indices in two η_{ik} coincide; such η_{ik} anticommute. As will be shown in the following, however, this situation cannot be ignored, since terms containing combinations of identical operators drop out on integration.

**** An equation of the form (21) was discussed in the literature[2] by analogy with the corresponding formula for a Bose field. In the present case, on account of the anticommutation of the spinors, such an analogy is not valid.

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Gas Bubble Chamber -- A Possible Recorder of the Elementary Act of Interaction of Ionizing Radiation with Matter*

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THE experimentally sucessful[1,2] attempt to record the tracks of ionizing particles in superheated liquid do not exhaust all possibilities of using the bubbles formed along the track to detect the tracks in the liquid. For example, it is possible to record the tracks of ionizing particles by using a supersaturated solution of gas in the liquid: the instantaneous supersaturation produced by the rapid decrease in gas pressure over the surface of the liquid makes the liquid with the gas dissolved in it internally unstable with respect to the formation of centers for the new phase, namely gas bubbles. The passage of the ionizing particle, causing accumulation of ion centers along the track, local heating of the liquid and break-up of the molecules will contribute to the formation of center volumes inside the liquid and convert them into gas bubbles, which produce the track image (a leading role in the initial stage of formation of the volume is played apparently by the initiating repulsion eruption) of closely located molecular complexes of equal charge, gathered by the ions produced by the ionizing particles. The dead time of the work and the diffusion inertia of the growth of the bubble in the "gas" bubble chamber, associated with the local "impoverishment" of the solution can apparently be reduced considerably by selecting the proper operating conditions and using mixture components having a higher mutual solubility (physical or chemical solution of gas in liquid).

The thermodynamic working conditions of the "gas" bubble chamber are more suitable than the thermodynamic working conditions of the "vapor" bubble chamber: "gas" operating conditions do not require that the liquid be heated to increase its vapor pressure, and the use of these conditions will apparently be advantageous for liquid with low surface tension at those temperatures for which the saturated-vapor pressure of the liquid is insufficient to break away center volumes.

The temperature diffusivity of the "gas" working conditions for the bubble chamber and the possibility of independently varying the components of the working mixture, apparently facilitate the transition to large effective working volumes and to the optimum working mixture.

If the idea of "gas" bubble chamber can be put into practice, it will contribute to the creation of a universal, stable and simple instrument for recording the elementary act of interaction of highly-penetrating radiation with matter.

* Author's own summary of a report prepared in 1953 at the Institute for Physical Chemistry of the Academy of Sciences, USSR.

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On the Problem of the Negative π-meson Decays

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1. IT is reported[1] that when photographic emulsions were exposed to slow negative π-mesons, 18 π-μ meson decays were observed among 40,000 meson track endings. Convincing arguments are cited to show that it is a question of π-meson decays and not some concomitant background event.

The observed events[1] are characterized by the presence of an appreciable energy distribution spread of μ mesons from $\pi\mu$-decays ($\delta E_\rho \approx 0.5$ Mev), which indicates the motion of π mesons at the