

# \*The Incandescent Lamp on Shabbat

The problem was approached solely from the point of view of an איסור דאורייתא, a Biblical interdiction, since even if it can be shown that there is no איסור דרבנני, the lighting of the incandescent bulb on Shabbat is most certainly forbidden by Rabbinic interdiction. The act of lighting the bulb on Shabbat can be assigned to one or more of three אבות מלאכה (major categories of "work"):

- a) הנקרה וכו' ("burning" and "extinguishing")
- b) מכה בפטיש ("striking with a hammer", i. e., completion of a utensil)
- c) בישול ("cooking")

In the operation of the incandescent bulb, no combustion or other chemical reaction is possible, between the filament and the nitrogen atmosphere. There is a distinction between two types of "fire":

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- a) oxidizing fire - radiation of heat and light and a chemical reaction (oxidation);
- b) non-oxidizing fire - only radiation of heat and light, no combustion.

The glowing filament of the bulb is a non-oxidizing flame. הנקרה etymologically, generally refers to the first type of fire. The Yerushalmi (פ"ו יומא ח"ה), discussing glowing embers of metal, makes a similar distinction, referring to the non-oxidizing fire as חולדה אש.

The mechanics of the bulb is most closely approximated by the act of צירוף, the tempering of metals. This act can be classified in one of the categories mentioned above.

- a) Rashi (שנה דף מ"א ע"ב) assigns tempering to מכה בפטיש. Since the filament returns to previous shape and consistency upon breaking the circuit, the operation of the incandescent bulb cannot be forbidden on account of מכה בפטיש which requires absolute change or permanent formation of a new product.
- b) Maimonides (פי"ב מהל' שנה ה"א) assigns tempering to הנקרה וכו'. The Talmud (שנה דף מ"ב ע"א) records an opinion that extinguishing of coal or wood embers is forbidden (ח"ב) while extinguishing of glowing metal embers is פטור. Rashi's explanation, to which Maimonides no doubt consents, is that a glowing piece of metal cannot be said to be "burning" since it is not consumed. (Compare Yerushalmi's treatment of חולדה אש). Maimonides records this opinion, that מכבין נחלה של מכתח בלשון הרבים but he says that if this act involved intent to temper, he is guilty on account of הנקרה וכו'. (The sole dissenting opinion in the interpretation of the Talmudic text that extinguishing of glowing metal is not forbidden is that of Rabenu Chananel, who believes the reason for the Talmud's lenience to be due to concern over פקוד נפש, danger to human

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life, in which case the actual act is essentially forbidden by the Torah).

- c) Maimonides (פ"ט מהל' שבת ה"ו) also states that melting of metal, etc., involves an איסור which can be classified under the major heading of מביטל. That is, where the act is performed with intent to temper, the act is classified as הנקרה and כבוי, but where it is performed for other purposes (i.e. for pouring into moulds) the איסור is that of מביטל. Similarly, the Talmud (שבת דף ע"ד ע"ב) forbids melting of tar on Shabbat because of מביטל. Operation of the incandescent bulb on Shabbat, with the filament glowing as a result, should thus be an act of מביטל. Rabbi Gorontchek (SINAI, Kislev, 5709 and HAPARDES, Tishri, 5710) tries to overcome this difficulty by relying totally upon the fact that מביטל must be a חולדה האור, a result of actual fire (i. e., oxidizing). However, this must be examined much more intensively, since it leads to certain far-fetched results such as, for instance, permission to cook on Shabbat, provided one uses an electric oven.

The following appears as a possible solution: We can assign a חולדה to an אב אב מלאכה even when חולדה and אב מלאכה are logically and formally dissimilar, but only involve a common intent. Thus heating tar and cooking are dissimilar, except that both involve intent to generate heat and cause a change by this heat. If, however, common intent is absent; then the חולדה becomes dissociated from the אב מלאכה and hence cannot be forbidden on the Shabbat as "work". Thus, in the instance of the filament, there is no formal similarity between it and the act of cooking and, what is more, there is not the same intent, since the object of the operator is not the generation of heat, but the radiation of light. The generation of heat is not an absolute and direct necessity for the radiation of light. (This idea can, in general, be proven by a study of Maimonides' opinion on פס"ט מורסא בשבת).

By accepting this view, the contradiction in Maimonides, raised by the Raaved (פ"ב מהל' שבת ה"ב) was solved. The

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Raaved insists that Maimonides should declare tempering a חולדה of הנקרה and כבוי even if no intent to temper exists, since he adopts the opinion of R. Yehudah that דבר שאינו מתכוון חייב פס"ק רי"ט. According to the principle mentioned above, the problem is solved, since the act of tempering and that of burning (and extinguishing), originally dissimilar, no longer share a common intent if the temperer does not intend specifically to temper, and the חולדה dissociates from the אב מלאכה in such a case.

One difficulty was pointed out in the opinion elaborated above. Although we can assume, a priori, that heating a filament and cooking food are quite dissimilar, more precise criteria are needed, in general, to determine the degree of similarity or dissimilarity between חולדה and אב מלאכה.