

(183) **Cancer in Manila.**—J. GUIDOTE and L. LOPEZ RIZAL. *Notas sobre el cancer en Manila. Rev. Filipina de Med. y Farm.*, 1927, 18, p. 167

THE authors tabulate the deaths and unstandardized death-rates from cancer and other malignant tumours in Manila and the country districts of the Philippines for the six years 1921–26 inclusive. The rate in Manila has increased, but not regularly, from 45.33 per 100,000 to 50.91. In the country districts there has been no increase, but the rates are very low, 8.30 per 100,000 in 1925, and the authors think the data may be incomplete.

The deaths in Manila are tabulated by age and sex and also by age and site (in this table the sexes are not distinguished, but patients admitted to hospital are distinguished from others). The conclusions drawn are: (1) Cancer mortality is increasing gradually in Manila. (2) The number of deaths among women is larger than that of deaths among men. (3) The maximum of age incidence on women is about the menopause, on men from 50 to 59. (4) The organs most frequently affected are the stomach, the genital organs (women) and the liver, in that order.

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(184) **Cancer in Uruguay.**—J. M. LLAMAS. *Anuario estadístico de la República Oriental del Uruguay. Pte 1ª del 'Anuario' y LXIII de las Publicaciones de la Dirección General de Estadística. Año 1925.* Montevideo, 1927.

DURING 1925, 1,197 deaths were ascribed to cancer, 653 of males and 544 of females. The proportion of deaths from cancer of all causes of deaths was 6.2 per cent. Deaths from cancer are classified by sex and site for the separate departments, and by age, sex and site for the whole republic. Cancer of the stomach and liver was the cause of 627 deaths; 39 deaths were assigned to cancer of the female breast and 88 to cancer of the female genital organs. The age distribution of all deaths from cancer was as follows:—

AGE	PERSONS
Under 15	7
15–24	16
25–34	27
35–44	119
45–54	222
55–64	304
65–74	315
75 and over	183
Unknown	4
Total	1,197

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CRITICAL REVIEW.

A REVIEW OF RECENT STATISTICAL STUDIES OF CANCER PROBLEMS.

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THE object of the following pages is briefly to review such of the papers and monographs published within recent years and utilizing mainly or wholly a numerical method as have, in the reviewer's opinion, advanced our knowledge of some aspect of the problem of malignant disease, whether by bringing to light some new element of the problem or by making it probable that some plausible hypothesis is unsound. Logically such a selection as is here attempted cannot be justified. The papers reviewed have nothing in common but a method which itself is subject to almost endless subdivision, so that any summary analysis is open to the charge of arbitrary cross-classification. It is also inevitable that a selection—both the demands of space and the limitations of the writer's knowledge imply that any review is a selection—may be coloured by the writer's individual predilections. In spite of these serious drawbacks, it is possible that a review, however incomplete and even biased, may be of some service to the general reader.

I. THE ALLEGED INCREASE OF CANCER.

By all lay writers, and a majority of medical writers, the recorded increase in the rate of mortality from cancer as a whole—a feature of

nearly all national statistics—has been accepted, if not precisely at its face value, as at least reflecting a substantial change of incidence with time. A minority of competent statisticians have dissented from this general opinion and endorsed the view of King and Newsholme that the recorded increase merely reflects improvement in the certification of causes of death. The most important recent papers dealing with this subject are those of Willcox, Stevenson (Registrar-General, 1917), Dublin and Schereschewsky. Willcox has developed the argument originally set out by King and Newsholme and has shown that the data of Frankfurt-on-Main accumulated since their paper was written are consistent with their hypothesis, viz., that the significant increase of cancer mortality is borne by the sites less accessible to examination and therefore such that diagnosis would become less difficult with improvement of medical technic. The other writers named have tended to support the commonly held opinion; Stevenson in particular has pointed out that neither in English nor American experience is it true that the increase in rate of mortality from cancer of inaccessible sites has uniformly been greater than that of accessible sites. Schereschewsky and Dublin and his co-workers, the former basing himself upon Registration data, the latter upon the material of the Metropolitan Insurance Company of America, concluded that when reasonable allowance was made for errors of record and changes in the age and sex constitution of the population a real increase of rate of mortality with time persisted. The balance of instructed opinion inclines towards the conclusion that the rate of mortality from cancer as a whole has really increased. At the same time it is recognized by those who hold that opinion that in most, perhaps all, countries the recorded changes during the last generation over-state the real change (see Wells, 1927). It is further to be remembered that the increase has affected the older age groups and is coincident with a fall in the rate of mortality from all causes together. A larger proportion of persons now live to the 'cancer age' who formerly died in earlier life, and the *quality* of these survivors may be different from that of persons in the decline of life 50 years ago. If we could show (1) that a natural and heritable predisposition to develop cancer existed, and (2) that those peculiarly liable to such development were also peculiarly liable to fall victims to the diseases of early and middle life the fatal incidence of which has notably declined (for instance, tuberculosis and several of the zymotics), an increasing liability to death from cancer at later ages would not imply any increased activity of factors, such as habits of life, industrial influences, etc., which *may* predispose to cancer. So far as laboratory experiments on animals are concerned there is convincing evidence in favour of (1) and a slight amount of evidence in its favour can be deduced from

some human material (Cockayne). Proposition (2) can neither be proved nor disproved.

In summary, it appears that there has certainly been no decrease and probably an increase of the real rate of mortality from cancer, but the records of the countries with the most highly developed systems of vital statistics indicate that this increase is slowing down.

II. THE DIFFERENCES BETWEEN RATES OF CANCER MORTALITY (WITHIN THE SAME COUNTRY).

(a) *As Affected by Sex and Civil State.*

In all countries down to very recent times, the rate of mortality from cancer was returned as being higher amongst women than men, but this is no longer universally true. There is little doubt that the factor of improved diagnosis—to which, as mentioned above, the *whole* increase of mortality has been attributed by some—is partly responsible, because cancers of the female breast and of the uterus, which form so important a part of the gross mortality from cancer of women, are relatively easy to diagnose, so that a smaller proportion of missed cases occurred in the past amongst cancers of females than of males. It was shown some years ago by Stevenson (Stevenson, 1913) that the fatal incidence of cancer of the female breast and ovary is relatively greater upon unmarried than upon married women and that the opposite conclusion holds with respect to cancer of the cervix uteri, so that changes in natality may have played a part. The statistical studies carried out at the instance of the League of Nations Health Committee and the monographs prepared by Lane-Clayton for the British Ministry of Health have confirmed the earlier conclusions as to the differential mortality by civil state. In addition, clinical-statistical studies (Deelman, 1920 and 1921; Peller; Kaufmann) have made it probable that the greater liability of married women to fatal uterine cancer depends upon injury to the cervix sustained at the *first* labour, that the distinction is between women who have borne children (or suffered a miscarriage) and those who have not. It does not appear that with an increase in the number of children born after the first there is an increase in the risk of uterine cancer. This conclusion may be of practical importance. It has long been believed, probably rightly believed, that non-specific irritation is a factor in the production of cancer, i.e., that if certain tissues or organs of the body are subjected to injury, or long-continued irritation, perhaps of a trivial character, it is more likely that a malignant growth will develop in the injured or irritated tissue than elsewhere (such irritation is of course to be carefully distinguished from the specific irritation resulting from the application of particular substances, e.g.,

coal-tar derivatives). It is possible that injury of the cervix uteri sustained in the process of childbirth, perhaps followed by infection, acts in this way; hence it may be that improved management of the puerperium, due to a higher general standard of midwifery, will be a factor of importance in reducing the incidence of cancer of the neck of the uterus, even a more important factor than the reduction of births associated with the general decline of the birth-rate.

With respect to the greater relative incidence of cancer of the breast upon the unmarried, the question has been studied whether here the factor of importance is the failure of the breast to pass through the normal cycle of changes associated with pregnancy. Lane-Clayton's work suggests that this is the explanation. She compared the histories of two samples of married women, one of women who had had cancer of the breast, the other of women who had not. When proper allowance was made for age and duration of marriage it appeared that the women who developed cancer were (of course independently of the fact of having cancer, i.e., allowing for duration of marriage *before* cancer developed) less fertile than the control sample. It seems probable therefore that the non-specific factor involved is the *absence* of a normal stimulus, i.e., that the case is to some extent in accordance with an old theory that malignant disease is prone to develop in obsolescent or non-functional organs. It need hardly be stated that this is only *one* of many factors and certainly not the most important; only a very small proportion of virgins do in fact develop cancer of the breast.

(b) *As Affected by Occupation.*

A large amount of work coming under this heading has been done (Stevenson, 1923; Registrar-General, 1928; Young, 1926; Young and others, 1926). Apart from particular instances of great intrinsic interest but limited scope, such as mule-spinners' cancer (Report of Departmental Committee, 1926; Southam), much progress has been made in the analysis of occupational data. English official statistics of occupational mortality have been considerably improved between the last two enumerations, those of 1910-12 and 1921-23. Not only were the classifications themselves more truly occupational and less industrial (that is to say, with respect to what the enumerated person actually did rather than with respect to the branch of industry in which he served), but the grouping together of occupations to form homogeneous social classes was improved. The result has been that while in the data for 1910-12 cancer mortality did not show regular increase from social class to class as one descended the scale, the fourth class having actually a lower mortality than the st—the fifth class, unskilled labourers, had, however, much the

highest mortality (see Stevenson, 1923)—the recently analysed figures show a more regular increase from the highest to the lowest social grading. Now the socially most prosperous class has the lowest rate of mortality from cancer. It has further been found that when this social distribution was tested for different sites of cancer, differentiation proved to be confined to certain sites accounting in all for about half the total mortality. As there is no significant social variation for the other moiety of the deaths it is naturally much more pronounced for the sites to which it does apply than for cancer as a whole. These sites include the alimentary tract from mouth to stomach inclusive, the skin, and the larynx. The suggestion is that the disadvantage of the poor is exposure to some irritant, or irritants, the action of which does not reach the internal organs of the body and cannot pass down the digestive tract below the stomach. It is unfortunate that, so far, occupational studies on a large scale should have been mainly confined to men, so that we have no similar study of the social incidence of cancers of the female breast and uterus. It is still more unfortunate that at present few countries compile and analyse occupational mortality statistics upon an adequate scale. It is perhaps not making an extravagant claim on behalf of our own country to say that the occupational mortality records of England and Wales are still the best available.

(c) *As Affected by Race.*

From very early times it has been believed that the incidence of different diseases upon persons of different physical type or race is uneven—for instance, that negroes are more susceptible than whites to smallpox. Some of the instances can perhaps be explained by lack of either selection or natural immunization; the disease to which an undue susceptibility is manifested might be one to which the susceptible race had been little exposed. This explanation could, however, hardly cover all diseases, and certainly not cancer. There is, however, the difficulty that the general habits of life and the physical and economic environments of different races are not the same. It would seem therefore necessary to compare the incidence of cancer upon different racial types within the same country and subject to a fairly uniform environment. Such a study has been undertaken by Niceforo and Pittard, whose monograph summarizes all the available information. The result is to leave the question still open, because, partly owing to incomplete anthropological data, partly owing to the unsatisfactory nature of the medical-statistical information, it was not found possible to prove that regions inhabited mainly by particular racial types were in fact subject to specially low (or high) rates of cancer mortality. Further progress here requires the collection of

more exact and ample data and must depend upon national or international organization.

(d) *As Affected by Locality.*

It has long been recognized that even within the same country and when proper allowance is made for differences of age, sex and occupational constitution of the local populations, the rates of mortality from cancer are not identical. Statistical efforts to explain these residual divergences have generally followed either the line of relating the mortalities to geological or climatological variations (e.g., Young, 1925) or of bringing the cancer mortalities into relation with some other index of a pathological state (e.g., Stocks and Karn's recent work on the correlation between mortality from cancer and the prevalence of goitre, and the earlier work of Maynard, Greenwood and Wood, and Claremont on the statistical association between diabetes and cancer). In spite of the suggestiveness of some of the work, particularly that of Stocks and Karn, it cannot be said that any very definite conclusions have yet emerged. Deelman's (Deelman, 1918) careful study of the contrasting mortalities from cancer of the two Dutch provinces Friesland and Limburg (in 1915 the rates of mortality per 10,000 were 8.30 in Limburg and 14.40 in Friesland) shows how difficult it is to reach conclusions and, notwithstanding the great advances in statistical technic of the last 30 years, it may be doubted whether the statistical method alone can solve the problem. The number of *possibly* relevant factors is so great that an exhaustive analysis is impracticable and the statistician must choose for study those which, in the light of other knowledge, seem likely to be relevant and important. This means, of course, that he must either, independently of his statistical acumen, have a deep insight into the etiological position, or must consent to act as the verifier of the notions of others having, or claiming, that insight. Mere roving statistical enquiries are not likely to lead to valuable conclusions.

Work has also been done in contrasting rates of mortality of smaller units of topographical division, villages, streets of villages or even houses. With regard to the last mentioned unit, which gives rise to the problem of so-called Cancer Houses, Pearson some years ago concluded that the distribution of deaths in houses was not random, but neither in the data handled by him nor in more recently compiled statistics was it possible to make allowance for variations in the numbers and *age constitutions* of the inmates, so that the meaning of the apparent bias of the distribution could not be ascertained. We do not know whether certain houses have an apparently undue proportion of deaths from cancer because there is some peculiarity in the houses themselves or because these chanced to be houses occupied

by an abnormal proportion of persons living at the cancer ages. A similar lack of relevant information invalidates, in the writer's opinion, the conclusions drawn by Sambon from his studies of the local incidence of cancer in Italy and elsewhere.

(e) *As Affected by the Habits of Life of Different Classes other than the strictly Occupational Habits.*

This subdivision necessarily overlaps (b) *supra* because, to take the most frequently discussed example, it is (statistically) very difficult to find groups of people *within the same country* whose habits of eating and drinking are different but whose occupations are the same, while if we compare groups from different countries, racial and climatological contrasts (not to speak of differences of accuracy of statistical systems) are introduced. The only recent enquiry which *strictly** falls within the present section is the work of Copeman and Greenwood on the cancer mortality of Catholic Religious Orders, particularly the Cistercians. It had been stated, on quite reasonable *prima facie* evidence, that the mortality from cancer amongst members of religious orders the rules of which prescribed abstinence from meat was extraordinarily low. Copeman and Greenwood, who had access to a wide range of data, were able to show that in the English Houses cancer undoubtedly occurred and that, taking account of the low general rate of mortality in many of them, there was no indication that the position of cancer relatively to that of other causes of death was in any way exceptional. When the enquiry was extended to cover Cistercian Houses in other countries it was found that the necessary statistical data for drawing conclusions did not exist. This enquiry did not, therefore, confirm the belief that a meat diet predisposes to cancer.

III. DIFFERENCES BETWEEN THE RATES OF MORTALITY OF DIFFERENT COUNTRIES.

(a) *The Comparison of Countries of similar Statistical and Economic Status.*

Having regard to the remarks made above, it need not be reiterated that comparisons of data compiled on different systems, e.g., when there is much variation between the proportions of deaths medically certified or between the rules of classification, are worthless. But even when the material and statistical accuracy of the data are the same, great divergences exist, as, for example, between the rates of mortality from cancer of the female breast and the uterus in the three countries, England and Wales, the Netherlands, and Italy. The

* The Official Analysis by Occupations (Registrar-General, 1928) brings out the low cancer mortality sustained by clergy in general.

reason for this divergence has been the object of a prolonged international enquiry carried out under the auspices of the Health Section of the League of Nations by representatives of the three countries. This investigation has thrown much light on related topics but has failed to explain the fundamental differences. Here, too, it does not seem that by means of purely statistical investigation the problem can be solved. Should it, however, be ultimately proved that similar divergences exist between the nationals of the three states domiciled in America—some preliminary results point in that direction—a further advance may be possible.

(b) *The Contrasting of 'Civilized' and 'Native' Races.*

Here, of course, any exact statistical comparison is impossible. A good deal of recent work has, however, been done on the relative frequency of malignant disease in native races, mostly on the basis of counts of hospital in-patients (Butcher, Hoffman, Macvicar, Pitsford, Pridie, Guazon, Mouchet and Gerard, des Ligneris, Surmont and Sava, Lalung-Bonnaire and Bablet, Bablet, Vedder, Megaw and Gupta).

The general result is that qualitatively all forms of malignant disease seen in civilized countries occur in native races, but that the proportional frequencies of different varieties are different. The necessary imperfections of the data make it impossible, at present, to relate these divergences from European experience to difference of habits of life or of race, with one or two numerically unimportant exceptions. A careful enquiry made by Hoffman respecting the incidence of cancer upon Red Indians, while suggesting that the incidence was low, failed to establish any definite association between either the consumption of meat or the prevalence of constipation and the cancer mortalities of different tribes. In the opinion of the reviewer, the data at present available are altogether insufficient to form the basis of any induction.

IV. SURGICAL STATISTICS OF CANCER.

The statistical researches described in the previous sections have been directed to the study of the etiology of cancer; those now to be dealt with had a humbler but more directly utilitarian object. Surgical treatment of some forms of malignant disease, having for its object complete removal of the original growth and its extensions, has now been practised for many years, but opinions as to its success have been by no means unanimous. It has not until quite recently been possible to give adequately supported answers to such questions as, (1) What is the average length of life of persons suffering from various forms of malignant disease who are not treated by any method designed to remove the disease? (2) What is the advantage, measured in terms

of increased average length of life, of surgical treatment adopted at different stages of the disease? (3) What are the comparative advantages of the knife and radiological treatment in different forms and at different stages of cancer? (4) What is the proportion of victims of cancer who receive early treatment and how may that proportion be increased?

A satisfactory statistical answer to the first question has been rendered possible by the work of Lazarus-Barlow and Leeming, Wyard, and others, whose data are statistically analysed in a report by Greenwood. This material provides a rough norm or standard by means of which the advantage of different methods of treatment can be gauged. The results of treatment with respect to two important sites, the uterus and female breast, have been elaborately analysed by Janet Lane-Clayton, who has not only made a complete study of the surgical literature of the subject but has had access to the data of the hospitals of a number of English cities. A paper by Greenwood and Lane-Clayton (1927) contains a non-technical summary of these results which prove that, for these sites, the radical surgical treatment of cancer is a much more hopeful procedure than generally realized. A somewhat similar analysis of the literature dealing with malignant disease of the rectum has been prepared by Darbyshire. So far as the sites named are concerned the first two questions enumerated above can now be fully answered. There is little doubt that early radical operation in cancer of the breast means an average prolongation of life of more than ten years, and it is probable that in cancer of the uterus the results are little less favourable (Lane-Clayton, Stewart and Young). With respect to the third question, there is satisfactory evidence of a clinical-statistical character that radiological treatment can compete favourably with treatment by the knife of cancer of the neck of the uterus, and reason to suppose that in this country sufficient advantage is not yet taken of the means offered by modern research in this field. With regard to the fourth question, it has been proved that not only in this country but also in Holland and Italy the proportion of patients who present themselves for treatment only when the disease has advanced beyond the reach of surgical art is very large. How this proportion can be reduced is of course not a problem for the statistician. The group of investigations just described marks a new era in the analysis and interpretation of surgical data. For the first time reasonably precise methods of statistical analysis have been applied to large bodies of data and reliable averages have been computed. In the course of this work—for instance, in the comparison by Lane-Clayton of the antecedents of cancer patients and controls—some indirect light has been thrown upon etiology, but the principal object has been the impartial assessment of clinical results, and there

can be no doubt that the introduction of these methods will raise the general level of discussion of rival methods of treatment.

CONCLUSION.

It will be obvious that none of the investigations above briefly described has, taken by itself, essentially changed our scale of values, none has shown that characteristic of the highest class of scientific work. But the cumulative effect of these laborious studies, on the positive side in increasing the precision of our description of the incidence and distribution of fatal cancer, on the negative side in showing the insubstantial character of many popular 'theories' and superstitions, has been appreciable. No man dares set limits to the achievements of genius; it might be that a man of the highest order of ability—one who was not only an expert statistician but also master of the very large body of experimental and pathological knowledge relevant to the issue—could, even from the existing imperfect data, deduce conclusions of far-reaching importance. Such men, however, are rare and no man of genius has yet turned his attention to this branch of the subject, which in the public mind tends to be associated with the facile generalizations of journalists and other enthusiastic but uncritical amateurs rather than with serious research. It is probable that by the gradual improvement in accuracy and completeness of the medical statistics of all nations we can best prepare the way for a really illuminating survey of the cancer problem. One of the advantages of the awakening of public interest in this matter is that in almost all countries—as the abstracts in this REVIEW testify—there are signs of improvement in the official records. It cannot, however, be said that at present much more can be hoped from the statistical method than an impartial study of strictly defined problems. The time is still distant when the data of all civilized countries and all subdivisions of these countries will be strictly comparable.

REFERENCES.

- BABLET, J.—*Ann. de l'Institut Pasteur*, 1926, 40, p. 922.
 BUTCHER, J. W.—*New Zealand Official Year Book*, 1926.
 CLAREMONT, C. A.—*Biometrika*, 1915-17, 11, p. 191.
 COCKRAYNE, E. A.—*Cancer Review*, 1927, 2, pp. 337-347.
 COPEMAN, S. M., and GREENWOOD, M.—*Reports on Public Health and Medical Subjects*, No. 36. Stationery Office, 1926.
 DARBYSHERE, F. J.—*Reports on Public Health and Medical Subjects*, No. 46. Stationery Office, 1928.
 DEELMAN, H. T.—*Geneeskundige Bladen*, 1918, 20, No. 12. *Nederl. Tijds. v. Geneeskunde*, 1920 (2), No. 10. *Ibid.*, 1921 (2), No. 26.
 Departmental Committee on Epitheliomatous Ulceration among Mule Spinners, *Report of*. Stationery Office, 1926.
 DUBLIN, L. I., KÖPF, W., and VAN BUREN, G. H.—*Cancer Mortality among Insured Wage Earners and their Families*. (Metrop. Life Ass. Comp.), New York, 1925.
 GREENWOOD, M., and WOOD, F.—*Jour. of Hygiene*, 1914, 14, p. 83.
 GREENWOOD, M.—*Reports on Public Health and Medical Subjects* No. 83. Stationery Office, 1926.
 GREENWOOD, M., and LANE-CLAYTON, J.—*Proc. Roy. Soc. Med. (Section of Epidemiology and State Medicine)*, 1927, 20, p. 23.

- GUAZON, P. C.—*Jour. Philip. Islands Med. Assoc.*, 1925, 5, pp. 157-161 and 184-186.
 HEYMAN, J.—*Acta Radiologica*, 1927, 8, p. 363.
 HOFFMAN, F. L.—*Cancer in Native Races*. Prudential Press, Newark, N.J., 1926.
 San Francisco Cancer Survey. *Third Preliminary Report*. Prudential Press, Newark, N.J., 1926. *Cancer in Mexico*. Prudential Press, Newark, N.J., 1927.
 KAUFMANN, F.—*Zentralbl. f. Gynäkol.*, 1926, 50, p. 198.
 KING, G., and NEWSHOLME, A.—*Proc. Roy. Soc.*, 1893, 54, p. 209.
 LAUNG-BONNAIRE and BABLET, J.—*Trans. 6th Biennial Congress of Far Eastern Assoc. Trop. Med.*, Tokyo, 1925, p. 955.
 LANE-CLAYTON, J.—*Reports on Public Health and Medical Subjects* No. 28. Stationery Office, 1924. *Ibid.*, No. 32. Stationery Office, 1926. *Ibid.*, No. 34. Stationery Office, 1926. *Ibid.*, No. 40. Stationery Office, 1927.
 LAZARUS-BARLOW, W. S., and LEEMING, J. H.—*Brit. Med. Jour.*, Aug. 16, 1924, p. 266.
 LEAGUE OF NATIONS HEALTH ORGANIZATION.—*Report on the Results of Demographic Investigations in Certain Selected Countries (Cancer)*; pp. 168. *Report on the Results of Certain Clinical Inquiries relating to Differences of Cancer Mortality in Certain Selected Countries*; pp. 39, Geneva, 1925.
 LIGNERIS, M. J. A. DES.—*Jour. Med. Assoc. of South Africa*, 1927, 1, p. 102.
 MACVICAR, N.—*South African Med. Record*, 1925, 28, p. 315.
 MAYNARD, G. D.—*Biometrika*, 1909, 7, p. 278.
 MEGAW, J. W. D., and GUPTA, J. C.—*Indian Medical Gazette*, 1927, 62, p. 299.
 MOUCRET, R., and GERARD, P.—*Bull. de la Soc. de Pathol. Exot.*, 1926, 19, p. 564.
 NICEFORO, A.—*Le Assicurazioni Sociali*, 1927, Anno 3, Gennaio-Febbraio, N.I.
 NICEFORO, A., and PITTARD, E.—*Considérations sur les Rapports présumés entre le Cancer et la Race*, Geneva, 1926. (League of Nations.)
 PEARSON, KARL.—*Biometrika*, 1911-12, 8, p. 430. *Ibid.*, 1913, 9, p. 28.
 PELLER, S.—*Arch. f. Gynäkol.*, 1928, 118, p. 59.
 PITSFORD, W. W.—*Med. Jour. South Africa*, 1925, 20, p. 237.
 PRIDIE, E. D.—*Brit. Med. Jour.*, 1925, 2, p. 649.
 REGISTRAR-GENERAL.—*Decennial Supplement, 1921 (Part II, Occupational Mortality, Fertility and Infantile Mortality)*. Stationery Office, 1928.
 SAMSON, L. W.—*Jour. Trop. Med. and Hygiene*, Feb. 2, 1920.
 SCHERSCHESKY, J. W.—*U.S. Public Health Bulletin* No. 155, Washington, 1925.
 SOUTHAM, A.—*Brit. Med. Jour.*, 1927, 1, p. 366.
 STEVENSON, T. H. C.—*Annual Report of the Registrar-General for 1913. Ibid.*, 1917. *Biometrika*, 1923, 15, p. 382.
 STEWART, C., and YOUNG, M.—*Lancet*, 1926, 2, p. 1258.
 STOCKS, P., and KARN, M. N.—*Annals of Eugenics*, 1927, 2, p. 395.
 SURMONT and SAVA.—*Bull. de l'Assoc. franç. pour l'Etude du Cancer*, 1927, 16, p. 136.
 VEDDER, E.—*Jour. Amer. Med. Assoc.*, 1927, 88, p. 1627.
 WELLS, H. G.—*Jour. Amer. Med. Assoc.*, 1927, 88, pp. 399-403 and 476-482.
 WELLCOX, W. F.—*Pub. American Stat. Assoc.*, 1916-17, 15, p. 702.
 WYARD, S.—*Brit. Med. Jour.*, 1925, 1, p. 206.
 YOUNG, M.—*Jour. of Hygiene*, 1925, 24, p. 403. *Glasgow Med. Jour.*, 1926, 23, p. 203. *Jour. of Hygiene*, 1926, 25, p. 209.
 YOUNG, M., RUSSELL, W. T., BROWNLEE, J., and COLLIS, E. L.—*Medical Research Council Special Report Series* No. 99. Stationery Office, 1926.

EDITORIAL NOTE.

The function of the macrophages in the growth of a rat sarcoma.—
 A. CARREL.

In a paper published in the *Comptes rend. Soc. de Biol.*, 1927, 97, pp. 17-21, and abstracted in this REVIEW (1927, 2, p. 407), Dr. Carrel stated that a culture of malignant fibroblasts from a rat sarcoma when inoculated into foxes produces rapidly growing tumours.

In abstracting the paper attention was drawn to this statement and it was suggested that it might be due to a misprint.

Dr. Carrel has sent information by letter that our supposition was correct and that the statement was due to a typographical error in his manuscript. The statement should therefore be that the cultures of malignant fibroblasts from a rat sarcoma when inoculated into rats give rise to tumours.