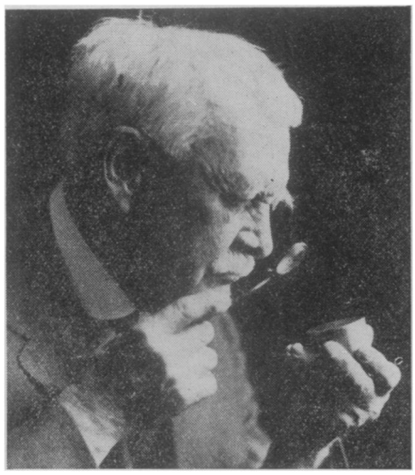
Explodes Photograph Into Steel

Physics



DR. CHARLES E. MUNROE, explosives expert of the U. S. Bureau of Mines. Dr. Munroe discovered the Munroe effect, with which his photograph has been literally exploded into steel

Shooting a photograph into the hardest of chrome steel with the aid of high explosive nitro-gelatin, and so making a photographic record as permanent as the steel itself, is the feat that has been accomplished as a result of the "Munroe Effect." This effect was the discovery of Dr. Charles E. Munroe, veteran explosives expert of the U. S. Bureau of Mines. An incidental result of the work is the proof that the blacks in a photographic print are due to varying thicknesses of finely divided silver, the thicker the deposit the darker being the shadow in the photograph.

The steel photograph was made recently by G. St. J. Perrott, superintendent of the Bureau of Mines experiment station at Pittsburgh, and sent by him to Dr. Munroe. To make it, a photograph of Dr. Munroe was laid on a piece of steel about two inches in diameter and an inch thick. On top of this was placed a disc-shaped piece of the nitro-gelatin explosive, which was then fired. Though the paper photograph was completely destroyed, when the steel cooled sufficiently to be handled, the profile of Dr. Munroe was found impressed on the surface. Where the photograph had been black, that is, in the shadows, the surface of the steel was raised, and where there had been high lights the steel was incised.

Another example of the effect that is in Dr. Munroe's possession now was made by W. O. Snelling, director of research of the Trojan Powder Company. In this case the words "Munroe Effect" were impressed into the surface of a block of the explosive, so that the letters were in intaglio. When this was exploded on a disc of the steel the letters appeared on it. However, they were also in intaglio on the steel. This is the opposite from what would be obtained with a die, for then the intaglio letters on the die would come out in relief on the finished product.

DR. MUNROE'S PORTRAIT in chrome steel, produced by firing a charge of high explosive over the steel with a print of the photograph between

Dr. Munroe explains the effect by saying that when the detonation of the explosive occurs, the entire amount of the solid is converted to gas. This volume of gas, however, momentarily has the same size and shape as the original block of the explosive, and is, therefore, extremely compressed. Where there was a cavity in the original explosive is the line of least resistance for the escape of the rapidly moving gas molecules. In seeking to escape, they collide with each other, pro- (*Turn to next page*)

Will the Etruscan Sphinx Speak?

Archæology

By R. V. D. Magoffin,

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Of the many as yet unsolved problems of antiquity, perhaps that of the whence, the how, and the whither of Etruscans is as troublesome and as hard as any. The Etruscan sphinx is clearly nearer every day to breaking its millenial silence.

In view of the fact that the first international meeting of the Congress of Etruscologists has just been held in Florence, Italy, where the great Etruscan museum is, it is well worth glancing at some of the things which have been done these past few years. Archæological journals in Italy, Germany, France and England have for five years been carrying articles on these mysterious and long lost Etruscans.

Excavations lately at several Etruscan sites in modern Tuscany have brought to light cemeteries showing burials of the older people in Tuscany, back as far as 1100 B. C. But about 800 B. C. in the cemeteries a new sort of burial rite, that of cremation, appears. With the burned ashes of these newcomers are found thousands of new objects, all of which are clearly importations. Most of them are of a near-oriental character which archæologists can place definitely as having come through and from Asia Minor.

The most interesting thing about the new finds in the cemeteries and rock-cut tombs is that they prove that the newcomers came to Italy by sea, not in any great horde of settlers, but slowly, probably in peaceful colonization style. The British archæologist, Dr. David McIver, rightly compares their arrival and penetration into northern Italy between the Arno and the Tiber (modern Tuscany) to the settlements made by the Norsemen in England as told by the sagas of Iceland.

The Etruscans from Asia Minor, whoever they were, won over the more numerous natives because they had a higher type of civilization, had better weapons, and being a small aristocracy, they had more cohesion in their group. Of course they also imposed their language on much of the territory in which they became overlords. An analogy is the use of the Norman-French in England in the twelfth and thirteenth centuries A. D.

A key to deci- (*Turn to next page*)

Munroe Effect—*Continued*

ducing a vast number of tiny molecular drills, which bore into the hardest steel.

Using the same principle, Dr. Munroe once blew a hole in a safe with a hollow cylinder of dynamite. He took a bundle of sticks of dynamite, then, by pushing a tin can through the center, he pushed out the center sticks, and bound together the other ones so as to form a ring. This he exploded in a vertical position upon a safe. The result was a hole in the top of the safe corresponding to the hollow center in the ring of dynamite sticks. This hollow cylinder had acted as a gun to fire the gas molecules through the steel.

Any thin object, such as a leaf, or photograph, can be reproduced on steel in this way, said Dr. Munroe, and so a permanent record can be obtained. The explosion has the effect of greatly magnifying slight differences in thickness, such as between the layers of silver in the shadows and highlights of the photograph.

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Rome celebrated its two thousand six hundred and eighty-second birthday by starting excavations at the site of the ancient Circus Maximus.

The city of Tacoma, Wash., has organized for a campaign against rats under the supervision of the U. S. Bureau of Biological Survey.

Nearly 10 per cent. of the area of Canada remains to be mapped.

Etruscans—*Continued*

phering the unreadable Etruscan language—not the letters, because we can read those—will not tell us very much. There are some 8,500 inscriptions in Etruscan, but they are nearly all very short, and clearly are for the most part simple epitaphs. The longest of the inscriptions is on the linen wrappings of a mummy found in Egypt.

The Etruscan alphabet is certainly derived from a Greek alphabet. But it is from a very early one, brought over in all probability from the original home of the Etruscans.

There are three examples of the early Etruscan alphabet. One is on an ivory tablet now in the museum in Florence. The second is in the Villa Giulia museum in Rome and is scratched on a vase from Formello. And the third is scratched on another pottery jar from Caere. This vase is in the Vatican at Rome.

Science News-Letter, May 26, 1928