

limit imposed by the smallest available electron tube. In making a single package to include the tube and other components, the shape as well as the size of the plug-in unit is a consideration.

The extreme compactness brings about higher internal temperatures than are usually encountered in conventional assemblies. Because of this, insulating materials commonly used are not satisfactory. Ceramics, vitreous enamels, and silicone-bonded bodies are used in the subminiature unit.

Low-dielectric-constant (low-K) ceramics, such as steatite, are used in preference to organic insulating material. The high-K titanate ceramics can serve not only as satisfactory printed-circuit base materials but also as miniature capacitor dielectrics. Fashioning the high-K ceramics bodies into cyl-

inders makes them stronger than they would be in flat shape. These ceramic cylinders are made to play a multiple role as capacitors, tube shields, stand-off insulators, and base material for printed wiring.

The intermediate-frequency amplifier chosen by the Bureau for miniaturization embodies a type of critical circuit layout which represents the most typical problems. Two methods of fabrication were employed in their construction. One assembly was designed so that it could be readily manufactured by techniques similar to those now employed in the electronic industry. The other, a printed circuit assembly, was made to the same general specifications as the first which uses standard miniature components.

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#### GEOGRAPHY

## Denmark Wanted in Pact

► TWO important reasons why Denmark is wanted in the group signing the North Atlantic Defense Pact are based on the nation's geographical position:

1. Denmark can control ship passage from the Baltic Sea to the Atlantic Ocean.
2. Denmark owns strategically located Greenland.

It is not the mainland Denmark on the Jutland peninsula that is the principal block in the water route from the Baltic to the ocean. It is the many islands between the peninsula and the southwest coast of Sweden, of which Sjælland is the largest and most important. It is on this island that Copenhagen, the Danish capital, is located. The north coast of the island is on the Kattegat, which separates the Jutland peninsula from Sweden and is the connecting waters between the Baltic and the Skagerrak and the North Sea.

Two passageways are available for ocean vessels and submarines, one to the east of Sjælland which, in its narrowest place, is only about a dozen miles wide, and the other to the west through what is known as Store Belt in whose waters are many small islands.

One important reason behind the construction of the Kiel canal across the German part of the Jutland peninsula was to give the German nation a way out of the Baltic without passage through Danish waters. Denmark's strategic position in controlling the entrance to the Baltic was one of Hitler's principal reasons for taking early possession of Danish territory.

Greenland's strategic value is its location in the North Atlantic close to the Great Circle air and ocean surface routes from America to Europe. Along with Iceland, a probable signer of the North Atlantic Pact, it is a stepping stone on the route from Labrador to the Scandinavian peninsula. Its southern shore area is suitable for emergency landing fields which could easily become

refueling stations for giant bombers traveling either eastward or westward.

Greenland is the largest island in the world if Australia is rated as a continent. While much of it is ice-bound, its southern shores are temperate enough to support its present population of approximately 20,000—stockmen, fishermen and miners. Weather stations on the island are of great value to air and surface ships passing to the south. Radar stations on the island could locate approaching planes, and loran stations would help navigators.

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#### ARCHAEOLOGY

## Stone-Age Game Animals Shown on Engraved Pebble

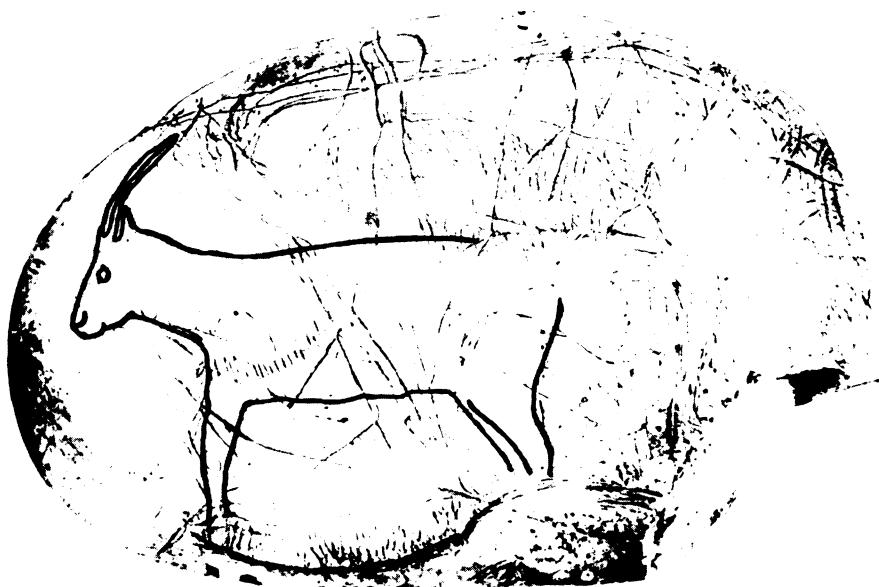
See Front Cover

► ANIMALS that cave-men hunted in the later Old Stone Age, some 20,000 to 25,000 years ago, are shown in a mass of finely engraved lines on a large rounded pebble, the size and shape of a big potato, found at the La Colombiere rock shelter in eastern France and now at the Peabody Museum of Harvard University. The find was announced by Dr. Hallam L. Movius, Jr., curator of palaeolithic archaeology.

Similar engraved pebbles have been found in the past, but this is regarded as one of the finest specimens of its kind ever discovered. The drawings, which show such animals as horse, ibex, rhinoceros and bison, are carved one over the other, so that it is somewhat difficult to make out what some of the animals are. One stocky horse figure, however, stands out with particular clearness, as shown on this week's cover of the SCIENCE NEWS LETTER. It has been gone over in ink to make it stand out from the other animals on the face of the stone. The head of an ibex and reindeer can be seen directly in front of the horse's nostrils when the picture is turned upside-down. The ibex is outlined below.

Nobody knows what purpose, if any, these portable art objects served, Dr. Movius states. It is conjectured that they may have had religious or magical significance.

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**ANCIENT GAME**—The picture of an ibex, gone over with ink to make it stand out, is one of several animals engraved on the La Colombiere pebble. A horse can be seen directly beneath the legs of the ibex when the picture is turned upside down, as shown on the cover.