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Univ. California
Radiation

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EB

WW DIARY

Berkeley 1/25/37

Prof. E.O. Lawrence (Physics)

Late in the afternoon WW visits L. and his radiation laboratory. WW sees the present cyclotron in operation, L. demonstrating with a Wilson cloud apparatus the copious neutron radiation some ten to fifteen feet from the instrument, and the way this radiation is absorbed by the three foot wall of water which they use for protection. L. and WW go behind this protection and L. signals to have the beam turned on for a few moments, during which WW sees the fluorescence of the air caused by a 5,000,000 V. electron beam escaping through a thick metal plate. L. says that he can produce a very homogeneous beam, the widespread impression to the contrary being due to an unfortunate and casual remark in one of L's early papers. Crocker has given the principal funds for the new laboratory L. expects to build very soon. This will be about sixty feet by a hundred feet. One end, one story in height, will form the large high room to house a cyclotron capable of producing 25,000,000 V. neutrons (50,000,000 V. alpha particles) at from 200-400 millivolts. The other end of the building will be three stories high. The first will be physics and shops, the second for biology, and the third for medical work. Biology and medicine will have first call on the machine. Funds are not yet available for the whole building, but L. expects that C. will come across. L's brother and one major and one minor assistant are already working on biological applications. Their chief result to date consists of the discovery that neutrons are some 5.5 times as effective as x-rays on cancerous tissue, while only about 4.5 times as

effective as x-rays in their effect on ordinary tissue. This differential, while only about 30%, may prove extremely important. For there is considerable evidence that in many cases x-rays are just short of the effectiveness that would give a cure; so that a 30% advantage might well be enough to give, in many cases, a favorable balance. L. is much more interested, however, in longer range and more fundamental biological applications. A recent visitor, a very distinguished biologist, said to L. that this technique could well be as important to biology and medicine as the discovery of the microscope; for that discovery enabled scientists to see cells, while this one enables them to "see" molecules.