

THE PREHISTORY OF TELEVISION

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IN his drama "Back to Methuselah" George Bernard Shaw depicts the following scene as a reality in the year 2170: the head of the British government is holding a conference with his cabinet ministers, who are several hundred miles distant, in this manner—that he operates a switchboard near his desk and, by pressing a certain key, makes appear on a silver screen a life-size picture of the person to whom he desires to talk and whose voice is simultaneously transmitted.

In April, 1927, the Bell Telephone Laboratories gave the first practical demonstration of transmitting over electric wires the pictures and voices of moving persons, voice and image being perfectly synchronized. A two-way telephonic communication was maintained between Washington and New York. Secretary Hoover in Washington opened the demonstration, and the illuminated image of himself cast over the wire on a screen in New York synchronized perfectly with his voice that was heard over the telephone at the same time. One telephone line was used for transmitting the voice, another for transmitting the television current and a third for synchronizing the electric driving-motors at each end of the lines. It has since been demonstrated that both the voice and the "picture" currents can be sent over the same wire or, in the case of radio transmission, over the same wave-length.

While television at present is a fact, it has been the dream of mankind for hundreds and thousands of years. In my monograph, "The Prehistory of Aviation," recently published by Field Museum, Chicago, I have emphasized the fact that human imagination has been of paramount importance and proved most fertile in the development of mechanics and inventions and that the trend of man's mind toward the romantic and adventurous has resulted in the conquest of the air. The essential point is that many fundamental contrivances have not been reasoned out logically through progressive scientific thought, but that man's mind conceived them through visionary reveries as an accomplished fact and then proceeded to work toward this imaginary goal. Thus television also has its prehistory in the domain of oriental folk-lore, a brief outline of which is given on the following pages.

In Firdausi's great epic poem, the *Shāhnāme* ("Book of Kings"), figures a cup which mirrors the world and distant persons. It is the property of King Kai Khosrau and appears in the love-story of Bizhan and Manizha. The king, while holding a feast, receives a petition for succor from the people of Irmān, whose country is being ravaged by wild boars, and sends Bizhan and Gurgin to scour the country of them. Through the machinations of Gurgin, who envies him, Bizhan falls in love with Afrasiyab's

daughter, Manizha, who carries Bizhan off to Turan and hides him in her palace. He is discovered and imprisoned in a pit with Manizha as his attendant. In the meantime Gurgin has returned to Iran, where his lame story rouses suspicion. By means of the divining-cup Kai Khosrau ascertains Bizhan's situation and dispatches the hero Rustam to deliver him. The king says to Giv, Bizhan's afflicted father (in Warner's translation):

Then will I

Call for the cup that mirroreth the world,
And stand before God's presence. In that cup
I shall behold the seven climes of earth,
Both field and fell and all the provinces,
Will offer reverence to mine ancestors,
My chosen, gracious lords, and thou shalt know
Where thy son is. The cup will show me all.

Then the poet narrates how Kai Khosrau saw Bizhan in the cup that shows the world:

When jocund New Year's Day arrived, Giv
yearned

For consultation with that glorious cup,
And came, bent double on his son's account
But hopeful, to Khosrau who, seeing him
With shrunken cheeks and sorely stricken heart,
Went and arrayed himself in Ruman garb
To seek God's presence. Then before the
Maker

He cried and oft-times blessed the Shining One,
Imploring of the Succorer succor, strength,
And justice on pernicious Ahriman,
And then returning to his throne, assumed
The Kaian crown, took up the cup, and gazed.
He saw the seven climes reflected there,
And every act and presage of high heaven,
Their fashion, cast, and scope, made manifest.
From Aries to Pisces he beheld

All mirrored in it—Saturn, Jupiter,
Mars, Leo, Sol and Luna, Mercury,
And Venus. In that cup the wizard-king
Went to see futurity. He scanned
The seven climes for traces of Bizhan,
And, when he reached the Kargasars, beheld
him

By God's decree fast fettered in the pit,
And praying in his misery for death,
With one, the daughter of a royal race,
Attending him. The Shah, with smiles that
lighted

The daïs, turned his face to Giv and said,—
"Bizhan is yet alive; be of good cheer!"

In one of the stories of the Arabian Nights (No. 271) the three sons of a Sultan of India—Prince Husain, Prince Ali and Prince Ahmed—undertake a year's journey into a distant part of the world to find some unusual treasure for their royal father, who had promised the hand of a princess to him who would bring back the rarest jewel. Prince Ali traveled to Shiras, capital of Iran, and while rambling in the bazar of the city, one day met a man who carried in his hand an ivory tube about a yard long and offered it for sale at the price of thirty thousand sequins. The prince thought him to be a fool, as he demanded so enormous a sum for such a wretched thing, but was soon informed that this broker was wiser and more sensible than all others of his profession. He examined the ivory telescope, which was equipped with a piece of glass at either end and which if placed in front of the eye brought anything close to it, even though it may have been many hundreds of miles away. Moreover, this tube had the miraculous power of showing any object or any person its owner desired to see. Prince Ali wished to see his father whom he had left in India, and no sooner did he hold the ivory tube close to his eye than he espied him hale and hearty seated on his throne and giving judgment to the people of his land. Then he demanded to behold his beloved princess, and immediately he caught sight of her as she was leisurely reclining on a couch, chatting and laughing and attended by a flock of maids.

In Grimm's tale, "The Four Skilful Brothers," the situation is very similar to that of the preceding story. Four brothers go out into the world to earn their living and to learn a craft. One becomes an expert thief. The second meets a man who asks him what he wishes to learn in the world. "I do not know it yet," he replies. "Come along with me and become a star-gazer; there

is nothing better than that, nothing will be hidden to one." He consented and became so clever a star-gazer that his master, when the boy had finished his apprenticeship and would leave him, presented him with a telescope and said, "This will enable you to see what occurs on earth and in heaven, and nothing will remain concealed to you." He meets with his three brothers, who have also acquired an extraordinary art, and soon there is an opportunity for them to put their knowledge to the test. The king's daughter was kidnapped by a dragon, and the king made it known that he who would bring her back should receive her as his consort. The four brothers decide to deliver her from the dragon. "I shall soon know where she is," said the star-gazer, looked through his telescope and announced, "I behold her, she is seated far away on a rock in the sea and beside her the dragon who guards her." Then he went to see the king and requested a ship for himself and his brothers, and crossed with them the sea till they arrived at the rock. They return with the king's daughter, and naturally engaged in a quarrel as to which should have her as his wife. The star-gazer said, "If I had not espied her, all your arts would have been futile; therefore she is mine." As all their claims were of equal merits, the king decided that no one should get her, but assigned to each a half kingdom as his reward.

Lucian, in his "True History" (I, 26), relates that in the palace of Endymion, king of the moon, he saw a large mirror placed above a well of mediocre depth. In descending into this well, it was possible to hear whatever was talked on earth; and in lifting one's eyes toward the mirror, one saw all towns and all nations as though one were in their midst. "I saw there my parents and my country," he adds, "I do not know whether they saw me too. I do not venture to affirm it, but he who declines to

believe me might go to the moon, and will then convince himself that I am not an impostor."

Zosimus, an alchemist who lived in Egypt during the third and fourth centuries A.D., discusses the electron, an alloy of gold and silver, and mentions a magic mirror which Alexander the Great had made of it and which subsequently was exhibited in the Temple of the Seven Gates (corresponding to the seven heavens) above all spheres. In this mirror one beheld one's own future and destiny until one's death. This was a divine mirror symbolizing God (compare Epistle of James, I, 23-24; I Corinthians XIII, 12; II Corinthians III, 18).

In 331 B.C. Alexander the Great founded the city named for him—Alexandria. About 280 B.C. the famed Pharos was constructed there by Sostratus of Cnidus—the earliest lighthouse known in history. It was about three hundred feet high, a three-storied structure; the lower story was square, the middle one octagonal, the upper one, which contained the light, circular and surmounted by a colossal statue of Poseidon (Neptune). The Pharos of Alexandria became widely known in the Islamic world, but Mohammedan authors erroneously attribute its foundation to the great world-conqueror himself, designating it Menarat Iskanderiah ("Lighthouse of Alexander"). They describe it as one of the marvels of the world. On the top of this lighthouse, they say, Alexander placed a magic mirror in which could be sighted all incoming ships, the country Rum (the Byzantine empire), the islands of the sea and whatever was done by the inhabitants. By virtue of this mirror, as long as it existed, the city of Alexandria was said to preserve its grandeur and power. The Persians called this lighthouse Mirror of Alexander (Aineh Iskenderi), believing that the fortunes of Alexandria depended on it, as it was a talisman con-

structed under the influence of a certain constellation. It is said to have broken to pieces shortly before the city was conquered by the Arabs in A.D. 641.

Rabbi Benjamin of Tudela, who traveled in the Orient between the years 1159 and 1173, mentions the high tower of Alexandria surmounted by a glass mirror by means of which the approach of a ship or a hostile fleet could be noticed even when it was a twenty days' voyage off. The city was therefore prepared for the reception of a hostile ship from whatever direction she approached. Once, however, when Greece was still subject to the Alexandrians, Benjamin continues, a Greek vessel cast anchor in the port of Alexandria. The captain, a Greek, Theodorus by name, instructed in all sciences, brought to the Egyptian king valuable presents of gold and silver, silk and purple. His ship was at anchor opposite the lighthouse. Every day the captain invited the guard of the lighthouse with his servants on board his ship until they were on friendly terms. One day he treated them to an opulent feast and filled them with wine till they were intoxicated and fell into a deep slumber. The captain then ordered his crew to smash the mirror, and set sail the same night. From that time onward Christian ships, small prowlers as well as large vessels, entered the port, and snatched away two large islands, Crete and Cyprus, which are still under Christian rule. Egypt was henceforward unable to resist the Greek power.

Leo Africanus, in his "History of Africa," writes that the mirror of Alexandria was of "steel glass" by the hidden virtue of which passing ships, while the glass was uncovered, should immediately be set on fire; but when the glass was broken by the Mohammedans, its secret virtue vanished.

The fame of Alexandria's Pharos and television mirror even spread to the Far

East. Chao Ju-Kwa, who was stationed as inspector of maritime trade at the port of Ts'üan-chou in Fu-kien and collected there from the lips of foreign traders much interesting information on the countries of the Indian Ocean, which he published in his "Chu fan chi," written in A.D. 1225, gives a brief notice of Alexandria and its lighthouse. "On the summit of it," he writes, "there was a wondrous large mirror. In the event of a surprise attack by foreign warships they would be detected beforehand by this mirror, and the troops on guard duty were ready to meet the situation. In recent years Alexandria was visited by a foreigner who asked for work in the guardhouse of the tower and who was employed as a janitor. He was not suspected for years, when suddenly he seized an opportunity of abstracting the mirror and flung it into the sea, whereupon he disappeared." A late Chinese cyclopedia (*San ts'ai t'u hui*) has disfigured this tradition considerably by stating that Tsu-ko-ni (Alexander) erected in Egypt a temple on the top of which there was a mirror which when pirates of other countries made a raid reflected them and thus announced their arrival.

In the famous letter of Prester John (71) purporting to have been written by him to the Byzantine emperor, Manuel (1143-80), is described a marvelous mirror which is reached by ascending a hundred and twenty-five steps over an elaborate structure of pillars. In this mirror all plots and machinations and everything that was done in the adjacent and subjected provinces either on behalf of Prester John or against him would be clearly revealed and recognized; day and night it was guarded by twelve thousand armed men that it might not be broken by an accident. In the work of Johannes Witte de Hese (1389) this mirror of Prester John is also mentioned: three precious stones are deposited in it; one of these

directs and sharpens the vision; another, the senses; the third, experience; three very capable doctors have been elected to examine the mirror and see in it everything that is done in the world.

A "History of the World" published in Neo-Greek by Dorotheos, metropolitan of Malvasia, at Venice in 1763, alludes to a magic mirror in the imperial palace of Constantinople made by the emperor Leo the Philosopher: whatever existed or happened or was intended to be done in the world could be most clearly visualized in this mirror. The Emperor Michael, who was given to a voluptuous life, was informed one day by a messenger that he had beheld in the mirror the war preparations of the Turks against Constantinople. Michael, who just pampered at a banquet, did not like to be disturbed and ordered a servant to smash the mirror to atoms.

According to an Arabic tradition, Saurid was the wealthiest king on earth and had a mirror made from various alloys, wherein he could scan whatever occurred in the seven zones, whether good or bad, and what land was irrigated or not. This mirror was placed in

the city of Amsus on the top of a green marble column. In the city of Sa on the bank of the Nile stood a pillar of white marble and upon it a mirror in which King Sa, for whom the city was named, was able to discern whatever happened in the seven zones.

Spencer, in his "Fairy Queen," has Merlin make a magic mirror in which a girl beholds the image of her swain. Walter Scott, in his "Lay of the Last Minstrel," relates that Cornelius Agrippa showed the Count of Surrey, during his sojourn in Italy, his sweet-heart Geraldine in a mirror as she was reclining on a couch and reading her lover's poems by the light of a wax candle.

Nathaniel Hawthorne, in his story "Dr. Heidegger's Experiment," refers to a looking-glass hung in the doctor's room, "presenting its high and dusty plate within a tarnished gilt frame. Among many wonderful stories related of this mirror, it was fabled that the spirits of all the doctor's deceased patients dwelt within its verge, and would stare him in the face whenever he looked thitherward."