HOW THE SCIENTIFIC AMERICAN TROPHY WAS MADE.

In the art of the silversmith we have a striking example of the increased demand for skilled labor which follows the introduction of machinery. Innumerable tools have been invented or adapted for the working of precious metals, but at every stage of their work they call for trained hands and alert brains—the tools supplement but do not supplant.

A brief survey of the manufacture, in the workshops of Messrs. Reed & Barton, of the trophy offered by the Scientific American for flying machines heavier than air, shows that the work has passed through many skilled hands, and that in each case the worker and not the machine has been the dominant factor.

The first designs, embodying the suggestion of the donor, were sketched out by an artist. Sometimes the artist elaborates a design from crude suggestions; oftener he is the creator. The main lines of a design having been decided on, the proportions are carefully studied and the details worked out, in a complete sketch the actual size of the proposed work. From this completed sketch, the artist makes a final drawing in water color, intended to convey as true an idea as possible of the finished work.

Hammer Work.

The preparatory work of reducing silver to sheet form, though requiring expert skill and care, is in most respects like that bestowed on any of the metals used in the arts, and the processes of melting, rolling, etc., need not be described here.

In the forming or "spinning" of the metal, the sheet is worked over a turned form, or "chuck," in a lathe. An illustration shows the spinning of the sphere of the trophy—a delicate piece of work which calls for the nicest and most accurate touch on the part of the worker. The spinner's chuck is usually turned from a block of carefully seasoned hardwood; but for undercut shapes—such as this sphere—which will not slide off a solid block, the chuck is built up in sections round a core. When the core is withdrawn the sections can be removed, one at a time, through the aperture in the spun metal.

Another illustration shows the silversmith at work on the lower part of the trophy. Hammer work is still the vital factor in shaping silver, for the delicate touch and control of the skilled worker has not been imitated by machinery. Many of the most beautiful examples of silverware are handwrought in this way; and the hammer, with which the art began ages ago, will doubtless continue to hold its place.

The ornamental features of the trophy were worked directly on it by hand, or reproduced from models specially made for it. These models were built up in wax upon the body or form prepared by the silversmith. This process of modeling is identical with the work of the sculptor who reproduces his models in marble or bronze, and it requires an equal amount of artistic knowledge and skill, in addition to a special knowledge of the technicalities of silver working. The modeler bestows much thought and care on his work, frequently finding it necessary to modify or even change the original design. What looks well in a water-color sketch may not be satisfactory when developed in mass, but may require the accentuating of some features and the subduing of others before a pleasing effect can be secured. When the wax model is completed, a plaster cast is taken, and carefully finished to serve as a pattern for the molder, who reproduces the model in metal by casting.

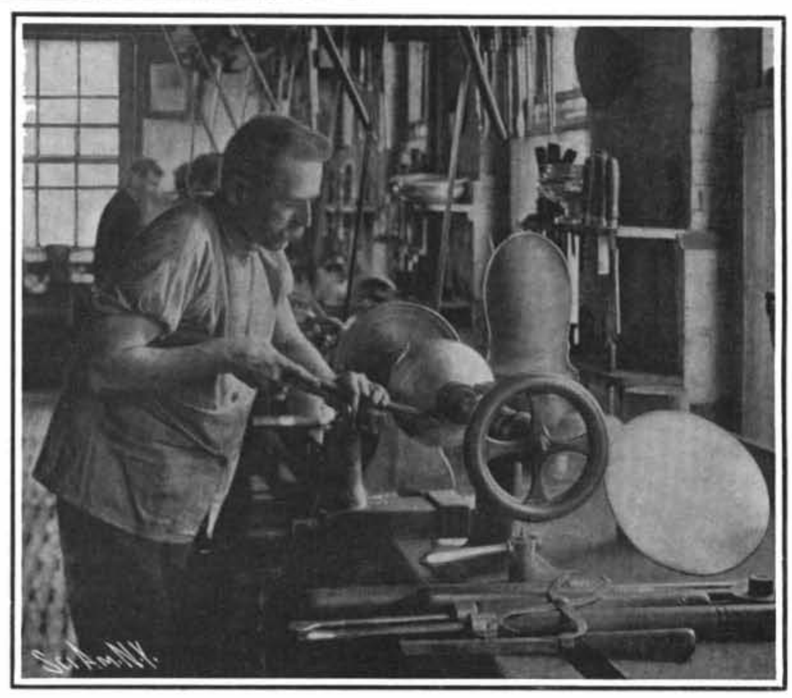
Casting is delicate work; some of the fine sands from which the molds are made are imported from Europe. These, after being accurately prepared, are tamped into iron frames around the plaster model. When a sharp mold is obtained, the frames are clamped together, dried, and the molten metal run in. With suitable sand and careful manipulation, exceedingly fine castings are secured.

The trophy is a fine example of the work of the chaser, and an illustration shows three men at work on various portions of the piece.

In the chasing of cast or sheet-metal work, a multitude of small tools are required—tiny chisels, punches, and riffles for cutting, hammering, or scraping the surface according to the texture desired. In *repoussé* work, where the metal has first to be raised or "snarled," this is done with a snarling iron—a hammer, which may be inserted in a hollow body, and by a sucession of rapid taps force the metal to rise or bulge out. During the snarling, the metal body is held by the operator, who guides it to obtain the raised pattern just where needed. The raised body is filled with a composition stiffening, which prevents any general sinking while yielding at any special point. The detail of the design is then tapped out on these bulges, by means of tiny punches.

When the spun, hammered, and cast portions of the trophy were chased, the several parts were assembled for soldering together. In soldering, a clean gas flame is used with the ordinary air pressure blowpipe. The portions to be joined having been accurately fitted are scraped clean at the points of contact, fluxed with borax, heated to the requisite temperature, and touched with a thin rod of solder, which should instantly flush the seam. A perfect solder joint is practically invisible, and is as strong as the metal itself. The making of a trophy necessitates a perfect cooperation among the workers engaged on it. Each individual must be skilled in his own department, and his work must dovetail in with that preceding and succeeding him. A weak link at any stage will be revealed in the final result. To produce a perfectly satisfactory trophy, such as this one, betokens not only a staff of skilled workers, but a well-organized workshop and men whose hearts are in their work. The trophy is on exhibition for a short time in the showrooms of Messrs. Reed & Barton, 32d Street and Fifth Avenue, New York city, where it is attracting much attention.

Finishing the Original Sketch.



"Spinning" the Sphere.

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Foreign Apples in Great Britain.

A report from Consul F. W. Mahin, at Nottingham, states that official figures show that Great Britain's annual import of apples is now nearly 9,000,000 bushels. One-half the import is from the United States. The total from all the British possessions is under 4,000,000 bushels; Canada's share is about 3,000,000, and Australasia's nearly 500,000. The import from all foreign countries other than the United States is therefore small. The favorite apples in the British market are certain kinds from the United States, but it is believed that the entire demand for imported apples could be met by Canada and Australasia.

FOOD VALUE OF DRIED FRUITS.

BY SIR FRANCIS HENRY LAKING, M.D., PHYSICIAN TO THE KING OF ENGLAND.

It is to be regretted that an economical and valuable article of food, in the shape of the dried currant, should be so much neglected. The dietetic value of the fruit is misunderstood and the prejudice against it entirely unjustified. Properly prepared, the currant might, with the greatest advantage, form an every-day item in the meals of the people, who seem to choose their food and arrange their dishes with an ignorance the extent of which is appalling. If people could be taught a few simple facts about the worth of various kinds of food commonly eaten, I am of opinion that much benefit would result. If some elementary knowledge of the chemical components of food could be imparted to the masses, I feel sure that our race would be healthier, more vigorous and better equipped to resist the attacks of disease.

Imagine what would be the benefit, if the toilers could be induced to master and act upon the fact that food, to be perfect, must contain in the proper proportions the three main elements—nitrogenous substances, carbohydrates, and fats. It should not be difficult, say, to popularize more extensively an inquiry into the meaning of "proteids"—that they are, in fact, the albuminous fundamental and principal constituents of the animal body; that food accurately abundant in proteid makes for the building of tissue and the making of muscle. The meaning of the word "carbohydrates" should not be incapable of demonstration in popular language; nor should the importance of the proper balance of the sugar in the food be difficult to explain in a manner intelligible to the people.

From recent analyses of samples of dried currants the fact has been verified that the fruit contains no less than 73 per cent of sugar in its most valuable form. This great saccharic proportion is already in the shape of grape sugar, and thus is potential to take up its work of producing and maintaining energy and vitality. It is what is known as "invert" sugar, a composite of dextrose and levulose. It assists digestion; it allays nervous excitement, and provides nourishment in case of nervous exhaustion. No fruit can show this large proportion except those of and kindred with the currant.

I wish it could be more generally realized that, in selecting articles of food to supply the constituents of normal diet, regard should be had to the amount of potential energy in the material. It should be an easy matter to convince the people that this or that food is good or bad—that certain things are abundant or deficient in essential food elements.

For instance, let us make an interesting comparison, and one that should be quite clear to the average intelligence: I mean the comparison between the components of currants and lean beef. The currants show 73 per cent of grape sugar, the whole of which contributes to manufacture energy; the beef contains no sugar at all. Currants contain 1.77 per cent of proteid; the beef 19.3 per cent. In currants there is but 20 per cent water; in beef 72 per cent, the bulk of which is waste. Lean beef con-