

PEACETIME DIVIDENDS FROM WAR TIME RESEARCH*

Wartime research in the field of metals was directed toward the solution of special technical problems to meet the requirements of new war developments in such fields as aircraft, radar, gas turbines, jet propulsion and atomic energy. In some cases an entirely new material had to be developed before the device would work at all. These new metallurgical developments will be used not only in the peacetime versions of war developments but will be employed for engineering applications in transportation by railroad, automobile and plane and in television and other forms of communication and in the vast chemical industry.

The war expansion of production facilities for many metals has made them more readily available, and new applications will be found for them in many articles for every-day use.

Question: You speak of metals and alloys, will you tell us more about them?

Answer: The word "metal" may be used in two senses,- it can refer to a metallic element, such as aluminum, copper, iron or nickel, or it may refer to a combination of these elements which would be known as an alloy and have metallic properties. For instance, steel is basically an alloy of iron and carbon,- nickel silver a combination of copper, nickel and zinc,- while the well known stainless steel is a compound of iron with 18% of chromium and 8% of nickel.

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The alloying of metals is generally done by melting the correct amounts of the desired elements in a furnace and casting or forging the product. Alloying is generally done to improve the properties of the basic metal and in effect produce a new material, often much more useful than any simple pure metal.

Question: We used to see a lot of nickel plate, but now everyone speaks about chrome finish, what is the difference?

Answer: The chrome finish of today is generally a heavy layer of nickel over the base to protect the latter from rusting plus a thin layer of chromium to protect the nickel from tarnishing, and keep it bright. In the case of automobile bumpers for the 1946 cars, we understand that some of these will contain a layer of nickel .002" in thickness while the thickness of the chrome will be less than 1/100th of the nickel or on the order of .000010" to .000015".

Question: What wartime metals will be used on the new cars?

Answer: Of the metals prominent in the war period, we will undoubtedly see a broader use of aluminum and also the retention of certain triple alloy steels, containing small amounts of nickel, chromium and molybdenum, which were developed during the war period but which are being retained on peacetime production because of their inherent merits.

Question: What parts have metals played in the development of jet engines?

Answer: This is one of the jobs for which a new material was required before jet engines could be made. A great deal of research luxury jewelry during the war period and its use continues

work was done to develop metals which would retain high strength at the bright red heat at which the vital parts operate. Stainless steel and the metal used in the heating element in your electric stove or toaster were the starting points of this research work which resulted in alloys containing various combinations of iron, chromium, nickel, cobalt and molybdenum.

Question: What influence will war developments have on metals used around the home?

Answer: While aluminum was well established in household articles before the war, we undoubtedly will see broader applications of it and also the introduction of magnesium, particularly in castings. Stainless steel will be used in more cooking utensils, ^{Some} either as straight stainless with copper-plated bottoms or as a double clad material with a good heat-conducting metal in the center. More thermostats and other automatic electrical devices will be used to make life easier. More metal furniture will be available; a great deal of which will have nickel and chrome finish.

Question: What metals are used in jewelry?

Answer: A wide variety of metals are used for jewelry, ranging from silver and gold to platinum and palladium. Strange as it may seem, small amounts of extremely high priced metals are often used on the cheapest jewelry. With a base of brass, a thin plate of silver may be finished off with a flash of rhodium to keep it free from tarnish. Palladium, a sister metal of platinum and lighter in weight, was introduced in luxury jewelry during the war period and its use continues

as it is well adapted to this service.

Question: During the war the 5-cent piece seemed to be made of a substitute metal?

Answer: Yes it was, the 50cent piece of normal times is an alloy of 75% copper and 25% nickel. As nickel was in great demand during the war its use in coinage was stopped and a metal consisting of copper, manganese and a small amount of silver was substituted. I understand the Mints have now returned to the old alloy.

Question: With all of this interest in directing beams at the moon we would like to know about the metals employed in radar.

Answer: Radar equipment uses many tubes similar to those in your radio which generally contain nickel, copper, iron and a little tungsten or molybdenum and a trace of barium and strontium. In addition, the powerful output tubes often employ platinum grids and tantalum plates, or at higher frequencies a magnetron is used with a nickel cathode, a copper shell, a powerful nickel-cobalt-aluminum Alnico magnet.