

latterly thrown himself, and with one piteous, haggard look on the table and its hateful surroundings, rushed wildly from the room.

With the exception of a few loiterers, the streets were deserted as this poor ruin hurried through them with uncertain gait, and his thin locks streaming in the chill breeze. With many halts and diversions from his course, he at length succeeded in reaching his home, and letting himself in with trembling hands, he mounted the stairway, and softly stole into the room in which boy Geoffrey was enjoying the dreamless sleep of childhood.

"I have beggared thee," he said, with a long heart-broken sigh, and the boy woke up suddenly, and wondered at him with round, sleepy eyes.

"Come, my little one," whispered the doctor, "I have a mission for thee; ask no questions, pretty; thine old grandad is sorely troubled." With a great sob, he lifted the astonished but obedient baby from his crib, and waiting no longer than to envelop him in a thick blanket, crept noiselessly down the stairs and out again into the night mist.

The small party in the room off Fleet Street, having broken up, was donning cape and muffler, when a feeble step came climbing the flight towards their room-door. This opened, and Doctor Bone silently entered, with his bundle so adjusted as to conceal the contents. Placing it gently upon the table, and still holding it, he turned to the young baronet and said—

"'Tis the last stake I lost to thee, boy; remember thy words—oh, God pity me!—remember thy words."

He was gone before they had recovered from their astonishment, when one exclaimed—

"Gadzooks, Harry, 'tis something that moves!"

Sir Henry strode hastily to the table, and with a suspicion of the truth unwound the blanket, and dis-

closed the soft form and wondering features of a living child.

A moment's silence, followed by a boisterous roar of laughter, attended this discovery, and a torrent of sarcastic congratulations and coarse jests were poured upon the happy recipient of the doctor's last stake. In the midst of it all he turned to them with something like a tear glittering in the corner of his eye.

"Hold thy gabble," he said roughly; "the doctor had more reason than most of us in his play after all. To be sure he saved my life once—though 'twas professionally—and his wish shall be fulfilled."

Seeing him in genuine earnest, they contented themselves with a few sneering utterances, which he paid no heed to, and prepared to go. Sir Henry, taking the child gently in his arms, and stilling its nervous tremors to the best of his ability, was also leaving the room when a cry from one who had gained the house-door arrested his attention. This last had stumbled over what appeared to be the lifeless body of a man, and upon a light being procured the old doctor was discovered, lying as he had fallen, in a confused heap upon the mat.

Yes, hope, and love, and the cruel sentence of poverty could wreak no more changes in those filmy eyes, and as they carried poor Bone to the room above, a hush fell upon the little band which had been unmoved by the earnest entreaties of the living man.

With a gruff kindness the baronet laid little Geoffrey away from the sight in another chamber, and went to give notice to the authorities.

As years passed on the report went that next to his dog, Pluto, Sir Henry loved an orphan child he had adopted; but the care with which the turf was tended above the grave of a certain doctor in an old country graveyard went to prove another tale than this.

B. C.

WEALTH FROM RUBBISH.

OLD BOOTS AND SCRAPS OF LEATHER.



FLINGING old slippers after a newly-wedded couple, whatever its original signification, acquires a new meaning in these days, when nothing is wasted which science, and art are capable of utilising. Long ago these well-worn "salutations" may have meant, "Your old friends won't forsake you;" but now the

custom may express the more prosaic and utilitarian advice, "Waste nothing; sell it when past use."

Everybody has heard some wag saying to a friend with a greasy hat, "It would make good soup;" but it has been reserved for modern chemistry to produce a veritable jelly from an old boot. That feat was accomplished by a gentleman in New York some years ago. It was not quite so white as blanc-mange, nor so sweet; but it is by no means impossible that, within a few years, "boot-jelly" may be as popular a dish at our restaurants as *grenouilles aux truffes* is in France.

Only a few years ago old boots were beneath the notice of the rag-gatherer, but now they are eagerly bought up by the itinerant merchant whose watchword is "Old clo'," and whose aim in life seems to be to give the least for the refuse he buys. Has the reader ever taken a stroll in that most salubrious of London *quartiers*, Seven Dials? If not, he might do so with advantage. Hundreds of artists—whose basket

of tools consists of a threepenny knife and a few irons, whose stock-in-trade is a piece of heel-ball and a box of gutta-percha glue—make the useless wearable. There they sit, in dark dirty cellars, or even in boxes not bigger than a rabbit-hutch, hammering, pegging, and paring; while in front of their infinitesimal *boutiques* are rows of boots, shoes, and slippers, highly polished, and looking very serviceable. Large boots worn to the uppers are stripped of their soles, the uppers cut down so as to get rid of the bad places, and fitted anew with virgin soles; holes are patched up with gutta-percha; and, after a few touches of heel-ball and a short application of the "iron," they stand forth as marketable commodities, and are eagerly bought by the poor who live in the surrounding courts and alleys. These cobblers are technically called "translators."

But even when the "old boots" are too far gone for these skilled artists, they are never thrown away. Few uppers are so bad but some inch or two may be cut out for a prospective patch; and no sole is so utterly depraved as to be unfit for tearing to pieces, ultimately to assume a new guise, and, like the ugly chrysalis, to be transformed into a thing of beauty. Leather, when reduced to its chemical components, consists of gelatin and tannin, which latter has been incorporated into the original skin in the process of manufacture. Heated in steam at a pressure of two or three atmospheres, leather is dissolved without any chemical change in its original composition. A simpler and equally effective process, however, is to immerse leather clippings in organic acids, such as tartaric, fifteen grammes of which will dissolve two pounds of leather scraps when heated to about 80° Centigrade. When soft it is washed in warm water, by which all the acid is removed, and then the glutinous substance is ready to be operated upon. This process takes no more than three hours, and the simplest appliances are employed.

Formerly shoemakers in a small way, and even large manufacturers, did not know what to do with the scraps of leather pared off soles in fitting them to boots, or leather cuttings wasted in dividing hides. The only use indeed of which they dreamt they were capable, was that the product of the summer operations should help to keep the workmen warm in winter. Hence, what scraps were made were usually burnt in the workroom stove. That was a pure waste of a very useful substance, and modern chemistry led them to utilise it. It is true that leather-ashes were sold to farmers for manure by large manufacturers, but the tannic acid that remained was soon found to be injurious to the crops, and hence that market was speedily closed.

Most people know what printers' rollers are like. These are manufactured from scraps of leather, which are first dissolved and mixed with about four per cent. of glycerine. This compound retains its elastic softness for a considerable time, and when it becomes too uneven in surface to be of further use, may be re-melted and moulded into fresh rollers.

Printing rollers used by calico and cotton printers

are made out of the upper leather of old boots. The worn-out material is first of all shred into very small pieces, then boiled in a solution of tartaric acid, and while in the soft state pressed with the pattern from matrix blocks and allowed to harden, which it does in a few days. It presents then a very even surface, and as it is a non-absorbent, is found invaluable in the Lancashire towns.

Most people imagine that goloshes are made of caoutchouc, but this is a mistake. There is, in fact, not more than from ten to fifteen per cent. of caoutchouc in the material, which has been immersed for three or four hours in about one-fourth its weight of bisulphate of carbon, when it combines readily with the gelatined scraps of leather, that have previously been dissolved at a low heat with a certain proportion of vinegar, glycerine, rape oil, and a little water. The prepared leather and caoutchouc having been thoroughly mixed, the mass is passed between steam-rollers and reduced to a sheet of the required thickness. This substance is more impenetrable than either leather or caoutchouc, and is used for many other things besides goloshes, waterproof leggings for fishermen and uppers for sea-boots being examples.

Glue-making used to be a very tedious and costly process; but since the decomposition of leather has been simplified—the scraps from the cobbler's stool or the great factories in Leicester and other towns—better glue is quickly got, and at much less expense. The great enemy to be got rid of is the tannic acid. Formerly it had to be precipitated by strong mineral acids and salts, but the action of these was neither certain nor entirely satisfactory. Now, however, the tannic acid is turned into what is known as humic acid by the application of strong alkalis. First of all the leather scraps or parings are dissolved in the usual way by tartaric acid, then boiled in about one-third their weight of a strong solution of common soda, which amalgamates with the objectionable ingredient. The gelatin is now rolled out into very thin sheets, hung out in the air to allow the humic acid to evaporate, re-boiled in soda, rolled out again, and re-dried three or four times till the tannic enemy entirely disappears. Nothing is then left but the pure animal membrane, which is easily convertible into powerful glue. Old boot-soles are equally useful with new leather for glue-making, and most of our worn-out "understandings" are eventually transformed into this article of commerce.

Now-a-days, indeed, nobody can be sure that he really gets a single piece of leather put on his boots when he sends them to be repaired. Where the cuttings or scraps are large enough for the purpose, they are cut by machinery into diamonds, triangles, squares, and other mathematical figures, with bevelled edges. These pieces are then fitted closely together, a strong cement, coloured as nearly as possible of the same tint as the leather, is now poured into the interstices, and the sheet being subjected to heavy hydraulic pressure, the small pieces are made to adhere so closely as to present the appearance of uniformity. Or, to make assurance doubly sure, a very thin veneer

of "split leather" no thicker than brown paper is pasted over the face, and the material goes into the market, and eventually comes into the hands of those who sole and heel one's shoes for half-a-crown, or is used by the dealer in second-hand boots.

No shoemaker now is foolish enough to cut up good leather for "heel-lifts"—as the layers for lifting boot-heels are called. "Lifts" are produced at about three-halfpence or twopence a pound. A Leeds gentleman, who now drives a thriving trade in "lifts," "inner soles," "shanks," and "counters," patented machinery for the purpose, which is capable of producing any amount of these necessary adjuncts to a pair of boots at so cheap a rate as to drive the old-fashioned shoemaking theories out of the trade. The scraps are first torn to shreds or ground to powder. A layer of this stuff is put into a mould,

covered with cement, another and another layer of leather and cement is added till the required thickness is attained, pressure being applied as each layer of cement is covered with a sprinkling of leather, and finally the whole is put into the hydraulic press, and afterwards trimmed to the required shape. In America paste is substituted for cement, and one firm in the town of Lynn uses half a dozen barrels of flour a week in making the paste. This substance is technically known as "pancake;" and somebody tells the story that upon one occasion, a shoemaker who kept three or four men constantly at work, was very much annoyed when in Lynn he was unable to find the "pancake-shop," the people that he accosted being under the impression that he was asking for an unknown "pastry-cook."

Several firms in England, Germany, and America are, however, employed in making new leather out of old, or scraps of new. The old is quite as good for the purpose as new, after being cleaned. The bits of real leather are simply ground and reduced to a pulp in the ordinary way. This pulp is mixed with india-rubber dissolved in spirits and treated with ammonia, which makes it of a greyish-white colour. The whole is then rolled out into sheets of any length or breadth—it may be narrow enough for belting, or wider than an ordinary cow-hide. It is said that this substance has all the appearance of leather, but that it wears much better, does not yield to hammering, is flexible, and impervious to water. Pump-leather, harness of all kinds, leather-belting without the expense

of joining more than once, or the annoyance consequent upon the joints parting, are made from it; and when in the condition of dough it may be moulded into hose, fire-buckets; or, mixed with curriers' shavings, cork, and other substances, rolled out into floor coverings. The cost of this new material is not more than 1¼d. or 1½d. per pound.

Some years ago a factory existed at Romsey for making parchment from the parings of raw hides treated with an alkaline solution, and answering to all the demands made upon it. This artificial production was perfect as regards colour, smoothness of surface, and strength; but it was superseded by the discovery of the conversion of thick unsized paper by sulphuric acid into a vegetable parchment at much less cost.

Perhaps the most ingenious use to which scraps of

old leather have been adapted is the following, a process so far perfectly successful:—The old soles of boots are torn up in the usual way, cleaned, and reduced to pulp. This is mixed with equal quantities of old bagging and waste paper and cast in moulds. When dry it is very hard and solid, and is used to fill into the tires of railway or tram wheels. It is said to be a great improvement upon wood, which was formerly used, and is neither so heavy nor so liable to crack by drought, or lose its shape, and endanger the safety of carriages and their living freight.

These are a few of the uses of old boots and scrap-leather; but the

manifold industries which have been created are still in their infancy, and there seems to be no limit to the varied uses to which the manufactured products may be applied; but perhaps enough has been said to show what has already been done, to account for the desire of a certain class of itinerants to buy old boots, and to explain the modern phenomenon of a pair of new spring-side boots at the low figure of 2s. 11½d. It was Dr. Andrew Wynter who, some years ago, wrote a charming article on the immoral and deteriorating influence of old boots upon the character of the wearer; but the day is not far distant apparently when the poorest will not be called upon to slouch through the streets slipshod and down-at-heel, for somebody may yet discover the means of moulding boots, as the glass-blower does bottles, and selling these necessary appendages for a fraction of the present cost of a wearable article.

W. GIBSON.



"ROWS OF BOOTS, SHOES, AND SLIPPERS" (P. 691).