

Maxwell's Silver Hammer¹

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Abstract

It is an often overlooked fact that someone, somewhere, is physically working to produce the things we use and a good deal of the environment we live in, for good or bad; that virtually every thing we know is a product of human labor. The essay tries to address this by looking at tools, and focuses on some varieties of that simple but essential tool, the hammer—a tool whose origins are prehistoric. It looks at woodworking hammers, at stone-breaking and cutting hammers, and finally at some of the hammers used in metalworking. The list is by no means definitive, but hopefully gives a broad understanding of how versatile this tool is, and also how it has been carefully adapted to suit different materials. The essay ends by referring to mythical hammers, most specifically Mjöltnir the “murder greedy.”

Keywords: hammer, mallet, wood, stone, metal, labor, work

The Magic Kingdom

It would seem that those of us fortunate enough to live in the developed world are becoming like children. We live in a magic world where things just appear, already complete and working. Like Aladdin and his lamp we can just stroke the keys of a computer keyboard, put in some magic words and numbers and a little later, books, clothes, washing machines,

food, anything you can think of will just appear before us. A child asks its parents for a glass of milk, and then a plastic bottle appears out of the fridge. How is the child to know where the cow comes into this, or what an enormous amount of machines are required to extract, sterilize and deliver it? The child quite rightly, if asked where the milk comes from, might say the supermarket. But the parents, do they know where the bottle, or the fridge more importantly, was made? Do they have any understanding at all of how these things were made? Children should live in a magic world but the transition to adulthood is to understand that the world we inhabit is a product of labor.

How are things made? With effort: people make them, however simple it may seem, however detached we are from this process. Someone somewhere is making every thing we use, and in this I would include our landscape, for good and bad. Think of the plough, the sickle, or the way the landscape of America was transformed by the invention of barbed wire; all of this is done with tools. Tools are a mediating mechanism between an aim, both literally and conceptually, a material and an action. Most of the tools we make things with now are very complex, but to make complex tools, you have to use other tools. Somewhere you have to start at the beginning.

In a drawer downstairs I have a neolithic stone hand axe given to me when I was a child. It combines the most crucial and basic of tools: something to hit things with and something to cut things with, but this most simple of tools was still made with another tool. It is a stone hit by another stone and that first stone was essentially a hammer. I am a sculptor: I make things and because of

this I have a lot of tools. I also have a lot of hammers. There are so many different types of hammers. In 1967, the sculptor Richard Serra made a verb list, of actions needed to make things. I would now like to make a list of some types of hammers and to describe what they are for, and how they are used.

I Have a Hammer

There are basically two types of hammers: hammers to hit materials with directly and those used to hit things with indirectly, through another tool such as a chisel. Some of them are very specialized, but some can be used for both. This said, it is a mistake to use tools for things they were not designed to do; it encourages bad work. Hammers are about one surface hitting another surface, and the interface between the two is very significant. Most hammers are designed with certain materials in mind: there are soft hammers and hard hammers. The three most basic materials they are designed to work are wood, metal and stone. There are also more sinister hammers designed to work on materials such as flesh and bone. Such tools are used in surgery, but historically they are more common as weapons. For what is a club, a cudgel, or the classic of crime fiction, the "blunt instrument," but a hammer?

The hammer is often used with great force, but sometimes with great delicacy. Think of food production: the mortar and pestle, the pounding of grains, the tenderizing of meat. Usually when using a hammer, a rhythm is used. My personal preference is blow, tap, blow. I suspect this is the beginning of music. Think of the flail, the loose-headed hammer used in threshing grain, and the songs that went with its traditional

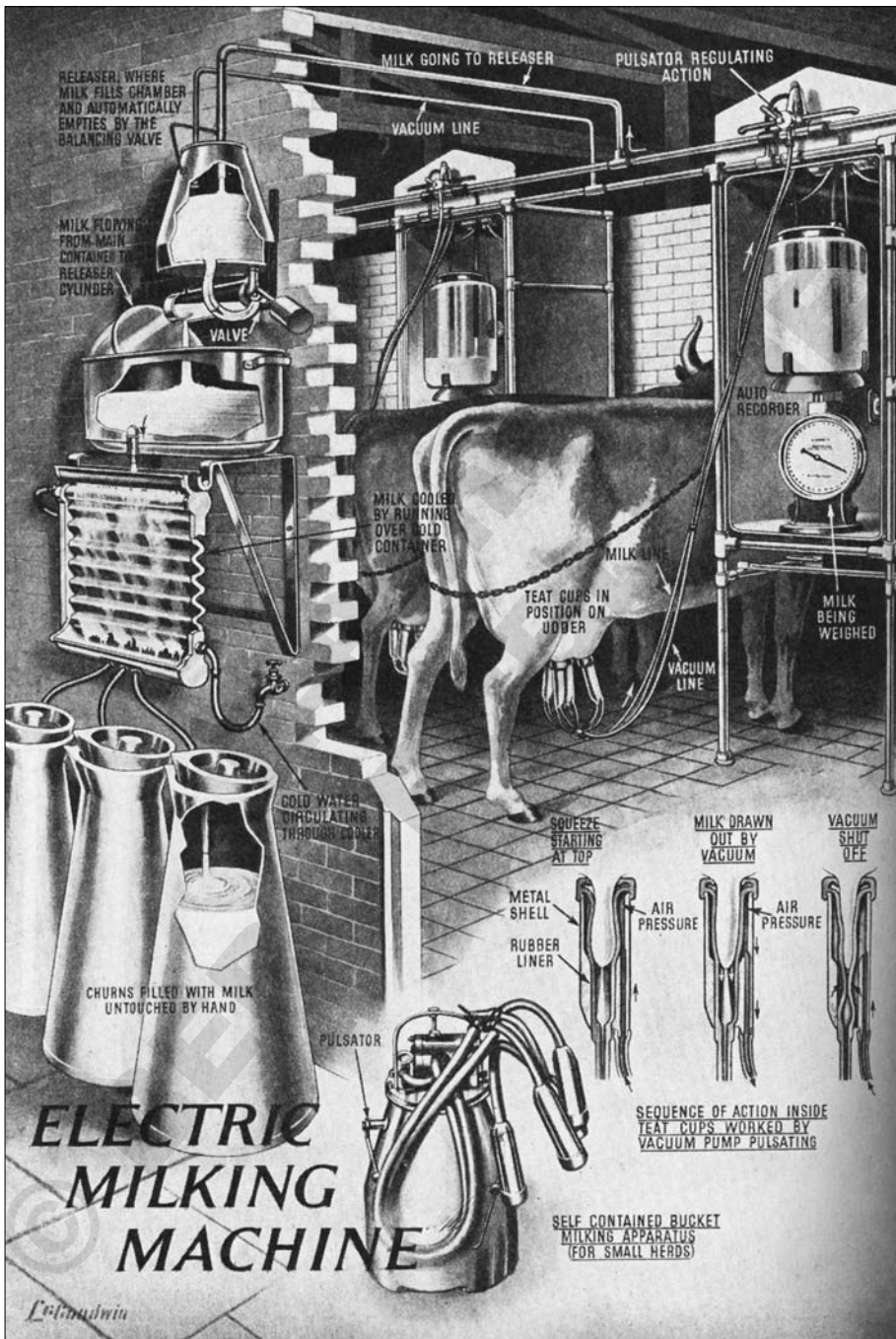


Fig 1 "Milking," from *How and Why it Works*, London: Odhams Press, 1948.

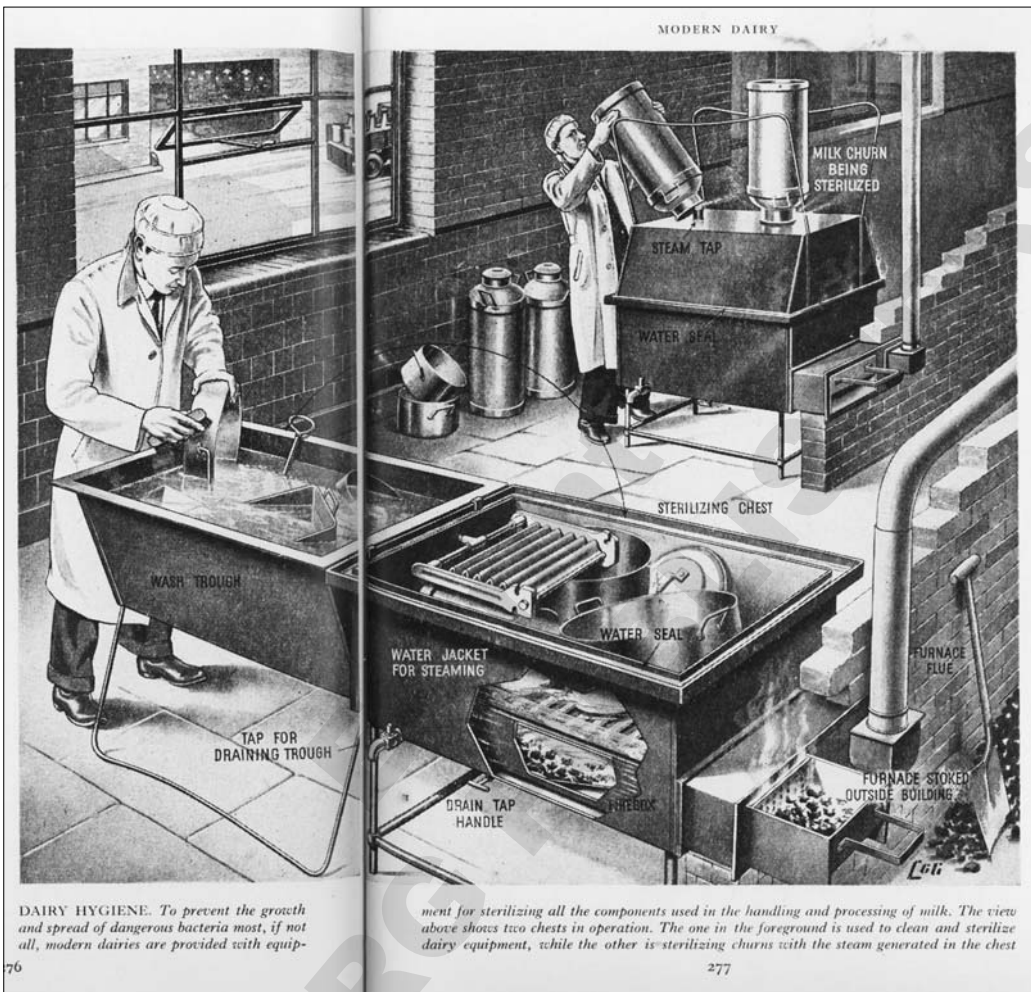


Fig 2 "Dairy Hygiene," from *How and Why it Works*, London: Odhams Press, 1948.

use. What is a piano but a machine full of hammers?

The following list is based on English tools, some European, some Japanese, simply because that's what I happen to have in my studio. I have added some I don't own, as I think they are essential in relation to understanding hand working. I have not included the multitude of power-driven

hammers, some of which stand as tall as houses. The list is a long way from being definitive.

Woodworking Hammers

I still have my first hammer, from a toy tool set I was given as a child.² It was a mallet.³ Mallets belong to the family of soft hammers, usually made completely of wood. They

are used to avoid damage to other tools, such as chisels, gouges and dowels, and for gently knocking timber joints together. Most countries have their own variants on this tool. English chisels tend to have wooden handles, so a wooden mallet is ideal.

The English carpenter's mallet has a rectangular head of beechwood usually of five inches, with edges tapered in toward the bottom to ensure the swing or arc of the mallet will hit the job square. The head is held on a tapered stock, which means that should the head become loose, a few downward taps on the bench should tighten it up.

The woodcarver's mallet has a conical head roughly conforming to the carpenter's mallet, again with the edges tapered toward the bottom. The conical head allows much more movement or variation in each individual blow to the chisel, as the carver works quickly on the multiple angles of tapping the job.

Japanese mallets, such as the *saidzuchi* and *kizuchi*, small and large, have cylindrical heads, and are of a similar construction, in that you can tighten the head to the shaft by tapping



Fig 3 Using a cross-pein hammer to lay veneer banding. From S. Chappel, *Woodworking*, London: Cassel, 1955.

it upside down on the bench. This is my favorite mallet; the weight seems to fit most jobs I do.

The dead blow hammer, which is a mallet, is mainly used to knock wooden joints together, or to deliver a heavy blow to a very delicate surface. The head is hollow and, in wooden versions, there is usually a brass weight inside the head. In the much more common rubber-coated types, the inside contains lead shot. On the outer stroke away from the job, the weight inside moves to the back of the head; as the inner stroke hits the job, usually a very light blow, the weight is thrown forward, but at this point the hammer is already on the surface of the job. It is soft-faced and the main blow is delivered from within the hammer; thus saving the surface while still delivering a strong blow.

The journeyman's mallet is very small, hand-sized, with a round handle and usually a brass slightly conical head. It is used to tap chisels in close woodcarving. Usually, you hold a hammer at the end of the shaft and use the swing of the shaft by the wrist alone, or if greater force is required, hold the wrist rigid with the elbow providing the swing, or for a still heavier blow, hold the wrist and elbow rigid, swinging from the shoulder. It is always important to remember that the best way to use any tool is to use the least amount of bodily energy, or force, possible. The shaft is in fact a lever. The journeyman's mallet is an exception: it should fit comfortably in the hand and you can even nestle the head in your hand to deliver tiny blows to the chisel for very fine work.

For light bench work, the main hard surface hammer is the cross-pein hammer, or thin-ended hammer. The pein is the back part of the hammer head. The shaft is made

of ash, hickory or sometimes beech, and oval-shaped to aid grip. The head is usually cast steel of either 8 or 14 ounces (about 225 or 400 grams) in weight, and is held in the shaft with wood or iron wedges. With each blow, the head will tend to loosen from the shaft. The cross-pein is used to start small nails, and can also be used to hammer veneering. There is a specialist hammer called a veneer hammer, but this is usually used as a draw tool rather than a striking tool. The striking face of the cross-pein is usually slightly rounded so the final blow to the nail or peg will not damage the job. There are a great variety of these hammers: the Warrington, which is the most common, the Exeter, rarely seen now, and the London. The German Hammer essentially has the same function, having a slightly curved face and a cross-pein, but a much simpler shape. In a way, the German is the classic hammer form, with a square head and a tapered rear or pein. The hammer used in the Soviet hammer and sickle sign, a symbol meant to represent the joining of agriculture with industry, is a blacksmith's cross-pein.

The claw hammer is used for heavier carpentry work. The claw, on the pein side, is there to draw out nails. A good claw hammer should be able to pull a six-inch nail (with the use of packing strips). The head is bigger and longer down the shaft than the cross-pein to give a bigger joint between the head and the shaft. Look in any professional tool catalog and you will find almost endless variants on this hammer, with steel shafts, titanium shafts, composite shafts, and subtle variations as to the head design, made by companies in America, Europe and Scandinavia in the main but variants are worldwide.

The Japanese *hakkaku genno* is an all-purpose hammer with a rectangular head, one face of which is flat, for striking nails and chisels (Japanese chisels are fitted with an iron ring at the top of the handle). The other head is slightly domed for the final blow to the nail. The hammers come in different weights. Nail pulling is usually done using a separate claw tool. The cross-pein and the claw hammer could be seen as two tools in one.

The splitting maul is not a tool you would find in most workshops. It is a tool used to split wood down its grain. The maul usually has a head of about 8 pounds (or 4 kilograms) and is very similar in size to a sledgehammer. The head is sometimes triangular or even conical in shape. The more common type looks superficially like a combination of a sledgehammer and an axe. The maul, however, has a much broader head, and must have a slightly convex head to try and stop it sticking in the grain of the wood being split. This is unlike the head of a cutting axe, which should have a slightly concave section to cut across the grain of the wood.

Stone Hammers

The sledgehammer is a very heavy tool, usually employed for breaking stone and concrete. It requires the use of both hands and the torso in a swinging movement. The handle is usually 33 inches (or 500 mm) long and the head weight is between 2.2 and 6.6 pounds (1–3 kilograms). Sometimes it is used with wedges to split stone. They used to be used by the police to break down doors, but today a new tool, the “dynamic entry Thor’s hammer,” is—along with the battering ram—the tool of choice. The name is said



Fig 4 Epstein in his studio carving *Maternity*, 1910–1912. From *Joseph Epstein Sculpture and Drawing*, W.S. Manley & Sons in association with the Henry Moore Centre for the Study of Sculpture, 1989.

to derive from shipbuilding, when ships were built on sledges held in place by wedges, which were removed by the use of very heavy hammers to launch the ships into the water.

The lump hammer is a smaller one-hand version of the sledgehammer and is used to deliver a heavy blow to steel chisels and for light demolition work. The handles are usually made of hickory and the heads weigh between 1 and 6 pounds (about 0.5–3 kilograms).

The Bouchard or bush hammer is used for reducing the surface of stone. There are basically two types: one a little like a

lump hammer, the other more like a pick. The ends of most modern versions have replaceable tips, usually held in place by pins or spigots. The tips are a surface of small pyramids set close together. They are very similar to steak tenderizers. These crush the surface of the stone, allowing the basic form of the job to be established.

The stonecarver's pick is essentially a hammer with a very long, double-pointed head, which is used to remove smaller lumps of stone from the job before starting close working with chisels.

The dummy mallet is very similar to the journeyman's mallet used in woodcarving.

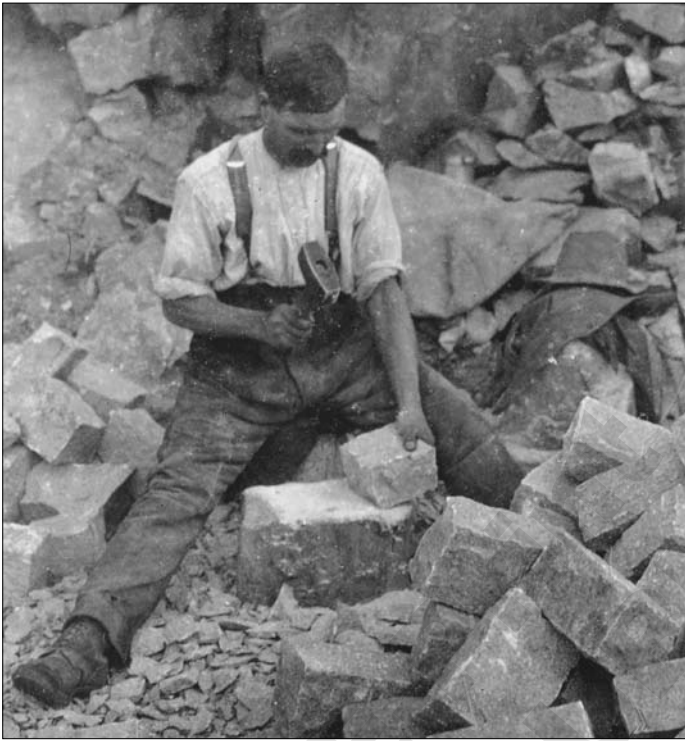


Fig 5 Making road setts in a Cumbrian quarry in about 1910. Reproduced in William Rollinson, *The Lake District Life and Traditions*, London: Weidenfeld & Nicolson, 1996.

The main difference is an iron head of about 0.5 kg, usually with an ash handle. This mallet sits closely in the hand for close chisel work and is ideal for lettering work.

Wooden mallets are again very similar to their woodworking equivalents. Usually made of beech, there are nylon and polythene versions, probably because they need less maintenance. Hardwood carving mallets should be kept moist and not treated with oil.

The geologist's hammer is very similar to a brick hammer, usually with a long head and square at one end for crushing the stone's surface. It is either chisel-shaped at the pein end to cut the stone or brick. Some variants have a pointed pein and are usually known as rock picks.

The slater's hammer is used for riving slate. It is a simple-looking job, but it requires great skill: usually a riving iron is used, set across the bed of the stone and struck with a lump hammer. The slater's hammer is used in roofing and has a square end, used for dressing the edges of the slate by crushing. It also has a pick pein for knocking a hole in the finished dressed slate for the nail, and usually a side-mounted claw for pulling out nails.

Metalworking Hammers

Again there is a vast range of metalworking hammers, and that range is in relation to the different properties of the metals being worked. Some metals, such as iron and steel, are difficult to work cold and only become malleable at red heat and need to be forged

against an anvil. Others, such as copper and aluminum, can be formed cold, but working hardens them and they need to be annealed in heat to return malleability. Others, like lead, are easily worked cold.

Ball-pein hammers are the most common metalworking hammers and come in different weights, from very heavy to very light. They are usually provided with a hickory shaft and a forged steel head. The ball-pein is usually used to knock over the ends of rivets when joining sheets, but can sometimes prove a useful forming tool.

Planishing, or metal-forming hammers come in a huge variety of forms, but they usually belong to the ball-pein family and have a broader, sometimes almost disc-like head. Some combine a square head and a round head, one each side of the shaft. They are used for working sheet metal, usually over a die (or dolly) set in the bench, an anvil, or even held in the opposite hand beneath the sheet, as is very common in car body repair. They are also placed into a leather pad for smaller concave forms, or on to pitch (pine tar composite) for repoussé work.⁴ The surfaces of these hammers need to be carefully protected to ensure that the surface of the job is not marked. One of this family of hammers is known as a shrinking hammer, which is similar in form to a planishing hammer, but has a serrated face used to crush the surface of the sheet into a smaller mass. It is worth paying good money for a shrinking hammer, as most of the cheap ones don't work.

Leadworking usually requires mallet-like tools, often made from boxwood, though plastic variants are available. The main mallet has a pear-shaped head on a bamboo shaft used to beat the metal into concave forms,

or a wooden slab-like mallet for forming sheet curves.

As in woodworking, metalworkers use soft-faced mallets and hammers to join and break apart sections of a job without damaging the surfaces. The copper-faced mallet is usually set in a cast iron head to give it weight on a hickory or ash handle, as is the rawhide mallet. There is a huge range of plastic- and rubber-headed mallets fulfilling the same purpose. The trick is to work out the relationship between the job, the surface of the job, and the weight and hitting surface of the mallet, as a mistake in this area can ruin the work.

Forging hammers come in many forms. The heads are usually of tool steel; some favor the weight to be central to the shaft, with a strong head and a cross-pein that can be horizontal to the shaft, vertical, or diagonal left to right. Some smiths prefer a much more forward weight and such hammers have a long head and a very short pein.

This is a very short list. Nothing has been said about clay paddles, or mechanical power-driven hammers, or upholstery hammers, or shoemaking hammers, or even the hammers used for killing fish, which interestingly are called "priests." However, before ending this list, limited though it is, a word of caution: never, ever, ask to borrow a hammer, or any other tool for that matter. For tools are like books and each has its own story. Even those bought, but unused, have their potentiality, like the hope of future life. Nothing good will come of it, other than a lifetime of hatred and regret. I still remember everyone who failed to return a tool or damaged it, and have I forgiven them? No, I have not. I have a good friend, much more

skilled than I am. He has a special toolbox full of broken tools and when people ask him to lend them tools, he gives it to them. "Interestingly," he said, "they don't ask again."

Mjölfnir the "Murder Greedy"

Mjölfnir the "Murder Greedy" is the metal-forging hammer that inhabits the magic world of myth, as an image of creation, fertility and sexual potency as well as destruction. The Gaulish god Succellus is depicted with a hammer and was the consort of the Earth goddess. In Greek mythology, Hephaestus is the smith god, entrusted with the thunderbolts of Zeus. He is also the husband of Venus. Vulcan is his Roman equivalent and the study of volcanoes, vulcanology, is named after his forges. But perhaps the most celebrated of hammers is Mjölfnir, the "crusher," the "grinder," and the "murder greedy"; the hammer of the Nordic god Thor. The hammer contained most of his power and could shrink or grow according to his will. It always returned to his hand and the Nordic poems known as the Eddas tell how he used it to slay the giants. It is the most magic of tools, mythic yet hidden, and the tool that

lies behind all others. It is also the most basic and practical of tools. A tool that is beautiful and terrible at the same time, and which we have used to make the world we live in and to destroy it.

Notes

- 1 "Maxwell's Silver Hammer" (Lennon/McCartney). From the *Abbey Road* album produced by George Martin; length 3.27 seconds; released September 26, 1969. The song is a "happy" murder song based on the story of Maxwell Edison, who killed his girlfriend, his teacher and a judge with a "silver" hammer in 1969. He was released in 2000 after serving a thirty-one-year sentence. There is a rather distasteful picture of him posing post-release with a hammer on the Internet.
- 2 From the Danish: hammer; Anglo-Saxon: hammor; Icelandic: hamarr.
- 3 From the old French: mallet; Latin: malleus, malleable.
- 4 Repoussé is the method of creating a relief design from the reverse of a sheet of metal, usually against a block of pitch composite, but sand and even gravel can be used for bigger forms. Chasing is the opposite, where the metal is worked from the front; often both techniques are used on the same job. The Statue of Liberty is an example of repoussé work.