

Public Health Reports

Issued Weekly by the

UNITED STATES PUBLIC HEALTH SERVICE

Volume 56 Part MELICIA JAN 6- 1342 Numbers 1-26 January–June 1941



FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, Surgeon General

DIVISION OF SANITARY REPORTS AND STATISTICS

E. R. COFFET, Assistant Surgeon General, Chief of Division

The PUBLIC HEALTH REFORTS, first published in 1878 under authority of an **act** of Congress of April 29 of that year, is issued weekly by the United States **Public** Health Service through the Division of Sanitary Reports and Statistics, **pursuant** to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

THE PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1941 For sale by the Superintendent of Documents, Washington, D. C. Price 5 cents. Subscription price \$2.50 a year

(II)

• •	
Acarina: Ixodoidea. (See Ornithodoros viguerasi.) Accidents and illness among persons living under different housing condi- tions—Britten and Altman	Page 609
Aedes aegypti mosquitoes, methods for controlling, with Gambusic holbrooki minnows at Key West, Florida—Le Van	1217
Alabama. (See Name of disease—Weekly State reports; United States— Monthly State reports.)	
Alcoholism and public health—Kolb	485
Alcoholism, summary of symposium on, available	663
Altman, Isidore: Illness and accidents among persons living under different housing conditions	600
Anonheline magazita fauna of southeastern Minnesota and adjacent Wig-	003
consin areas, a preliminary survey of — Daggy, Muegge, and Riley	883
proofed and nonmosquito-proofed homes—Hewitt and Kotcher	1055
Anthrax. (See United States—Monthly State reports.)	
Antirabies immunity of experimental animals, tissue factors in-Habel	692
Arey, Margaret S.: A clinical study of poliomyelitis in Charleston County, South Carolina, 1939	1007
Arizona (See Name of disassa Weakly State monorts: United States	1007
Monthly State reports.)	
Arkansas. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Armstrong, Charles: Choriomeningitis virus infection without central nervous system manifestations. Report of a case	907
Arnold, Francis A., Jr.: Domestic water and dental caries:	
I. A dental caries study, including L. acidophilus estimations	365
II. A study of 2,832 white children of 8 suburban Chicago communi-	
ties including Lactobacillus acidophilus studies of 1,761 children.	761
Aycock, W. Lloyd: Regional, racial, and familial relationships in leprosy in	
the United States	1324

B

Bactericidal effect of the paraffining of paperboard used for paper milk containers—Moss, Thomas, and Havens	944
Bacteriology, note on the "most probable number" index as used in-	
DallaValle	229
Bengtson, Ida A.:	
Complement fixation in endemic typhus fever	649
Immunological relationships between the rickettsiae of Australian and American "Q" fever	272
Studies on active and passive immunity in "Q" fever infected and immunized guinea pigs	327

	Page
Benzene (benzol): Its toxicity and potential dangers	519
Biological products. Establishments licensed for the propagation and sale	
of viruses, serums, toxins, and analogous products	234
Bloomfield, J. J.: The responsibility of the nursing profession in industrial	
hygiene	1131
Borden Company award, to Dr. C. S. Hudson	740
Britten, Rollo H.:	
Causes of physical disqualification under the Selective Service law.	
Early indications	1017
Illness and accidents among persons living under different housing	
conditions	609
Summary of physical findings on men drafted in the World War	41
Butler, R. E.: Human riboflavin requirement estimated by urinary excre-	
tion of subjects on controlled intake	510

С.

California:	
(See also Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Contra Costa County—Plague-infected rats	1175
Kern County—	
Plague-infected fleas 1176, 1228, 1263, 1295	, 1342
Plague-infected squirrels 1067	, 1176
Monterey County—Plague-infected fleas	1176
San Francisco—Plague-infected fleas	129 5
Cameron, W. Ross: Studies on immunizing substances in pneunococci.	
XI. Effect of variation in dosage of antigenic polysaccharide on serum	
antibody titer in human beings	822
Canada:	
Cerebrospinal meningitis, increase in	363
Provinces—Communicable diseases—Week ended—	
November 30, 1940	39
December 7, 1940	125
December 14, 1940	165
December 21, 1940	206
December 28, 1940	25 6
January 4, 1941	308
January 11, 1941	36 3
January 18, 1941	414
January 25, 1941	4 80
February 1, 1941	543
February 8, 1941	60 6
February 15, 1941	673
February 22, 1941	749
March 1, 1941	813
March 8, 1941	867
March 15, 1941	92 3
March 22, 1941	98 3
March 29, 1941	1037
April 5, 1941	1071
April 12, 1941	1128
April 19, 1941	1185

Canada—Continued.	
Provinces-Communicable diseases-Week ended-Continued.	Pa
April 26, 1941	11
May 3, 1941	12
May 10, 1941	12
May 17, 1941	12
May 24, 1941	134
Vital statistics	
First quarter 1940	\$
Second quarter 1940	19
Third quarter 1940	96
Concer in the mentally ill—Peller and Stephenson	19
Concer mortality in the United States III Geographic variation in	T
recorded cancer mortality for detailed sites for an average of the vers	
1020_22	94
General the insidence of in Detroit and Wayne County Michigan 1027	29
MaDowell	70
McDowen	11
Cancer, the incidence of in New Orleans, La., 1957-McDowell	114
Carbon disunde: Its toxicity and potential dangers	5
Carbon monoxide: Its toxicity and potential dangers	42
Carnahan, C. T.: Mechanical aids for stream surveys	8
Caswell, George: Qualifications of professional public health personnel:	-
III. Nurses	2
IV. Sanitation personnel	31
V. Laboratory workers	44
Chapin, Dr. Charles Value, death of	24
Chickenpox. (See United States; Monthly State reports.)	
Chinn, Alice L.: Report of a new type of pneumococcus which crosses with	
types X, XI, XX, XXIX, and XXXI antipneumococcic serums	e
Cholera: Foreign reports	, 134
Chorio-allantoic membrane of the chick embryo, the growth and effects of the	
tubercle bacillus on the; a method for studies in chemotherapy—Emmart	
and Smith	127
Choriomeningitis virus infection without central nervous system mani-	
festations. Report of a case—Armstrong and Hornibrook	90
Cirrhosis of the liver in rats on a deficient diet and the effect of alcohol-	
Lillie. Daft. and Sebrell	125
Clostridium perfringens (type A) toxoid, the application of the human	
serum opacity reaction for evaluating the antitoxin binding power (LB)	
of-Seal and Stewart	79
Colorado (See Name of disease—Weekly State reports: United States—	
Monthly State reports)	
Communicable diseases (See also Name of disease, Name of country)	
Communicable diseases common during 1040 reported provelance of	52
Conjunctivitie (See United States_Monthly State reports)	50
Connactions. (See Onlieu States—Monthly State reports.)	
(See also Name of disease Weakly State reports. United States	
(New that I wante of the second of the secon	
Montilly State reports.)	10
	10
outributions to outside journais of the personnel of the United States	
Public Health Service (January–December 1940)	, 80

Cooley, R. A.:	Page
Further new species of Ornithodoros from bats (Acarina: Argasidae)	910
Urnithodoros viguerasi, a new species of tick from bats in Cuba (Acarina:	6 0 0
	396
Councell Clare E + Wen and infectious disease	587
Councell, Clara E.: war and injectious disease	547
Abortion contagious in cattle State law for the control of held	
valid	116
Animals city ordinance prohibiting keeping of within restricted	110
area upheld	1258
Barber shops, provisions of city ordinance regulating hours of opera-	1200
tion of, held invalid	46 6
Bedding or upholstered furniture, statute regulating sale of, held in- valid	24 6
Confectionery products, statute regulating manufacture and distri-	
bution of, upheld	664
Damages, recovery of, because of contraction of silicosis	400
Employees, statutory provisions for protection of, against gases,	
vapors, dust, etc., upheld	156
Garbage, removal of, by city	974
Gases, vapors, dust, etc., statutory provisions for protection of em-	
ployees against, upheld	156
Lead poisoning, action by employee for	804
Meats, uncured or uncooked, city ordinance prescribing hours for sale of, upheld	1222
Milk and other dairy products, power of State board of health to	
make regulations concerning	354
Milk ordinance, enforcement of, not enjoined	1289
Miner, action by, for injuries claimed to have resulted from inade- quate ventilation of mine	597
Permits to independent milk distributors, regulation of city board of health regarding issuance of, upheld	740
Plumbers, regulations of local board of health governing, upheld	1120
Poultry, mere possession of unwholesome, held not violative of sani-	•
tary code provision	858
Rendering, licensing of business of	534
Respirators, furnishing of, to employees engaged in certain work	30
Sanitary privies, ordinance regarding, upheld	75
Sewers and sewage treatment plant, order of State stream control	1005
commission requiring city to construct, upheld	1027
Silicosis, recovery of damages because of contraction of	400
Trichinosis held compensable under workmen's compensation act	300
I uperculosis held not to be compensable under workmen's compen-	107
Sation act	1997
I marcula infection, retail food seller field liable for	00 1991
Cuba	48
Habana—Communicable diseases—4 weeks ended—	
November 16, 1940	85
December 14, 1940	256
January 11, 1941	414

Cuba—Continued.	
Habana—Communicable diseases—4 weeks ended—Continued.	Page
February 8, 1941	480
March 8, 1941	673
April 5, 1941	1128
May 3, 1941	1186
May 31, 1941	1346
Provinces—Notifiable diseases—4 weeks ended—	
December 7, 1940	308
January 4, 1941	363
February 1, 1941	749
March 1, 1941	813
March 29, 1941	1128
April 26, 1941	1186
Cuvillier, Eugenia: Studies on trichinosis. XIII. The incidence of human infection with trichinae as indicated by post-mortem examination of	
3,000 diaphragms from Washington, D. C., and 5 eastern seaboard cities_	836

D

Daft, F. S.: Cirrhosis of the liver in rats on a deficient diet and the effect of alcohol	1255
Daggy, Richard H.: A preliminary survey of the anopheline mosquito fauna of southeastern Minnesota and adjacent Wisconsin areas	883
DallaValle, J. M.: Notes on the "most probable number" index as used in bacteriology	229
Dauer, C. C.: Prevalence of poliomyelitis in the United States in 1940	875
Davis, Dorland J.: A clinical study of poliomyelitis in Charleston County,	
South Carolina, 1939	1007
Dean, H. Trendley: Domestic water and dental caries:	
I. A dental caries study, including L. acidophilus estimations	365
II. A study of 2,832 white children of 8 Chicago communities, includ-	
ing Lactobacillus acidophilus studies of 1,761 children	761
Dean J. O.: How health departments function with respect to specific problems	929
Deaths:	
(See also Mortality)	
All causes—Weekly city reports 36, 81, 122, 162, 202, 252, 305, 360, 411.	476.
540, 603, 670, 746, 810, 864, 920, 980, 1033, 1068, 1125, 1229, 1264, 1296, 1343.	1181,
Large cities	31,
76. 117. 157. 198. 247. 300. 355. 402. 466. 535. 598. 665. 741.	805,
859, 915, 975, 1028, 1063, 1120, 1171, 1223, 1259, 1290, 1	1338.
Delaware. (See Name of disease—Weekly State reports; United States— Monthly State reports.)	
Delinquents, a further study of the Rorschach test applied to-Pescor	381
DeMartini, F. E.: Mobile laboratory units of the Ohio river pollution	754
(See also United States Monthly State reports)	
(See also United States—Monthly State reports.)	307
Notes in the interview of the second	301
Tuly August and Sontombor 1040	165
July, August, allu, September 1940	673
OCLODER, MOVEMBER, AND DECEMBER 1940	010

Dental caries and domestic water: I. A dental caries study, including L. acidophilus estimations—Dean,	Page
Jav. Arnold. and Elvove-	365
II. A study of 2,832 white children of 8 suburban Chicago communi- ties, including Lactobacillus acidophilus studies of 1,761 chil-	
Dentiation of chine he towning of still	761
Deratization of snips by trapping, effectiveness of —Sherrard and Vion	1061
personnel:	
III. Nurses	211
IV. Sanitation personnel	311
V. Laboratory workers	445
Dick reaction and scarlet fever morbidity following injections of a purified	
and tannic acid precipitated erythrogenic toxin-Veldee, Peck, Frank-	
lin, and DuPuy	957
Diphtheria:	
(See also United States-Monthly State reports.)	
Weekly city reports	36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670,	746,
810, 864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296,	1343
Weekly State reports	33,
78, 119, 159, 200, 249, 302, 357, 404, 468, 537, 600, 667,	743,
807, 861, 917, 977, 1030, 1065, 1122, 1173, 1225, 1261, 1292,	1340
Directory of State and insular health authorities, 1940	10
Diseases, communicable, infectious, notifiable. (See Name of disease-	
Name of country.)	
Disqualification, physical, under the Selective Service law, causes of. Early	
Indications—Britten and Perrott	1017
District of Columbia:	
(See also Name of disease—Weekly State reports; United States—	
Monthly State reports.)	~~~
	863
Wasnington, an outbreak of psittacosis at the National Zoological Park at—Tomlinson	1073
Drinking water standards of the Treasury Department contemplated	1010
revision of	594
Dudley, H. C.: A portable unit for the determination of halogenated hydro-	001
carbons	1021
DuPuy, H. R.: The Dick reaction and scarlet fever morbidity following	
injections of a purified and tannic acid precipitated erythrogenic toxin	957
Dusts, industrial, the response of peritoneal tissue to—Miller and Savers	264
Dysentery. (See United States—Monthly State reports.)	-91

Е

Ecuador: Guayaquil, a note on modified radio pratique in-Olesen	292
Eddy, Bernice E.: Report of a new type of pneumococcus which crosses	
with types X, XI, XX, XXIX, and XXXI antipneumococcic serums	62
Elvove, Elias: Domestic water and dental caries:	
I. A dental caries study, including L. acidophilus estimations	365
II. A study of 2,832 white children of 8 suburban Chicago communi-	
ties, including Lactobacillus acidophilus studies of 1,761 children.	761

VIII V

Emmart, E. W.: The growth and effects of the tubercle bacillus on the choric-aliantoic membrane of the chick embryo: A method for studies	-
in chemotherapy	1277
Encephalitis, epidemic or lethargic:	
(See also United States; Monthly State reports.)	
Weekly city reports	38,
83, 124, 164, 205, 254, 307, 362, 413, 478, 542, 605, 672,	748,
812, 866, 922, 982, 1035, 1070, 1127, 1183, 1231, 1266, 1298, 1	1345
Erythrogenic toxin, a purified and tannic acid precipitated, the Dick re-	
action and scarlet fever morbidity following injections of-Veldee, Peek,	
Franklin, and DuPuy	957

\mathbf{F}

Felt-hat industry, mercurialism and its control in the Felton, Lloyd D.: Studies on immunizing substances in pneumococci:	663
XI. Effect of variation in dosage of antigenic polysaccharide on	
serum antibody titer in human beings	822
XII. Comparison of the effect of whole-cell vaccine and of poly-	
saccharide antigen in human beings	1041
Film, new educational, to aid nutrition campaign	352
Financial support of hospitals controlled by State and local governments-	
Pennell, Mountin, and Pearson	433
Finland: Communicable diseases—4 weeks ended—	
November 2, 1940	165
November 30, 1940	256
December 31, 1940	606
January 31, 1941	868
February 28, 1941	1071
March 31, 1941	299
Flook. Evelyn: How health departments function with respect to specific	
problems	929
problems Florida, <i>(See</i> Name of disease—Weekly State reports: United States—	92 9
problems Florida. (See Name of disease—Weekly State reports; United States— Monthly State reports.)	92 9
problems Florida. (See Name of disease—Weekly State reports; United States— Monthly State reports.) Foreign reports: Quarantinable diseases	92 9 87
problems Florida. (See Name of disease—Weekly State reports; United States— Monthly State reports.) Foreign reports: Quarantinable diseases 127. 166. 206. 257. 309. 364. 416. 480. 545. 674. 750. 814. 869. 9	929 87, 924.
problems Florida. (See Name of disease—Weekly State reports; United States— Monthly State reports.) Foreign reports: Quarantinable diseases 127, 166, 206, 257, 309, 364, 416, 480, 545, 674, 750, 814, 869, 9 984, 1038, 1072, 1129, 1187, 1232, 1300, 1347	929 87, 924,
problems	92 9 87, 924,
problems	929 87, 924,
 problems	929 87, 924, 110
 problems	929 87, 924, 110 957
 problems	929 87, 924, 110 957
 problems	929 87, 924, 110 957 282
 problems	929 87, 924, 110 957 282
 problems	929 87, 924, 110 957 282

Gafafer, William M.: Disabling morbidity among industrial workers, final	
quarter of 1940, with an index of the previous publications of this series.	799
Gambusia holbrooki minnows, methods for controlling Aedes aegypti mos-	
quitos with, at Key West, Florida—Le Van	1217
4056212	

IX:

Page

.

Page

Georgia. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
German measles. (See United States-Monthly State reports.)	
Great Britain: England and Wales-	
Infectious diseases—	
13 weeks ended March 30, 1940	85
13 weeks ended June 29, 1940	543
13 weeks ended September 28, 1940	983
13 weeks ended December 28, 1940	1186
Vital statistics—	
First quarter 1940	86
Second quarter 1940	543
Third quarter 1940	984
Fourth quarter 1940	1186

H

Haas, Victor H.: Studies on the natural history of the virus of lymphocytic
choriomeningitis in mice
Habel, Karl:
Factors influencing the efficacy of phenolized rables vaccines. II.
Virus content of vaccine
Tissue factors in antirabies immunity of experimental animals
Halogenated hydrocarbons, a portable unit for the determination of— Dudley1
Havens, Mildred K.: Bactericidal effect of the paraffining of paperboard used for paper milk containers
Hawaii Territory: Plague (rodent) 38, 164, 255, 479, 542, 812, 1127, 1231, 1
Hawkins, James W.: Regional, racial, and familial relationships in leprosy
in the United States1
Health defenses, special problems in our-McNutt
Health defenses, State and Territorial health officers confer on 1
Health departments, how they function with respect to specific problems-
Dean and Flook
Hesbacher, E. N.: Studies on immunizing substances in pneumococci. XII. Comparison of the effect of whole-cell vaccine and of polysaccha-
ride antigen in human beings 1
Hewell, Barbara: Quantitative studies of the tuberculin reaction. I. Titration of tuberculin sensitivity and its relation to tuberculous
Hewitt, Kedginal:
Observations on nousenoid anophelism in a selected group of mosquito-
proofed and nonmosquito-proofed nomes
Anomboles augdrimagulatus
Hillohoo H. F. Post constantium tubaraulosis survival rates in Minnesota
Himes A. T. Evanimental policy valities
Hookworm disease (See United States—Monthly State reports)
Hornibrook J W Chariameningitis virus infection without central ner-
Vous system manifestations Report of a case
Hospitals existing singly in counties have similar financial structure—
Mountin. Pennell, and Pearson
Hospitals controlled by State and local governments, financial support of-
Pennell, Mountin, and Pearson

.

Housing and crowding, urban	595
Housing, recent developments relating to public health interest in-Leuk-	
hardt	871
Housing standards in Milwaukee, procedure for the maintenance of-Senn.	189
Hudson, Dr. C. S., given Borden Company award	740
Hurlbut, Herbert S.: Sporozoites of Plasmodium lophurae, an avian malaria	
parasite, in Anopheles quadrimaculatus	1336
Hydrogen sulfide: Its toxicity and potential dangers	684

Iceland: Influenza. 414	4
Idaho:	
(See also Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Ada County-Plague-infected fleas 129	5
Canyon County-Plague-infected fleas 1228	8
Payette County-Plague-infected fleas 1228	3
Illinois:	
(See also Name of disease—Weekly State reports; United States—	
Monthly State reports.)	
Oak Park—Case of psittacosis in 1228	B
Illness, disabling, the prevalence of among male and female workers and	
housewives80	2
Illness and accidents among persons living under different housing condi-	
tions—Britten and Altman609	9
Indiana. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Industry, leadership in, and in public health—Fosdick110	D
Infantile paralysis. (See Poliom velitis.)	
Infectious disease and war—Councell54	7
Infectious diseases. (See Name of country.)	
Influenza:	
(See also United States—Monthly State reports.)	
Weekly city reports 36.	
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746, 810	
864 020 080 1033 1068 1125 1181 1229 1264 1296 1343	۲

 Weekly State reports
 33,

 78, 119, 159, 200, 249, 302, 357, 404, 468, 537, 600, 667, 743, 807,

 861, 917, 977, 1030, 1065, 1122, 1173, 1225, 1261, 1292, 1340.

 Iowa.
 (See Name of disease—Weekly State reports; United States—

 Monthly State reports.)

 Isbell, Harris:

Human riboflavin requirement estimated by urinary excretion of sub-	_
jects on controlled in take	-5İ0
The inhibiting effect of urea on the microbiological assay of riboflavin	282

J

XI

I

Jamaica:	
Communicable diseases-4 weeks ended-	Page
December 21, 1940	126
January 18, 1941	308
February 15, 1941	544
March 15, 1941	814
April 12, 1941	1037
May 10, 1941	1232
Vital statistics—Year 1939	415
Jay, Philip: Domestic water and dental caries:	
I. A dental caries study, including <i>L. acidophilus</i> estimations II. A study of 2,832 white children of 8 suburban Chicago communi-	365
ties, including Lactobacillus acidophilus studies of 1,761 children- Jordan, Carl F.: Studies on immunizing substances in pneumococci. XII. Comparison of the effect of whole-cell vaccine and of polysac-	761
charide antigen in human beings	1041

K

Kansas. (See Name of disease—Weekly States reports; United States— Monthly State reports.)

Kentucky. (See Name of disease—Weekly State reports; United States— Monthly State reports.)

Kerr, K. B.: Studies on trichinosis. XIII. The incidence of human infection with trichinae as indicated by post-mortem examination of 3,000 diaphragms from Washington, D. C., and 5 eastern seaboard cities_____ 836 353 Ketone vapor inhalation, study of effects of Kohls, Glen M .: Further new species of Ornithodoros from bats (Acarina: Argasidae)_ 910 Ornithodoros viguerasi, a new species of tick from bats in Cuba (Acarina: Ixodoidea)_____ 396 Three new species of Ornithodoros (Acarina: Ixodoidea) 587 Kolb. Lawrence: Alcoholism and public health 485 Kotcher, Emil: Observations on household anophelism in a selected group of mosquito-proofed and nonmosquito-proofed homes_____ 1055 Kramer, S. D.: Experimental poliomyelitis 581 Kruse, H. D.: Medical evaluation of nutritional status. IV. The ocular manifestations of avitaminosis A with special consideration of the

 \mathbf{L}

Laboratory units, mobile, of the Ohio river pollution survey—DeMartini.	754
Lead arsenate exposure, a study of the effect of on orchardists and on con-	
sumers of sprayed fruit	129
Leadership in industry and public health-Fosdick	110
Lead poisoning. (See United States-Monthly State reports.)	
Leprosy:	
(See also United States—Monthly State reports.)	
In the United States, regional, racial, and familial relationships in-	
Aycock and Hawkins	1324

Page
1217
149
1255
24
1141
992
285

Mc

McDowell, Arthur J.:	
The incidence of cancer in Detroit, and Wayne County, Michigan, 1937_	703
The incidence of cancer in New Orleans, La., 1937	1141
McNutt, Paul V.: Special problems in our health defenses	988

M

Mack, W. N.: Experimental poliomyelitis	581
Maine. (See Name of disease-Weekly State reports; United States-	
Monthly States reports.)	
Malaria. (See United States-Monthly State reports.)	
Market milk supplies of certain urban communities, report on	240
Maryland. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Massachusetts. (See Name of disease-Weekly State reports; United	
States—Monthly State reports.)	
Maternal cases of the National Health Survey, medical and nursing services	
for the	855
Measles	1287
Measles:	
(See also United States—Monthly State reports.)	
Weekly city reports	36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746,	810,
864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296, 1343.	
Weekly State reports	33,
78, 119, 159, 200, 249, 302, 357, 404, 468, 537, 600, 667, 743,	807,
861, 917, 977, 1030, 1065, 1122, 1173, 1225, 1261, 1292, 1340.	
Mechanical aids for stream surveys—Carnahan	815
Meningitis, meningococcus:	
(See also United States-Monthly State reports.)	
Weekly city reports	38,
83, 124, 164, 205, 254, 307, 362, 413, 478, 542, 605, 672, 748,	812,
866, 922, 982, 1035, 1070, 1127, 1183, 1231, 1266, 1298, 1345.	

XШ

Meningitis, meningococcus—Continued.	Page
Weekly State reports	33
78, 119, 159, 200, 249, 302, 357, 404, 468, 537, 600, 667, 743	, 807 ,
861, 917, 977, 1030, 1065, 1122, 1173, 1225, 1261, 1292, 1340.	
Meningococcus antiserum, a study of certain factors which influence the	
determination of the mouse protective action of-Pittman	92
Mental hygiene in the State health department-Vogel	1
Mercurialism and its control in the felt-hat industry	663
Michigan:	
(See also Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Detroit and Wayne County, the incidence of cancer in, 1937-	
McDowell	703
Milk containers, paper, bactericidal effect of the paraffining of paperboard	
used for-Moss, Thomas, and Havens	944
Miller, John W.: The response of peritoneal tissue to industrial dusts	26 4
Minnesota:	
(See also Name of disease—Weekly State reports: United States—	
Monthly State reports.)	
Post-sanatorium tuberculosis survival rates in-Hilleboe	895
Mississippi. (See Name of disease-Weekly State reports; United	
States—Monthly State reports.)	
Missouri. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Montana. (See Name of disease-Weekly State reports: United States-	
Monthly State reports.)	
Morbidity and mortality during 1940 and recent preceding years	1100
Morbidity, disabling, among industrial workers, final quarter of 1940, with	
an index of the previous publications of this series—Gafafer	799
Mortality. (See also Deaths.)	
Mortality and morbidity during 1940 and recent preceding years	1100
Mortality in 90 cities, summary of, 1940	402
Mortality rates, provisional, for the first 9 months of 1940	653
Moss, Frederick J.: Bactericidal effect of the paraffining of paperboard	
used for paper milk containers	944
Motor vehicle accident fatalities in the United States. 1939	465
Mountin, Joseph W.:	
Financial support of hospitals controlled by State and local govern-	
ments	433
Hospitals existing singly in counties have similar financial structure	498
Muegge, Oswald J.: A preliminary survey of the anopheline mosquito	100
fauna of southeastern Minnesota and adjacent Wisconsin areas	883
Mumps. (See United States—Monthly State reports.)	0.00
N	

National Nutrition Conference Nebraska. (See Name of disease—Weekly State reports; United States—	1233
Monthly State reports.)	• •
Nelson, Waldo E.: Quantitative studies of the tuberculin reaction. I. Titration of tuberculin sensitivity and its relation to tuberculous infection	1082
Monthly State reports.)	

	rage
New Hampshire. (See Name of disease—Weekly State reports; United	
States - Monthly State reports.)	
Monthly State reports.)	
New Mexico. (See Name of disease—Weekly State reports; United States—Monthly State reports.)	
New York:	
(See also Name of disease—Weekly State reports; United States— Monthly State reports.)	
New York, radio pratique at the port of—Olesen	1269
North Carolina. (See Name of disease—Weekly State reports; United States—Monthly State reports.)	
North Dakota. (See Name of disease—Weekly State reports; United States—Monthly State reports.)	
Notifiable diseases. (See also Name of country.)	
Notifiable diseases in the United States, 1939. Morbidity and mortality summaries for certain important communicable diseases	293
Nursing profession, the responsibility of, in industrial hygiene—Bloom- field	1131
Nutritional status, medical evaluation of. IV. The ocular manifestations of avitaminosis A with special consideration of the detection of early changes by biomicroscopy—Kruse	1301
Nutrition campaign, new educational film to aid	352
Nutrition Conference, National	1233

0

Ohio. (See Name of disease—Weekly State reports; United States— Monthly State reports.)	
Ohio river pollution survey, mobile laboratory units of-DeMartini	754
Oklahoma. (See Name of disease—Weekly State reports; United States—	
Monthly State reports.)	
Olesen Robert:	
A note on modified radio pratique in Guavaquil	292
Radio protique at the nort of New York	1269
Radio prasique at the port of fiew forkerent for	1200
Oregon:	
(See also Name of disease—Weekly State reports; United States—	
Monthly State reports.)	
Malheur County-Plague-infected fleas	1295
Orientation course of the United States Public Health Service for	
personnel to serve in nearth and samuation activities in connection	669
with national defense	004
Ornithodoros (Acarina: Ixodoidea), three new species of-Cooley and	
Kohls	587
Ornithodoros from bats (Acarina: Argasidae), further new species of-	
Cooley and Kohls	910
Ornithodoros viguerasi, a new species of tick from bats in Cuba (Acarina:	
Ixodoidea)—Cooley and Kohls	39 6

P

Palmer, Carroll E.: Quantitative studies of the tuberculin reaction. I. Titration of tuberculin sensitivity and its relation to tuberculous infec-	
tion	1082

Panama Canal Zone: Notifiable diseases—	Page
	410
November 1940	415
December 1940	410
January 1941	1184
	1184
March 1941	1184
Paramning of paperboard used for paper milk containers, bactericidal enect	044
Paratyphoid fever. (See typhoid fever: United States-Monthly State	944
reports.)	
Financial support of bosnitals controlled by State and least govern	
Financial support of nospitals controlled by brate and local govern-	499
Heavitals existing singly in counties have similar financial structure	400
Peek E C. The Dick reaction and scarlet favor morbidity following	490
injections of a nurified and tannic acid precipitated erythrogenic toxin	057
Pallarra	301
(See also United States—Monthly State reports)	
Weekly eity reports	38
83, 124, 164, 205, 254, 307, 362, 413, 478, 542, 605, 672, 748 866, 922, 982, 1035, 1070, 1127, 1183, 1231, 1266, 1298, 1345	, 812,
Peller, Sigismund: Cancer in the mentally ill	132
Pennell, Elliott H.:	
Financial support of hospitals controlled by State and local govern-	
ments	433
Hospitals existing singly in counties have similar financial structure	498
Pennsylvania. (See Name of disease-Weekly State reports; United	
States—Monthly State reports.)	
Peritoneal tissue, the response of, to industrial dusts—Miller and Sayers Perrin, T. L.: An institutional outbreak of pneumonitis. III. Histo-	264
pathology in man and rhesus monkeys due to the virus of "Q" fever	149
Perrott, George St. J.:	
Causes of physical disqualification under the Selective Service law.	
Early indications	1017
Summary of physical findings on men drafted in the World War	41
Personnel of the United States Public Health Service, contributions of, to	
outside journals (January–December 1940)	454
rescor, M. J.: A futner study of the Korschach test applied to denn-	901
quents	381
Physical findings on men drafted in the World War, summary of—Britten	041
and Perrott	41
Pittman, Margaret: A study of certain factors which influence the determi-	
nation of the mouse protective action of meningococcus antiserum	92
Plague: Foreign reports	480,
545, 675, 814, 924, 984, 1129, 1187, 1300,	1347
Plague (rodent): Hawaii Territory 38, 164, 255, 479, 542, 812, 1127, 1231,	1266
Plague-infected fleas:	
California—	
Kern County 1176, 1228, 1263, 1295,	1342
Monterey County	1176
Dan Francisco	1289

.

Plague-infected fleas-Continued.	
Idaho	Page
Ada County	1295
Canyon County	1228
Payette County	1228
Oregon-Malheur County	1295
Plague-infected rats: California-Contra Costa County	1175
Plague infected squirrels: California-Kern County1067,	1176
Plague infection reported in the United States during 1940	399
Plasmodium lophurae, an avian malaria parasite, sporozoites of, in .4no-	1336
Preumococci studies on immunizing substances in	1000
XI Effect of variation in desage of antigenic polysaccharide on	
serum entibody titer in human beinge-Felton Cameron	•
and Brather	800
XII Comparison of the effect of whole-cell versine and of poly-	044
All. Comparison of the energy of whole-cen vacche and of poly-	
backer and Veukel	1041
Dacher, and vaubel	1041
Pheumococcus, report of a new type of, which crosses with types A, AI,	69
XX, XXIX, and XXXI antipheumococcic serums—Chinn and Eddy	04 96
Pneumonia (all forms): weekly city reports	010, 010
81, 122, 102, 202, 202, 300, 300, 411, 470, 540, 003, 070, 740	, 010,
864, 920, 980, 1033, 1008, 1125, 1181, 1229, 1204, 1290, 13	40.
Pneumonitis, an institutional outpreak of. 111. Histopathology in man	
and rhesus monkeys in the pheumonitis due to the virus of "Q" lever-	140
Lillie and Perrin	149
Poison ivy (Rhus spp.) dermatitis, tannic acid treatment of-Schwartz	1000
and Warren	1038
Poliomyelitis:	
(See also United States—Monthly State reports.)	
Experimental—Kramer, Mack, and Himes	581
In Charleston County, South Carolina, 1939, a clinical study of—	100
Davis, Weber, and Arey	1007
Prevalence of in the United States in 1940—Dauer	875
"Sporadic," with special reference to the geographical and chronologi-	
cal distribution in Tennessee in the 18 months ended June 30,	
1940Lumsden	992
Weekly city reports	38,
83, 124, 164, 205, 254, 307, 362, 413, 478, 542, 605, 672, 748	, 81 2,
866, 922, 982, 1035, 1070, 1127, 1183, 1231, 1266, 1298, 13	45.
Weekly State reports	34,
79, 120, 160, 201, 250, 303, 358, 405, 469, 538, 601, 668, 744	, 808,
862, 918, 978, 1031, 1066, 1123, 1174, 1226, 1262, 1293, 13	41.
Prather, Perry Franklin: Studies on immunizing substances in pneumo-	
cocci. XI. Effect of variation in dosage of antigenic polysaccharide on	
serum antibody titer in human beings	822
Professional public health personnel, qualifications of:	
III. Nurses—Derryberry and Caswell	211
IV. Sanitation personnel—Derryberry and Caswell	311
V. Laboratory workers—Derryberry and Caswell	445
Protein, dietary, the influence of, on the toxicity of sulfanilamide-Smith,	
Lillie, and Stohlman	24
Psittacosis in Connecticut	161
Psittacosis in Oak Park, Illinois	1228

Psittacosis in Washington, D. C.	Page 863
Psittacosis: An outbreak of at the National Zoological Park, Washington,	
D. C.—Tomlinson	1073
Public health, count decisions on. (See Court decisions on public health.)	
Public health nursing curriculum committee, progress report of	679
Public Health Service publications. List issued during the period	
July-December 1940	530
Puerperal septicemia. (See United States-Monthly State reports.)	
Puerto Rico. (See United States-Monthly State reports.)	

Q

"Q" fever, Australian and American, immunological relationships between	
the rickettsiae of-Bengtson	272
"Q" fever infected and immunized guinea pigs, studies on active and pas-	
sive immunity in —Bengtson	327

R

Rabies in animals. (See United States—Monthly State reports.) Rabies in man:

(See also United States-Monthly State reports.)

Weekly city reports	1345
Radio pratique at the port of New York-Olesen	1269
Radio pratique, modified, in Guayaquil, a note on-Olesen	29 2
Rhode Island. (See Name of disease-Weekly State reports; United	
States—Monthly State reports.)	• •
Riboflavin requirement, human, estimated by urinary excretion of sub-	
jects on controlled intake-Sebrell, Butler, Wooley, and Isbell	510
Riboflavin, the inhibiting effect of urea on the microbiological assay of-	
Isbell, Wooley, and Fraser	282
Riley, William A.: A preliminary survey of the anopheline mosquito fauna	
of southeastern Minnesota and adjacent Wisconsin areas	883
Ringworm disease. (See United States-Monthly State reports.)	
Rocky Mountain spotted fever. (See United States-Monthly State reports.)	•
Rorschach test applied to delinquents, a further study of the-Pescor	381

8

Samoa (American): Vital statistics-Year 1940	1184
Sayers, R. R.: The response of peritoneal tissue to industrial dusts	264
Scarlet fever:	
(See also United States—Monthly State reports.)	
Weekly city reports	36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746,	810,
864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296, 1343.	
Weekly State reports	34,
79, 120, 160, 201, 250, 303, 358, 405, 469, 538, 601, 668, 744,	808,
862, 918, 978, 1031, 1066, 1123, 1174, 1226, 1262, 1293, 1341	•
Scarlet fever morbidity and Dick reaction following injections of a puri-	
fied and tannic acid precipitated erythrogenic toxin-Veldee, Peck,	
Franklin, and DuPuy	957

	Page
Schwarts, Louis: Tannic acid treatment of poison ivy (Rhus spp.) dermatitis	1039
Sectland: Vital statistics-	1000
Quarter ended September 30, 1940	86
Quarter ended December 31, 1940	1072
Year 1940	1072
Seal, S. C.: The application of the human serum opacity reaction for	
evaluating the antitoxin binding power (LB) of Clostridium perfringens	
(type A) toxoid	792
Sebrell, W. H., Jr.:	
Cirrhosis of the liver in rats on a deficient diet and the effect of alcohol	1255
Human riboflavin requirement estimated by urinary excretion of subjects on controlled intake	510
Selective Service law, causes of physical disgualification under the. Early	010
indications—Britten and Perrott	1017
Senn, Charles L.: Procedure for the maintenance of housing standards in	
Milwaukee	189
Septic sore throat. (See United States—Monthly State reports.)	
Sherrard, G. C.: Effectiveness of deratization of ships by trapping	1061
Siphonaptera. A study of the species infesting wild hares and rabbits of	
North America north of Mexico	914
Smallpox:	
(See also United States—Monthly State reports.)	
Foreign reports 208, 309, 418, 676, 869, 926, 1038, 1188, 1232,	1348
Vaccination laws and regulations in the United States, principal pro-	
visions of	167
Weekly city reports	36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746,	810,
864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296, 1343	i.
Weekly State reports	34,
79, 120, 160, 201, 250, 303, 358, 405, 469, 538, 601, 668, 744,	808,
802, 918, 978, 1031, 1006, 1123, 1174, 1226, 1262, 1295, 1341.	
Single, M. I.:	
I ne growth and effects of the tubercle bacilius on the chorio-aliantoic	
memorane of the chick emoryo: A method for studies in chemo-	1077
The influence of dictory protein on the toxisity of gulfanilemide	1411
Smith Theohold 1040 encoded given to Dr. Hereld P. Cor	24
Sodium solonito, the officiat of on the blood sugar and liver alveoren of rate	20
and mabita Wright	345
South Caroline	010
(See also Name of disease-Weekly State reports: United States-	
Monthly State reports)	
Charleston County, a clinical study of poliomyelitis in 1939—Davis.	
Weber and Arev	1007
South Dakota. (See Name of disease—Weekly State reports: United	
States-Monthly State reports.)	
Sporozoites of Plasmodium lophurae, an avian malaria parasite, in Ano-	
pheles quadrimaculatus—Hurlbut and Hewitt	1336
State and insular health authorities, 1940, directory of	10
State and Territorial health officers confer on health defenses	i 194
Stephenson, Charles S.: Cancer in the mentally ill	132

Stewart, Sarah E.: The application of the human serum opacity reaction	Lage
for evaluating the antitoxin binding power (LB) of Clostridium perfrin-	
gens (type A) toxoid	792
Stohlman, E. F.: The influence of dietary protein on the toxicity of sul-	
fanilamide	24
Stream surveys, mechanical aids for-Carnahan	815
Studies on active and passive immunity in "Q" fever infected and im-	
munized guinea pigs—Bengtson	327
Studies on immunizing substances in pneumococci:	
XI. Effect of variation in dosage of antigenic polysaccharide on serum antibody titer in human beings—Felton, Cameron, and Prather	822
XII. Comparison of the effect of whole-cell vaccine and of polysac-	022
charide antigen in numan beings-reiton, Jordan, nesbacher,	10/1
Studies on the network history of the views of lumphonetic chariemenia	1041
gitig in mice. Here	995
Studies on trichingsis XIII The incidence of human infection with tri-	200
chippe as indicated by nost mortam examination of 3 000 disphrame	
from Weshington D. C. and 5 eastern seehoard sities	
and Cuvillier	836
Studies quantitative of the tuberculin reaction I Titration of tuberculin	
sensitivity and its relation to tuberculous infection—Furcolow Hewell.	
Nelson, and Palmer	1082
Study of certain factors which influence the determination of the mouse	
protective action of meningococcus antiserum—Pittman	92
Study of effects of ketone vapor inhalation	353
Study of the effect of lead arsenate exposure on orchardists and on con-	
sumers of sprayed fruit	129
Sulfanilamide, the influence of dietary protein on the toxicity of-Smith,	
Lillie, and Stohlman	24
Sweden: Notifiable diseases-	
October 1940	166
November 1940	544
December 1940	606
January 1941	923
February 1941	1129
March 1941	1299
Switzerland: Communicable diseases-	
August 1940	87
September 1940	364
October 1940	415
November 1940	750
December 1940	814
January 1941	984
February 1941	1300
warcn 1941	1346

Tannic acid treatment of poison ivy (Rhus spp.) dermatitis-Schwartz	1000
Tennessee. (See Name of disease – Weekly State reports; United States –	1039
Monthly State reports.)	

Tetanus. (See United States—Monthly State reports.)	Page
Texas. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.	
Thomas, Robert C.: Bactericidal effect of the paraffining of paperboard	
used for paper milk containers	944
Tissue factors in antirables immunity of experimental animals—Habel	6 92
Tomlinson, Jr., T. H.: An outbreak of psittacosis at the National Zoo-	
logical Park, Washington, D. C	1073
Trachoma. (See United States—Monthly State reports.)	
Trichinosis:	
(See also United States-Monthly State reports.)	
Studies on. XIII. The incidence of human infection with trichinae as	
indicated by post-mortem examination of 3,000 diaphragms from	
Washington, D. C., and 5 eastern seaboard cities—Kerr, Jacobs, and	
Cuvillier	836
Tubercle bacillus, the growth and effects of, on the chorio-allantoic mem-	
brane of the chick embryo: A method for studies in chemotherapy—	
Emmart and Smith	1277
Tuberculin reaction, quantitative studies of the. I. Titration of tuber-	
culin sensitivity and its relation to tuberculous infection—Furcolow,	
Hewell, Nelson, and Palmer	1082
Tuberculosis:	
Post-sanatorium, survival rates in Minnesota—Hilleboe	895
Weekly city reports	36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746,	810,
864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296, 1343.	
Tularemia. (See United States—Monthly State reports.)	
Typhoid fever:	
(See also United States—Monthly State reports.)	
Weekly city reports	36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746,	810,
864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296, 1343.	
Typhoid fever and paratyphoid fever: Weekly State reports	34,
79, 120, 160, 201, 250, 303, 358, 405, 469, 538, 601, 668, 744,	808,
862, 918, 978, 1031, 1066, 1123, 1174, 1226, 1262, 1293, 1341.	
Typhus fever:	
(See also United States—Monthly State reports.)	
Endemic, complement fixation in-Bengtson	649
Foreign reports 209, 419, 677, 750, 927, 984, 1129, 1188,	1349
Weekly city reports	38,
83, 124, 164, 205, 254, 307, 362, 413, 478, 542, 605, 672, 748,	812,
<u>866 099 089 1025 1070 1197 1183 1931 1966 1908 1245</u>	•
600 , <i>722</i> , <i>7</i> 02, 1033, 1070, 1127, 1163, 1231, 1200, 1236, 1343	
000, 822, 802, 1090, 1010, 1121, 1100, 1201, 1200, 1280, 1040.	
U	
U U Undulant fever. (See United States—Monthly State reports.)	
U Undulant fever. (See United States—Monthly State reports.)	
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939	300
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939 1 Vital statistics—Year 1939 1	300 300
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939 Vital statistics—Year 1939	300 300
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939 Vital statistics—Year 1939	300 300
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939 Vital statistics—Year 1939 United States: Cancer mortality in. III. Geographic variation in recorded cancer mortality for detailed sites, for an average of the years 1930-32	300 300 245
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939 Vital statistics—Year 1939 United States: Cancer mortality in. III. Geographic variation in recorded cancer mortality for detailed sites, for an average of the years 1930-32 Communicable diseases—	300 300 245
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939 Vital statistics—Year 1939 United States: Cancer mortality in. III. Geographic variation in recorded cancer mortality for detailed sites, for an average of the years 1930-32 Communicable diseases— Current prevalence of 89, 259, 481, 751, 985, 1	300 300 245 191
U Undulant fever. (See United States—Monthly State reports.) Union of South Africa: Notifiable diseases—Years ended June 30, 1940, and June 30, 1939 1 Vital statistics—Year 1939 1 United States: Cancer mortality in. III. Geographic variation in recorded cancer mortality for detailed sites, for an average of the years 1930-32 Communicable diseases— Current prevalence of	300 300 245 191 177

United States—Continued.	
Communicable diseases—Continued.	Page
Monthly State reports (consolidated for the year 1940)	471
Reported prevalence of, during 1940	527
Weekly State reports	32,
77, 118, 158, 199, 248, 301, 356, 403, 467, 536, 599, 666, 742,	806,
860, 916, 976, 1029, 1064, 1121, 1172, 1224, 1260, 1291, 1339	•
Deaths (all causes)—	
Weekly city reports	36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746,	810,
864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296, 134	1 3.
Deaths—Large cities—Weekly reports (Weekly Mortality Index)	31,
76, 117, 157, 198, 247, 300, 355, 402, 466, 535, 598, 665, 741, 805,	859,
915, 975, 1028, 1063, 1120, 1171, 1223, 1259, 1290, 1338.	
Notifiable diseases in, 1939. Morbidity and mortality summaries of	
certain important communicable diseases	293
Motor vehicle accident fatalities in, 1939	465
Poliomyelitis, prevalence of, in 1940—Dauer	875
Principal provisions of smallpox vaccination laws and regulations in	
' the	167
Regional, racial, and familial relationships in leprosy, in—Aycock and	
Hawkins	1324
United States Public Health Service orientation course for personnel to	
serve in health and sanitation activities in connection with national	
defense	662
Urban housing and crowding	595
Urea, the inhibiting effect of, on the microbiological assay of riboflavin	
Isbell, Wooley, and Fraser	282
Utah. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	

V

Vaccines, phenolized rabies, factors influencing the efficacy of. II. Virus	
content of vaccine—Habel	641
Vaubel, Ellis K.: Studies on immunizing substances in pneumococci.	
XII. Comparison of the effect of whole-cell vaccine and of polysaccharide	
antigen in human beings	1041
Veldee, M. V.: The Dick reaction and scarlet fever morbidity following	
injections of a purified and tannic acid precipitated erythrogenic toxin	957
Venezuela: Caracas-Poliomyelitis 309), 544
Vermont. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Vincent's infection. (See United States-Monthly State reports.)	
Vion, C. J.: Effectiveness of deratization of ships by trapping	1061
Virginia. (See Name of disease-Weekly State reports; United States-	
Monthly State reports.)	
Virgin Islands of the United States: Notifiable diseases-	
October 1940	205
November 1940	20 5
December 1940	205
January 1941	1036
February 1941	1036
March 1941	1 09 6

XXII

Vital statistics:	
Canada—	Page
First quarter 1940	84
Second guarter 1940	125
Third quarter 1940	867
Great Britain—England and Wales—	
First quarter 1949	86
Second guarter 1940	5 43
Third guarter 1940	984
Fourth generter 1940	1186
Jamaica-Year 1939	415
Samoa (American)—Year 1940.	1184
Scotland—Quarter ended September 30, 1940	86
Vogel, Victor H.: Mental hygiene in the State health department	1

W

War and infectious disease—Councell547
Warren, Leon H.: Tannic acid treatment of poison ivy (Rhus spp.) dermatitis1039
Washington. (See Name of disease—Weekly State reports; United States—Monthly State reports.)
Water, domestic, and dental caries:
I. A dental caries study, including L. acidophilus estimations—Dean, Jay, Arnold, and Elvove365
II. A study of 2,832 white children of 8 suburban Chicago communi- ties, including Lactobacillus acidophilus studies of 1,761
children—Dean, Jay, Arnold, and Elvove
Weber, Francis J.: A clinical study of poliomyelitis in Charleston County,
South Carolina, 1939
States Monthly State reports.)
Whooping cough:
(See also United States-Monthly State reports.)
Weekly city reports 36,
81, 122, 162, 202, 252, 305, 360, 411, 476, 540, 603, 670, 746, 810, 864, 920, 980, 1033, 1068, 1125, 1181, 1229, 1264, 1296, 1343.
Weekly State reports
80, 121, 161, 202, 251, 304, 359, 406, 470, 539, 602, 669, 745, 809, 863, 919, 979, 1032, 1067, 1124, 1175, 1227, 1263, 1294, 1342.
Wisconsin:
(See also Name of disease—Weekly State reports; United States— Monthly State reports.)
Milwaukee, procedure for the maintenance of housing standards in— Senn189
Wooley J.G.
Human riboflavin requirement estimated by urinary excretion of
Subjects on control matching on the migrobiological assay of riboflavin 282
The minimum energy of readium solonite on the blood sugar and liver
wright, U. I.: The effect of soulum selence on the blood sugar and hver
glycogen of rats and rabbits
Wyoming. (See Name of disease—weekly State reports; United States—Monthly State reports.)

XXIV

INDEX

Y	Page
Yellow fever: Foreign reports	
166, 210, 25 7, 420 , 480, 545, 678	, 814, 928, 1072, 1129, 1189, 1349
Yugoslavia: Communicable diseases-4 weeks en	ded—
November 3, 1940	
December 1, 1940	
December 29, 1940	607
January 26, 1941	674
February 23, 1941	
• ,	1.

0

NUTRITION the Armor of Robust Health

THE responsibility of public agencies is to see to it that all people know about the startling new facts in nutritional science and that these facts can play an important part in keeping their family's health high and their spirits up no matter what the drain of defense work on their home and life.

These two scientific papers are reprinted at the request of the National Nutrition Advisory Committee.

They touch on the broader aspects of the entire nutritional front, as well as dealing specifically with one of the first important steps of that program.

> M. L. WILSON, *Chairman*, The Nutrition Advisory Committee to the Coordinator of Health, Welfare, and Related Defense Activities.

Enriched Flour and Enriched Bread: How it Started*

RUSSELL M. WILDER Rochester, Minnesota

THE BASIS of this story is the news release, dated January 29, 1941, of the National Research Council, in which announcement was made of the recommendation of its Committee on Food and Nutrition of enriched flour and enriched bread. The news release you have already seen. The story back of it is what I want to tell today.

The National Research Council's Committee on Food and Nutrition

RUSSELL M. WILDER, M.D., Ph.D., is one of the famed scientists whose achievements in medicine were recently honored in the book, "Physicians of the Mayo Clinic." After a brilliant practicing and teaching career Dr. Wilder, in company with Dr. Ray Williams and other co-workers at the Mayo Clinic, conducted a nutritional experiment that has led to an increasing appreciation of the need for thiamine (Vitamin B1) in every-day diets. Despite his heavy duties as Professor of Medicine and Chief of the Department of Medicine at the Mayo Foundation, a position he has held since 1931, Dr. Wilder has devoted increasing time and intensified work towards raising the standards of national nutrition. He is Chairman of the Committee on Food and Nutrition of the National Research Council and a member of the Nutrition Advisory Committee to the Coordinator of Health. Welfare and Related Defense Activities.

was organized at the request of the government to provide scientific guidance for a national nutrition campaign. The committee will be studying many important groups of food and the contribution made by them to an adequate diet. It recognized, however, that wheat flour and its products demanded consideration before any other class of food, if for no other reason than that wheat flour and its products contribute more calories to the American diet than any other class of food. Foods such as sugar, milk, cornmeal, edible fats and meat will receive attention in due time. Improving the food ways of a nation of one hundred and thirty million people is a large undertaking.

The vitamins and minerals of wheat

SOME PHYSICIANS and many others have criticized white flour and white bread for more than a hundred years. The early critics, among them Sylvester Graham, for whom graham bread was named, were mostly faddists who had little reason and no scientific grounds for their objections, but the situation now is different. Since the advent of what may be called "the vitamin era" the demand

*Read at the conference of bakers, millers and others to co-ordinate the introduction of enriched flour and enriched bread, Chicago, March 5, 1941. 3 for flour with better nutritional qualities has acquired formidable scientific backing. Dr. R. R. Williams issued a warning not long ago, published in "Cereal Chemistry": "To blink at these scientific facts," he said, "which will presently become common knowledge, would be suicidal for the commercial enterprises concerned." If such a statement can be justified, enrichment of flour and bread with vitamins and minerals, as now is proposed, represents a move not only in the interest of better public health for which it was intended, but also in the interest of the milling and baking industries.

The significance of the vitamin content of wheat first came to light in 1916 when McCollum and his coworkers reported on the presence in wheat germ of an antineuritic substance which they called water-soluble vitamin B. Published a few years later was a classic study by Osborne and Mendel on the nutritive value of the wheat grain. They pointed out that the wheat berry consists of about 83.5 per cent endosperm (the white starchy content of the berry), 1.5 per cent embryo or germ, and 15 per cent bran and inner coatings. The embryo they found to be rich in the watersoluble vitamin B, but this also was present in the bran and even in small amounts in the endosperm. Their article raised questions about milling methods, and interest in milling was further aroused in 1922 by a scientific paper of Bell and Mendel. It was revealed that while the wheat germ

is rich in vitamin B, the germ constitutes so small a part of the berry as a whole that its contribution to the total B content of the berry is only Wheat from about 15 per cent. which the germ had been removed by dissection still contained much of this vitamin. The patent white flour, which represents the extraction of from 60 to 70 per cent of the berry, accounted for only 10 per cent. The rest was in the bran and inner coatings, which with the germ are removed in the manufacture of white Other scientists corroborated flour. these observations and showed that nutrients other than the antineuritic vitamin also are more concentrated in parts of the grain removed in milling.

The antineuritic substance which McCollum, Mendel and their coworkers called water-soluble vitamin B has since been shown to consist of a number of vitamins, so that today this substance is referred to commonly as the vitamin B complex. In it are thiamine, also called vitamin B₁, riboflavin or vitamin B2, nicotinic acid, which has not been given a number, pantothenic acid, also not numbered, pyridoxine or vitamin B_e, choline and others. Of these, thiamine, nicotinic acid and riboflavin play a part in the formation in the body of enzymes necessary for the smooth oxidation of sugar, so that eating starchy foods such as flour. which by digestion is converted into sugar, creates an increased demand for them. This important knowledge has been obtained only recently from research conducted in numerous laboratories of biochemistry.

There are now available many reports of the thiamine (vitamin B_1) content of wheat. It varies considerably with locality, soil and weather conditions. Soft wheats, for example, contain less, as a rule, than hard wheats. The analyses of Booher and Hartzler, for instance, with which other reported data are in harmony, showed for soft winter wheat a content of thiamine representing about 1.6 mg. per pound (0.354 mg. for each 100 gm.), and for hard spring wheat 2.38 mg. per pound (0.525 mg. for each 100 gm.). A milligram (mg.) of thiamine represents 333 International units of vitamin B_1 .

Other nutrients in the wheat berry which have received consideration in recent discussions of flour and bread are d1-alpha tocopherol, commonly known as vitamin E—found only in the germ but of doubtful importance in human nutrition—and a number of minerals including iron, calcium and phosphorus. Whole wheat flour, according to recent studies, is a good food source of iron and phosphorus and contains significant amounts of calcium, whereas plain white flour is a poor source of all the vitamins and of most of the minerals.

The nutrition problem

You MAY be asking now about what this has to do with the public health, and whether the use of plain white flour and its products contributes at all importantly to the nutrition problem, granting there is such a problem.

When the story of the control of malnutrition can finally be told it may not be quite as dramatic a tale as that of the eradication of cholera and typhoid, but the advantages to the public health from such control will, in my opinion, match in importance what has been accomplished in sani-Typhoid either kills or ultitation. mately relaxes its hold. Nutritional deficiency saps vitality in so insidious a way that the victim may be unaware that enough is wrong to call a doctor. A few persons die of beriberi in this country, but not many. A few die of pellagra, but even before it was learned that nicotinic acid could be curative in pellagra, the number of deaths recorded in any single year did not exceed four or five thousand. The milder degrees of nutritional deficiency, although they are neither fatal nor completely incapacitating, constitute the nub of the problem of malnutrition. They wreck courage. They undermine the will to do. They interfere with sleep, so that rest is disturbed. They seriously depress resistance to other diseases, and in women contribute to the occurrence of complications during pregnancy. The prevalence of milder degrees of malnutrition, in the opinion of those who are best informed, accounts for much of the shiftlessness of the poor whites of the South, and for a considerable part of the relief rolls. The undernourished are unable to hold jobs if they find them; they become unemployable.

Sir John Orr, an English physician writing recently in the British Medical Journal, stated that improving the diet of workmen whose diets had not been up to standard had been "followed by increased output without any conscious effort and also by reduction in the number of accidents." He also referred to observations relating to "In some tests mental alertness. supplementary feeding of milk and other protective foods had been followed by definite improvement in the ability of previously undernourished children to learn, and in one such test the educational advance in a period of five months was equivalent to the advance usually made by these children in two years." Comparable improvement in learning capacity has been observed in a number of American schools after introducing the school lunch program.

Statements such as these may appear to you to be exaggerated. I myself demanded proof two years ago and got it. Since then Dr. Ray Williams with Dr. Mason and other associates, among whom I am happy to be numbered, has been engaged in studying effects produced on human subjects by the isolated restriction of thiamine (vitamin B₁). The scientific control maintained has been rigid. The subjects are housed in an isolated part of the hospital and remain continuously under the close supervision of a trained staff of nurses. The food given is analyzed for thiamine by Dr.

Mason, and a double check is obtained by regular analyses for thiamine of twenty-four hour collections of urine. The allowance of thiamine is regulated and changes in dosage are made without the knowledge of the subjects.

The degree of disability induced by withdrawing thiamine from the otherwise adequate diets of these persons was impressive. Fatigue appeared, interest in daily tasks was lost, accompanied by discouragement, depression and irritability. Appetite was lost. Multiple neurasthenic complaints were heard. The heart sounds became faint, the blood pressure fell, the pulse was irritable, and as the duration of the restriction was prolonged abnormalities in the action of the heart and the mobility of the stomach and intestine could be recorded with special apparatus. Likewise changes were noted in the chemical constituents of the blood, especially in the concentration in the blood of by-products in the oxidation or utilization in the body of sugar. These abnormalities were all quickly corrected when more thiamine was In the first of these studies given. the allowance of thiamine was restricted to less than 20 International units. Later, subjects were maintained on a level of intake of thiamine that was not much below what until very recently was considered nearly adequate. Translated into terms representing an equivalent intake for men eating 2500 to 3000 calories of food, the figure would be from 200 to 225 Interna-

tional units of vitamin B_1 (0.6 to 0.67 mg. of thiamine). This is an amount of thiamine as great as many persons receive in the foods they either elect to eat or take for lack of means to buy something better. In a survey conducted by the Rockfeller Health Board near Chapel Hill, North Carolina, the average intake for adult persons was 233 International units (0.699 mg. of thiamine). In the food purchase study made by Stiebeling and Phipard for families of employed wage earners and clerical workers in cities, the food contained less than 300 International units a day in 10 per cent of the families, and had allowance been made for loss in cooking and for waste the figure probably would be reduced to between 200 and 250 International units.

The results of the later studies of Williams show that people can live for six months or more on such a low intake of thiamine, without the development of abnormalities detectable with laboratory methods of examination. But there is a development of the symptoms I related before, and for passable health an intake at least twice as great, or in the neighborhood of 500 International units (1.66 mg. of thiamine) is necessary. The reports of Williams have confirmed and amplified earlier observations of Jolliffe and others.

Gross lack of any of the vitamins and for that matter of any important nutritional factor in food, gives rise to clearly recognizable disease, but as with thiamine, an intake of any vitamin or mineral which is only on the borderline of adequacy and provides no factor of safety is likely to lead to poor health. Reserves are necessary to meet increased requirements created by unusual exertion, complicating disease, pregnancy, lactation and other stresses to which men or women are exposed. The most reliable index of the extent of malnutrition in the United States is provided by the Stiebeling and Phipard report to which I referred. It showed that only about a fourth of the twenty-nine million non-relief families in America were purchasing food which provided diets that could be regarded as good, that more than a third or more had diets classed as poor.

You may question conclusions based on surveys, but before you reject these data please consider (1) that the standards of reference adopted by Stiebeling and Phipard were low in several particulars, as compared to the standards which are proposed by the Committee on Food and Nutrition of the National Research Council, and (2) that the income of two-thirds of the families of the United States, as reported by the Federal Bureau of Labor Statistics, is less than \$1500, with an average for this two-thirds of only \$826-\$17.25 a week per family, for housing, fuel, light, clothing and food. Of such an income the amount available for food is not more than \$8.75. It is possible to supply a very adequate diet on a budget of \$1.75 per capita per week, which for a family of five persons would represent \$8.75 but to do so you must depend on inexpensive

foods. This means including in the diet relatively much flour and bread, and the flour and bread until we had enriched flour had to be of whole wheat. Most people, however, use plain white flour, and recent analyses by Stiebeling of the quality of diets obtained by city families in the North and West revealed poor diets in 75 per cent of families spending \$1.75 per person per week.

However, all malnutrition is not confined to families of low income The children of the rich groups. often indulge excessively in the tempting confections of the candy merchant to their detriment. The sons and daughters of the well-to-do in many schools and universities, while receiving excellent classroom instruction in science, eat most unscientifically in boarding houses, fraternities and sororities. Evidence of the ill-effect of malnutrition on school performance has been presented. Also women frequently attempt to reduce themselves with no thought of possible injury to their nervous mechanisms, and business executives, getting paunchy, cut down on food without taking sufficient care about what can be cut without harm. Even liberal expenditures for food do not guarantee adequate diets. The analyses by Steibeling of the quality of diets obtained by city families in the North and West revealed poor diets in 5 per cent and only fair diets in another 25 per cent of families spending per person per week \$4.55.

The problem of malnutrition is not

۱

new, but as we meet it today a difference is apparent. Two generations and more ago food might be scarce and limited in variety, but all of what there was would be taken in a natural form and carry with it vitamins and minerals. Also there was much resort in former days to "pot licker," with which many of you city bred folks have no familiarity. In the spring there were fresh green things, sulphur and molasses and other simple rem- . edies for what may have been a mild dietary deficiency. Since those days the American diet has undergone a subtle change. Half of its calories formerly were provided by undermilled cereals, mainly as coarsely ground flour. This half has been replaced by less nutritive food. In part the replacement has been by roller milled white flour, which carries at most a sixth and usually less than a tenth of the thiamine and other vitamins that accompanied flour obtained by the more primitive milling methods of the past. In part the replacement has been by sugar, which carries no vitamins at all. To some extent this change has been compensated for by a greater consumption of garden vegetables and a greater consumption of milk, but unfortunately neither garden vegetables nor milk are very good sources of thiamine. They probably also are poor in nicotinic acid. Furthermore, being more costly, at least for the city dweller, garden vegetables and milk have gone disproportionately to families in the upper income groups, leaving the economically less fortunate

much more poorly nourished than they ever were. Sir John Orr and David Lubrock, in their book entitled "Feeding the People in War Time," published last March, related the deterioration of the diet of the working class in England in the nineteenth century to the rise of industrialism. "The diet came to consist more and more of the cheapest form of energy supplier, and by the time of the Boer War the required height for recruits for the Army had to be lowered from 5 feet 3 inches to 5 feet. It previously had been reduced from 5 feet 6 inches to 5 feet 3 inches. Since then improvement has been noted."

From theory to action

TNDIVIDUAL MILLERS and bakers, conscious that all was not right, have been experimenting for several years with fortification of flour and bread, adding thiamine, and in some instances other vitamins and minerals. Also much discussion of the subject has been heard in scientific circles. On December 9, 1938, a cooperative committee on vitamins of the Councils on Food and Nutrition and Pharmacy and Chemistry of the American Medical Association gave expression to certain principles relating to food processing in general. These principles as formulated and adopted by the Council on Foods and Nutrition March 18, 1939 were: (1) that in the processing of foods every effort should be directed to retaining in the products the food values of the natural foods from which they were

made, and (2) that if the processed foods are not nutritionally equivalent to the original foods from which they are obtained, it is in the interest of the public to restore dietary essentials removed in processing so that these foods may have the full nutritive value of the natural foods with respect to the substances restored or added.

In this manipulation of processed foods it was considered essential (1) that the materials added be restricted to those for which greater distribution was in the interest of public health, and (2) that the food should be a suitable vehicle for the minerals and vitamins to be restored. The added substances should mix well and not lose potency during the usual conditions of storage. They also should be in such form as to be available biologically to the consumer.

The Council considered that white flour represented a processed food which, while valuable in itself as an inexpensive source of starch and protein, could be nutritionally improved by adding to it certain substances removed from it in milling. Substances which could be added advantageously would be thiamine, riboflavin, nicotinic acid, iron and possibly calcium and phosphorus. All of these are available in suitable form.

In the interest of public health, improvement of the inexpensive staple foods was primary in importance, and what was done should be effected at a minimal added cost to the consumer. Otherwise added vitamins or minerals will not reach those who are most in need of them.

The aim in restorative fortification of foods was not to reach some hypothetical goal which had no bearing on the problem of human nutrition. It was to provide dietary essentials which people must get from their foods in order to maintain good health. The restored foods should make it easier for the person unskilled or unversed in nutrition to obtain the vitamins and minerals he ought to obtain with his food.

The principle of restoration to natural levels, as sponsored by the Councils of the American Medical Association, represented essentially fortification with a limit. Under this plan white flour would require addition to it of thiamine, nicotinic acid, riboflavin, iron, calcium and phosphorus in amounts sufficient to bring up the levels of these to their respective levels in whole wheat. The addition of thiamine was considered most important for most American diets, although under certain circumstances when meat and milk are not readily available riboflavin, nicotinic acid and calcium may assume as great an importance. It was not supposed that such a restored flour would be superior or even equal nutritionally to whole grain flour, but restoration to the degree proposed would go far. The Council recognized that although whole grain cereals might be preferable on theoretic grounds, an existing popular preference for white flour presented an extremely difficult, if not spread use either of whole grain products or of flour obtained by such a degree of undermilling as would be necessary to provide as much thiamine as was considered desirable. This preference of most of the public for white flour is based in part on the better keeping qualities of white flour, in part on the fact that the baking qualities of the better grades of white flour have been developed to a high state of perfection. A restored flour would provide the housewives and bakers with products of physical characteristics and baking qualities similar to those with which they had become accustomed.

an insurmountable, obstacle to wide-

Other discussion

THE FORTIFICATION OF foods was I made the subject of a symposium at the meeting in Toronto, April 26, 1939, of the American Institute of Nutrition. The discussion there was headed by Agnes Fay Morgan, Lydia J. Roberts, W. H. Sebrell, E. M. Nelson and Alonzo Taylor, all recognized as authorities in the science of nutrition. In general the principle of limited fortification was received with approval. In the meantime, at the request of the Council of Foods and Nutrition of the American Medical Association, Dr. Cowgill published in the Journal of the Association an exposition of the need for improving nutrition by adding vitamin B, to widely available accepted food. In this paper occurs the statement "It seems reasonable to believe that through the one act of adding the vitamin (vitamin B_1) to the white flours as a group, we would increase directly the vitamin B_1 intake of a greater part of our population than could be effected by any other single step."

Interest in the problem also had been growing in England. It was stimulated by the war, and in June, 1940, the decision was reached by Parliament to fortify white flour in England with thiamin and calcium.* • Likewise, in Canada, Dr. Frederick Tisdall, Chairman of the Committee on Nutrition of the Canadian Medical Association, and other nutrition experts, were promoting the use of "Melior" bread made with an undermilled flour.

Public hearings and conferences with Industry

THIS WAS the situation when the United States Food and Drug Administration, early in September, 1940, opened public hearings in Washington for establishing by regulation definitions and standards for flour. Representatives of the millers and allied industries appeared, and testimony was introduced by them as to what vitamins and minerals and how much of each should be considered suitable as additions to flour. Other testimony placed in the record the recommendations of the Council on Foods and Nutrition of the American Medical Association. These recommendations in the meantime had been accepted informally by a subcommittee of the National Research Council's Committee on Medicine, a subcommittee which was advisory in matters relating to the Army and Navy rations. Everyone attending the hearings of the Food and Drug Administration seemed to want something done about adding vitamins and minerals to flour, but so little agreement existed as to what should be done that after many days a recess was ordered.

In the meantime, Mr. M. L. Wilson, Director of Extension Service in the Department of Agriculture, who had been named chairman of an interdepartmental government planning committee for the national nutrition program, a program then in contemplation as a part of the defense activities, and Surgeon General Parran of the Public Health Service, had become deeply interested in the possibility of improving white flour. Both of them for many years had recognized the importance of the white bread problem. At their instigation, then, the executive officers of national associations of millers and bakers called a very informal meeting in Chi-

^{*}A note in "Science," December 20, 1940, p. 576: "The British Ministry of Food announces that the Flour (Vitamisation) Advisory Committee will have the assistance of Professor D. S. M. Watson of the Scientific Subcommittee of the Food Policy Committee of the Cabinet, of P. N. R. Butcher of the Ministry of Health and of the following officers of the Ministry of Food: Sir Norman Vernon, director of fleur milling; Professor J. C. Drummond and some others."

cago, which was attended by several leaders in these and allied industries. as well as by a number of invited physicians and scientists in government and out. Among the latter were Doctors Spies, Boudreau, Nelson, Stanley, Sebrell, Roberts and Williams. This was the meeting of which de Kruif wrote so brilliantly in an article published in Reader's Digest. The subject received additional consideration at a number of other conferences, and at general meetings held by the American Institute of Baking, the American Bakers Association, and the Millers National Federation. As a result, when the public hearings on flour were reopened by the Food and Drug Administration in mid-November, industry, science and government were thinking together as they had not been able to do before, and a harmony of opinion had been obtained which was most encouraging.

Action of the Committee on Food and Nutrition of the National Research Council

IN LATE NOVEMBER came the first meeting of the newly appointed Committee on Food and Nutrition of the National Research Council, a committee composed of nearly thirty people who represented leading scientific thought in nutrition in the United States. This committee endorsed the recommendations relating to vitamin and mineral additions to flour, which had been proposed in the final public hearings by several members of this scientific group, and by

representatives of the millers and bakers. At the same meeting of the Committee on Food and Nutrition, a subcommittee was appointed to study the development of related standards for bread. The recommendations of this subcommittee were adopted subsequently by the main committee. In their preparation Mr. Schumaker, President of the American Bakers Association. Dr. Tobev. Director, Department of Nutrition, of the American Institute of Baking, and Mr. Thomas, all representing the interests of the millers and bakers, cooperated with Dr. Nelson of the Food and Drug Administration, Dr. Sebrell of the United States Public Health Service, and Dr. R. R. Williams, members of the subcommittee.

The standards for bread were designed so that the advantages of an improved flour could be carried over to bread, and so that a baker using the new flour could automatically produce a bread with comparable nutritional improvement. At the same time it was recognized that the baker had at his disposal other methods for incorporating the desired vitamins and minerals in his loaf.

About this time word was received from the Food and Drug Administration that on the basis of testimony presented at the hearings on flour the legal advisors of the administration had expressed a preference for the name "enriched" for the proposed flour, and for bread which complied with related nutritional standards; also that if this name was acceptable to the committee of the National Research Council and to the industries it would be appropriate to start manufacture and distribution of the new products, enriched flour and enriched bread, without waiting for the promulgation of formal regulations.

The question of a name for the products had previously aroused much discussion. The industries had favored a coined word that could be copyrighted. The committee had wanted a designation which would indicate the nature and direction of the change made in plain white flour and white bread. The name "enriched" was acceptable to the committee, and the industries, after meetings of their executive officers and directive boards, graciously agreed.

Thus, on January 29, 1941, it was possible for the National Research Council to announce agreement on specifications and name for nutritionally improved flours and breads that had the approval of its Committee on Food and Nutrition. The approval of the Council on Foods and Nutrition of the American Medical Association had previously been obtained, as had that of the Millers' National Federation and the American Bakers Association. In the news release that was prepared, announcement also could be made that these national organizations had agreed to start production of enriched flour and enriched bread without delay. The industries, soon afterward, further indicated their support by agreeing between themselves to establish an agency to

co-ordinate the advertising of enriched flour and enriched bread with the general national program of health welfare, nutrition and allied activities, headed by Governor Paul V. McNutt. Mr. Paul Cornell, pastchairman of the Board of the Associated American Advertising Agencies, who is eminently qualified for such a responsibility, has been selected for this important post.

Enriched flour and enriched bread. according to the specifications recommended by the Committee on Food and Nutrition, are to contain thiamine, nicotinic acid and iron in amounts as prescribed in milligrams per pound. These amounts approximate those that would be found in a flour obtained by extracting 85 per cent of wheat of high vitamin quality, or respectively in a bread made with such flour. Riboflavin in a specified amount is made an optional ingredient for both flour and bread preceding receipt of assurance that an adequate supply of it has become available. Calcium, phosphorus and vitamin D may be added at the option of the miller or baker, with prescribed limitations as to amounts.*

^{*}The recommended specifications for enriched flour call for the following per pound of flour: thiamine 1.66 mg. nicotinic acid or nicotinic acid amide 6.15 mg., and iron 6.15 mg. Riboflavin is to be included in the specifications as soon as it can be shown that sufficient supplies of riboflavin are available. In the meantime, its inclusion is permitted as an optional ingredient if added in such amounts as

⁽Continued on next page)

This program seriously involves large and very important industries. Conflict of interests might have been anticipated. Nevertheless, the program is backed by more complete agreement between these industries, government and experts in nutrition-

(Continued from page 13)

are necessary to make the level in the flour, per pound, 1.22 mg. Other optional ingredients permitted are calcium, phosphorus and vitamin D to minimal levels of .05 gm., 0.5 gm. and 250 International units respectively. The specifications for enriched bread correspond to those for enriched flour to the extent that bread made using only enriched flour, yeast and water will be enriched bread. However, the enriched bread may be made from plain white flour by employing other available methods for incorporating the specified vitamins and minerals. The completed bread per pound must contain thiamine 1 mg., nicotinic acid or nicotinic acid amide 4.0 mg. and iron 4 mg., with riboflavin optional for the time being at a level of 0.8 mg. and calcium and vitamin D optional ingredients at minimal levels, respectively, of 0.3 gm. and 150 International units. Maximal levels are named for all of these factors.

al science than ever could have been obtained by a less democratic procedure. The decisions at which we have arrived are of the greatest importance, and all the many who have been devoting their time and effort to bring about this general agreement have reason to be pleased. We have contributed by example to the triumph of the American way in government, and are in position now to greatly improve national nutrition, and through it the national welfare. Edwin Grant Conklin, emeritus Professor of Biology at Princeton University, once said: "The ethics of science considers service of mankind to be the universal good; it teaches that both human nature and human nurture may be improved; that reason may overcome unreason, co-operation supplement competition and the progress of the human race through future ages be prompted by human intelligence and purpose." This is the scientific course upon which those who are engaged in improving the Nation's diet have cooperatively embarked.

Public Health Aspects of Enriched Flour and Bread*

W. H. SEBRELL, M.D. Chief of the Division of Chemotherapy National Institute of Health U. S. Public Health Service, Washington, D. C.

A S A PHYSICIAN and a health officer I am vitally interested in the health of the people of this country. The enriched flour and bread program is one of major importance in accomplishing something constructive to meet the serious dietary deficiencies

Dr. W. H. SEBRELL, at age 39, has already achieved international recognition for his research work on nutrition. His work on pellegra in 1928, as assistant to famed Dr. Goldberger, gave him an early interest in deficiency diseases. Shortly after graduation from the University of Virginia's Medical School, Dr. Sebrell became associated with the United States Public Health Service, where he has spent his entire career to date. In 1933 he was placed in charge of Nutritional Studies in the Public Health Service and has written innumerable scientific papers and reports on nutrition. A Fellow of the American Public Health Association, Treasurer of the American Institute of Nutrition, a member of the American Society of Biological Chemists, Dr. Sebrell has specialized in both the public and scientific sides of nutrition. As Surgeon, U. S. Public Health Service, he is a Federal representative on the National Research Council's Committee on Food and Nutrition.

which exist in this country today. Many of you may think that the American public is well-fed. As a matter of fact all of the recent dietary studies made in this country indicate very clearly that a large part of our people are getting diets which are below the standards necessary to maintain health. It has been reliably estimated that not less than one-third of our entire population are getting diets which are not entirely adequate.

Another misconception which some of you may have is that the inadequate diets in this country are found entirely in the lowest income groups. While it is true that *most* of the inadequate diets are found in this group, it has been found that inadequate diets also extend into the highest income group. Many of you in this audience are probably eating inadequate diets, not from inadequate incomes, but from poor food selection, special diets or lack of knowledge as to what you should eat. I have seen actual deficiency diseases in well-to-do business and professional people simply because they had neglected their diets as most of us are inclined to do. They

*Read at the conference of bakers, millers and others to co-ordinate the introduction of enriched flour and enriched bread, Chicago, March 5, 1941 15 eat what they want to eat and not what they need.

American diets are most likely to be deficient in some of the vitamins and minerals in spite of the large increase in the consumption of fruits, vegetables and milk in this country in recent years. For many years many different agencies in this country have been attempting through educational means to improve the American diet. It may surprise some of you to learn that the American diet is more deficient in thiamine, which is one of the vitamins of the B complex, than was the American diet of 100 years ago. Some of you may have felt that the increased consumption of fruits, vegetables, and milk has been one of the causes of the decreased consumption of flour and bread. I do not believe that this is true. One of the major causes for the decreased consumption of flour and bread in this country may be one which you have not considered very seriously or may have thought did not amount to very much, that is the fact that dietitians, home economists, colleges of home economics, and all the institutions in this country that are teaching nutrition have taught, and under present conditions must continue to teach, that white flour is practically devoid of minerals and vitamins, and that in obtaining an adequate diet one must be sure to get the necessary vitamins and minerals first from other sources and then complete the diet with any foods that suit the appetite - including white flour and white bread.

Diet and the physician

Physicians have to do just that in making special therapeutic diets. When I have to make a special diet I must first assure the vitamin and mineral intake; having secured that I can then consider the protein, fat and carbohydrates and then I can say eat enough white bread to make up your calories if you care to do so. This sort of thing has been going on for years.

In addition, whenever you hear anyone talking about reducing diets, which are so popular with the ladies these days, you almost invariably hear them advise a decreased consumption in flour and bread. This situation has been brought about by the highly refined milling processes which have made white flour such a beautiful product to look at but which have so seriously injured its nutritive value compared with the original wheat from which it is made. I do not blame the millers for making a highly refined flour. As I see it you men in industry are trying to give the public what it wants. The fault has been that the public did not want the right thing and I think we have to educate the public to want a flour and bread of high nutritive value.

The tendency of the American public to use highly refined foods has been manifested in other ways than in flour. I wonder if you realize that if you add together the calories consumed in the average diet from white flour, refined sugar, and highly refined fats you find that these items make up more than half of the indi-

vidual's average daily calorie consumption. As a result he must get all of his minerals and vitamins from the remaining 1,000 calories or so which make up his diet and this is the reason that our diets today are more deficient in thiamine than they were in the past. The increased vitamins and minerals supplied by fruits and vegetables are not enough to make up for the loss which has occurred in eating more highly refined foods of other types. It is factors such as these, which taken together with poor food selection and low incomes, are the major 'causes of the widespread dietary deficiencies existing in this country today, and I cannot over-emphasize the importance of these things from the point of view of preventive medicine.

A new concept has arisen in preventive medicine in the past few years. You no doubt think of preventive medicine as vaccination against smallpox, immunization against diphtheria. and sanitation of water and sewage. Today preventive medicine has advanced beyond that view. The up-to-date health officer is now concerned with building the healthiest possible population with the greatest resistance to disease. A major part of such a program is that the population shall receive a diet adequate in all respects. For this reason the widespread prevalence of deficient diets is of serious concern to the health officer and these dietary deficiencies and means for their prevention are now being studied in considerable detail.

B-vitamin and iron deficiencies

I is recognized that the most prevalent deficiencies in this country today are those due to deficiencies in members of the vitamin B complex and in iron. I have no intention of giving you a dissertation on the diseases produced by these deficiencies but there are a few facts with which any well informed persons should be familiar. The three members of the B complex which are most important from a health point of view in this country are thiamine, riboflavin and nicotinic acid.

Thiamine deficiency in its extreme form causes a disease known as beri-This was formerly thought to beri. be a tropical disease which did not occur in the United States. We now know that this is not the case. We see many cases of severe beriberi and we recognize that a condition known as peripheral neuritis which occurs in cases of pregnancy and in alcoholics, as well as in other diseases, is also a manifestation of thiamine deficiency which was not recognized a few years ago. But from the point of view of the entire population, even more important than these serious deficiencies has been the very recent recognition that thiamine deficiency also causes symptoms such as mental depression, easy fatigue, and undue anxieties and although the individuals with these symptoms are not sick in the sense that they do not go to bed, these things result in a lowered efficiency and possibly other more serious eco-

1

nomic consequences. There is every reason to believe that these symptoms are widely prevalent in this country because of our reduced thiamine intake.

The symptoms of riboflavin deficiency were just recognized about two years ago. This condition is manifested by fissures in corners of the mouth, a scaly condition around the nose and ears and disturbance in vision caused by blood vessels growing into the cornea of the eye which obscures the vision and may lead to blindness. These symptoms miraculously disappear on the addition of riboflavin to the diet. Although this disease has been recognized only so recently it is evident now that it also is widespread in this country.

The importance of riboflavin is further evidenced by the fact that it is found in every living cell, at least in all the higher forms of life, and when experimental animals are deprived of it they invariably die as is also the case with most of the other vitamins.

Nicotinic acid deficiency leads to a disease known as pellagra which was formerly thought to be confined largely to the southern United States. We now know that it exists throughout the United States. The symptoms of pellagra have been known and recognized for a long time and I do not believe it would be an exaggeration to say that not less than 200,000 cases occurred in this country last year. The disease kills more than 3,000 people in this country each year. Yet it can be entirely prevented by nicotinic acid which is one of the members of the vitamin B complex.

It has been known for only a few years that nicotinic acid will prevent pellagra. When I use the words "nicotinic acid" I know most of you immediately think of nicotine. It is most unfortunate that the name of the deadly poison nicotine sounds so similar to the name of this life-saving vitamin "nicotinic acid" which is found so widely in our daily foods. This unfortunate similarity is due to the fact that although nicotinic acid was made in the laboratory in 1867 no one found any practical use for the substance until to everyone's astonishment it was discovered in 1937 that it would prevent and cure pellagra a disease for which we had previously had no specific treatment. It may interest you to know that all during the years when I was searching for the pellagra-preventive vitamin I had a bottle of this same nicotinic acid sitting on the laboratory shelf-never suspecting that what I was seeking was standing at my elbow.

More important than the above symptoms, however, from the point of view of numbers of people involved, is that there were many thousands who had red tongues and suffered from indigestion and weakness due to a partial deficiency in this substance. In addition, there is an acute mental condition characterized by confusion and disorientation which is due to nicotinic acid deficiency.

Another point of considerable interest about these various diseases is that they are rarely found alone. We usually see an individual with symptoms of two or all three deficiencies at the same time. This is not surprising since these three factors of the vitamin B complex are usually found in the same foods. An individual does not select a diet that is deficient in just one of these things. Since his deficient diet is due to the absence of natural foods containing these vitamins the diet is likely to be deficient in the entire B complex rather than in just one of the factors, and in order to prevent the development of these deficiencies it is necessary to supply all of these factors as they would be supplied by natural foods.

One of the most important of the mineral elements for the human body Iron is necessary for the is iron. formation of the hemoglobin of the blood and if there is an insufficient amount of iron in the diet an anemia develops. Individuals living on foods raised on soils which are deficient in iron develop anemias, and school children have been found in this country with about one-half of the amount of hemoglobin in their blood that they should have simply because their food did not contain enough iron. These sickly, weak, undernourished, and frail children can never be any better until this iron deficiency is corrected. Identical conditions develop whenever the diet is deficient in iron

for any cause, whether it be because the foods are raised on iron deficient soils or because the iron has been removed from the food by milling or other processing.

Food vs. pills

There are other deficiency diseases T in the United States in addition to the above, however, from a public health point of view they do not cause the deaths, the illnesses and the economic loss which are caused by the above. Therefore, we are directing our attention to devising a program which will solve once and for all the problem of continuously getting into the American diet enough thiamine, enough riboflavin, enough nicotinic acid and enough iron to prevent the development of these deficiencies. Ι feel that the proper way to approach this problem is through dietary means and not through the use of vitamin pills or tablets. These conditions have developed as a result of our improper handling of foods and should be corrected by changing the handling of our foods so that the vitamin and mineral content is restored to a level which will be effective for this purpose.

There is no intention to make bread or flour a medicine. We are not attempting to treat disease—that is in the province of the physician. We are attempting to prevent disease and to prevent the disease conditions which we have brought down on our own heads through improper food practices and which should be, and can be corrected, by making suitable changes in our food habits. Just a few years ago I took the point of view that the way to correct these conditions was to try to stimulate the increased consumption of foods naturally high in these vitamins. I still think that this point of view is correct theoretically. Although I recognize that such a program if it succeeds at all will progress so slowly that it cannot meet the extensive deficiency conditions in our population today; therefore, as I see it the next best thing is to add these vitamins and minerals to foods which are consumed in large quantities especially by the low income groups.

We already have one example of this in the various forms of vitamin D milk that are now widely used in this country. Some of these products were introduced about ten years ago in an effort to solve our rickets problem, and today it is recognized that they are of the utmost value in the prevention of rickets. They have added very little to the cost of milk and yet are one of our best and most economical means of preventing rickets.

A stronger staff of life

B READ has always been the mainstay and principal component of the poor man's diet. The fact that it has become nutritionally inferior has taken away these vitamins and minerals from the very population groups which need them most. I feel that the addition of thiamine, riboflavin, nicotinic acid, and iron to flour and bread in sufficient quantities will represent a major contribution towards solving our dietary deficiency problem. There is great public interest in this subject at the present time. This public interest should be utilized and guided on a national scale in the right direction so that the public will obtain a product which will be of real health significance.

It is of equal importance that the public shall not be misinformed or misled. They should be reassured that they are receiving a food and not a The industry must take medicine. on itself the preparation and regulation of product for which you yourselves will permit no unsubstantiated claims. It is equally important that these enriched flours and breads shall reach the public at the lowest possible price. From a public health point of view it is most important to reach the lowest economic groups, and a premium price product is likely to be beyond their reach.

Again from a health point of view, it is of little importance how the necessary levels of vitamins and minerals are obtained in the flour and bread. The important thing is that the necessary substances are there in the final product in a quantity sufficient to be of value. And I would like to see this accomplished in the most economical way possible. I hope we will see these levels obtained in a variety of ways to meet a variety of tastes so that it will have the widest pos-

sible utilization. There is no reason why we should not have white flour to which the synthetic materials have been added, a lightly milled, creamy colored flour, and a dark flour with the vitamins and minerals retained by the milling process, and also that we shall have a variety of breads of various colors and flavors just so the vitamins and minerals are there. As far as I am concerned, I just want to know that the individual who is on a deficient diet gets into his stomach these things in the quantities in which he needs them and it is up to you gentlemen to get them to him in the best possible way.

Various nutritional programs have been tried in the past in an effort to solve our dietary deficiency problems. We have seen years of effort spent in an attempt to get people to eat whole wheat bread. I think we all recognize that this program has been definitely a failure. It has not solved the problem. Too many people still demand white flour and white bread, and I think we should give it to them as long as they demand it but also give them an opportunity to have their vitamins and minerals concealed in this product if they must have it that way.

As I have indicated, our deficiency problem is one of multiple deficiencies, therefore, the addition of thiamine alone is not sufficient. We have seen in recent months a number of breads appear on the American market which have been fortified with

thiamine and these breads have been advertised as being a superior product on this account. This is not enough. We frequently see cases of thiamine deficiency which go on and develop symptoms of nicotinic acid deficiency or riboflavin deficiency. The addition of thiamine is only a partial answer to the problem. Just as the addition of nicotinic acid or of thiamine and nicotinic acid would constitute only a partial solution to the problem. We need to put back into the flour vitamins which were originally present in the wheat, not just some of them, or you will still leave us with thousands of sick people. I want to remind you again that as a physician interested in public health I am also interested in solving this problem and that means the addition of all of the substances I have mentioned today. If we can make such an enriched flour and bread available we should be able to change our teaching practices and our educational activities in regard to the use of this flour and bread instead of having to relegate these items to the groups of foods which fail to supply many vitamins and minerals. Nutritionists and dietitians will be able to recommend them and utilize them in preparing adequate diets and I think the leaders in nutrition education in this country would welcome such an opportunity to utilize such an important element in our diet instead of having to tell a poor family that they must buy more expensive foods in order to get their necessary vitamins and

minerals. It is much simpler to tell that family to shift to enriched flour and bread. I hope to see this enriched flour and bread promoted in a conservative educational manner on the basis of its value as a contribution to a health preserving diet, and as a permanent program sold to the population on the basis of this value and with no promotional flash in the pan hysteria. If this is to be of any value it must be a *permanent* change in the American dietary and should be approached from that point of view. It is imperative that we have cooperative action between all of the agencies concerned. If an educational campaign is undertaken by health or other authorities before the flour and bread are ready commercially it will be just so much wasted effort. If the various

baking and milling companies undertake industrial campaigns without cooperation and without proper advice in regard to their advertising, exaggerated and unwarranted claims may nullify much of the work of the program.

I feel that here is a real opportunity for a great American food industry to carry on a program which will result in a permanent and valuable contribution to the health of this nation, and at the same time benefit our agriculture by increasing the proper utilization of one of our most valuable and economical foodstuffs.

Eagerly we look forward to the day when our children and our children's children will be armed with the armor of robust health.



VOLUME 56 JANUARY 3, 1941 NUMBER 1

W IN THIS ISSUE

A Mental Hygiene Program for the State Health Department Directory of State and Insular Health Authorities, 1940 Influence of Dietary Protein on Toxicity of Sulfanilamide



FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, Surgeon General

DIVISION OF SANITARY REPORTS AND STATISTICS

CHARLES V. AKIN, Assistant Surgeon General, Chief of Division

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C. Subscribers should remit direct to the Superintendent of Documents, Washington, D. C.

Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON: 1941

For sale by the Superintendent of Documents, Washington, D. C. Price 5 cents. Subscription price \$2.50 a year