privy or cesspool, and in many cases there were other sources, such as stables for horses and cows, pig sties, chicken yards, etc. When the nitrites were as high as 0.001 parts per 100,000 the water was condemned. When the nitrites ranged between 0.0003 and 0.001 parts per 100,000, the water was considered to be of suspicious quality and warning was given to boil before using for domestic purposes. In Brooklyn and Queens there are waters of known purity which show nitrites as high as 0.0003 parts per 100,000. Therefore, when nitrites amounting to 0.0003 parts per 100,000 were found, with other constituents of the water suitably low, such waters were passed as fit for domestic purposes.

It will be noticed on comparing the average figures in tables A, B and C, that nitrites decrease with ammonia, and that the figures for nitrates are about the same in each table. The average chlorin in table C is much lower than in tables A and B, while the average depths of the wells and their average distances from the sources of contamination are about the same. The nitrogen averages in table C approach those in table D. If one takes the nitrogen figures of the deep wells as a standard, the conclusion may be drawn (1) that the sandy soil of Brooklyn cannot be relied upon as a safe filter; (2) that Brooklyn soil in populous districts, so far as the author's evidence goes, seems to be nearing the saturation point with sewage; and (3) that, consequently these shallow wells are in growing danger of pollution.

44 (90). **"The influence of the external temperature upon the viscosity of the blood": RUSSELL BURTON-OPITZ.**

It was proved by a series of determinations that the viscosity of the "living" blood can be greatly influenced by changing the temperature of the surrounding medium. The viscosity was found markedly increased, if the dogs used in the experiments were immersed in water at 25° C. Warm water baths (42° C. to 45° C.) produced a corresponding decrease in the viscosity. The specific gravity of the blood was changed in a corresponding manner.

45 (91). **"The changes in the viscosity of the blood during narcosis": RUSSELL BURTON-OPITZ.**

Determinations of the viscosity of the "living" blood were made during deep and light ether and chloroform narcosis. It

was found that the viscosity is increased by deep and lessened during light narcosis. The specific gravity of the blood also shows regular variations. It is increased by deep and lessened by light ether narcosis. Chloroform, on the other hand, produces a slight decrease during deep and an increase during light narcosis. Hence the specific gravity cannot be regarded as an accurate index of the viscosity.

46 (92). **"Studies of the effects of radium on plants and animals,"** with demonstrations: Communicated by **WILLIAM J. GIES.**

The various studies of the effects of radium that are included in this communication were carried out at the writer's suggestion and under his general direction. All of them are still in progress. They were made possible by the generosity of Mr. Hugo Lieber, who gave the writer an abundant supply of radium bromid for each series of experiments. Professor William Hallock also encouraged the work by permitting the use of some of his valuable samples of radium bromid and radioactive substances. Dr. G. B. Pegram has given advice freely on physical matters connected with radioactivity. The studies included in this plan were the following (I–V):[1]

I. *"Preliminary notes on the effects of radium rays on plants":* C. STUART GAGER (New York Botanical Garden).

The radium (bromid) has been employed in several forms, and in degrees of activity ranging from 10,000 to 1,500,000. Experiments so far indicate that the effect is the same in kind, whether the plants are stimulated with gamma rays only, or with alpha and beta rays as well. When three kinds of rays are employed the effects, within the same time, seem to be increased. The results already obtained justify the following statements:

The rays of radium act as a stimulus to plants. For this stimulus there are minimum, optimum, and maximum points, depending upon the proximity of the radium to the plant, the strength, quantity, and condition of the radium salt, the time of exposure, and the nature and state of the tissue.

The early stages of seed germination are accelerated, if stimulation ranges between the minimum and optimum points, otherwise

[1] Each of the collaborators has written the report of his own share of the investigations.