stipend; he was entitled to it; he would ask for it that day. Mr. Goldie could but refuse it; but he did not think he would refuse it. Mr. Peterson made up his mind that he would complete the life assurance in either case that same afternoon. He had funds in hand sufficient for the first premium, and when he should have done all that was in his own power, he would trust to Providence to help him through. He had been assisted in the past and should be assisted in the future. And in that confidence he walked on cheerfully and briskly to his business.

NATURAL MAGIC.

BY JOHN NEVIL MASKELYNE.

PART I.—THE DARK AND MEDIÆVAL AGES.

OF all magicians undoubtedly Nature is the greatest. It is from the boundless resources of "natural magic" that the conjuror and illusionist obtains the best secrets of his art. Seeming miracles, indeed, produced by purely natural means, can be traced throughout the history of the ancient world, where science was the mighty lever by which clever, unscrupulous, and profligate rulers raised their secret rites above the comprehension of the masses, and bound them in the irresistible thraldom of superstition.

Modern science has probed to the quick the marvels by which, in times of popular ignorance, priests held in awe the pagan world. The same wonders, reproduced in all the beauty of nature's

magical arts, are now presented for the instruction and amusement of our favoured generation. Thus the most prolific sources of illusion at our command still depend upon those same laws which, though only then available to a limited degree, gave despotic sway to the wonder-working priesthood.

The precise methods of these early wonder-workers is not always known, but in the records of their deceptions we have abundant and unmistakable signs of subtle and ingenious effects produced by optical illusion. Specula or mirrors were used,—plane, polygonal, and concave mirrors of highly-polished silver or steel, or a composition of copper and tin, such as is still in use for reflectors. Indeed, it is doubtful whether the ancients may not have understood the manufacture of glass, for a passage in Pliny indicates that mirrors of that material were made at Sidon.

The celebrated Roman grammarian, Aulus Gellius, makes mention of specula possessing the curious property of reflecting no image of objects when placed in certain places, but recovering their power upon the position being changed; a phenomenon to be accounted for, as Sir David Brewster has pointed out, by the loss of reflecting power a silver mirror may instantly experience in a damp atmosphere, and as quickly recover when transferred to drier air.

The ancients must also have possessed considerable knowledge of acoustics, mechanics, and other sciences. When nature's storehouse was ransacked for engines to mislead, no marvel if ignorant minds were impressed with a belief in the visitation of the powers of the air and of darkness. The mysterious effect was heightened by pretended incantations, with accompaniment of artificial thunder. The poor dupes believed that the oracles spoke in a voice direct from the gods. No marvel, truly, if the people in those early days bowed down in abject terror, and submitted to the yoke of their imperious masters.

Egypt, notwithstanding its early civilisation, had a population sufficiently benighted to believe in the reality of the magician's power. The priesthood, mighty in words and deeds, were drawn from the ranks of princes or their connections, who, acquainted with certain not generally-known properties and affinities of bodies, held their subjects in the bondage of a superstitious awe—chains forged for them, as it seemed, by the gods themselves.

A stern noviciate had to be passed through ere the neophyte was ready to take his place in the temples of the gods. By solemn fasts, by marvellous draughts—such as the waters of Lethe and the fountain Mnemosyne in after times afforded: one to render the past a blank, the other to induce ecstatic visions, and both, doubtless, drugged—was the novice prepared. After going through so much to obtain, and being tied down by the most fearful vows to keep, and the most awful penalties in case they divulged, the secrets, no wonder that silence was maintained, or if some of the scientific knowledge they possessed should have been lost to the world.

The quick-witted Greeks improved upon the teachings derived from Chaldea and Egypt, and in the Eleusinian and other mysteries brought the arts of the priesthood to a well organised system.

Notwithstanding this, modern investigation and learning have stripped the pagan rites of the supernatural cloak, and these priests stand before mankind as tricksters, clever and unscrupulous jugglers.

In the gloom of their vaulted chambers—darkness being almost as essential to these ancient media as to most modern ones—when from the consecrated stone, as Pliny says, "the gods arose" in the blue wreaths of the burning incense, or when a phantasmagorial procession of the heathen deities passed athwart clouds of dust or smoke, and when lovely forms and beauteous landscapes suddenly gave place to outer darkness, and visions of horror from the nether world seemed to flit madly round, as dazzling light flashed momentarily and flickered before the eyes of the bewildered devotee, the "phenomena" were due to the priestly students of nature, who must have used some arrangement of concave mirrors and lenses by which images of solid bodies and pictures could be thrown upon such cloud-curtains. When the vivid lights and the enchanting scenery faded to black night—in which, by the lightning's flash, were presented forms to make the stoutest tremble—and the music of flutes, of trumpets, and of cymbals was drowned in thunder artificially produced and rumbling in solemn tones a-down the labyrinthine passages of the sacred caverns, and the earth would seem to tremble and yawn, the effect was merely an artifice of the priests further to impress the minds of their victims. A slight knowledge of mechanics would enable them to raise and depress the flooring of the caves, and that the priests adopted devices to this end has been proved by an examination of the Temple of Ceres, at Eleusis, where the floor was found to be much below the level of the portico. Afterwards grooves were discovered in the walls in which a false wooden floor might move up and down, and there were marble blocks at certain intervals, each containing holes at various heights for the wedges that fixed the flooring in its place. When Apollonius of Tyana, "the true friend of the gods," if not always the truthful one, visited India, and the sages there struck the ground in the temples of the gods with their magic wands, he who had been initiated at Athens into the Eleusinian mysteries well knew that signal to the stalwart arms below would set the floor upon which he stood heaving like the deck of a ship. When the Temple of Serapis, at Alexandria, was destroyed by order of Theodosius, it was found full of secret passages, and of machinery to aid in the impostures of the priests; and when those wily Egyptian retailers of the supernatural vaunted that their lamps would burn "for ever"—"and a day after," as the Hibernians have it—they omitted one important fact, that from these were laid secret pipes leading to bituminous wells, and the lamps having asbestos wicks, which are incombustible, but would raise the oil, they might almost be said to be in a fair way to burn eternally.

We are told by Ælian that upon Mount Erycus, in Sicily, in the open air, an inextinguishable flame burned on the altar of Venus; and Apollonius saw a cavern near Paraca, in India, which emitted a sacred flame. These were possibly like the fires of Pietramala, in Tuscany, which Sir Humphrey Davy attributed to an escape of carbureted hydrogen gas; and later, American gentlemen who were wont to say they had "struck ile" could tell similar stories of the earth vomiting forth flames.

The frantic delirium of the Delphic Phythia, in which the revelations of the gods came in raving and mysterious words, moulded to their own equivocal use by the bad priests, was no doubt induced by inhaling some sort of vapour issuing from beneath the tripod of the god.

Perhaps the most lucrative, and certainly not the least imposing (in a double sense), of the ancient mummery, was this voice of the gods by oracle. For some of these deceptions acoustics must have been studied by the priesthood, and the answer to an appeal from the suppliants came, conveyed through a tube, from the "rogue and vagabond" of old times to the lips of the figure. This is supposed to have been the case with the speaking head of Orpheus, in the island of Lesbos; and when the impostor Alexander of Abonotica, in Paphlagonia, proclaimed the serpent which twined round his neck to be Æsculapius, the god of medicine, the words which issued from the mask of a human face covering the reptile's head were, Lucian expressly states, transmitted through the gullet of a crane.

In other oracles less scientific, if not simpler, methods obtained, and the voices that issued from the oaks of Dodona, in the sacred grove around the Temple of Jupiter, may have owed something to ventriloquism or to the priests who could have lain concealed within their wide-spreading branches.

Curious investigation has discovered that many of the figures of the oracles were hollow, and in their interiors the soothsayers would hide, and thence deliver the mandates of the gods. When the sphinx, raised by the love-lorn king in memory of Rhodope of Corinth, gave, at the rising of the sun, prophetic answers, "the juggling fiends," who kept the word of promise to the ear only, were the priests, snugly ensconced within the head of the figure! Dr. J. Johnson, when exploring the excavations at Pompeii, found the identical spots where the priests of the Temple of Isis, an infamous crew, concealed themselves; and, he adds, "There were found the bones of the victims sacrificed, and in the refectory of the abstemious priests were discovered the remains of ham, fowls, eggs, fish, and bottles of wine. These jolly friars were carousing most merrily, and, no doubt, laughing heartily at the credulity of mankind, when Vesuvius poured out a libation on their heads, which put an end to their mirth."

The ravishing voices of the golden virgins in the Temple of Delphi were possibly simulated by an organ, which seems to have been known to the ancients, and could have been made to imitate such sounds. The music said to have proceeded from certain statues at sunrise and sunset was probably due in some cases to a natural cause. Baron Humboldt mentions subterranean sounds, as of an organ, that were to be heard upon the granite rocks of the Oronoko, in the wilds of South America, and called by the missionaries *loxas de musica*. He attributed the phenomenon to the difference of temperature between the external atmosphere and that confined in the deep and narrow crevices of the rocks. The air within these fissures increased in heat during the day as the sun's rays beat fiercely upon the face of the rocks, and as it reached its maximum the escaping current of air produced the musical sounds, which might gain in harmony from forcing a passage through the elastic films and spangles of mica partly covering the crevices, in which case the rocks would become a gigantic Æolian harp. May not the pagan priests have discovered some such rocks, and carved their vocal statues out of them. M. Dussaulx declares this to have been the origin of the musical fame achieved by the statue of Memnon at Thebes. He says, "The statue being hollow, the heat of the sun heated the air which it contained, and this air, issuing at some crevice, produced the sounds of which the priests gave their own interpretation." But the sweet and harmonious melody emitted by this majestic colossus as a salutation to the morn when the rays of the sun rose to the lips of the oracle, and the low and melancholy tones in which it sang at sunset, may have arisen from a totally different cause. Sir Gardiner Wilkinson, examining the inscriptions cut upon the pedestal of the figure, found one comparing the voice of the oracle to the sound of the striking of brass. He ascended to the lap of the statue, and struck the sonorous block with a hammer, when it responded with a sharp metallic ring, like the breaking of a harp string.

Verily the whole superstructure of the "religion" of these servants of the occult was built upon natural magic and lower trickery. They even carried their juggling arts into the contests of their gods, and rival priests played at "diamond cut diamond" with each other. Eusebius informs us that the Chaldeans, asserting that their gods were more powerful than all others, caused such of the latter as fell into their hands to be destroyed by fire. A priest of Canopus, however, ultimately established the superiority of the Egyptian deities by constructing an idol of porous earth. The artful magician filled up the cracks and crannies, and rendered them imperceptible with wax; then, running water into the capacious interior of the figure, his god was ready for the fire test. He thereupon challenged the Chaldeans, who prepared their altar and set the statue upon it, when, the wax melting, the water rushed forth and extinguished the fire. Thus were the gods of the Chaldeans vanquished!

As a knowledge of the erewhile mysterious laws and forces of nature dawned upon mankind and let in the light of truth upon the dark doings of the heathen magicians, a new and happier era for humanity commenced; but as light itself takes time to travel, so the first glimmerings of science struggled fitfully with a painful ignorance begot of past beliefs, and long ages had to pass ere the book of nature was thrown open so that every man might read therefrom its wonders. Therefore natural magic, applied to the mystification and deception of mankind, was not confined to early ages of the world. The mediæval magicians were also adepts in the production of illusions, though their power was limited, in comparison to their earlier prototypes, in consequence of the increased knowledge of the people. Notwithstanding the severe laws enacted in the middle ages against sorcery and magic, they still flourished; and even men of honest research encouraged mystery, as when Roger Bacon said it was well to hide the discoveries of the wise from a multitude unworthy to possess them.

In mediæval times, for the awe-inspiring purposes of the magician, optical deceptions were still, as ever, well to the front. The Greek emperor Basil saw, through the agency of Theodore Santabaren, the vision of his deceased son approach full of life, and in the bright glory of his youth, and then fade before his eager and fascinated gaze. He merely viewed a clever illusion, a piece of trickery in which a picture of the boy had been employed. This, brought nearer to a concave mirror, and so increasing in size, had appeared to advance, as if to embrace the monarch, while its sudden withdrawal made the image grow smaller until it vanished altogether. Cornelius Agrippa's magic mirror, wherein Surrey beheld the weeping and beloved Geraldine, and the vision of the beauteous Helen of Troy, said to have

been conjured up by Faust before the eyes of the Wittenberg collegians, are both of the same order of deception.

The celebrated description by the Florentine artist, Benvenuto Cellini, of the demons evoked by the power of a Sicilian priest at Rome—whither Cellini had repaired to woo the necromantic arts when his earthly mistress had proved faithless to him—tells how, accompanied by a friend, one Vincenzio Romoli, he went to the Coliseum, where the priestly professor of the black art proceeded "to draw circles upon the ground with the most impressive ceremonies imaginable; he likewise brought hither assafœtida, several precious perfumes, and fire, with some composition also which diffused noisome odours. As soon as he was in readiness he made an opening to the circle, and, having taken us by the hand, ordered the other necromancer, his partner, to throw the perfumes into the fire at the proper time, entrusting the care of the fire and perfumes to the rest; and thus he began his incantations. This ceremony lasted above an hour and a half, when there appeared several legions of devils, insomuch that the amphitheatre was quite filled with them." However, though the priest could summon such visions, he was quite unable to present the one for which the artist panted, the bewitching face of the fair tormentor who had "jilted" him; and after two or three attempts, extending over a month (and during which time, we may be sure, the magician made efforts to secure a portrait of Cellini's *inamorata*), the *séances* were abandoned, the defeated priest declaring that "love affairs were mere follies, from which no good could be expected." This, which gives us a fair insight into the illusions of the sixteenth century, is only a reproduction of the magic of the Egyptian wonder-workers, and accomplished by similar means, viz., the employment of mirrors and lenses, and does not require the use of a magic-lantern (invented by Kircher at a much later date), as suggested by Roscoe.

We can also trace the use of concave mirrors in Chaucer's description of the conjurors of his day, who would "bring in the similitude of a grim lion, or make flowers spring up in a meadow; sometimes they cause a vine to flourish, bearing white and red grapes; or show a castle built with stone; and when they please they cause the whole to disappear." All this leading up to Kircher's invention.

Superstition, unfortunately, is not for an age, but for all time, and though the ghost-raisers and the readers of man's horoscope are no longer rulers of their kind, but the "fools of fortune"—sunk to the level of a Vagrancy Act, and only acceptable to the illiterate and the vulgar—the glamour of the supernatural is still felt, and it remains—an ever-decreasing quantity, let us hope!—to be taken into any review of the human mind. Therefore, we shall not go far wrong in following in the wake of Sir David Brewster, who, sworn foe to humbug and deceit, strove to show how many wonders there are in nature still beyond the ken of ordinary mortals, and how careful we should be before concluding that "spiritual manifestations" are due to agencies other than of this world.

In the next paper I propose to treat of the *modus operandi* in some modern optical illusions.

A RUSSIAN WEDDING TRAIN.

THE picture which we reproduce from a painting by Nicholas Swertchkoff, one of the most noted of Russian painters, represents a South Russian wedding train in winter. The party are just coming from the church where the union has been consecrated by the "pope" of the district. Papa or Pope is the name commonly given in the Greek Church to a clergyman or priest. The church steeple is still discernible, and the sledge procession is now nearing the village where the wedding is to be celebrated by feasting and dancing. Even in midwinter, dancing is, next to eating and drinking, the chief item of the merrymaking connected with a wedding. The arrangement of the banquet is very much the same all the world over. From the poorest to the wealthiest, every family tries under such circumstances to place the very best they can afford, in the way of food and liquor, before their guests. The Russian peasant, as a rule, is very moderate in eating, but not so in drinking. A farm labourer will, for instance, on some occasions exceed the bounds of sobriety in drinking so far as to spend his long-earned savings in one day. At weddings these bounds are too generally overstepped in all northern countries.

At the procession one of the girls of the village carries before the bridegroom a loaf of bread with a wooden sword stuck through it. The meaning of this symbol is that the wife is to attend to domestic comforts, as represented by the loaf, and the husband owes protection to her, as shown by the sword. Dictionaries tell us that our word lady means originally "loaf-keeper," although some etymologists would fain trace it to Lada, which was the name of the goddess of youth and beauty in ancient Slavonic mythology. We do not venture to decide on the point. Dancing is carried on to a very great extent at Russian weddings. The Russian is as passionately fond of moving about on the light fantastic toe as the Frenchman or the Spaniard. The two leading Russian dances which we generally find at wedding celebrations are the *kasatcha* and the *vesmanka*. In these dances the arms and the legs are not alone active; the face also, nay, the whole body is at work; and, pantomimeism forms part and parcel of the choregraphic entertainment. In summer, of course, a Russian wedding must appear very different from what it does in winter, but in winter it is more characteristic of northern nature.

The manners and customs of a country are not wholly what man, but also what nature makes them. As a rule, the style of living, the dress, and the social habits of a people are to a great extent dictated by the situation, the soil, and the climate of the country they inhabit. In a measure, these remain the same when part of a nation is transferred from one country to another. The gipsies all over Europe cling to the way in which their nomad ancestors lived as pariahs in India. The Jews throughout the world, though generally a trading people, have preserved many habits of their fore-