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DRINK MORE MILK **MILK FOR HEALTH** **MILK MADE THE DIFFERENCE**

BUTTER WATERCRESS NO EXTRAS MILK CASEIN MARGARINE SUGAR

ISSUED BY THE NATIONAL MILK PUBLICITY COUNCIL

To illustrate the Medical Research Council's Report on the Diets for Boys during School Age.

These figures represent groups of boys who were given an ordinary diet for a year. At the end of that period six groups were given the extras as shown. The average annual gain in weight and height of boys given a pint of milk daily was 6.98 lbs. and 2.63 ins. respectively, whilst the boys given no extras gained only 3.85 lbs. and increased in height only 1.84 ins.

1. The subject

▪ Introduction

Outbreaks, Epidemics and Disease is a proposal for a primary source collection on disease and epidemic in the history of Medicine field. Covering topics from early modern epidemics, and diseases of the world wars, to foreign correspondent on tropical diseases and medical research, The National Archives holds a great wealth of material examining the different fields of impact on British medical history. This could therefore be an important resource enabling investigations into “the ways in which studying disease control and therapeutics in multiple contexts casts a critical light on the functioning of societies and governments” (John Hopkins School of Medicine)

“Already in these first two decades of the 21st century, the world has been sharply reminded time after time of the degree to which people in all countries and on all continents remain chronically vulnerable to infectious diseases, known and unknown” – WHO, 2018

From outbreaks of the plague and smallpox, to more recent epidemics of Covid-19, and Ebola, Humanity and Diseases share a long and eventful history - and whilst some diseases do stem back to the Neolithic period, research suggests that we are becoming increasingly more exposed to them, current and new, as time progresses. With the current state of global health crises, and the rising amount of epidemics, the study of disease and treatments are also, in turn, becoming increasingly popular.

This proposed collection will illustrate the change in diseases, reactions, treatments and medicine throughout time. Covering events and cases from the 19th and 20th century in particular, this proposal will also aim to include an examination of the economic effects of disease, controversy of treatments and the complexity of political medical action.

▪ Nature and Scope

Encompassing a period of the early 19th Century to late 20th Century, these four series cover a wide range of material available, from the public health and sanitation to medical research reports and controversies.

Whilst these series only cover a short timeframe in comparison to the larger timescale of British medical history as a whole, this selection was highlighted due to its popular consideration to be the era where medical discoveries, research and marvels were at its peak.

In order to understand the value of the selected material, it may be useful to see how this can be mapped out against a brief review of the history of disease in the 19th and 20th Century.

It must be noted that the following does not serve as an exhaustive history of the two centuries, but instead a condensed reference aid to provide an introduction into what the selected series offers.

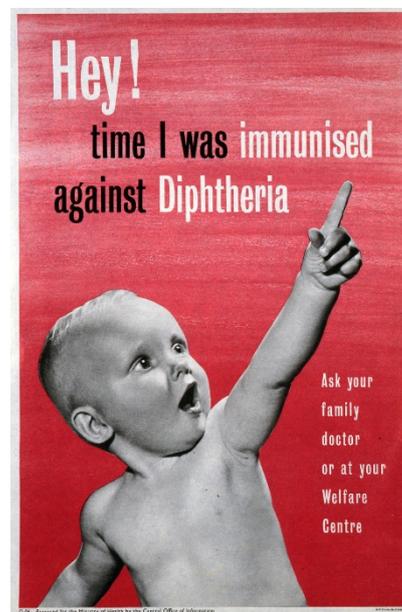
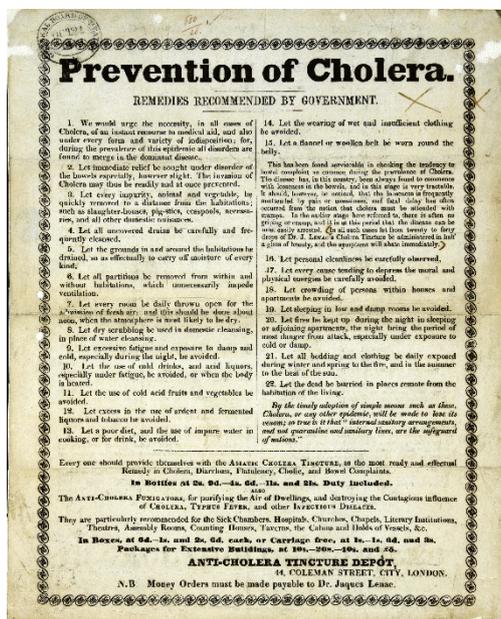
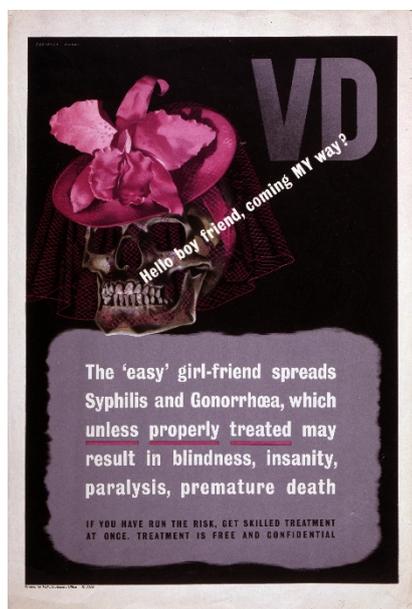
19th Century

- Disease in the 19th Century included long-standing epidemic threats such as smallpox, typhus, yellow fever, and the most notable of the group, Cholera. The world faced 6 pandemics of cholera in the 19th Century, the first three of which, had a significant impact on Britain.
 - In 1817, we saw the first cholera pandemic, which began Bengal, India. During the pandemic, deaths hit the hundreds of thousands for Indians, with also an additional 10,000 deaths of British troops, by 1826.
 - *See FD 1/384: Cholera in India: epidemic reports*
 - Despite the quarantine measures taken to prevent its arrival, Britain had to deal with the disease again, when England's first cholera incident occurs in Sunderland, 1831 during the second pandemic. This round of Cholera led to 32,000 deaths nationwide, with a further 23,000 lives, during the third cholera pandemic
 - Although little was done initially, the third pandemic spurred a greater effort to reassess sanitation and public health, and partly resulted in the Public Health act of 1846.
 - *See MH 48: Local Government Board, and Ministry of Health, Health Divisions: Public Health and Poor Law Services, Local Authority Correspondence*
 - Medical views towards disease in the 19th Century was undergoing a change. Following from the resurgence of Hippocratic ideas and the influence of 'Airs, Waters and Places' in the 1700's, the 19th Century started to see a shift from theories such as miasma and contagion, and the change of focus to Germ theory – as in the case of John Snow and The 1854 Broad street Cholera outbreak
- Other heavily impactful diseases include typhus (Irish Fever), yellow fever and the third plague epidemics, which had a significant bearing on European empires and trade. Efforts were made to control the outbreak in foreign territories, such as Gibraltar, the US, China and India:
 - *See MH 98/24 Confidential Correspondence concerning foreign epidemics of the plague and quarantine.*
- In addition to cholera, Tuberculosis can also be seen to share centre stage. Identified as a single disease in the 1820's TB became common among the urban poor, causing widespread public concern:
 - The MH 48 series is full of reports relating to tuberculosis, specialty hospital and treatment centres largely concerned with the disease.
 - *See MH 48/263: Use of Hemlington Smallpox Hospital for treatment of Tuberculosis patients*

20th Century

- Unlike the previous century, the medical advances of the 1900's meant worldwide pandemics a lot less common. However, this did not exempt the 20th century from frequent outbreaks, often originating from foreign countries.
- Faced with two world wars, the 20th century saw an increase in diseases such as influenza, tuberculosis, measles and many more – including a growing number of cases in war-related diseases, such as trench foot and shell-shock.
 - See MH 106: *MEDICAL SHEETS 1914-1915 (subseries Disease)*
 - See FD 1/142 *Malnutrition in Post-countries: Research and reports of visits to Belsen concentration camp*
 - See FD4/12: *The classification and study of the anaerobic bacteria of war wounds.*
- In addition to the global effects of the war, the 20th Century, the global effects of foreign diseases and outbreaks also had tragic effects worldwide. Britain became a lot more active in its global concern for foreign public health, with foreign aid and research experiments into tropical diseases becoming a lot more frequent and better documented.
- Some of the most notable research cases include:
 - Dr. Lucy Will's work on anaemia and folic acid (see FD 1/3501 *Research on Anaemia in pregnancy*)
 - Schistosomiasis in Egypt (see FD1/271-274: *Bilharzia Research Unit: Work in Egypt*)
 - The George De La Warr diagnostic camera (see FD1/54: *Dalawarr Laboratories: controversy*)
- Venereal diseases were also common throughout the 20th century, with diseases such as syphilis drawing particular attention in the early 1900's. Until the development of the drug *Salvarsan* in the early 1900s, the treatment of choice for several centuries was mercury, which had distressing side effects and limited effectiveness.
 - See FD 1/47-50: *Salvarsan Committee: report on Professor H Turnbull's and Dr (later Professor) D Russell's research*
- During the WWI there were nearly half a million hospital admissions for VD among British troops alone, whilst WWII saw preventative efforts intensify through films, lectures, posters, and leaflets.
 - See MH 48/66: *Venereal Diseases Scheme.*
- Medical practices, such as mass vaccinations, blood transfusions and the availability of a wider range of drugs, became more commonplace, with further investigations into disease led to a wider understanding of human science and at both the anatomy and environmental level.

- See FD 4/106: Small-pox and climate in India: forecasting of epidemics.
 - See FD 4/9: The use of atropine as a diagnostic agent in typhoid infections.
- See MH 48/502: Vaccination.



2. The documents

The following documents are the subject of this opportunity. Further detail including photos is given in the Annex. TNA invites partners to propose plans for digitisation.

Record Series:	Pieces:
MH 48	1 - 523 (selection is dependent on the publisher's choice)
MH 98	1 - 25
FD 1	1 - 9175 (selection dependent on the publisher's choice)
FD 4	1 - 310 (selection dependent on the publisher's choice)
TOTAL	TBC

3. The market

The History of Medicine is a strong interest in both the medicine field and History field. As mentioned above, the topic of disease and epidemic is one of growing interest, as the commonality of disease and epidemics increases through time.

Almost all medical courses will have an aspect of data analysis and review, which will include data of historical treatments and reviews of historical reports. Therefore, the value of the material will be essential to such courses. However, in addition to this knowledge, further module/course-specific examples are as followed:

UK & Europe	
Oxford - History of Science, Medicine and Technology (MSc/MPhil)	Key themes include; <i>'Disease, Medicine, and Imperialism', 'Imperial Networks and Knowledge', 'Hot Climates and Tropical Medicine'</i> Modules include; <i>'From Colonial Medicine to Global Health', 'Public economy of Health and Medicine in Africa', 'Medicine and Modern Warfare'</i>
Leeds - History of Health and Medicine (MA)	Modules include; <i>'Medicine and Warfare in the Nineteenth Century and Twentieth Century', 'Sexuality and Disease in Africa', 'Women, Gender and Sexuality: Archives and Approaches'</i>
Birmingham - History of Medicine (BMedSc/ Intercalated degree)	Modules include; <i>'Research Methodologies in the History of Medicine', 'Medicine and Society, 1750-1950', 'History of Occupational Health and Medicine', 'The History of Medical Institutions, 1700-1950', 'The History of Medical Specialisation, 1700-1950'</i>
King's College - Global Health and Social Medicine Research (Mphil/ Phd)	Research areas include; 'Political economy, sociology and history of pharmaceutical regulation' , <i>'Movements for 'people's health' in developing countries' 'socio-political and cultural dimensions of global health research, policy and innovation in developing countries, including disease control interventions such as outbreak response and preparedness'</i>
Heidelberg - Medicine	<i>Research at the Faculty focusses in particular on infectious diseases, cardiovascular research, neurology, translational and individualised oncology, transplantation and individualised immunotherapy.</i>
Erasmus University, Rotterdam – Health Economics	<i>"This course examines the links between health, health spending and economic welfare at the individual and at the societal level. E.g. the linkages between health and economic</i>

	<i>development, in particular, in the context of developing countries</i>
USA	
Yale - Epidemics in Western Society Since 1600	Leading themes include: infectious disease and its impact on society; the development of public health measures; the role of medical ethics; the genre of plague literature; the social reactions of mass hysteria and violence; the rise of the germ theory of disease; the development of tropical medicine; a comparison of the social, cultural, and historical impact of major infectious diseases ; and the issue of emerging and re-emerging diseases.
John Hopkin's School of Medicine - Social and Cultural Histories of Diseases	Course objectives include: <i>'Main features of the history of a range of infectious and non-infectious diseases.'</i> , <i>'Understand cultural, social, and scientific factors influence and defined disease in the past, and continue to do so'</i> , <i>'Evaluate different methodological approaches to studying the history of disease'</i>
American University of Beirut – Health Economics	<i>The course further addresses economic concepts of efficiency and inefficiency highlighting examples from developing countries. The course also explores concepts on financing a health system, exploring solutions and future challenges in health care costs</i>
NYU, Wagner – Topics in Health: Politics, Policy and Power	<i>This course is an introduction for undergraduate students to the major policy issues affecting health care and examines the role of government in the health care system. An important focus of the course is an assessment of the role of policy analysis in the formation and implementation of national and local health policy.</i>
University of Georgia, Florida – Medical Geography	Modules include; GEO 3453 – Peoples and Plagues; GEO 4938 – Disease Map Kriging; SWS 4550 – Soils, Water and Public Health; SYO 4400 – Medical Sociology; PHC 3440 – Global Public Health; HSC 4624 – Trends in International Health; GEO 3452 – Introduction to Medical Geography

ANNEX

• FD 1/3577: Deficiency Diseases in West Africa

CASE EXTRACTS

- Showing visual response to autoclaved marmite, autoclaved yeast or yeast.
- 1). 13/11/37. N.C. IBO, aged 15, thin depressed boy, does not smile. Skin of face greyish and "dry" looking. Severe perleche, raw RED, denuded tongue, dry itching scrotum. Burning of the feet. Mother states used to be bright and cheerful. Vision became defective Feb 1937 becoming severely so by March. In June he had to leave school because he could no longer see to read. He attended a mission hospital where he received injections (4/- an injection) on account of his condition. Spent 12/- but no improvement whatsoever. Mother is a petty trader selling stockfish. Diet gari, 4 cups daily, palm oil, stockfish daily, a small amount of meat occasionally, peppers and salt, some green leaves chiefly that known as "Akasa" - a bitter leaf. Vision 1/60 photophobia, unable to read print. Both discs show optic neuritis and are rather grey in appearance. Treatment autoclaved Marmite (Marmite Co) 1 cigarette tin weekly.
- 26/11/37. Mouth and perleche entirely cleared. Scrotum better. V 5/60 J 20 pt.
- 12/12/37. V 6/36 J 12.
- 17/12/37. V 6/24 J 12.
- 31/12/37. V 6/12 pt J 8 pt. Skin shiny and bright, whole appearance altered and patient delighted at his own progress.

1887

14 May 1941

Dear Smart,

I got tired of Fitzgerald Moore and found the easiest thing to do was to order 25 g. of nicotinic acid and 5 lbs of marmite to be sent to Surgeon Lieutenant R.L. Parish, RNVR. I hope you won't disapprove of this action.

Yours sincerely,

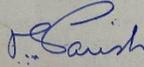
A.G.H. Smart, Esq., CMG, MBE, MD
Colonial Office
Downing Street, S W 1

Drugs supplied July 1941.

<u>RIBOFLAVINE.</u>		
Supplier.	Amount.	Amount remaining.
B.D.H.	120 lmg ampoules.	96 lmg ampoules.
Roche.	20 mg. powder.	20mg.
Roche.	500 tabs. lmg.	Nil.
Glaxo	20 250mg. powder	19 250mg.
<u>Nicotinic acid.</u>		
B.D.H.	25gram	10 gram.
<u>Thiamine.</u>		
Roche.	200 tabs. 3mg.	100 tabs. 3mg.
<u>Marmite</u>	5lb.	Nil.

The amount remaining was handed on to Major Goldsmith, RAMC after informing Dr. Fitzgerald Moore: Major Goldsmith has native wards where many cases of vitamin deficiency associated with eye disease are treated.

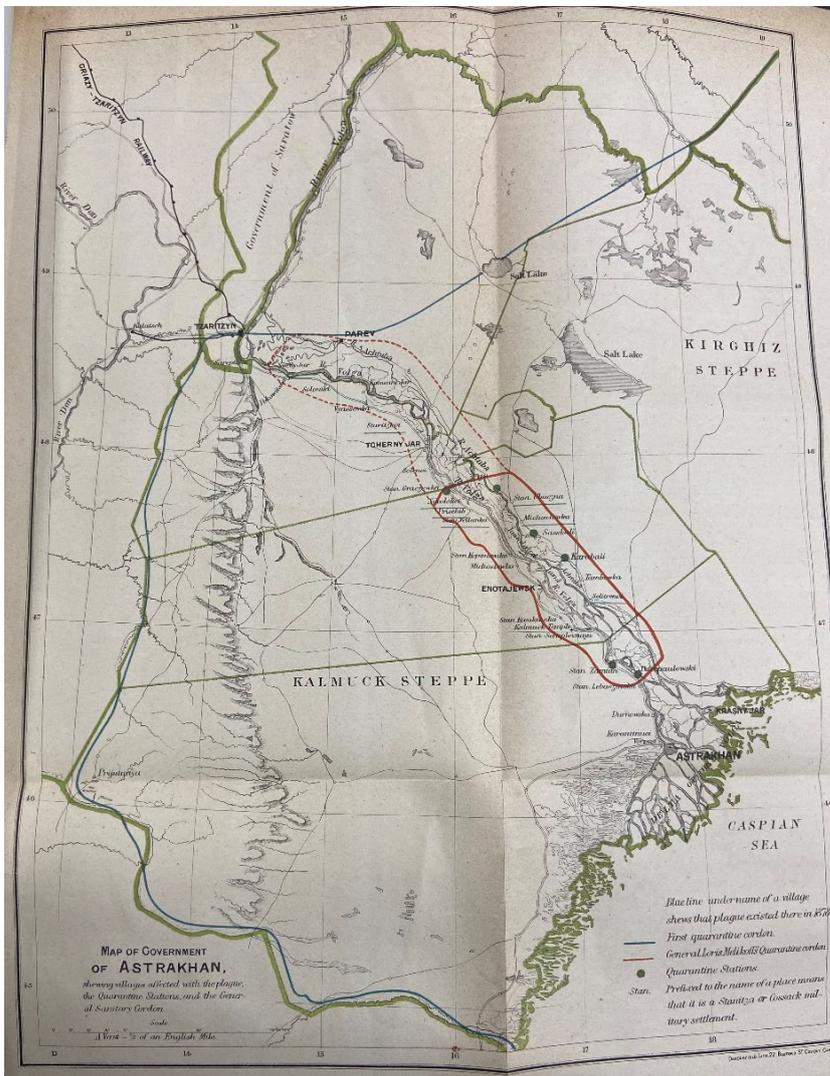
signed.


Surgeon Lieut. RNVR.
Acting Ophthalmic Specialist.

- In this piece, we can see how two experiments were carried out in West Africa, to treat deficiency diseases; Pellagra in Nigeria and Avitaminosis in Sierra Leone. In the first half of the document, we see the use of Autoclaved yeast extract (heated marmite) and cigarettes to treat Pellagra and the niacin (Vitamin B-3) which is said to cause the disease itself. The results as follows describe the patients' condition in detail, however any personal identifiable factors are kept vague and therefore low risk of identification
- Alongside the trial results and patient details, the piece also contains correspondence with The Marmite Food Extract company, and the ministry of Health, regarding the shipment and

- As you can see above, the correspondence also includes issues such as conflict between doctors and complaints to the Colonial Office, and the difficulty experienced with medical processes.

- **MH 98/24: Confidential Correspondence concerning foreign epidemics of the plague and quarantine**



Printed for the use of the Foreign Office. July 1875.

CONFIDENTIAL.
(2686.)

RECEIVED
OCT 23
1875

Both copies of this Report forwarded to the Secretary of State

Report by Consul-General Nixon on the Epidemic in Mesopotamia.

Consul-General Nixon to the Earl of Derby.—(Received July 14.)

My Lord, Bagdad, June 14, 1875.

IN continuation of my letter dated 29th ultimo, submitting copy of a demi-official letter from Surgeon-Major Colvill, of this Agency, I have the honour now to submit that officer's official Report on the epidemic in Mesopotamia, together with a copy of my letter to the Secretary to the Government of India on this subject.

I had also the honour to address your Lordship a telegram (copy annexed) regarding the wool that had arrived from the infected district, and I also sent a telegram to the Ambassador at Constantinople on the subject, but his Excellency did not consider that the merchants at Bagdad could be interfered with, except through the Turkish authorities. I asked the question in my telegram, as the process of teasing out the wool at Bagdad is not unlikely to spread the disease in the city. The wool trade is chiefly in the hands of English merchants, and nearly all the wool forwarded by the native merchants to England passes through the wool press of Messrs. Lynch and Co. We know that they have a great quantity of wool from the infected districts; and as a mere matter of precaution, wool arriving in England from Bussorah should be subject to a disinfecting process. I hear the French authorities have prohibited the entry of wool from this country into their ports. I cannot vouch for the truth of this statement, but that there is an intention of sending the wool from Turkish Arabia to foreign ports if interference be exercised by the Board of Health, may be relied on.

I have, &c.
(Signed) J. P. NIXON.

Inclosure I.

Surgeon-Major Colvill to Consul-General Nixon.

Sir, Bagdad, June 5, 1875.

I HAVE the honour to report my progress along the Euphrates in search of plague. In order to make myself understood it will be necessary to give some account, but so far only as my present object is concerned, of the line of country travelled (for it is practically unknown to us), and if possible to append a rude plan, for all the maps I have seen are not only deficient, but misleading,—towns are marked in large characters which have now no existence, while other towns have risen which have no place on the map; large canals with extensive permanent lakes which have existed of old are a blank, and the Euphrates is traced on these maps as a large river to its junction with the Tigris, while it actually disappears between Diwanayah and Samawah.

In this description of the country I will divide my route into sections from one

[503] B

- *This piece exemplifies the political effects of disease, through foreign correspondence on plague in Mesopotamia. Here, we can see how and where the plague has affecting certain areas the most, and measures of quarantine that has been put in place. Frequent reports by C.G. Nixon further displays the fears, proposals and events that ensues for the government.*

viz. :—

“Plague less, fifteen deaths at Bagdad by yesterday’s report; heat increasing, which kills the disease. The Pasha is draining the marshes which caused the sickness.”

The disease may now be said to be dying out, although isolated cases are likely to occur during the summer, but it is greatly to be feared that there will be an outbreak again next year. However, Abdool Ruhman Pasha, the Governor-General of the Province, is doing his best to prevent a recurrence by draining the marshes in the neighbourhood of Bagdad.

Plague is a malignant marsh fever apparently, and the whole system of irrigation in Mesopotamia seems to have collapsed, and the waters of the Euphrates spread over the country, and when the marshes dry up, the fever appears. It seems that the bed of the River Euphrates is on a higher level than that of the River Tigris, and therefore the measures now adopted by the local authorities may possibly alleviate the sickness.

- **FD 1/3501 Research on Anaemia in pregnancy: Report by Dr. Lucy Wills, London school of hygiene and Tropical Medicine**

- *This piece covers the workings of Dr. Lucy Wills, a haematologist and physician researcher who discovered a cure for macrocytic anaemia – a life-threatening disease characterised by enlarged red blood cells. Wills discovered that a nutritional factor in yeast could cure this anaemia and, initially called the Wills factor, was subsequently shown to be folate (a naturally occurring form of folic acid).*
- *This piece documents Wills' famous research on this disease in pregnant women in India. Including correspondence, applications for grants, and reported research, you can see the high praise received for her work on demonstrating the cause of the disease, in addition to the vitamin B₁₂*

Medical Research Council. Private & Confidential. 7.x.38.

Application by

Dr. LUCY WILLS, London School of Hygiene and Tropical Medicine, for a grant of up to £200 p.a. for research expenses.

Dr. Wills has the qualification M.B. (Lond.). From 1921 to 1928, and from 1933 to 1934, she held various posts, and carried out research work, at the Royal Free Hospital. Between 1928 and 1933 she spent most of her time in India, working on pernicious anaemia of pregnancy, under the Indian Research Fund Association. In 1934, she was awarded a grant of £400 per annum by the Lady Tata Memorial Trust, to provide her with expenses and assistance in work on macrocytic megaloblastic nutritional anaemia in monkeys, and its possible relation to tropical macrocytic anaemia. She held this grant until September, 1937, and later visited India at her own expense, to carry out clinical studies on the therapeutic effects in the human anaemia of liver and yeast fractions which had been found to cure the monkey disease. Dr. Wills now applies to the Council for a grant of up to £200 per annum, for two years, for the expenses of further research into the nature of the factor present in yeast and liver, which is curative in tropical or nutritional macrocytic anaemia of man and monkeys. The work would be carried out at the London School of Hygiene and Tropical Medicine, and the grant would be used for the purchase and upkeep of monkeys, current laboratory expenses, occasional extra laboratory assistance, and the purchase of necessary materials for the preparation of extracts.

Dr. Wills's recent publications include:-

'A new factor in the production and cure of certain macrocytic anaemias' (with W. Clutterbuck and B.D.F. Evans). Lancet, 6th Feb., 1937.

'A new factor in the production and cure of macrocytic anaemias and its relation to other haemopoietic principles curative in pernicious anaemia' (with P.W. Clutterbuck and B.D.F. Evans). Biochem. J., 1937, 31, 2136.

'Tropical macrocytic anaemia: its relation to pernicious anaemia' (with B.D.F. Evans). Lancet, 20th August, 1938.

Dr. Lucy Wills called and discussed her work with me. She has been repeating some work she carried out in India. She was able to produce macrocytic anaemias in monkeys by certain diets similar to the type of anaemia found among young men and women in that country. So far, she has only obtained this form of anaemia in one monkey in this country, but she thinks that two others are developing the same kind of condition. There is no achlorhydria among these monkeys, just as there is none among the people in India. She has further shown that autolysed yeast or marmite cures this condition, but whole yeast or ordinary yeast extracts will not do so.

Dr. Wills wishes to have an assistant for this work. I asked her if she had anybody in her mind, and she mentioned Dr. Alice Naish, suggesting that she might get £200 or £250 a year. She also asked about the Tata Fund for work on blood diseases. I told her that I regarded the work as important, especially if she can without fail produce macrocytic anaemias in monkeys by her diets. She should send in an application to the Council for a grant for an assistant, and at the same time apply to the Tata Fund for similar help. If she got money from the Tata Fund, she could then relinquish any M.R.C. grant she might get. She agreed to apply for both.

11th October 1937

Dear Lord Linlithgow,

I want to tell you about a woman investigator in medical science who is just about to come to India. She is a Dr. Lucy Wills. Some years ago she went, on her own initiative, to India and discovered a nutritional form of anaemia in Indian women which had not previously been described. This is what is known as a macrocytic form of anaemia, that is to say, a condition of anaemia associated with enlargement of the red blood corpuscles; in many respects it is similar to, but not identical with, pernicious anaemia as we meet it in England. She also discovered that this condition can be cured by giving yeast and yeast extract. After she had made these primary observations, Miss Wills returned to England in order to work out the problem experimentally. She succeeded in producing the same condition in monkeys, and proceeded to investigate the actual chemical compound in yeast and other substances which could cure the disease. She is now satisfied that she has got the substance, and is returning to India to test its curative properties on the anaemic condition in these Indian women.

I believe Miss Wills's headquarters will be the Haffkine Institute in Bombay, but that she will be travelling about India and will no doubt come to Delhi. I thought you might be interested to know these facts, and in any case I wish to assure you that she is a very fine woman and of the salt of the earth, so that if you hear about her or get any opportunity of assisting her in any way, I am sure you would like to do so, although she will probably not require any support. Her visits to India and her investigations are unofficial and made entirely on her own initiative and at her own expense, so that she has no claim on official assistance, and only the merit of her person and of her work seem to warrant all the assistance she may need.

With kind regards,
Yours sincerely,

E.M.

The Most Hon.
The Marquess of Linlithgow, P.C.,
K.T., G.C.I.E.,
McCregal Lodge, Simla, India.

Report of Work 1938 - 39

Dr. Lucy Wills in collaboration with Dr. Macrae and Mrs. Work of the Lister Institute has continued her work on the nature of the factor curative in tropical macrocytic anaemia. The therapeutic effect of different purified liver fractions has been observed and the principle curative in this macrocytic anaemia separated from the different fractions of the Vitamin B 2 Complex.

MEAN HEMOGLOBIN VALUES IN PREGNANCY.								
Mean Hb.% during first 16 weeks.								
R.F.H. 1943.			R.F.H. 1947.			U.C.H. 1947		
No.	Mean.	S.D.	No.	Mean	S.D.	No.	Mean	S.D.
350	89.8 ± 0.54	6.36	50	89.3 ± 1.05	7.39	101	87.5 ± 0.75	7.58
Mean Hb.% during last 12 weeks								
Treated Cases.			Untreated Cases.					
No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.
R.F.H. 1943	241	86.4 ± 0.51	7.91	R.F.H. 1943	219	80.7 ± 0.54	7.97	
R.F.H. 1947	89	87.1 ± 0.75	7.03	U.C.H. 1947	104	78.8 ± 0.80	8.12	

These findings seem to me important, both on general grounds and because it has been shown in a large series of cases that the incidence and severity of post partum haemorrhage is significantly higher in untreated women than in those receiving iron

• **FD 4/106: Small-pox and climate in India: forecasting of epidemics.**

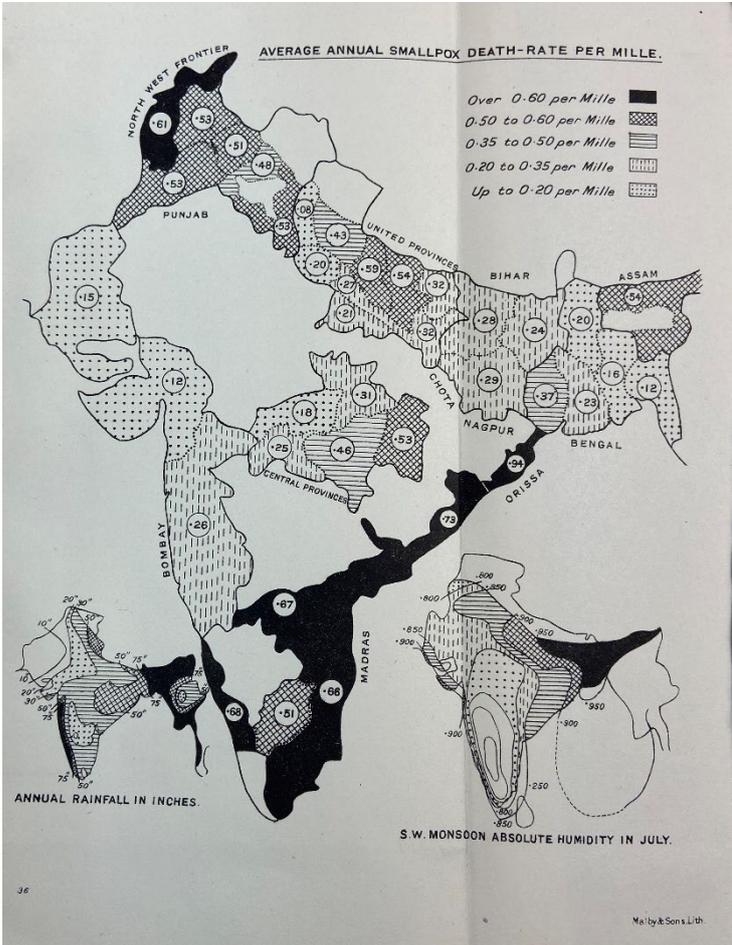
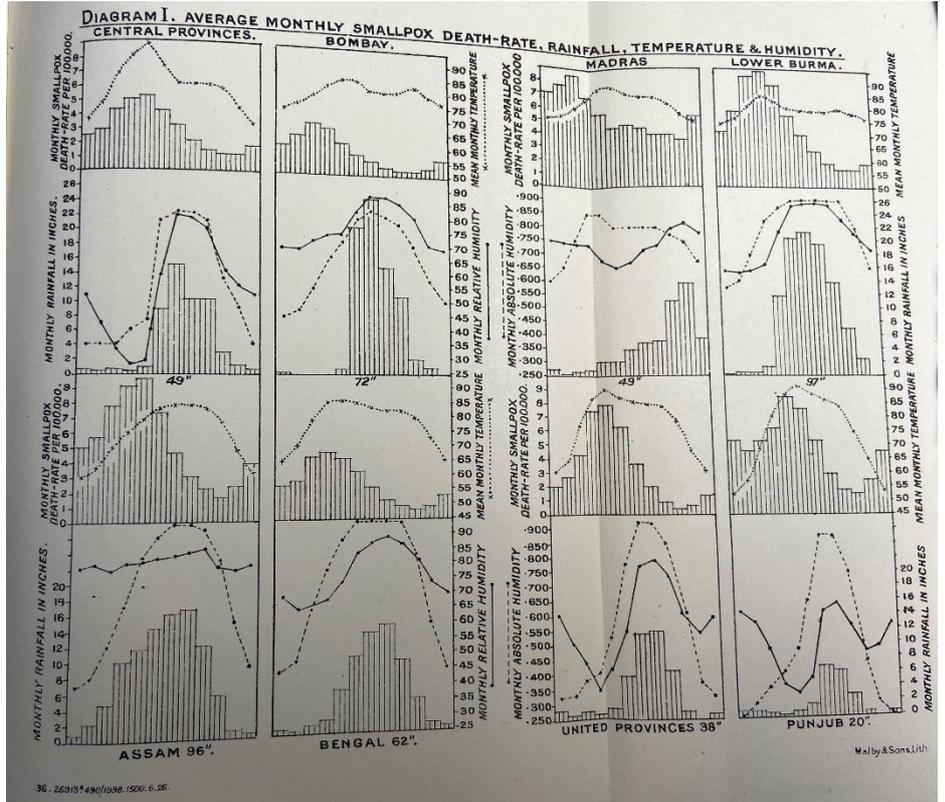
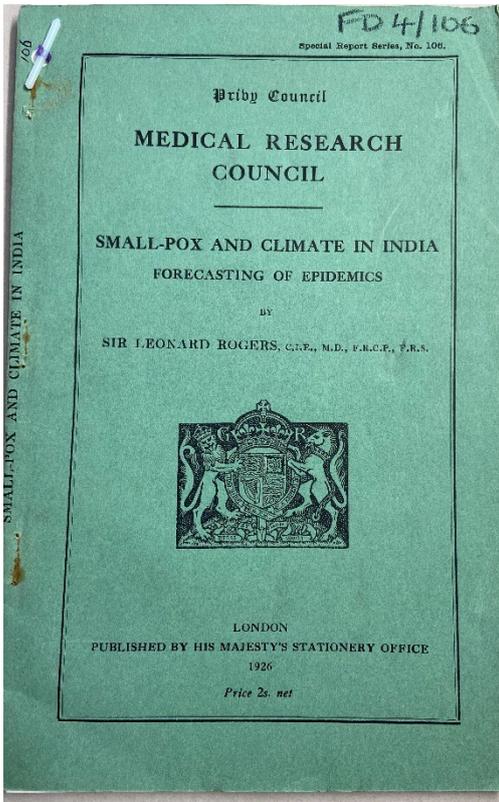


TABLE C. Data for Diagrams 2, 4, 5, 6, 7, and 8.

Year	Diagram 4. CENTRAL PROVINCES.				Diagram 2. LOWER BURMA.				Diagram 5. A.S. MADRAS.				Diagram 6. S.W. PROVINCES.				Diagram 7. PUNJAB.							
	Rainfall.	Smallpox Death-Rate per Mille.	Hospital Admissions per Mille.	Mean Monthly Temperature.	Rainfall.	Smallpox Death-Rate per Mille.	Hospital Admissions per Mille.	Mean Monthly Temperature.	Rainfall.	Smallpox Death-Rate per Mille.	Hospital Admissions per Mille.	Mean Monthly Temperature.	Rainfall.	Smallpox Death-Rate per Mille.	Hospital Admissions per Mille.	Mean Monthly Temperature.	Rainfall.	Smallpox Death-Rate per Mille.	Hospital Admissions per Mille.	Mean Monthly Temperature.				
1880	29.53	1.99	0.022	27.47	0.09	0.74	0.008	120.54	0.67	0.70	43.19	0.01	0.80	0.707	0.049	0.69	0.265	0.7	88.1	0.21	0.111			
1881	26.79	1.96	0.022	27.16	0.11	0.78	0.004	120.54	0.76	0.76	43.19	0.01	0.80	0.707	0.049	0.69	0.265	0.7	88.1	0.21	0.111			
1882	14.19	0.96	0.075	44.92	0.17	0.695	0.071	109.79	0.29	0.43	29.31	1.16	0.629	0.739	19.59	0.54	0.174	0.71	0.08	0.89	177	72.1	0.09	0.123
1883	18.12	0.17	0.199	33.23	0.08	0.739	0.052	121.20	1.00	0.78	43.01	0.45	0.638	0.927	17.02	0.21	0.24	0.71	0.15	0.779	179	61.4	0.07	0.026
1884	16.06	0.31	0.071	38.00	0.06	0.749	0.064	120.54	0.73	0.73	43.19	0.01	0.80	0.707	0.049	0.69	0.265	0.7	88.1	0.21	0.111			
1885	17.77	0.73	0.022	33.23	0.30	0.717	0.059	121.20	0.81	0.81	43.19	0.01	0.80	0.707	0.049	0.69	0.265	0.7	88.1	0.21	0.111			
1886	18.88	0.80	0.798	33.23	0.60	0.736	0.073	120.54	0.67	0.73	39.47	0.17	0.808	0.847	0.98	0.22	0.257	0.74	0.34	0.821	182	68.2	0.10	0.023
1887	18.08	0.49	0.728	29.22	0.06	0.715	0.069	120.54	1.05	0.99	49.19	0.19	0.831	0.746	12.27	0.24	0.294	0.71	0.19	0.625	184	73.4	0.09	0.047
1888	15.98	0.11	0.022	11.62	0.42	0.735	0.059	120.54	0.51	0.73	43.01	0.02	0.814	0.722	14.62	0.26	0.239	0.71	0.19	0.625	184	73.4	0.09	0.047
1889	16.02	0.74	0.024	44.92	0.08	0.731	0.057	120.54	0.37	0.69	25.45	0.81	0.830	0.775	11.03	0.33	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1890	17.44	0.46	0.075	33.11	0.46	0.760	0.076	121.20	0.85	0.72	43.01	0.02	0.814	0.722	14.62	0.26	0.239	0.71	0.19	0.625	184	73.4	0.09	0.047
1891	22.4	0.37	0.045	32.14	0.35	0.731	0.074	120.54	0.73	0.73	43.19	0.01	0.80	0.707	0.049	0.69	0.265	0.7	88.1	0.21	0.111			
1892	29.4	0.27	0.024	33.11	0.41	0.732	0.074	120.54	0.73	0.73	43.19	0.01	0.80	0.707	0.049	0.69	0.265	0.7	88.1	0.21	0.111			
1893	15.94	0.79	0.729	29.27	0.11	0.754	0.084	120.54	0.84	0.70	42.72	1.25	0.841	0.734	12.24	0.29	0.239	0.71	0.19	0.625	184	73.4	0.09	0.047
1894	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1895	29.4	0.27	0.024	33.11	0.41	0.732	0.074	120.54	0.73	0.73	43.19	0.01	0.80	0.707	0.049	0.69	0.265	0.7	88.1	0.21	0.111			
1896	18.23	0.23	0.748	33.08	0.29	0.745	0.086	120.54	1.00	0.69	41.65	0.51	0.828	0.741	11.41	0.41	0.400	0.71	0.19	0.625	184	73.4	0.09	0.047
1897	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1898	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1899	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1900	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1901	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1902	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1903	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1904	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1905	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1906	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1907	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1908	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1909	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1910	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1911	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1912	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1913	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1914	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1915	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1916	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1917	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1918	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1919	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1920	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1921	16.98	0.82	0.794	27.14	0.48	0.755	0.074	120.54	1.12	0.84	49.01	0.25	0.835	0.725	11.04	0.31	0.341	0.71	0.19	0.625	184	73.4	0.09	0.047
1922	16.98	0.82	0.794	27.14	0.48	0.755	0.0																	