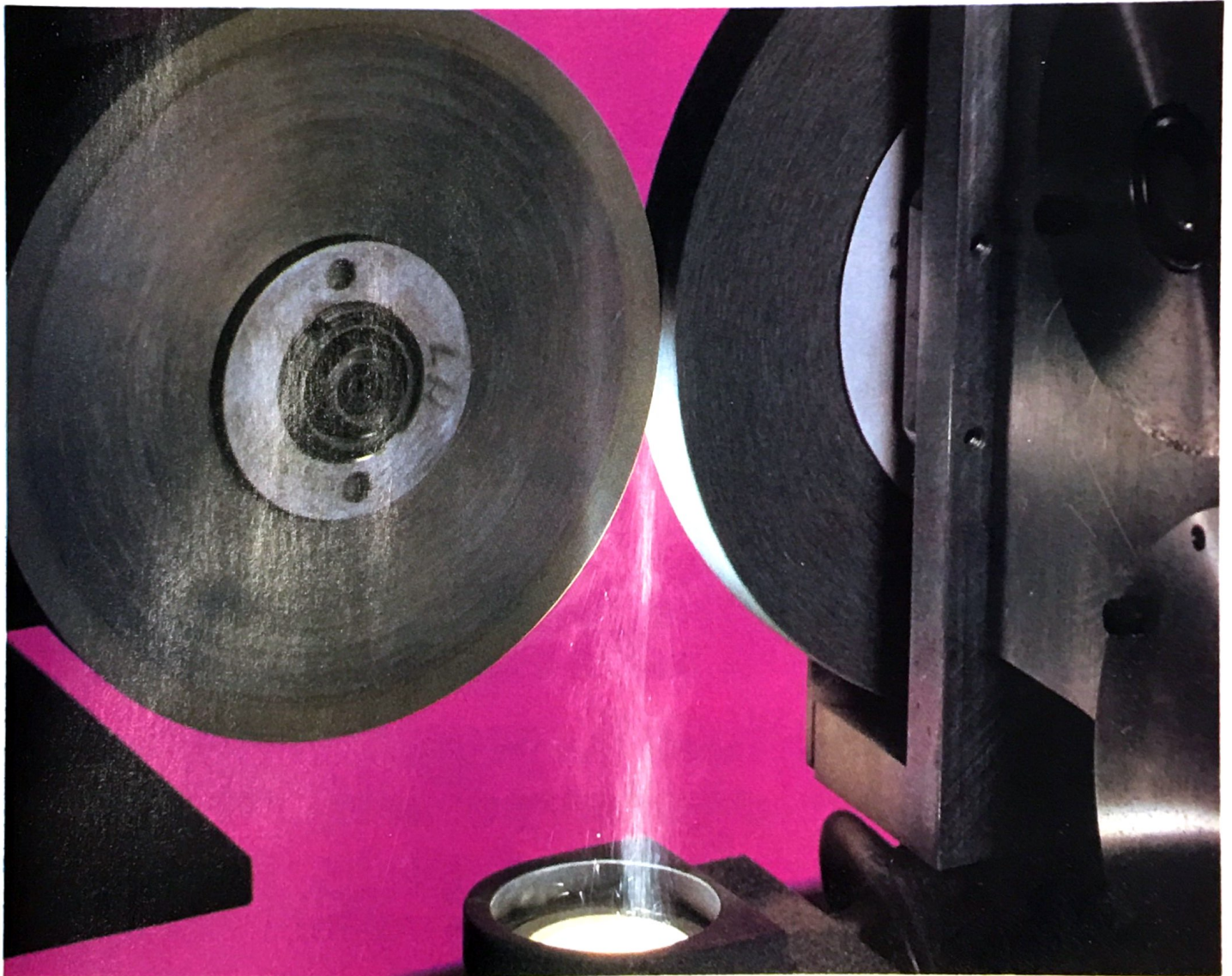


CUTTING TOOL ENGINEERING

August 1985

▪ Metal Cutting ▪ Metal Removal ▪ Abrasive Machining



Trueing and Dressing Superabrasive Wheels

Broaching • Coolant Drilling • Holmaking

New Products in Action

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CTE, Aug. 1985 Reviewed by the
Vol. 37, No. 4 Engineering Index



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Postmaster: Send address changes to CUTTING TOOL ENGINEERING, 464 Central Ave., Northfield, IL 60093. Send form 3579 to 464 Central Ave., Northfield, IL 60093

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Diamond wheel is trued and dressed on General Industrial Diamond Company Model 252 machine. © 1985 Will Rhyins. Photo courtesy: General Industrial Diamond Company, Whippany, NJ 07981





The History of Tools

This is the first of a series dealing with the history of tools. It is being presented by CUTTING TOOL ENGINEERING through the courtesy of Wilke Brothers Foundation. The next part will deal with tools in The Iron Age and the Industrial Revolution.

How many of us today remember our history lessons of The Stone Age and The Bronze Age? Or how many are historians interested enough in man's evolution?

As we prepare for the 21st Century, space shuttles to the moon and beyond are no longer something out of Buck Rogers comics, but are everyday realities. Sophisticated machines are producing a comfortable existence that was only dreamed of just a few decades ago, but today they are taken for granted. However, to have achieved this millennium, we had to start from a very basic existence.

Man's first tools were little more than stones with points or sharp edges. These were used in virtually unchanged forms for centuries. Yet so powerful were these "extensions of man's hands" that the prehistoric man not only survived, but he also expanded the areas previously closed.

Tools are needed for everything man makes, yet the basic production process must begin with the creation of the tools themselves. Historians record that the first "tool that made other tools" was a stone used to strike an edge on a pebble tool. The stone probably was also used for pounding and throwing.

As man refined his tools down through the ages, they in turn permitted him to create even more sophisticated tools. Such a general-purpose tool was the fist axe fashioned some 700,000 years ago. It could perform a variety of tasks, but none of these could be accomplished as efficiently as a tool designed specifically for each job. So, during the last 50,000 years of The Stone Age, man began making separate flint tools for slicing and sawing, drilling, burnishing, and scraping. With these "special-purpose" tools, Paleolithic (early Stone Age) and Neolithic (late Stone Age) man was better equipped to cut up the meat of animals for food, prepare hides for clothing and shelter, and to create new and better tools.

The Agricultural Revolution

The second leap forward in the history of tools was the Agricultural Revolution. It began about 12,000 years ago when our

ancestors learned to cultivate crops rather than simply gathering what nature provided, and to domesticate animals instead of hunting them. Freed from the need to follow wandering herds of animals or to move on when edible vegetation became scarce, man began to establish permanent villages.

No longer restricted by what, and how much, he could carry, man began accumulating tools, pottery, property, and other items that would be too clumsy, bulky, or heavy to transport from place to place. With an increasing number of people engaged in growing food, and each producing more, it became profitable for those capable of making tools and equipment to become full-time craftsmen, exchanging their wares or work for food and for goods made by other craftsmen.

By the time The Stone Age came to a close, man had created a wide variety of new and imaginative tools and found many ways of using them — the bow and arrow and spear for killing at distances, bone and ivory harpoons and hooks for fishing, bone and ivory needles for sewing, and pitfalls and snares for trapping predatory animals and edible prey. He also began using branches and reeds to make dwellings, and basket boats for crossing bodies of water and transporting items over distances.

Metal Tools

The next giant step for mankind came about 6000 years ago. It was the first use of metal tools that started man on the road to civilization as we know it today. First copper, then bronze, were utilized as materials for making tools and consumer goods.

The original impetus occurred when man discovered smelting; extracting a metal from an ore with heat. Wood fires could release copper from its ore in the form of a green stone called malachite. Second, in order to use copper to make useful tools that would keep a sharp edge and not bend, man had to find a way to overcome its softness. Alloying, mixing two metals together to create a new metal, solved this problem. Ancient man discovered that tin and copper ore mixed made bronze, a new metal harder than either of its components.

The greater efficiency and durability of bronze tools affected every aspect of life for many centuries. It was the leap forward in toolmaking which allowed increased production, the only true source of greater wealth and better lifestyles. The Pyramids of Egypt are a stunning example of what a large work force using bronze tools could achieve when individuals no longer had to spend all their time providing food and shelter for themselves and their families. △