GEOGRAPHY

Sicily Is Mountainous

Mountains lie close to the zig-zag Sicilian coast line with its good harbors and landing beaches, forming a natural fortification within the island.

➤ ALLIES LANDING on Sicily faced an up-hill fight. The topography of Sicily is discussed in the *Field Artillery Journal* (July) by Col. Conrad H. Lanza.

The zig-zag coast line, measured around all inlets, is about 1,700 miles in length. The straight-away distance across the north side of the triangular island, from Messina to Trapani, is approximately 170 miles. From Trapani the straight-away distance along the west coast is about 30 miles; the south or southwest coast extends 170 miles, and the east coast extends 125 miles from the southeast corner of the island back to Messina.

On the north shore there is an excellent harbor at Palermo and a city of 400,000 people, a railroad center for Sicily's extensive narrow-gauge railways. The surrounding plains are not very wide. Milazzo has a good harbor, but limited surrounding plains. Any advance into the interior from these cities would encounter strong mountain positions. Control of these harbors, however, was essential, as was also seizure of the adjacent airfields. From Milazzo land forces could advance around the north and the south sides of the Peloritan mountains on Messina.

Trapani and Marsala, on the 30-mile west coast, have good harbors and good landing beaches. But the invasion of the interior from this area is made difficult by the mountains, Monte Grande, less than 20 miles back from the shoreline.

The best landing beaches for the invasion of the interior of Sicily are reported to be on the southwest and east coasts. Their number is limited and undoubtedly they have been strongly fortified. The mountains and hills along these coasts are not as close to the shore as those in the north; they are not so high and are more easily crossed.

Once in Sicily the Allies found many good hard-surfaced roads built with a local asphalt. They are too narrow for the most effective military traffic but will prove very useful. There are very few rivers to cross. The climate is generally mild so military operations can be conducted at any time. Summer days may get excessively hot. Rainfall is scanty.

For many centuries the inhabitants of Sicily have lived in towns, rather than on farms or in rural villages. This was because of the fear of attack by enemies in the frequent wars during the Middle Ages.

Houses are built of stone. They are easily converted into military obstacles and may delay advancing troops to a considerable extent. With a total population in Sicily of about 4,000,000, these towns are plentiful.

While much opposition was to be expected at the good landing beaches, one factor was very favorable to the Allies. Landing operations need not wait the turn of the tide, as the Mediterranean has no tides.

Science News Letter, July 24, 1943

PHYSICS

Cloud Chamber Is Used To Catch Germs for Count

➤ GERMS floating in air can be downed by using the Wilson cloud chamber, then counted and identified, Prof. Carl E. Nielson of the University of California told the meeting of the American Physical Society.

Here is how it's done: As a piston in the box-like chamber is suddenly moved in such a way as to increase the volume, the air expands to fill the increased space. When a gas thus expands, temperature goes down. This causes the moisture in the air to condense onto the germs—or condensation nuclei, as the scientist terms them. The dew-laden germs then sink to the bottom of the chamber where they are caught in a dish.

Suggesting the new technique as another possible use of the cloud chamber which is ordinarily used to study ions, Prof. Nielson pointed out that most methods of air sampling remove an unknown percentage of the germs; the cloud chamber downs them all.

Experiments conducted by Prof. Nielsen show that dust particles of germ size also serve as condensation nuclei when the air is slightly supersaturated with moisture.

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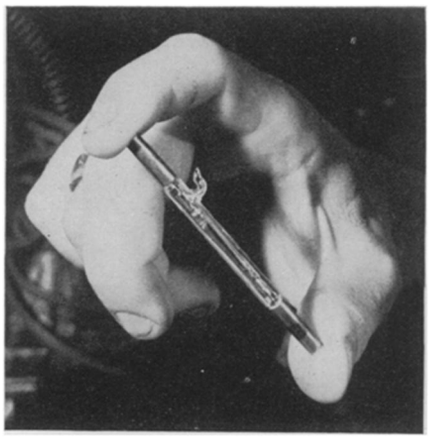

MERCURY LAMP — Scarcely bigger than a wooden match, this small mercury lamp developed by the General Electric Company is good for one million photographic exposures.

GENERAL SCIENCE

Research Problems Listed For the Young Scientist

➤ A WORLDFUL of research problems awaits youthful scientists, Dr. Colin Garfield Fink of Columbia University declares (*Science,* July 9), listing six to challenge those of vision and courage:

1. Perfection of electric lighting 10 times as efficient as any present type.
2. An improved automobile gas engine operating at three or four times the efficiency of the present one.
3. A paint for wooden structures that is rainproof and sunproof.
4. An alloy of aluminum as resistant to fatigue as steel.
5. A metal or other material to take the place of our rapidly dwindling resources of copper or of lead.
6. A material to take the place of leather for shoes with all the good, or even better, qualities of leather.

Stating that "the chances of finding new products and new processes have never been equalled in the past," Dr. Fink recommends radical research to America's youthful scientists.

To show the difference between radical or fundamental research and development research, Dr. Fink cites the production of billiard balls out of plastic in place of elephants' tusks as a discovery radically different from anything that has gone before. Development research might try to raise more elephants or try to develop longer or bigger tusks through changes in diet.

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PHYSICS

Speed Pictures by Flash

A "still" photograph of a wheel revolving at 70,000 revolutions per minute can be taken with a new, easily portable mercury flash lamp outfit.

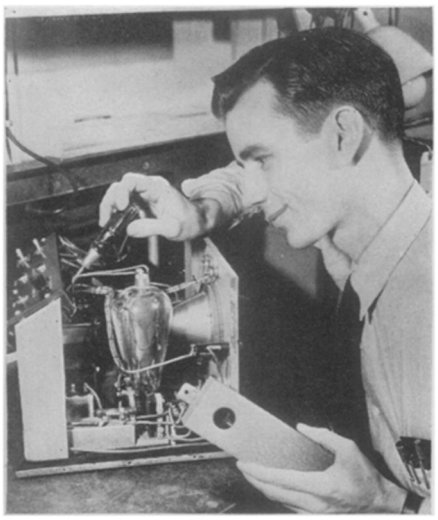
➤ A NEW compact high speed electronic light unit has been developed by the engineers of the General Electric Laboratory, with the direction of S. Lawrence Bellinger, which can take photographs with an exposure of only one-millionth of a second. High speed photographs taken in recent years are only one thirty-third as fast as this new unit.

A portable box 10 inches square, weighing under 20 pounds and containing a mercury lamp about the size of a cigarette constitutes the entire device. The light source on the front of the box resembles an auto headlight and can be operated either manually by means of a push button, by electrical contacts or by a phototube and preamplifier. It will illuminate an area of twenty square feet with sufficient light intensity to photograph the fastest moving objects.

Some features of this new high speed unit are its standard replaceable electrical parts, together with one electronic tube and a 100-watt Mazda mercury lamp. It can be operated on an ordinary 115-volt alternating current household lighting circuit. The current is rectified by an electronic tube and then used to charge a capacitor which serves as a sort of electrical storage tank. There is enough power accumulated in three seconds to operate the lamp at full intensity. The energy used in each flash is so slight that it is only sufficient to light a 40-watt lamp one-tenth of a second. The small mercury lamp has a life value of one second, which makes it good for one million exposures. This would be equal to 500 years of an average newspaper photographer's work. Lamps of this type are now being used as high-intensity light for illuminating airports, television, motion picture studios and various other means.

Although complete experimental tests have not been made, due to the pressure of war work, photographs have been taken of high-speed machinery such as turbines and supercharger parts. A "still" photo of a wheel revolving at 70,000 revolutions per minute has been taken with this new device.

Science News Letter, July 24, 1943



FLASH PHOTOGRAPHY — The inside of a portable millionth-of-a-second flash light for photography is being shown by S. L. Bellinger, a General Electric engineer. The phototube accessory equipment which may be used in fast operation of the light is held in his left hand.

PUBLIC HEALTH

Keep Ham In Refrigerator To Avoid Food Poisoning

➤ BE SURE to keep the ham in the refrigerator, if you want to avoid having yourself, your family and guests get sick with food poisoning or ptomaine poisoning as it used to be called. Food poisoning rarely kills anyone, but it is most unpleasant and may be so weakening that the victims lose considerable time from work.

Probably the most common cause of food poisoning is the staphylococcus, a germ which is also familiar as the cause of boils. When these germs get into food they can, under suitable conditions, produce a poison which will sicken the person eating it or food containing it. You cannot tell from either the taste or smell when ham has this poison in it.

Staphylococci are very common germs, found on fingers, hands and in the air, so it is almost impossible to keep some of them from getting into food. It is quite possible, however, to prevent the conditions that lead these germs to produce their poison in the food. The chief measure for controlling this situation is keeping food at low temperatures until it is to be cooked and eaten.

Ham and tongue come right after custard-filled bakery goods in the number of food poisoning outbreaks caused. The rapidly cured, pre-cooked, and ready-to-eat hams now on the market are particularly dangerous. These are safe when they leave the packer, but the danger is that so many people fail to realize that they must be kept really cold in the refrigerator.

Ham sandwiches made from ham that had been subjected to a tenderizing process caused an outbreak of food poisoning among patrons of an upstate New York restaurant recently, the state health department reports. Those who ate the ham the day it was cooked escaped. But the next day the restaurant's mechanical refrigerator broke down. Even though two large pieces of ice were put into it, it apparently was not cold enough to keep the ham from being poisoned by staphylococcus germs.

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AERONAUTICS

New Process Shortens Time For Doping Plane Surfaces

➤ NEW LACQUER and a process for pre-treating fabric are expected to speed "doping" of plane and glider surfaces by nearly a third. This time-saving team is a duPont development now in production.

In the past, vast amounts of special cotton fabric have been transformed into a taut and tough outer hide for training planes and gliders by stretching the cloth over the aircraft framework and applying dope with brush and spraygun plus laborious sanding.

Now the plane fabric can be pre-treated before shipment to the plane plant. Use of the method permits scarce solvents to be reclaimed and used over and over. Some of the subsequent doping and sanding is eliminated.

Pre-doping can be coupled with the new type of lacquer, which contains a fifth more film-forming solids than had been practical heretofore. All slow paint brush work has now been replaced by high-speed spraying, the company reports, and the lacquer still further reduces the number of coats needed to finish a plane.

Science News Letter, July 24, 1943