

adult tissues into modified reproductive or "gametoid" tissue. This, however, does not completely explain malignancy; there may possibly be in addition conjugation of cells or of nuclei. Let us hope that before long Dr. Bashford and his colleagues may give us further information on these and other points so necessary for the complete solution of the cancer problem.

The reports of the cancer research laboratories of the Middlesex Hospital<sup>1</sup> contain several papers which are, however, for the most part of purely medical interest, e.g. cancer in certain organs, and various methods of treating the disease. A report by Prof. Karl Pearson on cancer statistics collected by Messrs. Hillier and Tritsch is of considerable interest. For this the histories of 3000 cases of cancer were carefully analysed, and the results of Prof. Pearson's mathematical analysis are:—(1) as regards age incidence frequencies, that cancer is far more likely to occur in childhood in the male than in the female; (2) as regards a family history of cancer (that is, heredity in cancer), there seems to be a slight correlation between a case of cancer and a family history of cancer, but this is so slight as to be within the probable error of random sampling; and (3) that there is little or no relation between the presence of cancer and a tubercular family history, but there is a relation between the presence of cancer and the presence of tuberculosis.

The first report of the Liverpool Cancer Research Fund<sup>2</sup> has also recently been issued. This fund has been instituted by Mr. Sutton Timmis, who has vested in two trustees a sum of 10,000*l.*, which is administered by a committee empowered to spend 1000*l.* to 1500*l.* per annum until the fund is exhausted or the cause of cancer discovered. A cytolytic milk has been prepared by injecting a cow with carcinomatous material, but the cases treated with it are not yet sufficiently numerous to allow an expression of opinion as to its value. Investigations are also being made into malignant growths of man and animals by Dr. Albert Grünbaum, who has been appointed director of these researches.

Mr. Cecil H. Leaf in a booklet<sup>3</sup> discusses the clinical causes and prevention of cancer of the breast, with an analysis of 100 cases. Of the 100 cases, 84 were married and 16 single, and the author thinks that very early marriages and errors in lactation may act as exciting causes. In 35 of the cases there was a definite history of injury, and unsuitable corsets are suggested as taking some share in the production of mammary cancer. Diet, e.g. excessive meat eating, use of alcohol, and of salt, could not, as has been suggested by some, be ascribed as a cause of the disease. Finally, some suggestions are made with the view of prevention.

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#### ELECTRICAL TRANSMISSION OF PICTURES AND SCRIPT.<sup>4</sup>

THE problem of distant electrical vision is one to which much speculation and experimenting have been devoted. Before this problem can be attempted with any hope of success, however, the preliminary one of the electrical transmission of photographs over a distance has to be solved. This problem, it may be

<sup>1</sup> "Archives of the Middlesex Hospital. Vol. ii. Second Report from the Cancer Research Laboratories." Edited by Alex. G. R. Foulerton, F.R.C.S. (Macmillan and Co., Ltd., 1904.)

<sup>2</sup> "First Annual Report of the Liverpool Cancer Research (The Mrs. Sutton Timmis Memorial Fund), Albert S. Grünbaum, M.D., Director." (University Press of Liverpool, 1904.)

<sup>3</sup> "The Clinical Causes of Cancer of the Breast and its Prevention." By Cecil H. Leaf, M.A., M.B., F.R.C.S., Assistant Surgeon to the Cancer Hospital. Pp. 64. (Archibald Constable and Co., 1904.) Price 2*s.* net.

<sup>4</sup> "Elektrische Fernphotographie und Aehnliches." By Dr. Arthur Korn. Pp. 66. (Leipzig: S. Hirzel, 1904.) Price 1 mark.

stated at once, has been mastered, and it is now possible to transmit photographs in this manner, and successful results have been obtained over telegraph and telephone lines 800 kilometres long.

It does not need much consideration to see how important such a process would be for journalistic and police work if it could be industrially exploited, and it were possible simply to hand a sketch or photograph in at the telegraph office and send the same as one now sends an ordinary telegram. The evening papers would be able then to publish photographs taken at the seat of war in Korea on the same day. Unfortunately, with the apparatus at present to be had, the time taken to transmit a half-plate photograph is half an hour. The cost of the use of a telegraph line of any length for half an hour would be it is needless to point out, prohibitive. The lessening of the required time of transmission is, however, simply a matter of further development, and no good reason can be seen why in a few years' time the process should not be an adjunct to every existing telegraph line.

The author of the present work has devoted considerable time to this subject, and his booklet consists of an exact description of the apparatus and processes he has worked out. The author is to be commended on the very precise and careful way in which he has described every detail, so that it would be possible for anybody, with the help of this book, to reproduce, without any original work, the same results as he has obtained himself.

The method shortly consists of the following:—A ray of light is made to pass systematically all over the transparent film to be transmitted. After passing through the film it impinges upon a selenium cell the resistance of which varies proportionally to the amount of light which passes through the photograph. These varying currents pass through the line and are received in a moving coil galvanometer the pointer of which, in moving, inserts or takes out resistance in a high tension circuit, according as the current flowing in the moving coil changes. In the high tension circuit a small vacuum tube is connected, and it follows that the illumination of this tube is proportional to the light passing through the plate at the transmitting end of the line. This vacuum tube now passes over the sensitised photographic paper in synchronism with the ray of light over the transmitted plate, and thus a reproduction of the same is obtained. The transmitted film and sensitised paper are each wrapped on a glass cylinder. These cylinders are rotated by motors, and synchronised once each revolution. Only one wire is needed for the transmission, with, of course, an earth return.

In the case of the transmission of handwriting and half-tone illustrations, the same are got up on metal foil with electrically non-conducting ink. A conducting point then travels over the metallic foil, and closes and opens the sending circuit according as it is travelling on a marked or an unmarked place. The receiver used by the author is a modification of that described above, the essential point being the use of the vacuum tube fed with the Tesla currents. The speed reached is 500 written words per hour. For a half-tone illustration a strip  $\frac{1}{2}$  cm. wide and 10 cm. long can be sent in 100 seconds.

It would seem that there is not very much practical value in the transmission of handwriting; the type printing telegraph of to-day fulfils all ordinary requirements, and it would be only very seldom that a transmission of handwriting would be required. It is to be hoped, however, that this electrical "distant photography" will make rapid progress.

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