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### An experimental contribution to the treatment of carbon monoxide poisoning.

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Macht and Teagarden in a study concerning the effects of light on the toxicity of quinine and quinidine sulfates have found that the activity of these drugs is potentiated by exposure to ultraviolet rays. In connection with these experiments it occurred to one of the authors that such radiations might possibly influence the toxicity of carbon monoxide for animals by hastening the dissociation of carbon monoxide from the hemoglobin with which it is firmly combined. A few preliminary experiments performed on rats seemed to corroborate this supposition. It was found in a series of rats, all of which were poisoned to the same degree with carbon monoxide, that those animals which were exposed to direct sunlight recovered more quickly than other rats similarly poisoned which were kept at the same temperature in a dark place. An extensive investigation was accordingly begun on the effects of light and more particularly of ultraviolet radiations on the toxicity of carbon monoxide. Experiments were made on shed blood, on the one hand, and "clinically" on various animals such as mice, rats, rabbits and dogs on the other hand. It was found that animals which were poisoned with gas and were radiated with ultraviolet rays recovered much more quickly and completely than similar animals poisoned to the same degree and which were kept at the same temperature in the dark. Comparative studies of blood on the two conditions showed that the break-up or dissociation of carbon monoxide hemoglobin took place much more rapidly under quartz-lamp radiation than normally. In making such comparative studies the phytopharmacological method of testing for carbon monoxide hemoglobin was found to be especially convenient and useful. The radiations employed in the present experiments were obtained from the Hanovia "Alpine Sun" quartz mercury vapor lamp. It was further found that a slight accel-

eration in the degree of dissociation of carbon monoxide hemoglobin can be produced by increase of temperature. The marked break-up of the monoxide hemoglobin through ultraviolet radiation was shown, however, to be entirely independent of the heat waves, inasmuch as in all experiments the effects of radiations on animals were compared with control animals kept in a dark room at the same temperature.

Experiments have been undertaken to determine the relative value of radiations of various wave lengths obtained from the mercury vapor lamp. Furthermore, the finer mechanism of action of ultraviolet rays on carbon monoxide blood has been analyzed by physico-chemical methods by the senior author with the collaboration of Dr. Arthur Grollman of the Chemical Department of this University. The penetration of various rays through the skin and other animal tissues is also being investigated. Full data will be published in due time.

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### The effect of ultraviolet, x-ray, and radium radiations on the phytopharmacological reactions of normal blood.

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Phytopharmacological investigations by Macht and various collaborators have brought out the interesting fact that living plant tissues are often more sensitive to poisons and metabolic products of animal origin than living animal tissues are to the same substances. This was found to be especially true of normal as compared with pathological blood specimens, as, for instance, in case of menstrual blood, described by Macht and Lubin elsewhere. It occurred to the authors that possibly by the use of phytopharmacological test preparations certain changes in normal blood might be detected which are not demonstrable by the use of animal tissues or preparations. In the present investi-