the other hand for the lower T_c substances the values of ω_0 are reasonable, and their variation can be ascribed to renormalization.

The predictions of the present theory are rather definite, but in order to check them direct determinations of the function $\alpha(x)$ have to be performed. This is possible, in principle, by measuring α and μ (by ARPES), using the same samples.

6. RESISTIVITY IN THE NORMAL STATE [14]

The linear temperature dependence of the normal state resistivity of high-T_c cuprates was always a puzzle for theorists, and one of the checks for the theory to be correct was this dependence. Unfortunately, people always managed to get the linear dependence in their theories based on completely different assumptions, e.g. RVB (Anderson and Zou) [27], nested Fermi surfaces (Virosztek and Ruvalds) [28], spin fluctuations (Morita et al.) [29], oxigen chains (Abrikosov and Falkovsky) [30]. Therefore such a result can neither prove nor disprove a theory. The easiest way to obtain a linear temperature dependence is an assumption that the electrons interact mainly with some optical mode having a low frequency, and the T comes from the Bose distribution $[exp(\omega_0/T) - 1]^{-1}$ at $T \gg \omega_0$. This sort of explanations is likely to be wrong because the high frequency resistivity $\sigma(\omega)^{-1}$ at $\omega \gg T$ varies linearly with ω (see e.g. ref. [32]), i.e. ω replaces T; this can happen only if $T, \omega \ll \omega_0$ - the limiting energy of quasi-particles mediating the interaction.

We are not going to make an exception and will also obtain the linear resistivity in the framework of the theory presented above. We will show that scattering of electrons from electrons at low temperatures is much larger than scattering from phonons; therefore we will consider it first (the same was true for the model of nested Fermi surfaces [28]). In the previous section we have assumed that the interaction between electrons due to exchange of phonons is stronger than the Coulomb repulsion (actually they are of the same order of magnitude). Here however the situation can be different. The matrix element of the Coulomb interaction is

$$\frac{4\pi e^2/\varepsilon_\infty}{k^2 + \varkappa^2}, \tag{40}$$

whereas the interaction via phonons is

$$g\left(\frac{\varkappa^2}{k^2 + \varkappa^2}\right)^n \frac{\omega(k)^2}{(\delta\xi)^2 - \omega(k)^2}. \tag{41}$$

In the forthcoming the integral over k will require $k \sim \varkappa$, and since $\delta\xi$ will be of the order of T, the second matrix element will be much less than the