BY BOB ROZAIESKI & WILBUR PAN

Separated At Birth?

Western and Eastern tools might not be as different as you think.

East meets West. *While the differences between Western and Japanese planes are fairly obvious, their initially hidden similarities might intrigue you.*

At first glance, Japanese woodworking tools and techniques seem like the platypus of the woodworking world. Beginning in the Edo period in the early 1600s, Japan isolated itself from the rest of the world, especially the West. A policy of *Sakoku* meant that no foreigner could enter Japan and no Japanese could leave the country – under penalty of death in either case. This policy continued for more than 200 years until the mid 1800s, when Commodore Matthew Perry forced the opening of Japan to the West.

As a result, almost all the development of Western woodworking techniques and styles from the Jacobean through the early Victorian periods were unknown to Japanese woodworkers. And like the platypus, Japanese woodworking techniques evolved in isolation, resulting in a method of work that was different than in the Western world. One of the most well-known differences between Japanese and Western woodworking techniques is in the approach to planing wood.

Go West, Young Man

Most of us are familiar with the setup and use of Western handplanes. There's a stock or body made of wood or metal, a bed or frog to support the iron, also made of wood or metal, a lever cap or wedge to hold the iron in place, and possibly a tote and knob (though some Western planes lack these). The planes are pushed away from the body in use, and the power comes from the legs and the transfer of weight from the back foot to the front foot.

The sole of a Western plane is one flat surface from toe to heel. The iron projects below the plane of the sole and establishes the depth of cut. Western planes also vary in length depending on their intended purpose. The sole of the plane acts as a reference surface. As a result, the longer and flatter the plane's sole, the flatter the resulting board will be.

Roughing planes such as the fore or jack plane are of a middling length (15"-18") in order to be light enough to rapidly remove material by taking thick shavings, but also long enough to begin flattening the board. Surface-refining planes such as the try or jointer plane are longer (22"-24") in order to ride the remaining high spots in the board and bring it to final flatness. Finishing planes such as the smooth plane, on the other hand, are short so that they can easily tackle localized areas of tough or reversing grain that remain after using the try plane.

In use, one puts weight over only the toe of the plane at the start of the stroke. As the area of the sole behind the mouth begins to make full contact with the board being planed, the weight is gradually transferred to the back hand. Once the plane is entirely on the board, the majority of the weight is on the rear of the plane. At this point, the front hand serves only to help steer the toe and keep the iron in the cut. Most of the planing force comes from behind the iron once the entire sole is in contact with the wood.

This transfer of weight makes the length of the plane behind the iron an important factor when using a plane for flattening and straightening faces and edges. As the plane begins to cut at the start of the stroke, the iron removes wood, making the area of the board behind the iron lower than the area in

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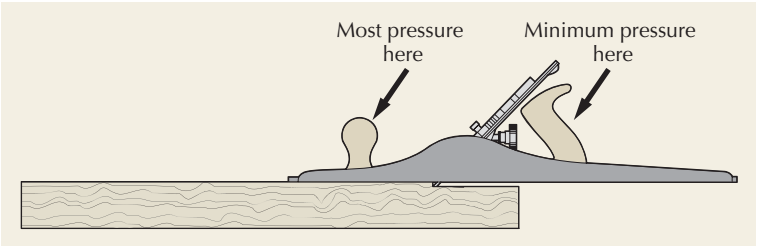
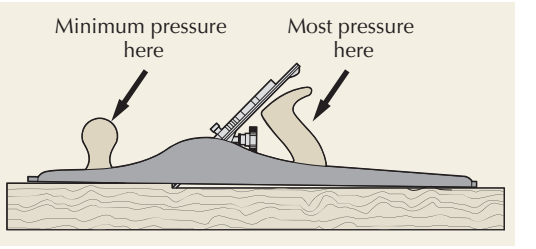


Down in front. *Pressure is over the toe of the plane at the beginning of the cut. The area of the sole behind the mouth is not in contact with the board.*



Going up. *Pressure transfers to the rear of the plane once enough of the sole behind the mouth is over the board. The toe then tips up off the work.*

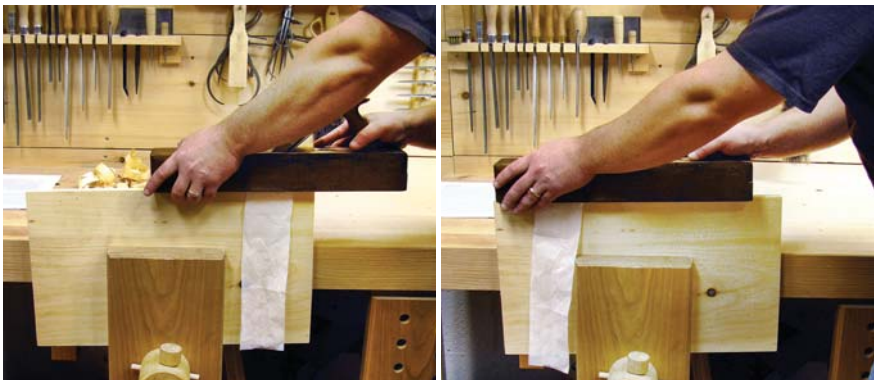
front of the iron. At this point, the back of the plane is not in contact with the board at all. After the transfer of weight, the heel of the plane becomes the plane's reference surface and the toe rides above the board at a very slight angle.

In a Western plane, the area of the sole behind the iron provides the reference for the majority of the cut. So it makes sense that Western planes designed for flattening and straightening, i.e. try planes and long jointer planes, are longer behind the mouth of the plane. The longer and flatter the sole is behind the iron, the flatter and straighter the resulting surface will be, because the longer surface will span the high spots in the board.

Enter the Dragon

As mentioned before, Japanese woodworking techniques developed in isolation from the Western world, and one result of that is a much different approach in the types of planes used to mill and flatten stock. Unlike the Western woodworking plane arsenal, where a somewhat long fore plane is used to initially flatten a board, followed by a longer try plane for flattening, then finished with a short smoothing plane to clean up the surface, the lengths of Japanese planes for these tasks are all nearly the same length – about $10^{1}/_{2}$" or so. What allows these planes to accomplish the same tasks – despite this obvious difference – are variations in the setup of the blade and mouth of the plane, and a variation in the sole configuration of a Japanese plane.

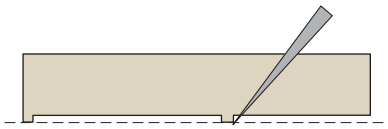
The sole of a Japanese plane is different from a Western plane. On a Japanese plane, the sole contacts the board at only two points, and there are two different setups with this method, depending on the task at hand. These days, most Japanese planes are used as smoothers, and if a Japanese plane is being used as such, the sole of the plane contacts the workpiece only at a narrow area at the front of the plane, and at another narrow area immediately in front of the mouth. The sole is relieved with a very shallow hollow between these two points, as is the area behind the mouth.



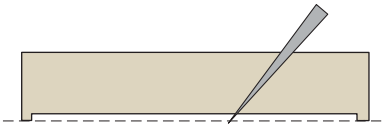
Balancing act. *The iron acts as a fulcrum or pivot point because the sole is flat. At the start of the cut, the toe is down and the heel is up (left). Once the weight transfer is complete, the heel is down and the toe is up, as shown by the tissue paper slipped under the toe (right).*

In use, the Japanese plane is placed at the end of the board away from the woodworker, with arms extended. Downward pressure is placed on the front of the plane. As the plane is pulled, the downward pressure does not transition from the front of the plane to the rear as it would for a Western plane. Instead, the downward pressure stays constant from the beginning to the end of the stroke, so there is no shift in reference during the planing stroke, unlike the shift from front to back when using a Western plane.

If a Japanese plane is being used to true a surface or an edge, however, the sole is set up differently. Instead of having areas at the front of the plane and the area in front of the mouth touching the board, a Japanese plane set up for truing a surface has two areas on the front and back of the plane touching the surface, with the sole relieved between these two points, and the blade set so



Two points of contact. *In the most common configuration of a Japanese plane, the sole is slightly relieved so that there are only two points where the sole of the plane contacts the wood: at the front of the plane and immediately in front of the mouth. The relief is on the order of $^{1}/_{64}$" or so, and is exaggerated in the drawing for clarity.*



Two points of contact, take two. *Japanese planes set up for truing a board are set up so that only the very front and back of the sole contacts the wood, and the blade is set so that it is in line with those points of contact. Again, the relief is just about $^{1}/_{64}$", and is exaggerated in the drawing for clarity.*

that the cutting edge is in line with those two touch areas.

This plane is pulled in the same way as other Japanese planes, with downward pressure throughout the stroke, but because of the geometry of the setup, the entire length of the plane can be used as a reference to flatten the board.

The Japanese equivalent of a scrub plane, called an *ara-shiko kanna*, shares many features with its Western equivalent. Its primary job is to quickly and efficiently remove wood to take a rough-sawn board to a flatter state, so it has a blade with a fairly pronounced camber, and a wide mouth and throat to allow thick shavings to pass through. Like a Japanese smoother, the sole of this plane is set up to touch the board at only two points at the front of the plane and immediately in front of the mouth.

The next step in milling a board is to true the surface. Here a Japanese woodworker would use a *chū-shiko kanna*, which would be the equivalent of a Western fore plane. This plane has less of a camber and a tighter mouth than the *ara-shiko kanna*, so it takes thinner shavings, and ultimately will flatten the face of the board being milled. A *chū-shiko kanna* is typically the same length as the *ara-shiko kanna*, but because this plane is used to true up a surface, the sole of this plane is set up so that the front and back of the soles touch, with the cutting edge of the blade set in line with those two surfaces.

The long and the short of it. *Most Japanese planes are about 10½" long (left). The* naga-dai kanna*, the Japanese equivalent of a try plane, is the exception to this rule, being about 15"-16" long (right).*

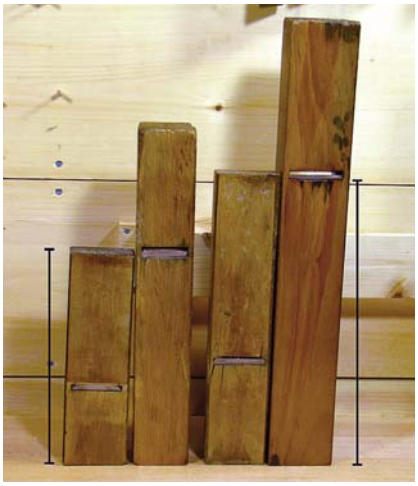
Of course, the longer the plane, the easier it would be to flatten an edge, and there are longer Japanese planes than the usual 10½"-long Japanese planes mentioned so far. These planes are called *naga-dai kanna*, and are usually about 15"-16" long, and serve the same purpose as a Western try plane. Like the *chū-shiko kanna*, these planes are set up with the front and back ends of the plane touching the workpiece and the cutting edge in line with these areas. Again, the entire length of the plane is used as a reference for planing. The added length certainly would help with truing and flattening longer boards.

Coincidence or Fate?

While the setup (flat sole vs. hollowed sole) and use (push vs. pull) of Western and Japanese planes differ considerably, it's interesting to note that the lengths of the reference area of each plane are almost identical. The length of the sole behind the mouth on a Western fore plane, for example, is very similar to the length of a Japanese *chū-shiko kanna* set up for flattening. Similarly, the length of the sole behind the mouth on a Western try plane is very similar to the length of a Japanese *naga-dai kanna* set up for flattening.

This is intriguing. How is it that two completely isolated methods of woodworking evolved to come up with nearly identical lengths of reference for flattening boards? Does this mean anything? Is this part of the Zen of working wood by hand? Did the hand-tool gods have some kind of divine intervention during the design of these tools? Maybe.

On the other hand, perhaps it's nothing more than a confirmation that physics works. The mechanics of flattening a board or edge should be the same regardless of where in the world you are, and maybe it's us woodworkers, perhaps misguidedly, who are often on the lookout for the differences in the way we work, when we should be looking for similarities and common ground, instead. PWM



Separated at birth? *When the reference lengths of the* chū-shiko kanna *and a fore plane are compared side by side, they are nearly identical in length. The same is true for a* naga-dai kanna *and a try plane.*

Bob hosts the popular hand-tool podcast at the Logan Cabinet Shoppe (logancabinetshoppe.com). Wilbur lives in New Jersey and writes about Japanese woodworking tools on his blog "giant Cypress" at giantcypress.net.

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