an "erroneous impression as to the development of our knowledge of this problem."

In a brief report such as mine, it is obvious that an extended bibliography would have been out of place. It seemed, moreover, advisable not to make any further reference to Dr. Loeb's work because of the following facts:

(a) The mixed stocks used in his experiments were raised outside of his own laboratory and their ages were only approximately recorded, while the mice which I used have been inbred brother to sister under constant observation since 1909, the exact date of birth of each animal being recorded.

(b) Loeb's youngest class of spayed animals was three to six months old at castration; they may or may not have been bred previous to this. He makes no statement regarding this point, whereas my female mice were all castrated within the 28 to 35-day period and were virgins.

(c) In his total of 133 castrated animals, 98 were non-tumorous, while 35, or 26.3 per cent., were tumorous. These findings he considers significantly different from his 63 non-breeding animals (virgins), 44 of which were non-tumorous and 19, or 30.1 per cent., of which were tumorous. It seems that should a probable error be applied to these figures, there would be no significant difference between them. This fact is shown more conclusively if the totals for my experiment, shown below, are compared with his, mentioned above.

Virgin females, 207; Cancerous 20, or 9.6 per cent.; Non-cancerous 187.

Spayed females, 210; Cancerous 21, or 10 per cent.; Non-cancerous 189.

This provides clear evidence that his statement "prevention of breeding has some influence on the cancer incidence in mice but to a much less extent than castration" is entirely unconfirmed by experiments more than twice as extensive as were his.

(d) In that part of his experiment in which he attempted to "feminize" castrated males by implanting ovaries, he used a grand total of 19 animals, none of which developed mammary tumors.

In my experiment 210 animals were used for operation and four developed mammary tumors.[1]

This in turn provides clear evidence that his conclusion that the "transplanted ovaries are probably not able to call forth rhythmic growth changes in the mammary gland . . . and consequently cancer is not induced in such animals as the result of the experimental procedure" is totally contrary to the fact obtained in a series more than ten times as extensive as his own.

Without the positive evidence that it is possible to cause mammary tumors by transplanting ovaries to the bodies of castrated males, the statement that ovarian hormones are one of the factors in the etiology of mammary cancer seems to lack final confirmation. Such proof was not provided by Loeb's work.

In view of these facts, it still seems that it would have been better had Dr. Loeb not forced a consideration of the earlier papers to which he referred.

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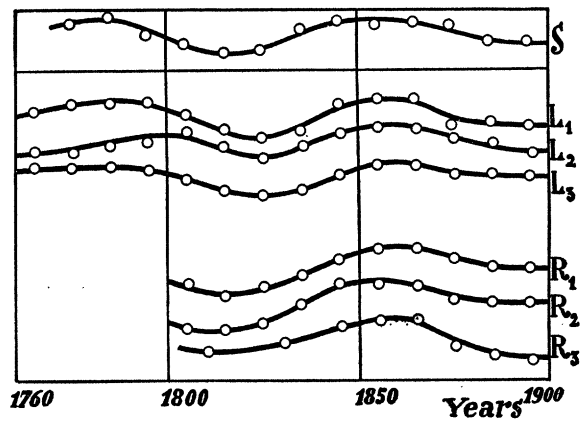
[1] Since my paper was published, seven additional males in this experiment have developed mammary tumors and many of the animals are yet alive.

ON A RELATION OF THE SUN'S ACTIVITY TO SOME BIOLOGICAL FACTORS

THE relation between the activity of the sun and different physical and biological factors on the earth can be illustrated by the following curves. The curve S gives the number of sun spots as a measure of the sun's activity (*Wolf*). Curve L_1 gives the relative



numbers of births, L_2—deaths and L_3—marriages for Leningrad and the curves R_1, R_2, R_3 give the same numbers for all the territory of Russia. In all cases there are given *means for ten years*. It would be of interest to find the same relations for other countries.

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THE SHARP RATTLING IN STEAM-PIPES

WHEN the water in a cryophorus is at a temperature somewhat above freezing, it is possible to trap bubbles of water vapor in the liquid column by holding the cryophorus horizontally. Under the proper conditions of pressure due to motion of the liquid column, the bubble of water vapor will *suddenly* condense, causing the water surfaces of the bubble to come together with a sharp click.