having common vibrational levels and also from the combination differences calculated using microwave data. The agreement between the combination differences from the (2, 0) and (0, 0) bands and (0, 0) and (0, 1) bands (see Table I) confirms the correctness of our analysis. Our combination differences thus obtained are much different from Rai et al.'s indicating their analysis to be incorrect.

The constants were finally determined using usual graphical method. Our constants for the ground state agree well with the constants reported by microwave study. The constants reported by Rai et al. for the ground state differ considerably from the microwave value. Our excited state constants also differ from Rai et al.'s value. The constants thus obtained are given in Table II.

June 30, 1980.


THE DISAPPEARANCE OF CESR AND MECHANISM OF SUPERCONDUCTIVITY

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In the earlier papers we had reported our results of CESR and spin wave resonance in A-15 superconductors in the normal and superconducting states. It was concluded that the disappearance of CESR and spin wave resonance in the superconducting state was indicative of nonphononic mechanism of superconductivity. In this note we discuss this important conclusion further to point out that our model is in accord with various other findings, inexplicable in terms of the BCS theory.

We first analyse the findings of Schultz et al.'s on CESR studies of Al carried out in the normal and forced normal state. Almost immediately after Kaplan's calculations, when it became apparent that the CESR studies in the superconducting state could give an insight into the relaxation mechanism of the Cooper pairs, Schultz et al. carried out CESR studies on Al in the temperature range of 77 K to 1.4 K. It is worth pointing out that although Tc of Al is 1.2 K, the CESR observations at 1.4 K correspond to the situation where the metal is in the forced normal state as the applied magnetic field is in excess of the critical magnetic field of Al.

Figure 1 depicts our results for Nb₃Ge and those of Schultz et al. for Al at different temperatures. It is interesting to note that in the case of Nb₃Ge (Tc = 22.65 K) the CESR line has completely disappeared at 4.2 K while for Al in the forced normal state, the CESR line is markedly reduced in intensity. According to Kaplan and Asai and Swihart, if the BCS mechanism were operating, the CESR should not have vanished (for Nb₃Ge at 4.2 K) or nearly vanished (for Al at 1.4 K).

The disappearance of CESR and side absorptions in Nb₃Ge, we explained on the basis of antiferromagnetic coupling resulting in an ordered magnetic state. Both CESR and spin waves in such a state are not expected unless fluctuations are imposed by applying higher magnetic fields and microwave frequencies which would necessarily revert the material normal.

Results of Schultz et al. immediately follow the above contention. The near vanishing of CESR in the forced normal state is most likely to be the direct consequence of a phenomenon analogous to the occurrence of the spin flop region involving canting of spins due to the application of the magnetic field in antiferromagnetic materials. A small canting is

![Fig. 1. CESR spectra at various temperatures for (A) Al and (B) Nb₃Ge g-value for Al = 1.997 g-value for Nb₃Ge = 2.02]
expected to give rise to a spin polarization and thereby
one should observe a reduced resonance absorption
which would have completely vanished in the ordered
magnetic state. The near vanishing of the line
cannot at all be expected in the BCS mechanism
where forced normal state is not any different from
the normal state, as phonon-mediated coupling is
broken and the spins are completely polarized (Fig. 2).
Because of this, the question of different relaxation
mechanism does not arise. It is worth pointing out
that even in the superconducting state the relaxation
time does not change appreciably. The absence
of $s_z$ in waves in the normal state of Al is not surprising
as the exchange interactions are expected to be weak.
Moreover the thickness of the Al films is compara-
tively very larger, i.e., about 28 to 250 microns as
compared to 3000 A for Nb$_3$Ge films. larger
thickness would make the resolution of the side
bands in Al to be difficult, if not impossible.

Interestingly, both magnetic susceptibility and
NMR measurements of Al below $T_c$ is more readily
explained in terms of the collective electron antiferro-
magnetism envisaged by us and they do not straight-
away follow from the BCS mechanism. Indeed, such
a possibility of the collective electron antiferromagnetic
state in superconductor has been suggested recently
by Fradin et al. using the spin echo technique for
YRhB$_4$.

It may be stressed that presently there exists no
direct experimental support for the electron-phonon
coupling in superconductors. The quasi particle
tunneling studies, carried out in conjunction with
the inelastic neutron scattering experiments, where
$G(q) = a^2F(q)$ holds, provide no direct support,
but have to be stretched appreciably to justify the
phonon mediation. Indeed, Peter et al. have ques-
tioned the validity of the assumptions implicit in
McMillan's theory when applied to A-15 and
Chevral phases. The results pertaining to $G(q) =
a^2F(q)$, in fact, simply indicate that the phonon
energy is affected in superconducting transition, though
the former need not necessarily be the cause of
the latter. The recent work of Kim has shown that
the phonon energy can considerably be affected
by exchange enhancement in A-15s as the ion-ion
interaction is screened by conduction electrons.
A change in phonon energy therefore could be
a property of the superconducting state which might
as well result from exchange interactions. In fact
the failure of McMillan's equation has led to other
possible superconductivity mechanisms in A-15s.
The above discussion tends to reveal that the mecha-
nism in question is most likely to be through the
exchange interactions of antiferromagnetic type
between the itinerant electrons within conduction
band.

What we have discussed above is not to be confused
with the recent computations of Riedel and Witter who
discovered that if the BCS mechanism were to hold,
the ferromagnetic paramagnons would depress the
transition temperature. Such type of paramagnons
would also lower $T_c$ in our model as the ferromagnetic
polarization of itinerant electrons would necessarily
result in the breaking of the ordered antiferromagnetic
state in the conduction band.

October 24, 1980.

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SYNTHESIS OF α-BENZAMIDO-
β-(2-METHOXYNAPHTHYL)-ACRYLIC ACID

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In connection with our studies on α-β-substituted acrylic acid (I), α-benzamido-β-(2-methoxy-2-naphthyl)-acrylic acid (III) was required in quantity. Literature survey indicated that the compound was still unreported. This communication reports the synthesis of the new compound starting with 2-methoxy-1-naphthaldehyde (III) obtained from 2-methoxy-2-naphthalene by for-}

ylation using phosphorus oxychloride and dimethyl}
formamide according to the procedure of Vincent et al.2. The aldehyde was converted into 2-phenyl-
4-(2-methoxy-2-naphthalenyl)-5-oxazolone (II), which on partial hydrolysis with baryta water afforded the compound (I) the structure of which was confirmed by analytical and spectroscopic methods.

The u.v. spectrum of the compound (I) showed a high intensity band with \( \lambda_{\text{max}} \) at 225 nm and a broad low intensity band with \( \lambda_{\text{max}} \) at 342 nm indicating the presence of the chromophore \(-\text{CH} = \text{CH} - \text{CO}-\). The i.r. spectrum showed absorptions in the regions 815–650, 1275–1250, 3550–3250 cm\(^{-1}\) and at 2950, 1925, 1640, 1600, 1575, 1350 cm\(^{-1}\) revealing the presence of \(-\text{N} = \text{H}, -\text{CH}_3, -\text{C} = \text{C} - \text{COH}, \) substituted amide and \(-\text{C} = \text{C}-\) structural groupings in conformity with the structure of the compound.

The nmr spectrum displayed a three proton singlet at \( \delta 4.05 \) (\(-\text{OCH}_3\)) and a broad singlet at \( \delta 4.8 \) measuring one proton (\(-\text{N} = \text{H}\)). The vinylic proton was seen at \( \delta 8.6 \) as an ill-defined singlet measuring one proton. The aromatic protons were as a hax-
stack multiplet measuring eleven protons in the range \( \delta 7.2-8.2 \text{ ppm} \). The mass spectrum displayed molecular ion at \( m/e 347 \) (1%). The base peak was seen at \( m/e 105 \) (C\(_9\)H\(_5\)CO\(^{7+}\)). Significant ions occurred at \( m/e 77 \) (C\(_9\)H\(_{13}\)N\(^{13+}\)); at \( m/e 197 \) (M-COOH and \(-\text{C}_6\text{H}_5\text{CO}\)); at \( m/e 182 \) (M-COOH and \(-\text{C}_6\text{H}_5\text{CONH}\)) and at \( m/e 167 \) (C\(_{12}\)H\(_{11}\)O\(^{7+}\)). The compound gave positive response to Lassaigne's test for nitroge-

and reformulated the azlactone (II) on heating with acetic anhydride.

**Experimental**

All melting points were uncorrected. UV spectrum was taken on Varion Tectron u.v. vis spectrophotometer model 635. IR spectra were recorded on S.P. 1000 i.r. spectrophotometer. NMR spectra were recorded on Varian-EM-360, 60 MHz nmr spectrometer with TMS as internal reference. Mass spectrum was taken on Hitachi RMU-6E mass spectrometer.

2-Methoxy-1-naphthaldehyde (III) : β-naphthyl methyl ether (5-3 g) was treated with dimethylformamide (3 g) and phosphorus oxychloride (3-4 ml) in ice cold and anhydrous condition. The reaction mixture was then heated over a water bath for 16 hours,