

# With GRAMOPHONE and RADIO

By "B NATURAL"

## Do Pick-ups Ruin Records?

**NOT** a few gramophone enthusiasts have been turned away from their decision to install an electric gramophone or combination by the very unwise remarks that the pick-up is hard on the records. This statement probably emanates because the pick-up if not properly adjusted will certainly damage the record considerably, but this can be said of the mechanical sound-box, only most gramophone enthusiasts have the common sense to leave this alone, whereas the pick-up is usually regarded as an instrument that can be put on by anybody without any need to read instructions and can be operated without due care and without changing the needles regularly.

There are two forms of wear that take place on a gramophone record. One is due to the direct friction of the needle on the walls and the base of the groove, and the other is due to the pressure between the needle and the record. The latter can be reduced by using a counter-balanced sound-box or pick-up, but its use is not conducive to obtaining the finest tone. The effective weight under no circumstances must be less than 4ozs. nor greater than 6½ozs.

It is not difficult to see that wear due to the pressure of the needle against the sides of the groove will take place at a more rapid rate where heavy modulation of the record occurs. Look for a moment at the diagrams (fig. 1) depicting a record before and after it has been played. The steep rise in the centre of the middle groove is a deeply modulated portion, and the needle in following this tract tends to "cut the corners" with the result that there is greater wear at this point. The grooves are very small in comparison with the needle (see fig. 2), and the sole cause of the musical reproduction is the movement imparted to this relatively clumsy needles by the fine grooves. In the mechanical sound-box, the needle has a greater mass to move. The diaphragm is relatively large and stiff. This means that the more deeply modulated parts must have a considerable strain in order to move the diaphragm to accommodate them. With the pick-up, however, the moving parts are reduced to a minimum; merely a small bar between two magnets. This small movement as we have explained before is amplified by the power amplifier in the radio set or gramophone.

Gramophone designers aim to keep the wear of the record on the bottom of the groove where it will not affect

the tonal qualities, and this can be brought about by only the use of a well-designed pick-up and well-chosen needle. In our previous article we discussed needles and explained how a needle that had been used has a broader surface and could not penetrate deeply into the groove, and consequently wore away its sides, shortening considerably the life of the record. It is necessary then to use with the pick-up the finest needle possible, so that they may rest on the bottom of the record and not on the sides of the

inary sound-box has been used, it will be noticed that the needle in its path from the left to the right of the photograph has done everything possible to avoid going round the corners. It has ridden up the sides of the grooves, and in some places right over the top before slipping back into its somewhat erratic path. The corners have been deformed in one case, a corner has been made sharper, while in another, right on the left of the photograph, the needle has attempted to go dead straight instead of round the bend.

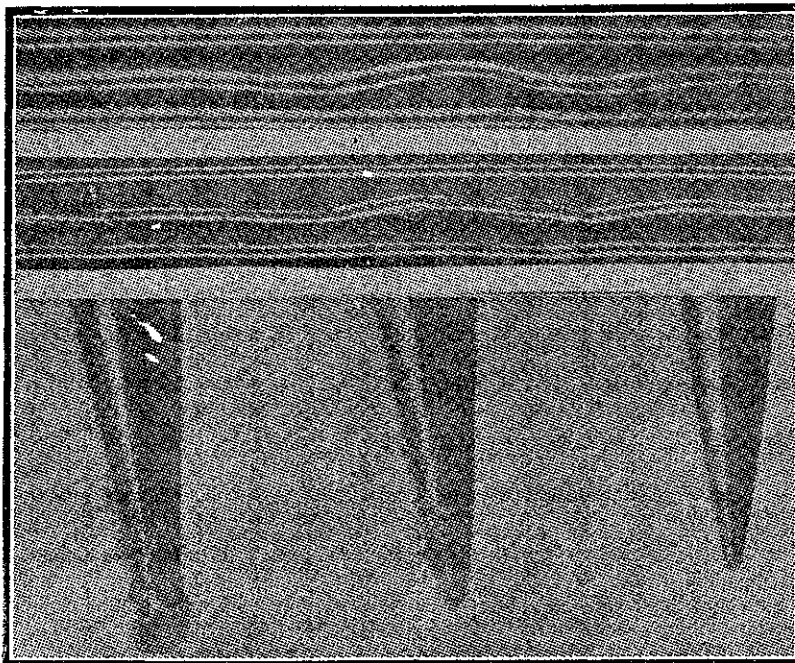


Figure 1.—The top photo represents an unused record. The centre a record that has been played by a standard mechanical soundbox 50 times. The lower photo shows the amount of record collected by the needle from the record. (See text.)

groove. For this purpose the soft needles, the fibre, or the tungstyle, are the best.

Our photographs depict the result of some very interesting and enlightening experiments along this line. The top photograph of figure 1 shows a record that has not been played. The next shows it after it has been played 50 times with a standard gramophone. Figure 3 shows a section of the same record after it has been played 50 times with a pick-up, using a fine needle. It will be noted that there are no signs of wear.

Referring for a moment to the photograph showing the result after an ord-

The effect of this upon the life of the record and the tone of the instrument can readily be imagined. The rather clumsy diaphragm of the mechanical reproducer, reluctant to take all that there is in a record, and almost unable to reproduce it, is totally outclassed by the pick-up, which, not having the same bulk to move, can take the corners more easily and reproduce the resulting notes with greater fidelity.

The average method of holding the needle does not allow it to move properly in the groove, and instead of reaching the bottom it often wears itself along the walls of the channel. This can be seen in photograph No. 2,

Our subject this week concerns, perhaps, the most vital topic with which owners of the pick-up and electric gramophones are concerned. This short discussion is based on actual tests conducted in England in which the wear caused by both mechanical and electric reproducers are compared. The article proves that such a stigma placed upon the pick-up that it ruins records is by no means just, and that, as a matter of fact, the pick-up is remarkably light on the records, even more so than the mechanical sound box.

previously referred to. The slant of the needle throws the pick-up part of the record in contact with the upper portion of the groove walls, and so they are either broken off or worn down rapidly. Reference to figure 4 shows the effect when a fine needle is used in a vertical, or almost vertical, position. The weight of the pick-up or gramophone head rests on the bottom of the groove, the wear on which does not affect the tone of the record nor its life. In the lower portion of figure 1 we have a new needle. On the right is the same needle which has been run over a new 12-inch record which has been very carefully cleaned to eliminate any trace of grit or dust on the surface. The third example shows a similar needle which has been run over another record which has been more worn than the first one, and which has not been carefully dusted. It will be

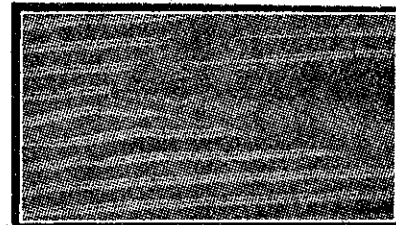


Figure 2.—A needle resting in one of the grooves. Note the comparative size. The groove shows white.

noted that the amount of dust collection and portions of the record surface which are clinging to it is very much greater than on the previous needle. These pieces of record have been collected mainly from the sides of the groove, for it is only when we come to the vertical needle or very fine needles that records are worn in the way they should.

The average gramophone always wears more on the walls, but the electrical

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