the cause of cancer we are dealing with two factors—(1) a predisposing cause, probably due to auxetics, which are set free by injury, X-rays, and atrophy, which are actually injected into the tissues by the commodities, and which occur in excess in the tissues generally in persons above the age of forty—the cancer age; and (2) an exciting cause, the nature of which has still to be worked out, and which supervenes on top of (1). Whatever this exciting cause is, it is responsible for the metastasis and death. It would seem that a combination of the two causes is essential, namely, that cancer is due to local manuring of the tissue; either one or other by itself appears only to cause benign tumour formation. H. C. Ross.

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DR. ROSS's letter raises the question as to whether photosensitive molecular systems of the nature of those contained in the gelatino-bromide emulsion might not be affected by auxetics and augmentors applied under suitable conditions. If such effect was found to exist, the facts he adduces would not be out of line with the view that some molecular change within the cell finds a counterpart in actions progressing in the unstable film under the stimulus of radiation or equivalent chemical influences.

The reasons set forth by Dr. Ross against the theory that soot acts mechanically appear convincing, although I cannot agree with him that this substance can be described as soft and floury. There has always been difficulty in accounting for its peculiar virulence on the mechanical theory. Some time ago I looked for the emanation of radium in soot, but found very little. If it acted like charcoal we would expect a large amount, in which case Dr. Lazarus-Barlow's views would find additional support in this direction.

I may add that some of the suggestions put forward in the lecture which was in part issued in NATURE of June 10 have been under investigation here for some time. J. JOLY.

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The Magnetic Storm of June 17 and Solar Disturbances.

As my final note on Dr. Chree's letter in NATURE of July 22 and Mr. Buss's of July 29 may I remark that, so far as I am aware, there is no rule, "One spot, one storm"? On the contrary, a disturbed area of the sun's surface may be connected with a series of successive, or intermittent disturbances, as it is carried round by the sun's rotation. When the same region reappears at the next synodical rotation, and sometimes, if it survives as an active region, for several synodical rotations, it will continue to be associated with a series of magnetic disturbances at each rotation. For instance, in 1898, January 11 to July 31, a disturbed region of the sun, which subsisted during eight rotations, was associated with not one only, but with several magnetic storms, at each successive reappearance. Nor is the selection of such a region arbitrary, when there happen to be several other disturbances at the same time on the sun. The selection is conditioned by the activity of the region, and by its position relatively to the position of the earth, when projected on the sun. So far as I am aware, mere statistical enumerations of sun-spots, or total areas of sun-spots, and their relations to magnetic storms, take no account of these important considerations.

The efficiency of a disturbed region of the sun, marked by sun-spots, is greater on the descending portion of the sun-spot curve than even at maximum. The reason of this is, because after the maximum, the mean latitude of the spots is falling towards the sun's equator, and since the heliographic latitude of the earth varies between $\pm 7^{\circ}$, the earth is placed in a more favourable position to be affected by a solar disturbance. In the twenty-five years, 1889–1913, there were seven years in which the mean daily projected or disc-area of sun-spots was greater than 1000 10^{-6} units, and eighteen years in which it was less. In the seven maximum years there was a mean of 100 disturbances a year, and a yearly mean daily disc-area of 1537·7 units. The ratio between these two numbers, or what may be termed the "efficiency ratio," is 0·065. Similarly for the eighteen years in which the mean daily disc-area was less than 1000 10^{-6} units, the mean number of disturbances was 73·7 per year, and the yearly mean daily disc-area was 378·9 units, which gives an "efficiency ratio" 0·195, three times as great as in the maximum years. Of these eighteen years, twelve were on the descending arm of the sun-spot curve. These numbers show that the position of a disturbed region of the sun relatively to the earth is more important than its size. In addition, the character of the spot has to be considered.

To apply these principles of selection to the case of the magnetic storm of June 17. Since the beginning of 1913, all the sun-spot disturbances, with insignificant exceptions, had been confined to regions above 12° on each side of the solar equator. From June 12 to June 21 an entirely new active group of spots covering a considerable area appeared on the sun's equator. The heliographic latitude of the earth was also most favourable. The first very great magnetic storm of the present solar cycle took place on June 17, preceded by a disturbance on the 16th, and followed by a disturbance on the 18th.

With regard to the 27-day period shown in the quiet magnetic days, I associated them with the whole solar hemisphere only in this sense, that, as a rule, when there is no solar spot, there is no magnetic disturbance. The proviso is added, because a region of the sun which may be free from spots may, by the presence of faculæ or flocculi, still continue to be magnetically active, after the spots have died away. In several cases the region will continue to be magnetically active, on account of the appearance of new spots near the faculæ or flocculi belonging to the former disturbance. A. L. CORTIE.

Stonyhurst College Observatory, Blackburn,
Lancs., July 23.

Science and Food-Supply.

IN connection with the proposed "Mobilisation of Science," it may be of importance for Great Britain to direct the attention of her scientific men to the possibility of increasing the food-supply produced in the country. Here she might very hopefully call upon her organic chemists for aid; by asking them to devise means for extracting nutritive material from the crops which are not now used for food.

Nearly all vegetable matter contains the nutritive elements needed. In a certain sense, for example, "all flesh is grass"; but we cannot digest vegetable matter of that kind directly; it must be put through a chemical process before it can be assimilated. The process usually adopted is to put it into the stomachs of animals, and then we eat the animals. Through the intervention of cattle and sheep we thus eat grass in the form of beef and mutton.

In a similar manner, deer and goats and many other animals which are not limited to a grass diet convert moss, and shrubs, and bark, and small branches into nutritive material for man. The wood