

Science News-Letter

The Weekly Summary of Current Science

EDITED BY WATSON DAVIS

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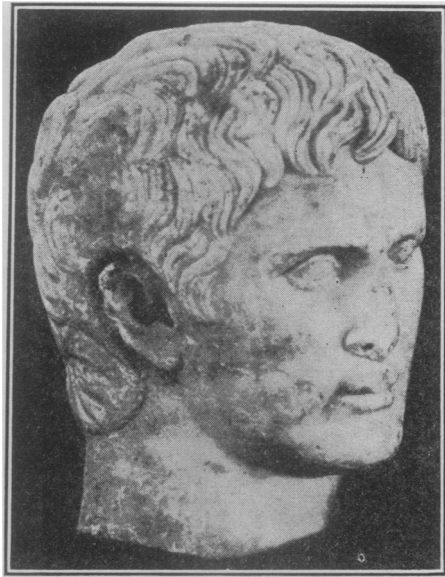
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ARCHAEOLOGY

City Visited by St. Paul Unearthed by Scientists



Not a prize fighter, but a battered head of the Emperor Augustus found in Antioch.

By EMILY C. DAVIS

Antioch, the city most often remembered as the place where the Apostle Paul turned from the Jews to offer his message of Christianity to the Gentiles, has acquired a new fame.

Archæologists who have excavated among the ruins of this ancient Roman colony have been studying the fragments of sculpture and architecture unearthed there, and these finds are declared to be outstandingly fine examples of the art of their time.

This means distinction of a high order, since the rivalry among Roman colonies was keen, and each city was eager to outshine the others, and if possible Rome itself, in the magnificence of its temples and monuments.

It should be said at the start that this Antioch which is winning the admiration of archæologists after it has lain buried for so many

centuries is not to be confused with the Syrian Antioch where the Apostle Paul also preached, and where the name of Christian was first bestowed upon his converts. This ruined city is the Antioch of the province of Pisidia, high among the mountains of Asia Minor.

It was to Pisidian Antioch that Paul came about the year 46 A. D., when the city was a busy center of Roman civil and military administration. His preaching at the Jewish synagogue so attracted the entire population that "when the Jews were gone out of the synagogue, the Gentiles besought that these words might be preached to them the next Sabbath."

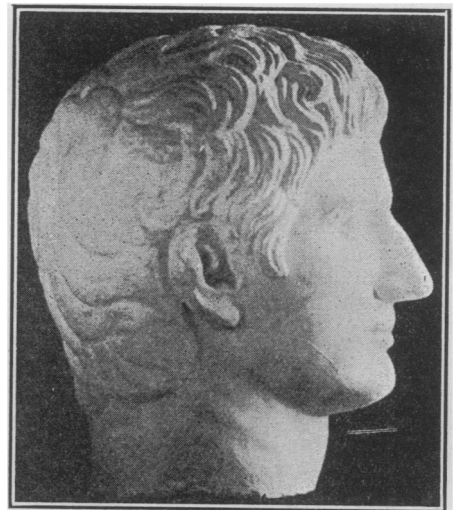
The account in the Book of Acts continues to say that on the next Sabbath almost the whole city gathered to hear him and that when the Jews saw the multitudes they were envious of Paul's popularity and condemned his preaching. Whereupon Paul and his companion Barnabas made a decision of policy that was so important in the history of the early church, saying boldly:

"It was necessary that the word of God should first have been spoken to you but seeing ye put it from you, and judge yourselves unworthy of everlasting life, lo, we turn to the Gentiles.

"And the word of the Lord was published throughout all the region."

Paul departed from the city, but Antioch's interest in his teachings grew for several centuries. The recent excavations have revealed the foundations of two large churches, one a cathedral, probably the first cathedral of the early church.

The city's destruction is believed to have been caused by the Arabs, about 713, though earthquakes have played a part in shaking down the



The handsome features of Augustus restored.

walls and columns. As far back as 1833, the modern career of Antioch began when a British clergyman who was hunting for the ancient cities connected with church history found his way to the ruins and identified them as the true site of Pisidian Antioch.

Eighty years elapsed, and then Sir William Ramsay conducted trial excavations there and found that valuable relics lay only a few feet below the surface. The war interrupted his work, until 1924, when the University of Michigan became interested in Antioch and sent an expedition there in cooperation with him, under the direction of Dr. David M. Robinson, of Johns Hopkins University.

The full report of the important finds which have been made by this expedition has not yet been published, because scientists of the expedition are still studying several thousand photographs and exhaustive notes which they brought back.

The difficulty of reconstructing
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Antioch Unearthed

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the city and its life is particularly great. Not only was the entire area completely wrecked, but natives of the modern city nearby are accustomed to use the ruins of Antioch as a source of building materials.

Dr. Francis W. Kelsey, of the University of Michigan, director of the Near East Research of the University, states that "with rare exceptions, there remain exposed to view on the hill only blocks of limestone of such size and hardness that the natives have not been tempted to break them up.

"How many ruins still lie under the surface it is difficult to estimate; for in a number of places the natives in quest of building materials have dug down into a ruin and quarried it. Architectural fragments and inscriptions, and occasional pieces of sculpture are seen in the walls of houses and public fountains, and even in the cemeteries."

In spite of this wholesale removal of the city's stones, the expedition was able to trace foundations of the important buildings, and to find enough stones and carvings for the architect of the staff to draw detailed reconstructions, showing how the city's finest edifices looked in Antioch's prime.

In the area that has been uncovered they have found sculpture which members of the party pronounce finer than similar art in Rome itself.

"The temple area contains specimens of the best Roman sculpture known," is the opinion of Dr. Robinson.

"I don't believe that a Roman built this temple, nor that a Roman could have built it," said Dr. Robinson in a recent interview. "I believe that the colonists must have engaged a Greek to build their temple, for it combines the Greek beauty and rhythm with the solidarity approved by the Roman. And as a bit of more specific evidence, the mason's marks about the building are in Greek."

This temple which was so beautiful was on a hill in the center of the city, Dr. Robinson explained. Below it was a public square, known as the Square of Tiberius, which was lined on either side with shops. From this square, a broad stone stairway led up to another open space known as the Square of

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STUDY HELPS FOR SCIENCE CLASSES

These articles will be found to be especially useful in class work

GENERAL SCIENCE

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BIOLOGY

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HYGIENE

Make the Punishment Fit the Crime,* p. 117. Rheumatism a Disease, p. 121. Ultra-Minute Germs Studied,* p. 119.

CHEMISTRY

Oil Smelted Copper, p. 115.

PHYSICS

Un Homme De Genie,* p. 115. Anti-freeze Mixtures for Radiators,* p. 121. Americans to See Eclipse,* p. 123.

(This will fit on a 3 x 5 card.)

Science News-Letter, November 20, 1926

News-Letter Features

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Science News-Letter, November 20, 1926

A new company in Canada is to make paper from waste straw.

Baltimore has the densest population of any city in the United States.

Dyed silks, both unweighted and tin-weighted, deteriorate if exposed to the sun.



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Ultra-Minute Germs Studied

A brief glimpse into a new world, more minute than that revealed by the most powerful microscopes, was given scientists at the Philadelphia meeting of the National Academy of Sciences. Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research of New York, described researches that are in progress upon one of the world's mystery diseases, encephalitis lethargica, popularly known as sleeping sickness.

There is a realm of invisible organisms living within the animal body. Against these deadly submicroscopic germs, called "viruses," the medical world has no safeguard, Dr. Flexner explained. The bacteriologist can not grow them, his eyes can not see them, he can distinguish them only by their effects. Many of the most troublesome diseases, such as encephalitis and the hoof and mouth disease of cattle are caused by these viruses.

In studying encephalitis, which suddenly appeared in the world in 1916 in Europe and which since 1919 has been epidemic in this country, medical researchers believed that they had found evidence that the virus of this deadly disease was the same as that obtained from ordinary cold sores such as have afflicted the lips of the human race since a remote past. The contents of these cold sores when injected into rabbits produced a diseased condition quite similar to that of human encephalitis. But further research, particularly that of the Rockefeller Institute, failed to substantiate the identity of the two viruses and Dr. Flexner told the academy that the cause of encephalitis is still an unsolved problem. Two years ago Japan suffered from a severe epidemic of a new disease similar in character to the encephalitis of this country and Japanese investigators may throw some light on the problem. Seven out of ten people afflicted in Japan died and the disease has a high fatality rate in this country as well.

The eye of the camera, which can see with light too short to be caught by the human eye, will be used in investigating the invisible viruses, Dr. Flexner explained. By taking photographs through the ultra-microscope which utilizes ultra-violet rays, and perhaps even using the very short X-rays themselves, it may be possible to picture the guilty germs at present invisible.

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Edison was 30 years old when he invented the incandescent light.



Looking down from the ruins of Antioch toward the modern city, which has many historic stones from old Antioch built into its shops and homes.

Antioch Unearthed

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Augustus. And here, set against a semi-circle of the native rock, stood the temple.

This religious center of the city proved a hiding place for a variety of valuable relics. When the expedition began to clear away the earth and piles of broken stones they discovered in the Square of Tiberius a stone circle six feet in diameter set in the paving. Holes in the circle had once been fitted with metal letters to spell out the inscription that a certain Roman aedile, or magistrate, had presented the pavement of the square to the city.

The stairway between the lower and higher squares was decorated at the top landing by three great arches elaborately carved, in the form of a memorial to the Emperor Augustus. Two powerful looking Pisidian chiefs with their hands bound are carved over the arch in token of Augustus' conquest. His victories on land are shown by a frieze of shields, breastplates, and other weapons, and his naval triumphs are represented by a frieze of ships, tritons, dolphins, and other marine symbols, with Poseidon himself, god of the sea, among them.

The temple in the upper square remains somewhat mysterious, as no inscription has yet been found stating in whose honor it was built. Study of fragments of the sculptures leads Dr. Robinson to believe that it may have been a shrine dedicated both to the Emperor Augustus and to the local god of fertility, known as Men.

"Enough parts of the temple have been found so that it could be rebuilt," says Dr. Robinson, "though there is small chance of the Turkish government carrying out such a project. The architect of the expedition spent many days examining the architectural units that were identified. From these he has been able to draw a very accurate reconstruction, even to the elaborately carved figure that crowned the pointed roof of the edifice."

Besides the temple, other traces of Augustus' influence on the city have been found by the excavators. One of the objects unearthed was a marble head which had been buried in a Byzantine house. The nose and mouth had been battered and there was no sign of any other part of the statue. But when a restoration of the nose and other features was made on a plaster cast of the head, the fine profile of the handsome Augustus was revealed.

After careful examination of the head, Dr. Robinson has concluded that it is an idealized portrait of the Roman emperor made by a sculptor who had never seen his royal subject.

"The head conforms so strictly to the Augustus type, and yet it is so academic and generalized," he says, "that it is safe to apply to it the explanation that waxen or clay portraits of Augustus were sent to the provinces to be copied by local artists who had never seen Augustus himself."

He believes that the statue was set up late in Augustus' lifetime,

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Antioch Unearthed

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probably at the time the temple was erected. As there is no trace of a rayed crown or any other sign of deification about the carving, the likelihood is that the Emperor was still living when this statue of him was set up in the distant Roman colony.

Another important Augustan relic is the *res gestae*, or deeds, of the famous emperor, which were carved on four massive blocks of stone and were placed on the steps leading up to the Square of Augustus.

The temple area also yielded an inscription of a different kind, the earliest known warning to food profiteers in existence. This long Latin inscription carved on a stone tablet had been posted in the public square during the serious famine which took place about 93 A. D. But it was found in a Byzantine home built several centuries later on the edge of the square. The food edict had been used by the builder as an ordinary stone in the wall of the house.

The edict, which is in a good state of preservation, has been translated and analyzed by Dr. Robinson, who says:

"The local authorities of Antioch seem in ancient days to have been unable to cope with the famine situation. This had led to hoarding of grain in the hope of later securing higher prices, and an appeal was made to the governor on behalf of the people to compel the speculators and producers to sell. The governor answered their petition with an official edict for their city.

"The edict ordered each person to declare before the officials how much grain he had, and how much he was deducting for his household and for seed. The rest he was ordered to offer for sale, and if he evaded the order, the surplus grain that he hoarded was to be confiscated.

"An outstanding fact about this ancient food edict is that it forbade any one to make over 100 per cent. profit, whereas in our own times, 400 and 500 per cent. profit was not unknown in the recent war."

From the temple of Augustus the expedition went down near the city wall to study the foundations of Christian churches. The city was at the height of its Roman pomp when the Apostle Paul visited it. But where he went to preach in the Jewish synagogue is unknown. Such buildings were unpretentious,

often being of wood, and no trace of a synagogue has been discovered.

Two churches have been found, one on the hill, the other, a basilica, in the lower city; and the possibility has been suggested that this basilica might have been built on the spot where Paul taught his Greek speaking converts.

"On account of the hostility of the Jews, the earliest Christian congregation could hardly have had the use of any public building or place for its meetings," Dr. Kelsey explains. "Probably at the beginning, gatherings were held in the ample court of some private house, the home of a wealthy believer, in a secluded part of the city. If this was true, it may well be that the house in which the apostles preached was replaced by a church, and that this church, as the congregation increased, was replaced by the splendid edifice, and that, finally, the later basilica was built on a slightly higher level, on ground consecrated by the preceding centuries of Christian worship.

The later church, nearest to the surface had been bereft of its columns and architectural pieces when the scientists found it. But they cleared away the earth, revealing the plan of a building 200 feet long, with a few broken shafts of columns

The possibility of something hidden deeper remained, and when workmen had dug only two feet below the floor, they discovered the floor of an older church, possibly the earliest Christian cathedral ever built.

The excavation of Antioch represents a strictly twentieth century viewpoint of archaeology. When scientists began to go out to remote regions with pickaxes and shovels and dog tents, they went hoping to bring back rare specimens to enrich their collections, as well as to learn more about lost civilizations. But in the past few years, the countries that happen to own ancient ruins have begun to look with disfavor upon collectors, either professional or amateur; so that now practically all scientific digging is conducted with a purely detached and academic interest.

All sculptures and fragments of inscriptions found at Antioch must be turned over to the Turkish government, and some are already reposing in the local museums. To the scientists goes the honor of discovery and the chance to add to the store of definite knowledge of the ancient world.

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