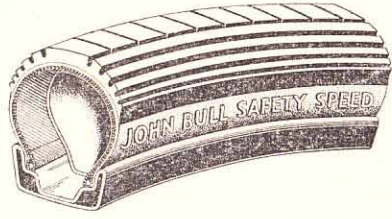


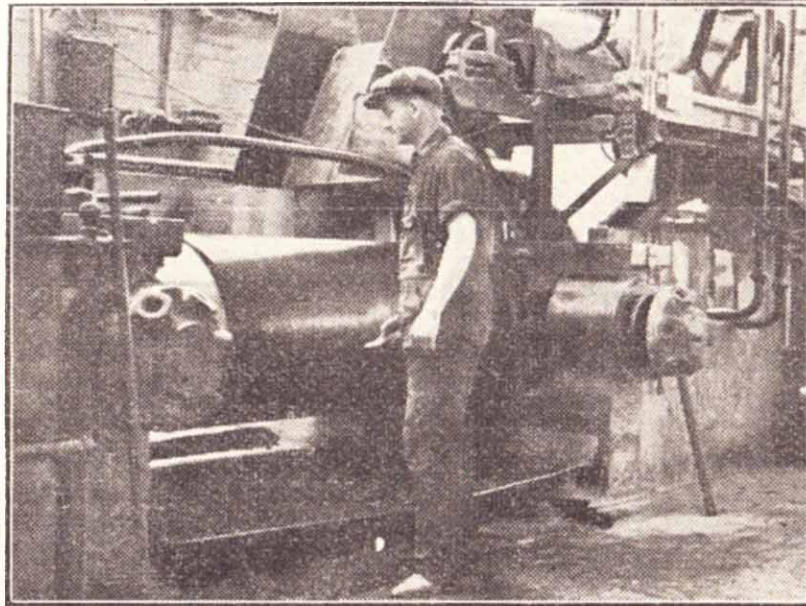
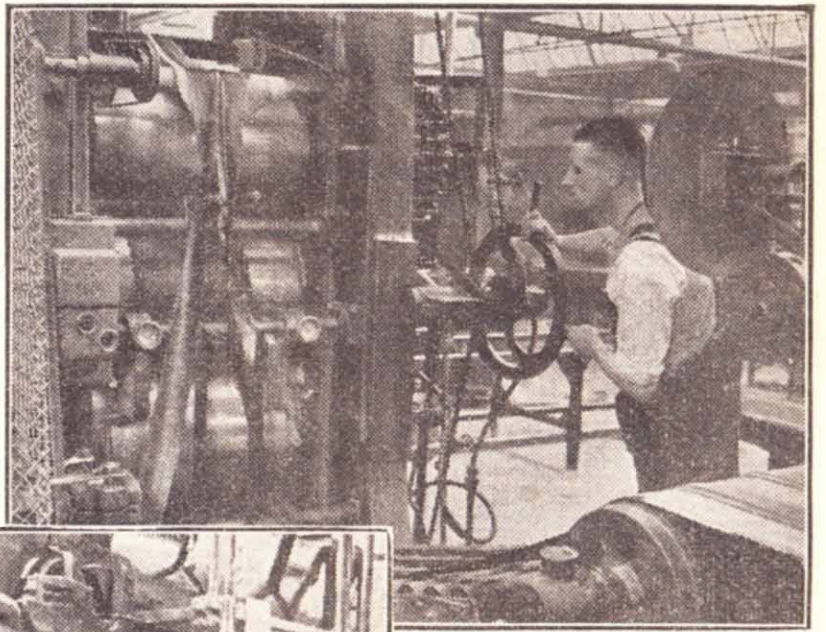
At the John Bull Tyre Works

PUTTING SAFETY and SPEED into a TYRE



(Right) The treads being made three at a time

(Below) Rolling in the sulphur to complete a batch of raw rubber



THE plaited straw coverings to the bundles had come straight from the Orient, and the stencilled signs on the chests (that looked as if they might contain tea) betokened a Malayan origin.

Boxes, bundles, and bales—what a tale they could tell of their long journeys from the rubber plantations of the Far East! For I was standing in the raw rubber stock room of the John Bull Tyre Company's works, and all around me were the various rubbers awaiting the first stage of their conversion into tyres.

For there are many types of rubber. The original Para rubber (from the Amazon Valley) is now but little used, as it arrives in this country in a very dirty state, and results in a heavy loss when cleaned. The bulk of the supply comes from Malaya, with a little from Ceylon.

within bounds, and sees that not a particle of it escapes.

Raw rubber, chemicals, and finally a sealed bag of the carbon black, go hurtling into the depths of the machine. A touch of an electric button and all is shut tight. Another button, and the whole mixture is turned and churned, round and round and over and over, until the various constituents are welded together into a homogeneous mass of black, of the substance of moist putty.

Electric controls regulate the mixing time, and a travelling band carries the mass off to the rolling machines as soon as each batch is finished.

Here the rubber receives its portion of sulphur . . . the chemical



Hand building the Safety Speed tyre

When the various bundles and chests are undone the raw rubber is revealed as a roughly cube-shaped mass, built up of layers of tough slabs, in colour ranging from white, through the browns, down to nearly black.

Each type of rubber is destined for a different purpose, for each has its different qualities. But the initial treatment is the same for all.

First the cubes are sliced under a power press into sixths, for ease of handling, and then they are stacked in large ovens at a temperature of over 100 deg. Centigrade.

From these the raw rubber passes to the mixing rooms, where delicately balanced scales weigh out the necessary amounts of the various chemicals (including carbon black, which gives the rubber intended for the treads its hue) against the weight of the various batches of rubber.

Now this carbon black used to be the bugbear of the tyre industry, for the finely-ground particles, if given the chance, escape into the air and cover everything within reach with a greasy coating of black. But at the John Bull works a most ingenious machine confines the powder

that, after heat has been applied, vulcanises the rubber, so that instead of being plastic it becomes the hard, puncture-resisting rubber we know as the tread of our tyres.

Three feet in diameter and some seven feet long, the giant rollers turn the rubber round and round, while skilled hands measure on just the exact quantity of sulphur wanted. At this stage the rubber has to

be kept cool, for any heat would start the vulcanising process too early, so a continuous stream of water runs through the inside of the rollers to keep the temperature normal.

Coloured electric bulbs over the machine give the signal for the operator to finish the rolling, and with a knife held against the rubber he rips it up into slabs a yard square.

These slabs are dropped into a water tank, which coats them with a thin film of chalk, so that they can be more easily handled. But, first, from each and every slab, a small piece is cut off the corner. Both sample and slab are numbered, and the sample goes up to the chemical laboratory for analysis.

Every batch of rubber mixed is, therefore, checked by the chemists to see that it conforms to the high standard laid down. Until the sample is O.K.'d no piece of rubber is put into circulation for conversion into any of the hundred and one items turned out by the works.

Next stage is maturing. The slabs go into a store, where they lie and mature for hours or days, according to the type of rubber and the purpose for which it is destined.

From the yard-square slabs the rubber has now to be shaped down into the strips required for the treads.

In this particular article I am going to deal with the Safety Speed tyre and its manufacture—but the process is much the same for all cycle tyres.

A complicated rolling machine shapes the slabs down and, three at a time, continuous strips emerge, ready to take their place, after cutting to length, as tyre treads.

Meanwhile, what of the cord that forms the carcass of the tyre?

Here, again, just as much care is given to every stage as the great rolls of linen fabric are treated and cut to length.

Pure rubber is worked into the fabric (two layers each side) as it unrolls, and then it passes slowly through an enormous "oven" which drives off the naphtha solvent (in which the rubber has been dissolved).

(The naphtha fumes, by the way, are collected and turned back into liquid, to be used again and again.)

The cutting machine, which chops off exact widths of fabric, each one of which makes a tyre, is a most ingenious affair. It automatically measures off the exact width re-

quired, and, furthermore, holds the tension even at all times, so that there is not even the slightest variation in the width of the long strip.

We are now ready to watch an actual tyre being made up . . . and from electrically controlled machinery we switch over to the skilled eyes and hands of craftsmen who, with lightning-like fingers, build up the Safety Speed tyres.

On a collapsible steel drum the length of the fabric is first laid . . . a rapid twist of the drum and it becomes a complete circle just twice the width of the finished tyre.

The circular wires that form the wired edge now go into place, and each edge of the circle of fabric is turned back over its wire, so that the join comes right in the middle of the tyre . . . where it will be covered by the tread.

Then follows the understrip of pad rubber, and finally the rubber strip that is to form the tread.

All this time the tyre is still in its flat circular shape . . . it will not begin to look like a tyre until it reaches the vulcanising room.

A final inspection, and the tyre is ready for its last major process—the moulding and vulcanising of the tread.

The steel moulds are, of course, shaped internally to the reverse pattern of the tread. The circular strip of fabric and rubber is placed inside the mould, and air is forced into an air bag (much like an inner tube), so that the tyre has to take the shape of the outer mould. Terrific pressure shapes the rubber tread into the finely cut squares that make up the running surface of the Safety Speed, and then the heat vulcanises the rubber.

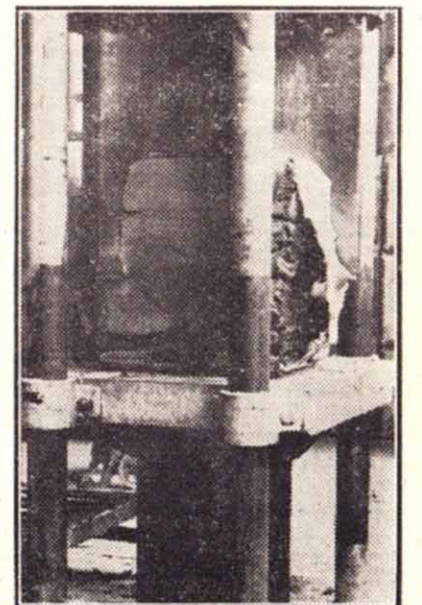
All this part of the process is electrically controlled just the exact amount of time—not a second more or a second less—so that the rubber is turned into a hard-wearing tread, but which is still resilient and "lively."

The secret of the speed in this particular tyre lies just as much in the care taken with the processing as in the choice of fine materials.

The vulcanising is carried out at a lower temperature than normally used, applied for a longer period of time. This results in much greater flexibility in the tyre.

From the mould the tyre goes for trimming and inspection. First the inevitable "whiskers" from the edges of the mould are trimmed off by hand, and then eagle-eyed inspectors go over the tyres. None but perfect tyres are allowed to go out for dispatch; even the slightest mark

(Continued on page 19)



Cutting up the raw rubber

YOU CAN'T BEAT



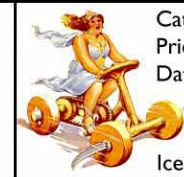
DOUGLAS ISLE OF MAN FOR A JOLLY HOLIDAY

PRINCIPAL EVENTS, 1939:

Air Race (London to Isle of Man)	May 27	Highland Games July 17
Manx Air Derby May 29	Isle of Man Agricultural Society's Summer Show at Douglas August 10
T.T. Motor Cycle Road Races	June 12, 14 and 16	International Sheep-Dog Trials at Howstrake August 31
Open Bowling Tournament	June 12 to 17	Manx Grand Prix Motor Cycle Road Races Sept. 12 and 14
International T.T. Bicycle Race	June 22		
Tynwald Ceremony (Manx Open-Air Parliament at St. John's) July 5		

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to change down slickly into bot-
 flamboyant finish, with chrome-plated
 head and rear ends, head-tube picked

Putting Safety and Speed Into a Tyre

(Continued from page 18.)

in the tread—not a flaw to you or me—is sufficient to ensure rejection.

While we leave the tyre to go through its wrapping process prior to dispatch, let us have a peep inside the checking-room.

From time to time I have mentioned the electric system of controls. John Bull call this their electric eye . . . and it is watching out all the time for your interests.

Intricate wiring systems run from the various mills and vulcanising presses into a room full of recording machines from which emerge rolls of paper.

On these rolls a series of dashes is printed by electric impulse. Each dash signals a step in the process of manufacture, so that every tyre, on its way through the works, "makes its mark" on the paper strip. Apart from "visual inspection" of the tyre itself, inspectors check up on the electrically-made track, making sure

that the tyre is perfect where the eye cannot reach . . . inside the rubber.

As to the tyre in use, well, we have already told our readers about the Safety Speed . . . safe, because of ratchet tread that gives it 100 per cent. traction, and speedy . . . well, remember that Harry Hill broke the fifty miles record on it last year, covering the half-century of miles in 1 hr. 44 min. 30 sec.

The ratchet stud tread works on this principle—as stud after stud takes the pressure of the drive, each is rigidly supported by its neighbour, from which it is separated by only a hair's breadth.

When riding, the effect is as if the tread were a plain, continuous band. But when the brakes are applied (or in the event of the beginnings of a skid) the reversal of pressure throws open the ratchet, and gives the tyre the necessary bite on the road surface.

Yes, truly a tyre that lives up to its title . . . Safety Speed.

"The Bicycle," May 20, 1939

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