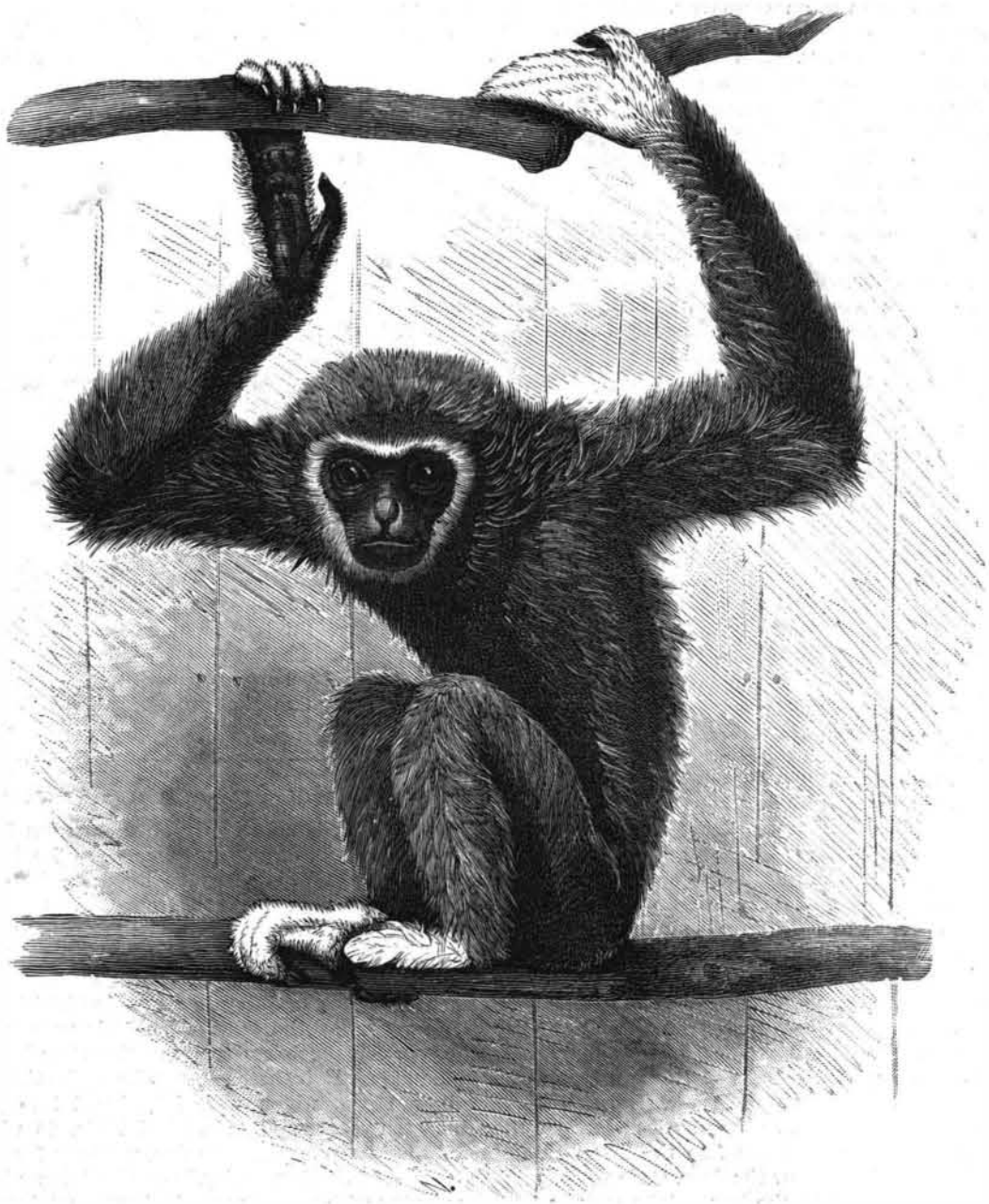
THE GIBBON IN THE BERLIN ZOOLOGICAL GARDEN.

The long-armed ape (*Hylobates lar*), shown in the accompanying cut, is considered the best representative of the anthropomorphic apes, on account of the finely shaped, human-like head, the lack of a tail, the prominent forehead and jaws, and the nose, which is only slightly flattened; but his upper limbs are very much out of proportion. It is well known that when a man stretches his arms out to their full length, the measure from the tips of the fingers of one hand to the tips of the fingers of the other hand is equal to his height. In the case of the gibbon, this measure is double his height. When his arms are allowed to hang, they reach the ground. This ape has been rightly called "a dwarf among anthropoids." His greatest height is about 2 ft. and 3 in., while other members of this species, such as the gorilla, orang-outang, and the chimpanzee, are considerably larger. The long white hands and the frame of light hair around the face are characteristic features of this animal.

The gibbon is the only one of the anthropomorphic apes which is capable of walking upright without any support, but his gait is very peculiar, his body swinging back and forth, and his arms being extended like balancing poles. The limbs of this animal show to their best advantage when he is in his element, that is, in the trees. His movements are light and elastic as he swings rapidly from branch to branch, making graceful curves, and he flies from one tree to another without apparent exertion. Brehm called the gibbon a "bird in an ape's shape," and "the best rope dancer under the sun."

The home of the gibbon is Farther India. Once caught, he soon becomes tame, and delights his keeper by his affectionate and trusting disposition. An explorer tells of the extraordinary love of the mother gibbon for her young, and, speaking of her care for them, he says:

"I have often seen the mother take her children to the water, and, not allowing herself to be disturbed by their cries, wash their faces so clean that many a human child might envy the young ape the care it received."
—*Illustrirte Zeitung.*



THE GIBBON IN THE BERLIN ZOOLOGICAL GARDEN.

NEW PROCESSES IN THE MANUFACTURE OF BEET SUGAR.

Among the new apparatus that have recently been devised for use in the manufacture of sugar from beet roots, there are some that are sufficiently original to be described to our readers.

In this industry, it is necessary, in the first place, to weigh the beets, and this is one of the most important of the new operations, since the tax is based upon the gross weight of the roots, and is very high. It is important, then, to weigh only the clean material, that contains only the sugar, and to get rid of all extraneous matter, such as water, earth, gravel, etc.

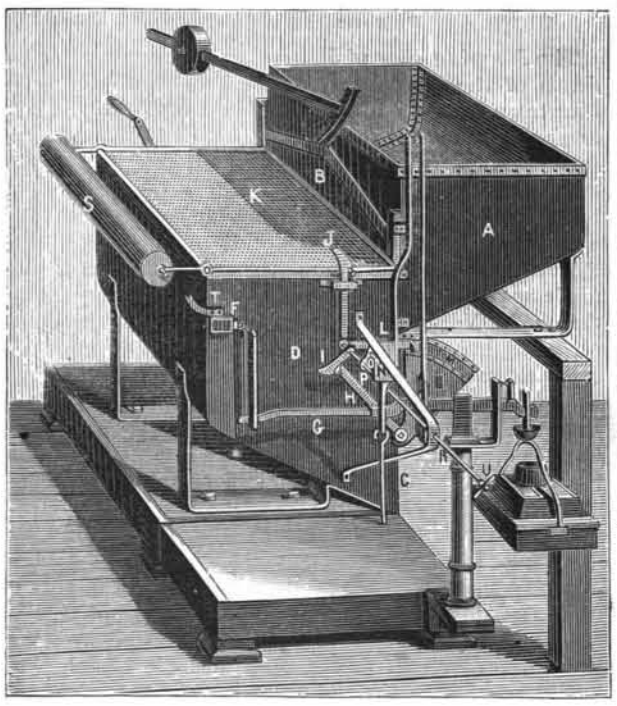


Fig. 2.—AUTOMATIC MACHINE FOR WEIGHING BEETS.

The apparatus shown in Fig. 1 effects this object perfectly, as has been proved in practice. It is called by its inventor a revolving-brush wiping and conveying machine. The apparatus consists of parallel cylindrical brushes revolving in the same direction. These brushes are composed of pissava, whalebone, or steel wire.

Their core consists of a wooden roller keyed to an iron axle. All the brushes are fixed between the two sides of a wrought or cast iron frame, and their journals run in bearings. One of the ends of each of the axles is provided with a bevel wheel, which is actuated by a series of pinions keyed upon a longitudinal shaft. This latter is fixed upon supports at one side of the conveyer, and is connected with the motor through a belt.

The apparatus operates as follows: The beets make their exit from the washer all covered with water (and often, too, with bits of earth that have not been removed by the washing), and fall into the wiping conveyer. The object of the latter is to remove from them, during their travel to the hopper of the weighing machine, all the water and mud that covers them.

Without this drying and cleaning, the valueless material would be weighed, and pay the same rate of tax as the saccharine material.

The beets enter the conveyer on the upper surface of the rollers, and here are quickly caught by the bristles of the brushes, and are revolved and rubbed by each brush in turn from the moment they enter until they drop into the hopper of the scales. The motion of the roots is continuous. They revolve between each pair of brushes isolatedly, pulled forward by the brush in front and backward by the one behind. In such a situation, they pivot upon themselves and present every portion of their surface to the friction of the brushes.

The roots that follow fall against those that are pivoting between the two brushes, and free them from the hind brush, while the one in front carries them further along. The same operation is effected between each succeeding pair of brushes, in a continuous, regular, and rapid manner. The beets undergo a vigorous rubbing from the bristling rollers, from the moment they enter until they make their exit from the conveyer. When the roots have reached the end of their journey, they are both dry and clean, and are then fit to be presented for taxation. The apparatus is capable of cleaning from 33,000 to 44,000 pounds of roots per day.

The next apparatus that we shall mention is an automatic weighing machine for use in sugar works. The administration of indirect taxes now levies his tax upon the raw beet, instead of, as formerly, upon the sugar as it comes from the manufactory.

It is therefore necessary for the administration and the manufacturer to use great care in the important operation of weighing. Both parties have to take great precautions to prevent causes of error, and sometimes possible frauds, in the taking of weights and in the verification made by each. Every detail has been foreseen with remarkable minuteness by the law. It has become necessary to devise scales that shall make the mind of the administration easy, and at the same time satisfy the sugar manufacturer. Such apparatus have to satisfy very many conditions in order to be accepted by the administration, and at the same time have to be relatively simple, in order that they may be applied with facility and without any stoppage in their operation.

The apparatus under consideration is one of the best of its kind, and one of the least complex, considering the diversity of the uses required of it. According to law, a weighing apparatus must close the door upon the arrival of new beets when the scale box is full, and

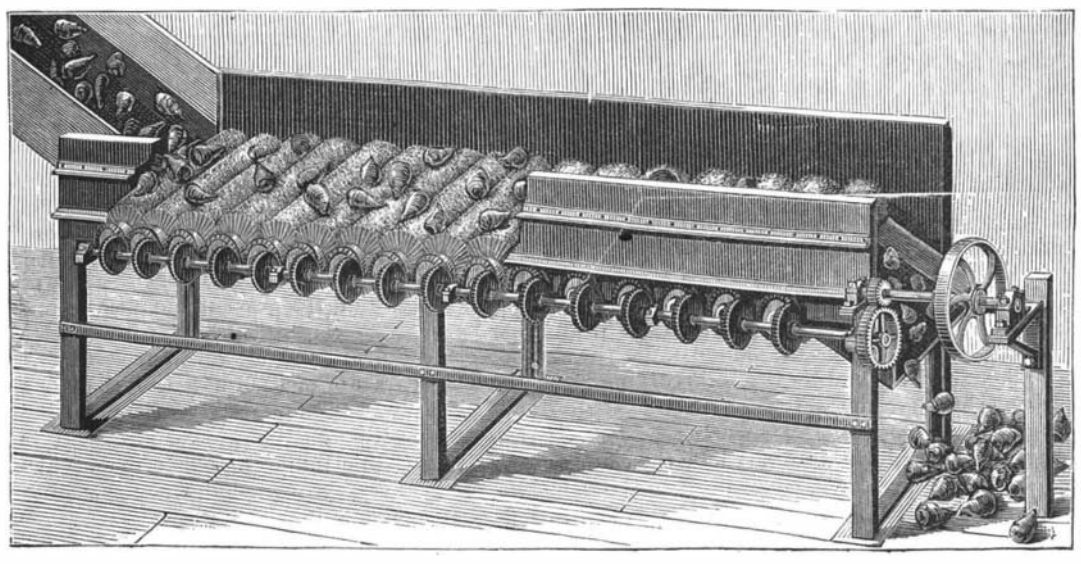


Fig. 1.—MACHINE FOR CLEANING BEETS.

not be able to open it, on emptying, as long as beets can enter to be weighed. It must, moreover, be unable to open upon emptying, when the weight is not regulated to the agreed upon amount (say 1,000 lb.), or when the cover of the weighing compartment is not closed. Everything has been thought of. This shutting down of the cover prevents beets being inserted by hand into the weighing compartment while the latter is open for the exit of the weighed roots.

The apparatus must likewise prevent beets from entering the weighing compartment as long as the latter is not perfectly closed. Then an automatic motion causes the cover to open, and unbolts the door. Every weight taken is inscribed automatically in a counter placed under lock and key in a glass case.

The operation of weighing, which must be effected as rapidly as it is accurately, on account of being done 400 times a day, is performed as follows: The beets first enter the upper box, A (Fig. 2), which is closed by a door, B, which slides up and down. When the door is down, the upper box is open, and the roots fall into the weighing box, D, which is placed directly upon the scale platform. The cover, K, is then necessarily lifted. The boxes, A and D, are made of iron plate. They have sloping bottoms, and have a regulated capacity (say of 1,000 lb.). While the box, A, is emptying into D, it is impossible to open the door, C, through which the roots make their exit. Two sectors, E, connected with the hinge of the door, C, are placed at each end of the latter. In the engraving, these are shown in the position they take when the door is closed. They are held fast in this position by the sliding door, B, which, descending in advance of them, checks them, and renders it impossible to open the door, C.

When the box, D, has its proper weight of roots, the door, B, is raised by means of a weighted lever. The box, A, is then closed, and there is no longer any obstacle to prevent the sectors from moving to the left; that is to say, from following the motion of the door, C, when the latter opens to let the beets out of the box, D. Before this occurs, however, it is necessary to regulate the weight to say 1,000 pounds, and to close the cover, K.

Upon the one axis in common of the two sectors, E, and the door, C, there is a stiff lever, H, which keeps the sliding door, B, closed as long as it rests upon the catch, I. This latter will not free the lever, H, and consequently will not allow the door, C, to open, until the quantity of beets in the box weighs exactly 1,000 pounds.

The weight having been regulated, the two indices placed under the eye of the employe of the sugar house tally with each other. The employe then shuts down the cover, E, which, in closing, abuts against the head, J, of the lever, J P L (that pivots upon the apex, R, of its angle), and engages therewith, thrusting back, as it does so, the vertical part, J P, of the lever, and lifting its end, L. This latter then comes in front of the slider, M, of the sector, E. Prior to this, the end, L, was in front of one of the guides of the slider, M, and still barred passage to the sector, E, and prevented the opening of the door, C, because the cover, K, was not down.

The weight is now regulated, and the fastened down cover prevents any further addition to the box. The roots can now be removed by permission of the agent of the administration. The latter places his hand upon the handle, U, of the rod, R, and, revolving it by a motion from left to right, pushes backward the catch, I. The lever, H, which was resting upon the catch, I, and kept the door closed, now becomes free; and the door, C, under the weight of the beets in the box, D, turns on its hinge and opens.

The tax agent is enabled to unbolt the door, C, because the weight is accurate and the indices agree. In such a case only will the head of the lever, P, which is connected with the rod, R, that carries the catch, I, enter the notch, O, of the plate, N. Such entrance of the head, P, into the notch, O, is necessary in order to permit of the motion that disengages the catch, I, from the lever, H. The plate, N, which is fixed to the movable rod of the scale indices, travels therewith, and descends if the charge of the box, D, is heavier than 1,000 pounds, but rises if the weight is not great enough. When there is an overweight, the lever head, P, strikes the plate, N, above the notch, O, and, when the weight is insufficient, the head strikes beneath it. In either case the agent will not be able to disengage the catch, I, and, consequently, leave the door, C, free to open. This is the gist of the system: It is necessary to be able to shove the catch, I, to the left in order to disengage the door, C; and such a motion cannot be effected except when the lever head, P, presents itself directly in front of the notch, O, in the plate, N, and when the said head can enter the notch under the action of the handle, U. In order to obtain this position, it is indispensable that the weight shall be exact and that the indices shall agree.

The number of weighings is figured in the counter, F, through the action of the connecting rod, G, connected with the sector, E. This latter travels with the door, C, with which it is connected, going to the left when the latter opens and to the right when it closes. Every motion, the to and fro one included, inscribes a unit in the counter, F. When the door, C, is closed, the sector is situated back of the open door, B, and the latter forms an obstacle to C's opening. When, on the contrary, B is closed, and the door, C, is open, the sector is beneath B, and it is then impossible to close the latter as long as C remains open. This also is a condition that is exacted by the administration.

The mode in which the apparatus is maneuvered is, in brief, as follows: The employe of the sugar works opens and closes the door, B, by means of a weighted lever, and then shuts down the cover when the weighing is finished and regulated. Then the tax officer comes in and manipulates the handle, T, that unfastens the catch, I, and sets the door, C, free. This latter opens of itself under the pressure of the beets in the box, D. When the latter has discharged its contents, the sugar works employe brings the door back to its former position, and through the same motion all the parts become firmly locked again. The cover is open, and the sliding door of the box, D, again becomes free to descend, in order to allow of the entrance of a new supply of beets to be weighed. Neither the tax officer nor the representative of the sugar works can touch the mechanism that guarantees the accuracy of each operation, since this is surrounded by a grating carrying the state seal. The interests of the manufacturer and of the public treasury are thus perfectly guarded by this honest mechanical adjunct of the bureau of taxes. —*La Nature.*

German Willow Boxes—A House Industry.

Box making is notoriously an occupation in which only the poorest of people engage. In the East End of London it affords a scanty living to hundreds of families, who have to work from early morn to far past dewy eve in order to earn a few pence per gross, which is the reward of their labor. Miserable as this work and its pay may be, it will astonish some to learn that the peasantry in a remote district of South Germany follow the same work during one period of the year for much less remuneration than is obtained in London. It is these people who make the German willow boxes, which were introduced into London about ten years ago by Mr. Paul Metz, to whom the credit is in a great measure due, not only for creating a demand for this "sundry," but also for providing the peasantry with employment during the winter months, when it is impossible for them to follow their outdoor work. Mr. Metz was led into this trade through first supplying some confectioners' boxes, but it was only after considerable preliminary difficulty that he was able to strike upon a timber which would yield "chips" at all equal to the English willow. It may not be generally known that willow boxes are almost indigenous to Great Britain; on the Continent pinewoods are employed for making the "chips" used by pharmacists there, and the same kind of boxes have been brought into the English market since Mr. Metz introduced the German willows; but these pinewood boxes are much inferior in color and finish to the true "willow."

In the district to which we have referred, Mr. Metz has a central agency, superintended by a trustworthy overseer, who collects the timber, and has it cut up into logs for sale to the peasants. After the harvest season is over, the peasants go to the agency and receive a supply of wood; this they take to their homes, and slice it by hand into the thin shavings which are required for the sides and ends of the boxes. The slices are then suspended from the ceilings until they are thoroughly dried. Slicing is done by the father of the household or the elder sons, but in the other operations all members of the family who are able to lend a hand are employed.

After drying and smoothing out the slices of wood, they are stamped out into the circular pieces for top and bottom—which operation is done with punches obtained from the agency—and the long narrow pieces required for the sides. This operation differs from that followed in making pill boxes, in which case a long tube of cardboard is first made, and then cut up into shorter cylinders of the required size. In the case of willow boxes, the operation is much more tedious, as will be seen. The next part of the operation is the formation of the box; this is simply done by taking a disk, the edge of which is smeared with a peculiar quick-drying cement, passing round it a strip of the wood, and placing below the overlapping edge a touch of the cement. The box is then slipped between two parallel wooden bars, which allow free sliding, and yet prevent the bent wood springing back. The cement, although quick-setting, does not become firm for half an hour or more, so that the two bars are of such a length that by the time a box traverses from one end to the other it is practically firm, although the worker passes in the boxes with remarkable rapidity. The cement which is used is one of the secrets of the industry; it is a home-made article, free from glue, yet strong and capable of resisting either damp or heat to a wonderful degree. The bodies and lids of the boxes are both made in the manner described, and, after being fitted, are carried to the agency, where they are examined, counted, and payment made according to number. This payment is very low, as may be judged from the fact that a man earns only from 5s. to 6s. per week, young children from 2s. to 2s. 6d., and youths about 4s. But even this miserable pittance is "found money" to the peasants, and, were it not for these German willows, they would in most cases have no employment during the winter, or would have to take to a lower class of box making. There are over a thousand families engaged in the industry, apart from those employed in the agency to pack the boxes. It is rather a remarkable fact that the boxes, although made entirely by hand, and necessarily passing through several hands, are yet spotlessly clean. In this respect they are no way inferior to machine-made boxes, while they have a polish about them which English willows do not have. This, we believe, is natural to the wood, and is enhanced by the peculiar manner of cutting it into slices and drying.

After the boxes are packeted and packed in cases they have to be carried long distances, both by land and sea, before they reach London; but, notwithstanding this extra expense, the German boxes have competed successfully in the market against old established English manufacturers without the aid of any subsidy. This is the more notable from the fact that these boxes have never been included in the stock of the German durggists, nor indeed were they known in Germany until Mr. Metz established the industry. A German *apotheker* would use a small porcelain pot for sixpennyworth of ointment, but he would screw up a pennyworth in a piece of paper. There does not seem to be much chance of preserving the manufacture for England. The elements of cheapness which Germany possesses in the cheap labor, a fairly abundant supply of suitable wood on the spot, and, not the least important, a ready market, have been indicated, and are likely to remain. For many years the supply of English willow has been steadily growing smaller, and it is a matter of difficulty to get wood sufficiently white. When it is obtainable, its price is as many pounds as the German wood is shillings, so that the German willows have the advantage from the first. On a recent visit to Mr. Metz's warehouses in Jewin Street, we were asked to pick out at random any packages of the boxes from the general stock. As some attempts have been made to depreciate the quality of the German boxes, it is only fair to say that in no case did we find any one box either soiled or with any part uncemented or likely to become so.—*Chemist and Druggist.*

Poisoned by a Cobra.

The *Morning Star* of Jaffna, in Ceylon, reports the death of the taxidermist of the Victoria Museum in that town from the bite of a cobra, under curious circumstances. While feeding a cobra, which he thought was harmless from previous extraction of the poison bag, it suddenly bit his hand. For a few minutes he took no notice, thinking the bite harmless, but pain and nausea soon began. Carbolic acid was applied, ligatures were bound round the arm, an incision was made at the bite, and the blood of the arm was wholly removed. Various antidotes were used, but the unfortunate man lost the power of speech, and soon after every muscle seemed to have become paralyzed, and breathing entirely ceased. Artificial respiration was, therefore, resorted to, and this operation was unceasingly continued for nine hours, when at last the patient made an attempt to breathe, and soon regained consciousness enough to make his wants known. He steadily improved until the Friday, the accident having taken place on a Wednesday, and then astonished those around him by stating that during the severe operation of Wednesday night he was conscious of all that was taking place, but was unable to make his feelings known, not having power over a single muscle. It would seem that the poison paralyzed the nerves of motion, but not those of feeling, for he could see and hear and feel, although the physician, even by touching the eyeball, could get no response either of feeling or consciousness. His partial recovery was, however, followed by a high fever and inflammation of the lungs, and he died, perfectly conscious, on the following Sunday.

A Costly Machine.

The Waterville, Me., *Mail* describes a machine invented by Prof. Rogers, of Colby, which inscribes upon a polished surface from 30,000 to 50,000 parallel lines in each square inch, and which is of much use in the conduct of his astronomical labors. It was not perfected without an outlay of several thousand dollars. A single screw, which is twenty inches in length, and employed directly in the inscription of the lines above mentioned, after several attempts at construction, was finally produced, only after an expenditure of $3,000. The very limited use, the editor adds, to which the machine can be put renders the procurement of a patent wholly unnecessary.