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- I.** . . . , , 2006
- II.** I. D. . . . , 1834 – 1934 ., 1984
- III.** . . . , 1934 – 1984 ., 1984
- IV.** . . . , . . . , 1994
- V.**
- VI.** . . . , . . . : 1870 .,
- VII.** . . . , , 1936
- VIII.** . . . , 1993
- IX.** . . . , , isralove.org/load/2-1-0-1131
- X.** . . . , ? 2002
- XI.** . . . ,
- XII.** . . . , , 1887 – 1960, 1961
- XIII.** . . . , , 1887 – 1960, 1961
- IV.** . . . , , 1970

S, G, i:
www.sheynin.de

Google, Oscar Sheynin.

[i]

§ 3.4: *the constant growth dividend discount model.*
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[ii]

1804 . ()

(. .5),

(, - (, (,) , (,))

20 (, XIX - ,)

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[ii].

[iv] (2002)

(1837),
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[vi]

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[vii]
1994, . 96):

(Ghosh

[viii],

),

), (

(Morant & Welch 1939)

(1990/2010, . 187 – 190)

(Fisher 1937, . 306)

(1947, . 63)

(1948, . 68) 1910- , 1920- 1930-

XVIII

(1947, . 64):

(1948, . 68) 1939 .

(1928/1964, . 228):

[...] []

7). (1891, . 313) (1892)

(, 2004).

1909 .

(2013, § 16.2). (, . 9 . 16)

, 1947

().

Nayak (2009).

[viii]

(

Dict. Scient.

Biogr.).

.2 20.

(.21),

)

(.1).

(1973)

(1887 – 1920).

1922 ., § 5,

[x]

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[xi]

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(1908 – 1989),

1989 .

1,5 , 3 (. 102 .)

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(. 423 – 434);

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(. 495 – 504)

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,

(2008). , , ,

[xiv]

, , , , ,

(1990/2010), § 7.8.

[xii].

I

Jukka Rantala, On joint and separate history
of probability, statistics and actuarial science.

Festschrift für Tarmo Pukkila etc.

E.P. Liski . Tampere, 2006, pp. 261 – 284

1.

30

Beard ., *Risk Theory* ().

, Teivo Pentikainen.

Encyclopedia (2004).

(2005)

. Daston

[]

1

(?)

§ 2

; § 3

4

?

(Glossary of Intern.

Assoc. of Supervisors):

35

(Ogborn 1956).

Acta Senatus (Ogborn 1956).

XVIII Equitable Life Insurance, [] (Evans 1998).

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2.1.

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surivorships) [
§ 1],

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(Ore 1953)¹⁰,

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(tariff theory),

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, England & Verrall (2002), Loimaranta . (1980),
Pitkänen (1975) van Eeghen . (1983).

(1918), Whitney
premium). (risk

(risk premium)

Longley-Cook (1962).

Bühlmann (1967; 1969), Bühlmann & Straub
(1970); Bühlmann & Jewell (1987) Hachemeister (1975).

(Kalman 1960)

§ 3.3.

Lemaire (1995) Loimaranta (1972).

(1978) Haberman & Pitacco (1999).
, Hoem & Aalen

3.3.

Teivo Pentikäinen,
1975 .
, Pentikäinen (1975; 1980), Pentikäinen .
(1989) Daykin . (1994).

Rantala (2000)

().

3.4.

250

(. § 2),

XIV .

Whelan . (2002).

(Bachelier 1900),

23

(. .

),

(. . .),

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)

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, *Journal des Actuaires Francais*

20

1950-

, replicating portfolio (. . .

)

Redington (1952).

) , (

(dividend discount model)

(1901).

.. (Whelan 2002)

(Whelan),

1869 .

Sprague

Journal of the Institute of Actuaries.

Whelan (2002) Hardy (2005)

.. , Pradier (2005).

(1986; 1995).

(rate)

Wilkie

(mean reverting)

Pukkila . (1994).

(Long Term Capital Management),
Myron Scholes Robert Merton. 1997

() ,

2000 .,

4.

(rates)

Whelan (2002)

Borch,

24

25

(Bühlmann 1997)

Bühlmann

, Hans

Ammeter,

Encyclopedia (2004)

- 1.
- 2.
- 3.
- 4.
5. 1669
6. (2013, § 3.2.2).
7. 1594 .(1970, . 56).
- 8.
9. 1977 .
10. Bellhouse (2005).
11. (2013, § 2.2.4).
- 12.
13. (1774)
- 14.
- 15.
16. (.)
17. (Hald 1998, . 336,
18.): (2013, § 7.1.1).
19. XIX .
20. § 3.4
- [xiii].
- 21.
22. ?
23. . [viii, . 12].
24. ()

25.
26.

- Barnwell R. G.** (1856), *A Sketch of the Life and Times of John de Witt* etc. New York.
- Beard R. E., Pentikäinen T., Pesonen E.** (1969), *Risk Theory*. London.
- Bernstein P. L.** (1996), *Against the Gods. The Remarkable Story of Risk*. New York.
- Bühlmann H.** (1967), Experience rating and credibility. *Astin Bull.*, vol. 4, pp. 199 – 207.
- (1969), Experience rating and credibility. *Astin Bull.*, vol. 4, pp. 157 – 165.
- (1997), The actuary: the role and the limitations of the profession since the mid-19th century. *Astin Bull.*, vol. 27, pp. 165 – 171.
- Bühlmann H., Jewell W.** (1987), Hierarchical credibility revisited. *Mitt. Vereinigung Schweiz. Versicherungsmathematiker*, Bd. 70, pp. 35 – 54.
- Bühlmann H., Straub E.** (1970), Glaubwürdigkeit für Schadensätze. *Astin Bull.*, pp. 111 – 133.
- Cramér H.** (1930), *On the Mathematical Theory of Risk*. Stockholm.
- (1955), *Collective Risk Theory. Survey of the Theory from the Point of View of the Theory of Stochastic Processes. Seventh Jubilee Volume*. Skandia Insurance Co. Stockholm.
- Daston L. J.** (2005), Domestication of risk: mathematical probability and insurance 1650 – 1830. fee.uva.nl/ke/act/history.htm
- Daykin C. D., Pentikäinen T., Pesonen E.** (1994), *Practical Risk Theory for Actuaries*. London.
- Embrechts P., Klueppelberg, C. Mikosch T.** (2003), *Modelling Extremal Events for Insurance and Finance*. Springer.
- Encyclopedia** (2004), *Encyclopedia of Actuarial Science*. J. L. Teugels, B. Sundt. Chichester.
- England P. D., Verrall R. J.** (2002), *Stochastic claims reserving in general insurance*. *Brit. Actuarial J.*, vol. 8, pp. 443 – 518.
- Evans J.** (1998), Mortality, behold and fear. *Actuarial Research Paper No. 84*. Renn (1998, pp. 29 – 42).
- Haberman S.** (1996), *Landmarks in the History of Actuarial Science (up to 1919)*. Actuarial Research Paper No. 84. Dept. Actuarial Sci. & Statistics. City Univ. London.
- Haberman S., Pitacco E.** (1999), *Actuarial Models for Disability Insurance*. Boca Raton, USA.
- Hachemeister C.** (1975), Credibility for regression models with application to trend. *Credibility: Theory and Applications*. P. M. Kahn. Academic Press, pp. 129 – 163.
- Hald A.** (1998), *History of Mathematical Statistics from 1750 to 1930*. New York.
- Halley E.** (1693), Estimate of the degree of mortality of mankind etc. [Baltimore, 1942.]
- Hardy M. R.** (2005), We are all “actuaries of the third kind” now. *North Amer. Actuarial J.* April 2005, pp. iii – v.
- Hoem J., Aalen O. O.** (1978), Actuarial values of payment streams. *Scand. Actuarial J.*, pp. 38 – 47.
- Kalman R.** (1960), New approach to linear filtering and prediction problems. *Trans. ASME – J. Basic Engineering*, vol. D82, pp. 35 – 45.
- Kopf E. W.** (1927), Early history of the annuity. *Proc. Casualty Actuarial Soc.*, vol. 8, pp. 225 – 266. fee.uva.nl/ke/act/history.htm
- Lemaire J.** (1995), *Bonus-Malus Systems in Automobile Insurance*. Kluwer.
- Lewin C.** (1998), Earliest days. *Actuarial Research Paper No. 84*. Renn (1998, pp. 9 – 28).
- (2001), Creation of actuarial science. *Zentralbl. f. Didaktik der Mathematik*, Bd. 33, pp. 61 – 66.
- Loimaranta K.** (1972), Some asymptotic properties of bonus systems. *Astin Bull.*, vol. 6, pp. 233 – 245.

- Loimaranta K., Jacobsson J., Lonka H.** (1980), On the use of mixture models in clustering multivariate frequency data. *Trans. Intern. Congress Actuaries 1980*, vol. 2, pp. 147 – 161.
- Longley-Cook L. H.** (1962), Introduction to credibility theory. *Proc. Casualty Actuarial Soc.*, vol. 49, pp. 194 – 221.
- Lundberg F.** (1903), *Approximerad Framställning av Sannolikhetsfunktionen. Aterförsäkring av Kollektivrisker*. Stockholm.
- Norberg R.** (2004), Survey of actuarial credibility theory. *Enc.* (2004).
- Ogborn M. E.** (1956), The professional name of actuary. *J. Inst. Actuaries*, pp. 233 – 246.
- Ore O.** (1953), *Cardano, the Gambling Scholar*. Princeton.
- Pentikäinen T.** (1975), A model of stochastic-dynamic prognosis. Application of risk theory to business planning. *Scand. Actuarial J.*, pp. 29 – 53.
- (1980), A stochastic-dynamic model for insurance business. *Trans. Intern. Congress Actuaries*, pp. 283 – 294.
- Pentikäinen T., Bonsdorff H., Pesonin M., Rantala J., Ruohonen M.** (1989), *Insurance Solvency and Financial Strength*. Helsinki.
- Pitkänen P.** (1975), Tariff theory, premium calculation principles. *Astin Bull.*, t. 8, pp. 204 – 208.
- Pradier P.-C.** (2005), Value-at-risk since 1784. A comprehensive history. fee.uva.nl/ke/act/history.htm
- Pukkila T., Ranne A., Sarvamaa S.** (1994), On stochastic modelling of inflation. *Actuarial Approach for Financial Risks, AFIR 1994*, vol. 2, pp. 589 – 609.
- Rantala J.** (2000), Control theory – a useful actuarial tool? *Giornale dell'Istituto Italiano degli Attuari*, LXIII, pp. 111 – 127.
- Redington F. M.** (1952), Review of the principles of life-office valuations. *J. Inst. Actuaries*, vol. 78, pp. 286 – 315.
- Renn D.**, (1998), *Life, Death and Money*. Oxford.
- Sheynin O.** (1968), On the early history of the law of large numbers. *Biometrika*, vol. 55, pp. 459 – 467. : *Studies in the History of Statistics and Probability*. E. S. Pearson, M. G. Kendall. London, 1970, pp. 231 – 239.
- (1977), Early history of the theory of probability. *Arch. Hist. Ex. Sci.*, vol. 17, pp. 201 – 259. **S, G**, 30.
- Todhunter R., King G.** (1915), *Institute of Actuaries' Textbook of the Principles of Interest, Life Annuities and Assurance* etc. London.
- van Eeghen J., Greup E., Nijssen J.** (1983), Rate making. *Surveys of Actuarial Studies*, No. 2. Rotterdam.
- Whelan S.** (2002), Actuaries' contributions to financial economics. *Actuary*, Dec. 2002, pp. 34 – 35.
- Whelan S., Bowie D. C., Hibbert A. J.** (2002), A primer in financial economics. *Brit. Actuarial J.*, vol. 8, pp. 27 – 74.
- Wilkie A. D.** (1986), A stochastic investment model for actuarial use. *Trans. Faculty Actuaries*, vol. 39, pp. 919 – 954.
- (1995), More on a stochastic asset model for actuarial use. *Brit. Actuarial J.*, vol. 1, pp. 777 – 964.
- Whitney A. W.** (1918), The theory of experience rating. *Proc. Casualty Actuarial Soc.*, vol. 4, pp. 274 – 292.
- (1970), (1970), (1970), XIX, . 2. . (2013), **S, G**, 11.
- Bachelier L.** (1913, French), *Theory of Speculation*. Princeton, 2006.
- Bellhouse D.** (2005), Decoding Cardano's *Liber de Ludo Aleae*. *Hist. Math.*, vol. 37, pp. 180 – 202. **S, G**, 79.
- Laplace S.-D.** (1774), Sur la probabilité des causes par les événements. *Oeuvr. Compl.*, t. 8. Paris, 1891, pp. 27 – 65.

II

I. D.

: 1834 – 1934 .

I. D. Hill, Statistical Society of London – Royal Statistical Society.
The first 100 years: 1834 – 1934.
J. Roy. Stat. Soc., vol. A147, pt 2, 1984, pp. 130 – 139

Proceedings (5, 87),
(*Pro*., 1, 194), (*Jubilee*, 263) 47
48.
[:
I]

1.

Annals ... ()... Bonar & Macrosty (1934),
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(.16 – 17),

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1.2.

Hilts (1978), Drinkwater (1834) Babbage
(1853). [7:16],

2.

& Macrosty 1934, .22 – 28): (Bonar

[. . .].

[1839 .]

:
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95 (2, 130),

⁵ (.131).

, 1840 .. (3, 8) :

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(.10).

1842 . (5, 87) :

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1842 .(5, 86)

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101) : 1855 .(18, .[...])

285) : (18, [])

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1865 .(28, 492):

1877 . Shaw-Lefevre (40, 509):

1887 . (50, 614)

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1839 . (2, 133)

1840 . (3, 1)

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(3, . 1 - 2)

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1856 . (19, 1)

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1860 . Senior (23, 360) :

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(28, 478 491)

1865 ., 50 [...],

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(*Proc.*, 1, 194):

1853 . (16, 18) ,

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$$p = \pm 2\sqrt{2pq/n}, \dots 2\sqrt{2} \quad 3 .$$

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1878 . (41, 598),
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1885 . 50
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(*Jubilee*, 181 – 217).

(. 263)

1896 . (59, 392) 100
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1893 . (56, 671)

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(76, 165 – 193).

1920-
1929 . J. O. Irwin
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1863 . (26, 79)

, 1870 .

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1900 . (63, 381)
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1873 . (36, 1 – 18)
(37, 308) 15,
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1885 ., 1891 . (54, 418)
[...].

13.

[...] 1934 .
(97, 654) :
[...]

1. :
2. , 1790 – 1855,
- 3.
- 4.
5. . Chadwick (1842).
6. ?
7. ,
8. ,
9. :

10. (David 2001, . 226),
(.)
11. , . § 1.1, ,
- 12.
13. [iii].
- 14.
15. ,

: *J. Roy. Stat. Soc.* = JRSS

Babbage Ch. (1853), Manuscript. JRSS, vol. 124, 1961, p. 546.

Bonar J., Macrosty H. W. (1934), *Annals of the Royal Statistical Society*. London.

Chadwick E. (1842), *Report on the Sanitary Condition of the Labouring Population*. Edinburgh, 1965.

David H. A. (2001), First (?) Occurrence of Common Terms etc. David H. A., Edwards A. W. F., *Annotated Readings in the History of Statistics*. New York, pp. 209 – 246.

Drinkwater J. E. (1834), Manuscript. JRSS, vol. 98, 1935, pp. 140 – 151.

Edgeworth F. Y. (1913), The use of the theory of probabilities in statistics relating to society. JRSS, vol. 76, pp. 165 – 193.
1996 .

Guy W. (1850), On the relative value of averages derived from different numbers of observations. JRSS, vol. 13, pp. 30 – 45.

--- (1865), On the original and acquired meaning of the term *statistics*. JRSS, vol. 28, pp. 478 –

--- (1873), John Howard as a statist. JRSS, vol. 36, pp. 1 – 18.

Hilts V. L. (1978), Aliis extendum, or, the origin of the Statistical Society of London. *Isis*, vol. 69, pp. 21 – 43.

Yule G. U. (1911), *Introduction to the Theory of Statistics*. London. 1937 .
, M. G.

Kendall. : (1960),

III

. . .

(1934 – 1984)

R. L. Plackett, Royal Statistical Society.
The last fifty years: 1934 – 1984.
J. Roy. Stat. Soc., vol. 147, pt. 2, 1984, pp. 140 – 150

(131, 478 – 529),
, *J. Roy. Stat. Soc.*

1.

50
Annals of the Roy. Stat. Soc., 1934
– 1971 (L. H. C. Tippett, 135, 545 – 568).

1.
. *Annals* 1972 .

2. 1939 .

1931 . []
J. O. Irwin

2.
Bell Telephone Lab. W. A. Shewhart

. 1932 .

. . . 3. 1933 .

1934 . [.].
(Supplements)
. 1940 .

3.

1942 .

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B. P.

4.

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 1969 – 1973 . (?) (137, 412 – 427).
 1965 .
 ,
 ,
 1970 – 1971 .
 , ,
 , 1976 . 8
 11 – 16 .
Teaching Statistics (,),
 1979 .
 ,
 . [...] .
 1949 – 1956 . 40 .
 .
 [...] ,
 .

1974 .
Statistical Sources ().
Reviews of United Kingdom
1970 . S. Rosenbaum

; . (134, 534 – 610).

5.

1960 1983 .
1945 .
, 1955 .–
– 1977 . 1979 .

, 1982 . 1982 .

. [...]

6.

1941 ., 1946 ., 1948 . ,

[...]C

(1968 .,).

1948 .

() 1950 .

Applied Statistics ().
1952 . L. H. C. Tippett,

1964 .

Applied Statistics () ,

[

1974 .) ,

News and Notes (

.]

7.

[...] 1971 .

[]

(136, 583 – 596).

?. 1979 . (142, 299 – 328), 1982 .

1986 .

[...] . 1980 – 1981 .

[...]

9 .

(145, 195 – 207).

1976 .

[]
(26, 125 – 135; 28, 184).
1980 .

1981 .
(145, 395 – 438).

I. D. Hill . [1980 . D. J. Fruin
.] [...]

8.
[1975 .
11 1977 .
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9.
[1988 – 1989 .
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10.
[1942 . , 1948 .
10 . 1980 .
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1. , .
2. .
3. 1933 – 1936 .

4. :
5. .
6. .
7. , , .
8. 1964 – 1984 .
9. (
-),
10. , .
11. , .

IV

XIX

F. Jongmans, E. Seneta, A probabilistic *new principle* of the 19th century. *Arch. Hist. Ex. Sci.*, vol. 47, 1994, pp. 93 – 102

1.

XIX

1812 . (1837).

Bienaymé (1840)

Heyde & Seneta (1977,

§ 5.6).

(1837),

(Eugene Charles Catalan,

1814 – 1894),

(. .)

Dale (1991).

1, (1983).

1974).

(1837, § 90)

$$c \mu = m + n$$

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l (. .

$$P_1 = \frac{a(a-1)\dots(a-q+1)}{(a+b)(a+b-1)\dots(a+b-q+1)} = \frac{C_a^q}{C_{a+b}^q}$$

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$l=0$.

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(1841)

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§ 4)

$$P_2 = \frac{a-p}{a+b-p}$$

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($= 0$, $q=1$), $2 = l(+ b)$

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 (1825 – 1826)
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 $i, i = 1, 2, \dots, 6 -$, $l = i$
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 (. 468)
 Dale (1991, . 299)
 $(H_i) = 1/6, 1/7$
 $i = 7,$
 $4/7.$
 7 § 3,

3.

$$P_B = \frac{X_1}{N_1} \quad (1877)$$

$$P_B = X_1/N_1.$$

$$X_1 \quad N_1 \quad (1877).$$

$$p_B = EP_B = E(X_1/N_1).$$

$$E(X_1|N_1) = N_1 X_0/N_0,$$

$$E(X_1/N_1|N_1) = X_0/N_0,$$

N_1

$$p_B = E(X_1/N_1) = X_0/N_0.$$

$$(N_1 = N_0) > 0.$$

$$P_A = (X_0 - X_1)/(N_0 - N_1).$$

$$N_1 \quad N_0 \quad 1, 2, \dots, N_0 - 1, \dots \quad (N_1 = N_0) = 0.$$

$$E(P_A|N_1) = \frac{X_0 - E(X_1|N_1)}{N_0 - N_1} = \frac{X_0 - (N_1 X_0/N_0)}{N_0 - N_1} = X_0/N_0,$$

$$p_A = E(P_A) = X_0/N_0,$$

(1877)

§ 2,

, D, ...

$$N_i X_i$$

$\{(N_i, X_i)\}, i = 0$

$$E(X_i|N_i, N_{i-1}, X_{i-1}) = N_i X_{i-1}/N_{i-1}$$

$$E\{(X_i/N_i)|(N_{i-1}, X_{i-1})\} = X_{i-1}/N_{i-1}.$$

$$E\{(X_i/N_i)|(N_{i-1}, X_{i-1}), \dots, (N_0/X_0)\} = X_{i-1}/N_{i-1},$$

$(N_{i-1}, X_{i-1}), \dots, (N_0/X_0)$

(X_i/N_i)

$\{X_i/N_i\},$

$\{(X_i/N_i), F_i\},$

$$F_i = \{(N_i, X_i)(N_{i-1}, X_{i-1}), \dots, (N_0/X_0)\}$$

(1974),

N_i, N_i

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(1877), § 2,

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$N_1, 1, 2, \dots, N_0 - 1,$

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Jongmans & Seneta (1993).

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 (Bibliothèque générale de l'Univ. de
 Liège, Ms 1307C, V. 470).
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 (1837), (Heyde & Seneta 1977, § 3.3),

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polyt. Bénard,

Bénard (1835). 1832 – 1837 .

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$n - i$ $H_i -$ $P(D|C),$ $D -$
 $(+ 1) -$

$$P(D|C) = \sum_{i=0}^n P(D|C, H_i) P(H_i | C),$$

n , (. 266),
 $n - p.$ $i = 0, 1, \dots$

$$P(H_i|C) = P(H_i)P(C|H_i) \div \sum_j P(C|H_j)P(H_j).$$

() , ,

$$P(H_i|C) = P(C|H_i) \div \sum_j P(C|H_j),$$

, . . . :

$$P(H_1) = P(H_2) = \dots$$

$$P(H_i) = \frac{P(H_i)}{(1841, .76)} \cdot \frac{P(H_i|C)}{P(C|H_i)}$$

5.

14 (Heyde & Seneta 1977, § 5.10)

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1. ?
2. , . . .
- 3.
4. (1797 – 1872),
5. 1788 . (2013, § 11.2-4).
- 1874 . 1885 ..
- (1987, . 130).

6. 40 (. § 2),

7. ?

1817 .

- . . . (1987),
- . . ., **Sheynin O.** (2002), Sampling without replacement: history and applications. *Intern Z. f. Geschichte u. Ethik Naturwiss., Techn. u. Med.*, Bd. 10, pp. 181 – 187. **S, G**, 29.
- (2013), **S, G**, 11.
- Bénard M.** (1835), Note sur une question de probabilités. *J. Ecole Roy. Polyt.*, 24-ième cahier, t. 15, pp. 264 – 278.
- Bienaymé I. J.** (1840), Principe nouveau du calcul des probabilités etc. *Soc. Philomatique Paris, Extraits*, sér. 5, pp. 37 – 43. *l'Institut*, 333, t. 8, pp. 167 – 169.
- Catalan E.** (1841), Deux problemes de probabilités. *J. math. pures et appl.*, t. 6, pp. 75 – 80.
- (1877), Un nouveau principe de probabilités. *Bull. Acad. Roy. Sci., Lettres et des Beaux-Arts Belg.*, 2-ième sér., t. 6, pp. 463 – 468.
- (1884), Application d'un nouveau principe de probabilités. . . . , 3-ième sér., t. 6, pp. 72 – 74.
- (1886), Problèmes et théorèmes de probabilités. *Mém. Acad. Roy. Sci., Lettres et des Beaux-Arts Belg.*, t. 46, pp. 2 – 16.
- Dale A. I.** (1991), *History of Inverse Probability*. New York. [New York, 1999.]
- Heyde C. C., Seneta E.** (1977), *I. J. Bienaymé*. New York.
- Jongmans F., Seneta E.** (1993), Bienaymé family history from archival materials and background to the turning points test. *Bull. Soc. Roy. Sci. de Liège.*, t. 62, pp. 121 – 145.
- Mondesir E.** (1837), Solution d'une question qui se présente dans le calcul des probabilités. *J. math. pure et appl.*, t. 2, pp. 3 – 10.
- Poisson S.-D.** (1825 – 1826), Sur l'avantage du banquier au jeu de trente-et-quarante. *Annales math. pures et appl.*, t. 16, pp. 173 – 208.
- (1837), *Recherches sur la probabilité des jugements* etc. Paris, 2003. **S, G**, 52.
- Seneta E.** (1974), Note on the balance between random sampling and population size. *Genetics*, vol. 77, pp. 607 – 610.
- (1983), Modern probabilistic concepts in the work of E. Abbe and A. De Moivre. *Math. Scientist*, vol. 8, pp. 75 – 80.

. . .

(1888)

84),

(MacKenzie 1981, .

(

/

(*New Enc. Brit.*, 15-

, . 19, 2003, . 725

).

438 – 439

);

(1892, .

[vii,

].

*humanitarianism*¹,

2 .

3 .

4 ,

. 83. (1981).
[]
.[...]
.[...]

84. . [...]
.[...]
.[...]
(1901)

111): (1897, . 1, .

[?]
(. 86) (1902, .),
(
):
, . . .
, . 87.
, . 86, 1909 .:

[...] ?

(1888/1891, . 375):

1.

2.

3.

4.

MacKenzie D. A. (1981), *Statistics in Britain, 1865 – 1930*. Edinburgh.

Pearson K. (1888), *Ethic of Freethought*. London, 1891.

--- (1892, .), . , 1911.

--- (1897), *The Chances of Death and Other Studies in Evolution*. London.

--- (1901), *National Life from the Standpoint of Science*. London.

--- (1902), Prefatory essay. The function of science in the modern state. *Enc. Brit.*,
10- . 32 = New volume 8, c. vii – xxxvii

VI

...

... : 1870 .

(1870)

(1870)

,
,
(Mémoires 1870).

(1859, . 328)

:

[]

[] , (

[] . [...]

1823 .

(,
) ,
(, , ,) .

(.),
(
) (1899 – 1907), ()
(1859) (1944 – 1951).

(1968, . 335, .),
1954, . 162). (

, 1856 – 1869 . (, . 103).

(

1968, .335 336). (1875),
505, 1, 86) 1878 .
.5 . (1950).
1954) 1870 . (1869),
(1869), , , ,
(1872), (,
.) . XII :
.267 – 278
(1870) . .268 :
, [...] , 1823 . ()
). (1879/1880,
1936 .) (Sheynin 1994). :
1823 . , , (Sheynin 2012;
2014).
, (1745) . , ,
(Fuss 1786, .44/47 57/60), . (1958), (1832)
(, 1954, .32 – 33). , , ,
(Liagre 1868; Brialmont 1868)
, , (1852) ,

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Brialmont:

Schols (1875),
Jouffret

Jouffret (1874)

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(Hermite 1859).
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(1990, . 128)

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(2012).

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(1982, . 132):

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Gram (1879). (Hald 1998, § 25.4).

(Hald 1998, §§ 25.2 – 25.3). 533 ()
) , 527 (n + 1)
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 n-); (1946, . 178 – 182), ,

P. Tchebychef

Formules d'interpolation par la méthode des moindres carrés

Mémoires couronnés et mémoires des savants étrangers.
 Acad. Roy. des Sciences, des Lettres et des Beau-Arts de Belg.,
 t. 21, 1870, pp. 25 – 33

S'il s'agit de trouver les coefficients a, b, c, \dots dans l'expression de u représentée par la formule

$$u = F(x)[a + bx + cx^2 + \dots],$$

où $F(x)$ est une certaine fonction de la variable indépendante x et $u_1, u_2, u_3, \dots, u_n$, désignent les valeurs données de u qui correspondent aux différentes valeurs de $x = x_1, x_2, x_3, \dots, x_n$, – l'on peut calculer les termes de l'expression u successivement, l'un après l'autre, d'après la série

$$u = F(x)[K_0 \cdot 0(x) + K_1 \cdot 1(x) + K_2 \cdot 2(x) \dots]$$

et trouver, en même temps, la somme des carrés des erreurs commises dans la représentation des valeurs données de u , en s'arrêtant aux termes 1, 2, 3, ..., .

Nous donnons les formules définitives pour calculer les membres de la série mentionnée.

Dans ces formules les sommations s'étendent à toutes les valeurs de l'indice i , depuis $i = 1$, jusqu'à $i = n$, et $\sum d^2$ désigne la somme des carrés des erreurs dans la représentation des valeurs données de u par la série arrêtée au terme $F(x) \cdot K_0(x)$, somme d'après laquelle on trouvera l'erreur quadratique moyenne par la formule

$$E = \sqrt{\frac{1}{n} \sum d^2}.$$

Formules relatives à la détermination du terme $F(x) \cdot K_0(x)$

$$(0, 0) = [F(x_i)]^2, K_0 = \frac{\sum F(x_i)u_i}{(0, 0)},$$

$$0(x) = 1, \sum d_0^2 = \sum u_i^2 - (0, 0)K_0^2.$$

Formules relatives à la détermination du terme $F(x) \cdot K_1(x)$

$$(0, 1) = [F(x_i)]^2 x_i, (0, 2) = [F(x_i)]^2 x_i^2$$

$$a_1 = \frac{(0, 1)}{(0, 0)}, b_1 = \frac{(0, 1)}{(0, 0)}, (1, 1) = (0, 2) - b_1(0, 1),$$

$$\sum d_1^2 = \sum d_0^2 - (1, 1)K_1^2.$$

$$K_1 = \frac{\sum F(x_i)x_i u_i - (0, 1)K_0}{(1, 1)}, \quad 1(x) = x - b_1.$$

Formules relatives à la détermination du terme $F(x) \cdot K_2(x)$

$$(0, 3) = [F(x_i)]^2 x_i^3, (0, 4) = [F(x_i)]^2 x_i^4,$$

$$(1, 2) = (0, 3) - b_1(0, 2), (1, 3) = (0, 4) - b_1(0, 3),$$

$$a_2 = \frac{(1, 1)}{(0, 0)}, b_2 = \frac{(1, 2)}{(1, 1)} - \frac{(0, 1)}{(0, 0)}, (2, 2) = (1, 3) - b_2(1, 2) - a_2(0, 2),$$

$$K_2 = \frac{\sum F(x_i)x_i^2 u_i - (0, 2)K_0 - (1, 2)K_1}{(2, 2)},$$

$${}_2(x) = (x - b_2) {}_1(x) - a_2 {}_0(x), \quad \sum d_2^2 = \sum d_1^2 - (2, 2)K_2^2.$$

Formules relatives à la détermination du terme $F(x) \cdot K_3$

$$(0, 5) = [F(x_i)]^2 x_i^5, \quad (0, 6) = [F(x_i)]^2 x_i^6,$$

$$(1, 4) = (0, 5) - b_1(0, 4), \quad (1, 5) = (0, 6) - b_1(0, 5),$$

$$(2, 3) = (1, 4) - b_2(0, 3) - a_2(1, 3),$$

$$(2, 4) = (1, 5) - b_2(1, 4) - a_2(0, 4),$$

$$a_3 = \frac{(2, 2)}{(1, 1)}, \quad b_3 = \frac{(2, 3)}{(2, 2)} - \frac{(1, 2)}{(1, 1)}, \quad (3, 3) = (2, 4) - b_3(2, 5) - a_3(1, 3),$$

$$K_3 = \frac{\sum F(x_i)x_i^3 u_i - (0, 3)K_0 - (1, 3)K_1 - (2, 3)K_2}{(3, 3)},$$

$${}_3(x) = (x - b_3) {}_2(x) - a_3 {}_1(x), \quad \sum d_3^2 = \sum d_2^2 - (3, 3)K_3^2.$$

Formules relatives à la détermination du terme $F(x) \cdot K$

$$(0, 2 - 1) = [F(x_i)]^2 x_i^{2-1}, \quad (0, 2) = [F(x_i)]^2 x_i^2,$$

$$(0, 2 - 2) = (0, 2 - 1) - b_1(0, 2 - 2),$$

$$(1, 2 - 1) = (0, 2) - b_1(0, 2 - 1),$$

$$(2, 2 - 3) = (1, 2 - 2) - b_2(1, 2 - 3) - a_2(0, 2 - 3),$$

$$(2, 2 - 2) = (1, 2 - 1) - b_2(1, 2 - 2) - a_2(0, 2 - 2),$$

$$(3, 2 - 4) = (2, 2 - 3) - b_2(2, 2 - 4) - a_3(1, 2 - 4),$$

$$(3, 2) = (2, 2 - 2) - b_3(2, 2 - 3) - a_3(1, 2 - 3),$$

$$\dots \dots \dots$$

$$(-1,) = (-2, +1) - b_{-1}((-2,) - a_{-1}((-3,)),$$

$$(-1, +1) = (-2, +2) - b_{-1}((-2, +1) - a_{-1}((-3, +1)),$$

$$a = \frac{(-1, -1)}{(-2, -2)}, \quad b = \frac{(-1,)}{(-1, -1)} - \frac{(-2, -1)}{(-2, -2)},$$

$$(,) = (-1, +1) - b(-1,) - a(-2,),$$

$$K = \frac{\sum F(x_i)x_i u_i - (0,)K_0 - (1,)K_1 - (2,)K_2 - \dots - (-1,)K_{-1}}{(,)},$$

$$(x) = (x - b) {}_{-1}(x) - a {}_{-2}(x),$$

$$\sum d^2 = \sum d_{-1}^2 - (,)K^2.$$

Appliquons cette méthode d'interpolation aux sept premières données du tableau II pour exprimer les trajets u du projectile en fonction des durées x par le polynôme

$$u = ax + bx^2 + cx^3 + \dots$$

Dans ce cas $F(x) = x$.

$$[\begin{matrix} x_1, x_2, \dots, x_7 \\ u_i \end{matrix}]$$

En cherchant à exprimer u par un seul terme

$$F(x) \cdot K_0(x) = x \cdot K_0(x),$$

on prendra

$$\begin{aligned} [F(x_i)]^2 &= x_i^2 [\quad \quad \quad] \\ F(x_i) \cdot u_i &= x_i \cdot u [\quad \quad \quad] \end{aligned}$$

$$[\quad \quad \quad \cdot \quad \quad \quad :]$$

$$F(x) \cdot K_0(x) = 247,85x.$$

La somme des carrés des erreurs avec lesquelles le terme trouvé représente les valeurs données se déduit de [$\quad \quad \quad$:]

$$\sum d_0^2 = 0,07854535.$$

$$[F(x) \cdot K_i(x) \quad i = 1, 2, 3]$$

On trouve pour l'erreur quadratique moyenne avec laquelle les quatre termes trouvés représentent les valeurs données de u

$$E = \sqrt{\frac{\sum d_3^2}{n}} = 0,0084.$$

En s'arrêtant aux termes trouvés, on a pour l'expression cherchée de u

$$u = 105,36x + 15984x^2 + 25631000x^3 - 3546000000x^4.$$

Nous nous sommes servi de l'arithmomètre de M. Thomas de Colmar pour calculer les produits, les puissances et des quotients qui entrent dans les formules de l'interpolation. Avec cette machine on peut faire facilement et promptement la multiplication de huit chiffres pour huit chiffres, ou de sept par neuf, et la division de seize chiffres par huit chiffres.

FIN

- . *Science*, vol. 84, 1936, . 289 – 290.
(1968, . 303).
- . . (1946),
.. . 171 – 188.
. . (1985),
. 28, . 26 – 78.
--- (1986),
. 30, . 224 – 247.
. (.) (1982),
. . (1869), 1867 . [...]
- 5, . 871 – 905. (1954) 1856 ..
--- (1870),
. : 1859.
--- (1870), Mémoire sur les experiences faites á l’Etablissement de M. Krupp à Essen au mois de Novembre 1867, pour déterminer les pressions des gaz de la poudre dans l’ame des bouches à feu. *Mémoires couronnés et mémoires des savants étrangers, Acad. Roy. des Sciences, des Lettres et des Beau-Arts de Belg.*, t. 21, pp. 3 – 24.
--- (1872), *Traité de balistique extérieure*. Paris.
--- (1875), Magnus de Sparre, Mouvement des projectiles oblong dans le cas du tir de plein fouet. 6, . 163 – 165.
. . (1954),
--- (1958),
. „ . . (1990),
. . (1950),
- XIX 39- 7, . 75 – 81.
. . (2012),
Weekly, . 535 – 536, . 2012, . 10 – 31.
. . (1925),
(.) 1959.
. . (1855), 2, . 103 – 126.
--- (1857), 2, . 127 – 145.
--- (1858), 236 – 238.
--- (1859,), 314 – 334.
--- (1864), , pp. 541 – 560.
--- (1870), Appendice [to Mayevski (1870)]. Formules d’interpolation par la méthode des moindres carrés. *Mémoires couronnés et mémoires des savants étrangers, Acad. Roy. des Sciences, des Lettres et des Beau-Arts de Belg.*, t. 21, pp. 25 – 33.
--- (1875), 3, . 66 – 87.
--- (1899 – 1907), *Oeuvres*, tt. 1 – 2. St. Pétersbourg. A. A. Markov, N. Ya. Sonin. (.) : New York, 1962.
. . (1968), 1917
- Brialmont** (1868), Rapport [.]. *Bull. Acad. Roy. des Sciences, des Lettres et des Beau-Arts de Belg.*, No. 11. Cl. des Sciences, pp. 382 – 384.
Euler L. (1745), *Neue Grundsätze der Artillerie ... Opera omnia*, ser. 2, t. 14.
Fuss N. (1786), Lobrede auf Herrn Leonhard Euler. In Euler, *Opera omnia*, ser. 1, t. 1, pp. 4 – 122.
Gram J. P. (1879), Über die Entwicklung reeler Funktionen in Reihen mittelst der Methode der kleinsten Quadraten. *J. reine angew. Math.*, Bd. 94, 1883, pp. 41 – 73.

- Hald A.** (1998), *History of Mathematical Statistics from 1750 to 1930*. New York.
- Hermite Ch.** (1859), Sur l'interpolation. *C. r. Acad. Sci. Paris*, t. 48, pp. 62 – 67.
- Isserlis L.** (1927), Note on Chebycheff's interpolation formula. *Biometrika*, vol. 19, pp. 87 – 93.
- Jouffret E.** (1873), *Sur la méthode des moindres carrés et ses applications au tir*. Paris.
- (1874), Sur l'établissement et l'usage des tables de tir. *Revue d'artill.*, 2^e année, t. 3, oct. 1873 – mars 1874, pp. 51 – 72.
- (1903), *Traité élémentaire de géométrie à quatre dimensions*.
- Lagrange J. L.** (1832), Formules relatives au mouvement du boulet dans l'intérieur du canon. Extraites des manuscrits par S.-D. Poisson. *J. de l'Ecole Polyt.*, 21^e cahier, sept.
- Liagre [J. B. J.]** (1852), *Calcul des probabilités et théorie des erreurs* etc. Bruxelles.
- (1868), Rapport [], *Bull. Acad. Roy. des Sciences, des Lettres et des Beau-Arts de Belg.*, No. 11. Cl. des Sciences, p. 381.
- Mémoires** (1870), *Mémoires couronnés et autres mémoires. Acad. Roy. des Sciences, des Lettres et des Beau-Arts de Belg.*, t. 21.
- Schols Ch. M.** (1875), De interpolatie-formule van Tchébycheff volgens de methode der kleinste vierkanten. *Verslag. Med. Kon. Akad. Wetens., Amsterdam*, Afd. Natuurkunde, t. 9, pp. 301 – 311. : La formule d'interpolation de Tchébycheff suivant la méthode des moindres carrés. *Archives néerlandaises des sciences exactes et naturelles*, t. 12, 1877, pp. 102 – 112.
- Sheynin O.** (1994), Chebyshev's lectures in the theory of probability. *Arch. Hist. Ex. Sci.*, vol. 46, pp. 321 – 340.
- (2012), New exposition of Gauss' final justification of least squares. *Math. Scientist*, vol. 37, pp. 147 – 148.
- (2014), Elementary exposition of Gauss' final justification of least squares. *Silesian Stat. Rev.*, No. 12 (18), pp. 39 – 47.

VII

. . .

P. C. Mahalanobis, A note on the statistical and biometric writings of Karl Pearson.
Sankhya, Indian J. Stat., vol. 2, 1936, pp. 411 – 422

(),

[Morant . 1939].

(1892, 1900 1911).

[141]

1,

1.

1893

2.

(

).

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3.

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(. 234).

1903 – 1920 . [39].

[40]

[41] 1908 1918 .
1906 – 1919 .

[42, 43] [47].

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[49, 50]

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[52, 53].

, 1931 – 1935 .,
[54],

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[72, 73]

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, 1875 – 1876 ⁸.
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[92, 93].

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[126]
[127],

[128].
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+ 0,5.
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[136],
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[140]¹⁰.

13.

[141]. 1894 – 1897 ..

(. 15) ¹¹ [142].

1909, 1910 1911 .
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[144]

[145]

[146, 147]. 1910 – 1911 .

[148, 149].

[150]

[151, 152]

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¹².

1914 – 1918 .

1914 .

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(H. Risley)

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[171] simometer [170]. [169] 1907

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[173, 174], [175, 176], [177]

[178]. [179]

[180] [180 – 182]

[183] [184]

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[186]

[187], [188] [189].

14 [190]

(K. Pearson)

Annals Eugenics = Ann. Eug.
Biometrika = Biom.
Draper's Co. Res. Mem. Biom. Ser. = Biom. Mem.
Phil. Trans. Roy. Soc. Lond. = PTRS

1. On the dissection of asymmetrical frequency curves. *PTRS*, vol. A185, 1894, pp. 71 – 110.
2. Skew variation in homogeneous material. *PTRS*, vol. A186, 1895, pp. 343 – 414.
3. Supplement to [2]. *PTRS*, vol. A197, 1901, pp. 443 – 459.
4. Second supplement to [2]. *PTRS*, vol. A216, 1916, pp. 429 – 457. :
vol. 12, 1919, pp. 259 – 281.
- 5, 6. On systematic fitting of curves to observations and measurements, pt. 1. *Biom.*, vol. 1, 1901, pp. 265 – 303. Pt. 2, *Biom.*, vol. 2, 1902, pp. 1 – 23.
7. On certain types of compound frequency distributions in which the components can be individually described by binomial series. *Biom.*, vol. 11, 1915, pp. 139 – 144.
8. On corrections for moment-coefficients of limited range frequency distributions. *Biom.*, vol. 12, 1919, pp. 231 – 258.
9. On certain properties of the hypergeometrical series and on the fitting of such series to observation polygons in the theory of chances. *London, Edinb. and Dublin Phil. Mag.*, vol. 49 [vol. 47?], 1899, pp. 236 – 246.
10. On the moments of the hypergeometrical series. *Biom.*, vol. 16, 1924, pp. 157 – 162.
11. On a certain double hypergeometrical series and its representation by continuous frequency surfaces. , pp. 172 – 188.
12. Notes on skew frequency surfaces. *Biom.*, vol. 15, 1923, pp. 222 – 230.
13. On non-skew frequency surfaces. , pp. 231 – 244.
14. The fifteen constant bivariate frequency surface. *Biom.*, vol. 17, 1925, pp. 268 – 313.
15. Thoughts suggested by the papers of Welch and Kolodziejczyk. *Biom.*, vol. 27, 1935, pp. 228 – 259.
16. Regression, heredity and panmixia. *PTRS*, vol. A187, 1896, pp. 253 – 318.
17. On the correlation of characters not quantitatively measurable. *PTRS*, vol. A195, 1901, pp. 79 – 150.
18. On the inheritance of characters not capable of exact quantitative measurement. , pp. 79 – 150. A. Lee.
19. On contingency and its relation to association and normal correlation. *Biom. Mem.*, vol. 1, 1904.
20. On the general theory of skew correlation and non-linear regression. *Biom. Mem.*, vol. 2, 1905.
21. On a general method of determining successive terms in a skew regression line. *Biom.*, vol. 13, 1921, pp. 296 – 300.
22. On further methods of determining correlation. *Biom. Mem.*, vol. 4, 1907.
23. On a new method of determining correlation between a measured character A and a character B of which only the percentage of cases etc. *Biom.*, vol. 7, 1909, pp. 96 – 105.
24. On a new method of determining correlation when one variable is given by alternative and the other by multiple categories. *Biom.*, vol. 7, 1910, pp. 248 – 257.
25. On an extension of the method of correlation by grades or ranks. *Biom.*, vol. 10, 1914 – 1915, pp. 416 – 418. Second note. *Biom.*, vol. 13, 1920 – 1921, pp. 302 – 305.
26. On polychoric coefficients of correlation. *Biom.*, vol. 14, pp. 1922, pp. 127 – 156.
27. On the measurement of the influence of broad categories on correlation. *Biom.*, vol. 9, 1913, pp. 116 – 139.
28. On a correction to be made to the correlation ratio . *Biom.*, vol. 8, 1911, pp. 254 – 256. vol. 14, 1923, pp. 412 – 417.
29. On the correction for broad categories. *Biom.*, vol. 27, 1935, pp. 364 – 372.
30. On theories of association. *Biom.*, vol. 9, 1913, pp. 159 – 315. D.
Heron
31. On a form of spurious correlation which may arise when indices are used in the measurement of organs. *Proc. Roy. Soc.*, vol. 60, 1897, pp. 489 – 498.
32. On the constant of index-distributions as deduced from the like constants for the components of the ratio with sp. ref. to the opsonic index. *Biom.*, vol. 7, 1910, pp. 531 – 541.
33. On the influence of double selection on the variation and correlation of two characters. *Biom.*, vol. 6, 1908, pp. 111 – 112.

34. On the general theory of the influence of selection on correlation and variation. *Biom.*, vol. 8, 1912, pp. 437 – 445.
35. On certain errors with regard to multiple correlation [...]. *Biom.*, vol. 10, 1914, pp. 181 – 187.
36. On some novel properties of partial and multiple correlation coefficients in a universe of manifold characteristics. *Biom.*, vol. 11, 1916, pp. 231 – 238.
37. On first power methods of finding correlation. *Biom.*, vol. 17, 1925, p. 459 – 469.
38. On the probable errors of frequency constants and on the influence of random selection on variation and correlation. *PTRS*, vol. A191, 1898, pp. 229 – 311.
L. N. G. Filon.
39. On the probable errors of frequency constants. Introductory pts 1 – 3. *Biom.*, vol. 2, 1903, pp. 273 – 281; vol. 9, 1913, pp. 1 – 10; vol. 13, 1921, pp. 113 – 132.
40. On the generalised probable error in multiple normal correlation. *Biom.*, vol. 6, 1908, pp. 59 – 68. A. Lee.
41. On the product moments of various orders of the normal correlation surface of two variates. *Biom.*, vol. 12, 1918, pp. 86 – 92. A. W. Young.
42. On the probable error of a coefficient of correlation as found from a fourfold table. *Biom.*, vol. 9, 1913, pp. 22 – 27.
43. On the probable error of a biserial. *Biom.*, vol. 11, 1917, pp. 292 – 302.
44. On the probable error of a mean-square contingency. *Biom.*, vol. 5, 1906, pp. 191 – 197. J. B. Blakeman.
45. On the probable error of a coefficient of mean-square contingency. *Biom.*, vol. 10, 1915, pp. 570 – 573.
46. On the probable error of a coefficient of contingency without approximation. *Biom.*, vol. 11, 1916, pp. 215 – 230. *Biom.*, vol. 12, 1919, pp. 259 – 281.
47. The probable error of a Mendelian class frequency. *Biom.*, vol. 11, 1917, pp. 429 – 432.
48. On the distribution of the standard deviations of small samples. Appendix 1 to the papers of “Student” and R. A. Fisher. *Biom.*, vol. 10, 1915, pp. 522 – 529.
49. On the distribution of the correlation coefficient in small samples. Appendix 2 to the papers of “Student” and R. A. Fisher. A cooperative study. *Biom.*, vol. 11, 1917, pp. 328 – 413.
50. Further contributions to the theory of small samples. *Biom.*, vol. 17, 1925, 176 – 199. *Biom.*, vol. 19, 1927, pp. 441 – 442.
51. On the distribution of the first product moment-coefficient in samples drawn from an indefinitely large normal population. *Biom.*, vol. 21, 1929, pp. 164 – 193.
G. B. Jeffrey, E. M. Elderton.
52. Further applications in statistics of the $T_m(x)$ Bessel function. *Biom.*, vol. 24, 1932, pp. 293 – 350. S. A. Stouffer, F. N. David.
53. On the application of the double Bessel function to statistical problems. *Biom.*, vol. 25, 1933, pp. 158 – 178.
54. On the mean character and variance of a ranked individual and on the mean and variance of the intervals between ranked individuals. Pt. 1. *Biom.*, vol. 23, 1931, pp. 364 – 397; Pt. 2. Case of certain skew curves. *Biom.*, vol. 24, 1932, pp. 203 – 279. Pearson M. V.
55. Tables of the probability integrals of symmetrical frequency curves in the case of low powers such as arise in the theory of small samples. *Biom.*, vol. 22, 1931, pp. 253 – 283. B. Stoessiger.
56. On the nature of the relationship between two “Student’s” variates (z_1 and z_2) when samples are taken from a bivariate normal population. , pp. 405 – 422.
57. Some properties of “Student’s” z : correlation, regression and scedasticity of z with the mean and standard deviation of the sample. *Biom.*, vol. 23, 1931, pp. 1 – 9.
58. Further remarks on the z -test. , pp. 408 – 415.
59. On the criterion that a given system of deviations [...] can be reasonably supposed to have arisen from random sampling. *London, Edinb. and Dublin Phil. Mag.*, vol. 50, 1900, pp. 157 – 175.
60. On the probability that two independent distributions of frequency are really samples from the same population. *Biom.*, vol. 8, 1911, pp. 250 – 254.
61. On the general theory of multiple contingency with sp. ref. to partial contingency. *Biom.*, vol. 11, 1916, pp. 145 – 158.

62. On the application of “goodness of fit” tables to test regression curves and theoretical curves used to describe observational or experimental data. , pp. 239 – 261. : vol. 12, 1919, pp. 259 – 281.
63. On the chi-squared test of goodness of fit. *Biom.*, vol. 14, 1922, pp. 186 – 191.
64. Further note on the chi-squared test of goodness of fit. *Biom.*, vol. 14, 1923, p. 418.
65. Note on the relation of (P , χ^2) goodness of fit test to the distribution of standard deviations in samples from a normal population. *Biom.*, vol. 19, 1927, p. 215.
66. Experimental discussion of the (χ^2 , P) test for goodness of fit. *Biom.*, vol. 24, 1932, pp. 351 – 381.
67. On the probability that two independent distributions of frequency are really samples from the same parent population. , pp. 457 – 479.
68. On the parent population with independent variates which gives the minimum value of χ^2 for a given sample. *Biom.*, vol. 25, 1933, 134 – 146.
69. On a method for determining whether a sample [...] has probably been drawn at random. , pp. 379 – 410.
70. On a new method of determining goodness of fit. *Biom.*, vol. 26, 1934, pp. 425 – 442.
71. On the influence of past experience on future expectation. *Lond., Edinb. and Dublin Phil. Mag.*, vol. 13, 1907, pp. 365 – 378.
72. The fundamental problem of practical statistics. *Biom.*, vol. 13, 1921, pp. 1 – 16, 300 – 301.
73. On a method of ascertaining limits to the actual number of marked members [...]. *Biom.*, vol. 20A, 1928, pp. 149 – 174.
74. On generalised Tchebycheff theorem in mathematical theory of statistics. *Biom.*, vol. 12, 1919, pp. 284 – 296.
75. On the distribution of frequency (variation and correlation) of the barometric height at divers stations. *PT RS*, vol. A190, 1897, pp. 423 – 469. A. Lee.
76. On Fr. Galton’s problem. The most suitable proportion between the values of first and second prizes. *Biom.*, vol. 1, 1902, pp. 390 – 399.
77. On the multiple correlation of brothers etc. *Biom.*, vol. 17, 1925, pp. 129 – 141.
78. On the mathematical theory of errors of judgement with sp. ref. to the personal equation. *PT RS*, vol. A198, 1902, pp. 235 – 292.
79. On the mathematical theory of random migration. *Biom. Mem.*, vol. 3, 1906. J. Blakeman.
80. Numerical illustrations of the variate difference correlation method. *Biom.*, vol. 10, 1914, pp. 340 – 355. B. M. Cave.
81. The sampling errors in the theory of a generalised factor. *Biom.*, vol. 19, 1927, pp. 246 – 291. M. Moul.
82. Biometry and chronology. *Biom.*, vol. 20A, 1928, pp. 241 – 262, 424. C. F. Trustam.
83. Notes on the history of correlation. *Biom.*, vol. 13, 1920, pp. 25 – 45.
84. The contribution of Giovanni Plana to the normal bivariate frequency surface. *Biom.*, vol. 20A, 1928, 295 – 298.
85. Historical note on the normal curve of errors. *Biom.*, vol. 16, 1924, pp. 402 – 404.
86. James Bernoulli’s theorem. *Biom.*, vol. 17, 1925, pp. 201 – 210.
87. Note on a solution due to Laplace. *Biom.*, vol. 20A, 1928, pp. 166 – 174.
88. Laplace. *Biom.*, vol. 21, 1929, pp. 202 – 217.
89. Historical note on the distribution of the standard deviation of samples [...] drawn from an indefinitely large normal parent population. *Biom.*, vol. 23, 1931, pp. 416 – 418.
90. Walter Frank Raphael Weldon, 1860 – 1906. *Biom.*, vol. 5, 1906, pp. 1 – 52.
91. *Life, Labours and Letters of Fr. Galton*, vols 1, 2, 3A, 3B. Cambridge, 1914 – 1930.
92. *Fr. Galton, a Centenary appreciation*.
93. *Charles Darwin, 1809 – 1882*. London, 1923.
94. *Tables for Statisticians and Biometricians*. Pt. 1, 1914, 1924, 1930. Pt. 2, 1931.
95. *Tables of the Complete and Incomplete Beta-Function*. Cambridge, 1930.

96. *Tables of the Incomplete γ -Function*. London, 1922.
97. *Tables of the Complete and Incomplete Elliptic Integrals*. London, 1934.
98. *Tracts for Computers* NNo. 1 – 20. Cambridge, 1919 – 1934.
99. *Logarithmica Britannica. Tracts for Computers* NNo. 11, 14, 16 – 19, 1924 – 1934.
100. On the numerical evaluation of high order incomplete Eulerian integrals. *Biom.*, vol. 27, 1935, pp. 409 – 423. M. V. Pearson.
101. On the principle of homotyposis and its relation to heredity, to the variability of the individual, and to that of race. Pt. 1. Homotyposis in the vegetable kingdom. *PTRS*, vol. A197, 1902, pp. 285 – 379.
102. On fundamental conceptions of biology. *Biom.*, vol. 1, 1901, pp. 320 – 344.
103. On homotyposis in homologous but differentiated organs. *Proc. Roy. Soc.*, vol. 71, 1903, pp. 288 – 313.
104. On inheritance in the Shirley Poppy. *Biom.*, vol. 2, 1902, pp. 56 – 100.
105. Variation and correlation in lesser celandine from divers localities. *Biom.*, vol. 2, 1903, pp. 145 – 164.
106. Cooperative study of *Vespa Vulgaris*. *Biom.*, vol. 7, 1909, pp. 48 – 63; vol. 8, 1911, pp. 1 – 12.
107. Biometric study of the blood corpuscles of the common tadpole. *Biom.*, vol. 6, 1909, pp. 402 – 419.
108. On the relation of the duration of pregnancy to size of litter and other characters in bitches. *Biom.*, vol. 22, 1931, pp. 309 – 323. M. V. Pearson.
109. The laws of ancestral heredity. *Biom.*, vol. 2, 1903, pp. 211 – 236. M. V. Pearson.
110. On the generalised theory of alternative inheritance with sp. ref. to Mendel's law. *PTRS*, vol. A203, 1904, 53 – 86.
111. On a mathematical theory of determinantal inheritance from suggestions and notes of the late W. F. R. Weldon. *Biom.*, vol. 6, 1908, pp. 80 – 93.
112. Further remarks on the law of ancestral heredity. *Biom.*, vol. 8, 1911, pp. 239 – 243.
113. On a new theory of progressive evolution. *Ann. Eug.*, vol. 4, 1930, pp. 1 – 40.
114. On the laws of inheritance in man. Pt. 1. Physical characters. *Biom.*, vol. 2, 1903, pp. 357 – 462. Pt. 2. Mental and moral characters. *Biom.*, vol. 3, 1904, pp. 131 – 190. A. Lee.
115. A first study of the statistics of pulmonary tuberculosis. Inheritance. *Biom. Mem.*, vol. 2, 1907.
116. A second study of the statistics of pulmonary tuberculosis. Marital infection. 1908.
117. A first study of the inheritance of vision and of the relative influence of heredity and environment on sight. *Eugen. Lab. Mem.*, vol. 5, 1909. A. Barrington.
118. *The Treasure of Human Inheritance*, vol. 1, pts 1 – 8, vol. 2, pts 1 – 6, vol. 3.
119. *Albinism in Man*, pt. 1, 1911; pts 2 and 4, 1913.
120. On the inheritance of the deformity known as split-foot or lobster-claw. *Biom.*, vol. 6, 1908, pp. 69 – 79. Internal albinism. *Biom.*, vol. 7, 1910, pp. 244 – 247. Two new pedigrees of muscular dystrophy. *Ann. Eug.*, vol. 5, 1933, p. 179 – 191.
121. *The Influence of Parental Alcoholism on the Physique and Intelligence of the Offspring*, 1910. Second study, 1910.
122. *Preliminary Study of Extreme Alcoholism in Adults*, 1911.
123. On the effect of a differential fertility on degeneracy. *Biom.*, vol. 7, 1909 – 1910, pp. 258 – 275.
124. *On the Correlation of Fertility with Social Value*. 1913.
125. On the hereditary character of general health. *Biom.*, vol. 9, 1913, pp. 320 – 329.
126. Further evidence of natural selection in man. *Biom.*, vol. 10, 1915, pp. 488 – 506.
127. *Statistical Study of Oral Temperatures in School Children with sp. ref. to Parental, Environmental and Class Differences*. 1914.
128. *Study of Data Provided by a Baby-Clinic in a Large Manufacturing Town*. 1922.

129. Inheritance of physical characters. *Biom.*, vol. 12, 1919, pp. 367 – 372.
130. On the Relationship of Health to the Physical and Psychological Characters in School Children. Cambridge, 1923.
131. The problem of alien immigration into Great Britain. *Ann. Eug.*, vol. 1, 1925, pp. 5 – 127; vol. 2, 1927, pp. 111 – 244, 290 – 317; vol. 3, pp. 1 – 76, 201 – 262. M. Moul.
132. Inheritance of mental disease. *Ann. Eug.*, vol. 4, 1931, pp. 362 – 380.
133. Opsonic index: mathematical error and functional error. *Biom.*, vol. 8, 1911, pp. 203 – 256.
134. On the appearance of multiple cases of disease in the same house. *Biom.*, vol. 8, 1912, pp. 404 – 412.
135. On the probability that two independent distributions of frequency are really samples of the same population with sp. ref. to recent work on the identity of trypanosome strains. *Biom.*, vol. 10, 1914, pp. 85 – 143. No. 60
136. On criteria for the existence of differential death-rates. *Biom.*, vol. 11, 1916, pp. 159 – 184. J. F. Tocher.
137. The influence of isolation on the diphtheria attack- and death-rates. *Biom.*, vol. 10, 1915, pp. 549 – 569. E. M. Elderton.
138. The check to the fall in phthisis death-rate since the discovery of the tubercle bacillus and the adoption of modern treatment. *Biom.*, vol. 12, 1919, pp. 374 – 376.
139. Statistical studies of dietaries. *Biom.*, vol. 10, 1914, pp. 172 – 174.
140. Lancashire milk experiment. *Ann. Eug.*, 5, 1933, pp. 337 – 338.
141. *The Chances of Death and Other Studies in Evolution*, vols 1 – 2. 1897.
142. *The Scope and Importance to the State of the Science of National Eugenics*. *J. Oxford Univ. Jur. Sci. Club* Aug. 1907; *Eugen. Lab. Lecture Ser.*, vol. 1, 1909, 1911.
143. *The Groundwork of Eugenics*. *Eugen. Lab. Lecture Ser.*, vol. 2, 1909, 1912.
144. *The Problem of Practical Eugenics*, 1912.
145. *The Academic Aspects of the Science of National Eugenics*, 1911.
146. *The Relative Strength of Nature and Nurture*, 1912.
147. *Nature and Nurture: The Problem of the Future*. *Eugen. Lab. Lecture Ser.*, vol. 6, 1910, 1913.
148. *The Influence of Parental Alcoholism on the Physique and Ability of the Offspring: Reply to the Cambridge Economists*, 1910.
149. *An Attempt to Correct Some of the Misstatements made by Sir Victor Horsley and Mary D. Sturge in Their Criticism of the Memoir First Study of the Influence of Parental Alcoholism*, 1911. [121].
150. *Darwinism, Medical Progress and Eugenics*. *Eug. Lab. Lecture Ser.*, vol. 9. 1912.
151. *Tuberculosis, Heredity and Environment*, 1912.
152. *The Fight against Tuberculosis and the Death-Rate from Phthisis*.
153. *Sidelights on the Evolution of Man*.
154. *The Handicapping of the First-Born*.
155. *The Right of the Unborn Child*.
156. *The Function of Science in the Modern State*.
157. *National Life from the Standpoint of Science*.
158. *Social Problems, Their Treatment, Past, Present and Future*, 1912.
159. *Eugenics and Public Health*.
160. Mendelism and the Problem of Mental Defect. Pt. 2. The Continuity of Mental Defect, 1914.
161. . Pt. 3. On the graduated character of mental defect and the need for standardizing judgements as to the grade of social inefficiency which shall involve segregation. *Questions of the Day and the Fray*, vol. 9, 1914.
162. Preliminary note on interracial characters and their correlation in man. *Biom.*, vol. 2, 1903, pp. 347 – 356.
163. On the relationship of intelligence to size and shape of head and to other physical and mental characters. *Biom.*, vol. 5, 1906, pp. 105 – 146.
164. On our present knowledge of the relationship of mind and body. *Ann. Eug.*, vol. 1, 1926, pp. 382 – 406.
165. On the stability of cephalic indices within the race. *Biom.*, vol. 16, 1924, pp. 116 – 138. L. H. C. Tippet.

166. Dextrality and sinistrality of hand and eye. *Biom.*, vol. 19, 1927, pp. 165 – 199.
167. On the interrelationship of certain characters in man (males). *Ann. Eug.*, vol. 5, 1933, pp. 364 – 410. H. A. Ruger.
168. Cranial type contours. *Biom.*, vol. 8, 1911, pp. 123 – 202.
169. The definition of alveolar point. *Biom.*, vol. 17, 1925, pp. 53 – 56.
170. On simometers and their handling. *Biom.*, vol. 26, 1934, pp. 265 – 268.
171. On the importance of the type silhouette for racial characterisation in anthropology. *Biom.*, vol. 20B, 1928, pp. 389 – 400.
172. The cranial coordinatograph, the standard planes of the skull and the value of the Cartesian geometry to the craniologist etc. *Biom.*, vol. 25, 1933, pp. 217 – 253.
173. On the measurement of internal capacity from cranial circumferences. *Biom.*, vol. 3, 1904, pp. 366 – 397.
174. On further formulae for the reconstruction of cranial capacity from external measurements of the skull. *Biom.*, vol. 19, 1927, pp. 211 – 214.
175. On measurements of internal diameters of skull etc. *Biom.*, vol. 21, 1929, pp. 85 – 123.
176. Note on Dr. Wagner's memoir on cranial measurements. *Biom.*, vol. 27, 1935, pp. 133 – 144.
177. On the problem of sexing osteometric material. *Biom.*, vol. 10, 1915, pp. 479 – 487.
178. Was the skull of the Mariori artificially deformed? *Biom.*, vol. 11, 1921, pp. 338 – 346.
179. In a paper by M. I. Tildesley, A first study of the Burmese skull. *Biom.*, vol. 13, 1921, pp. 176 – 262.
180. On the coefficient of racial likeness. *Biom.*, vol. 18, 1926, pp. 105 – 117.
181. On the application of the coefficient of racial likeness to test the character of samples. *Biom.*, vol. 20B, 1928, pp. 294 – 300.
182. Note on standardisation of method of using the coefficient of racial likeness. , pp. 376 – 378.
183. A study of the nasal bridge in the anthropoid apes and its relationship to the nasal bridge in man. *Biom.*, vol. 9, 1913, pp. 391 – 445.
184. A study of the long bones of the English skeleton. *Biom. Mem.*, vols. 10 11, 1919.
185. On the sesamoids of the knee-joint. Pt. 1, man. Pt. 2, Evolution of the sesamoids. *Biom.*, vol. 13, 1921, pp. 133 – 175, 350 – 400. A. G. Davin.
186. Further investigations of the morphometric characters of the individual bones of the human skull. *Biom.*, vol. 27, 1935, pp. 424 – 465. T. L. Woo.
187. On the skull and portraits of George Buchanan. *Biom.*, vol. 18, 1926, pp. 233 – 256.
188. The skull and portraits of Henry Stewart, Lord Darnley, and their bearing on the tragedy of Mary, Queen of Scots. *Biom.*, vol. 20B, 1928, pp. 1 – 104.
189. The Wilkinson head of Oliver Cromwell and its relationship with busts, masks and painted portraits. *Biom.*, vol. 26, 1934, pp. 269 – 378. G. M. Morant.
190. *The Science of Man, Its Needs and Future Prospects*, 1920.
- . . (1927, . 1928),
. 4. , 1964, . 217 –
232.
. . (1947),
. 91, . 53 – 64.
--- (1948), 3, 4, . 143 – 151.
. . . . (1947),
. , 11, . 561 – 566.
. . (1990), ,
2010.
--- (2013). S, G, 11.
Cramer H. (1946, .), , 1948.

Fisher R. A. (1921), On the mathematical foundation of theoretical statistics. *Phil. Trans. Roy. Soc. Lond.*, vol. A222, pp. 309 – 368.

--- (1937), Professor Karl Pearson and the method of moments. *Annals Eug.*, vol. 7, pp. 303 – 318.

Ghosh J. K. (1994), Mahalanobis and the art and science of statistics etc. *Indian J. Hist. Sci.*, vol. 29, pp. 89 – 98.

Morant G. M., Welch B. L. (1939), *Bibliography of the Statistical and Other Writings of Karl Pearson*. London.

Nayak T. K. (2009), Impact of Karl Pearson’s work on statistical developments in India. *Intern. Stat. Rev.*, vol. 77, pp. 72 – 80.

Pearson E. S. (1990), “Student”. *Biography of W. S. Gosset*. Oxford. R. L. Plackett, G. A. Barnard. **S, G**, 68.

Pearson K. (1891), Atom squirts. *Amer. J. Math.*, vol. 13, pp. 309 – 362.

--- (1892,), , 1911.

--- (1894), Science and Monte Carlo. *Fortnightly Rev.*, vol. 55, pp. 183 – 193.

--- (1897), *Chances of Death and Other Studies on Evolution*. London.

1. (1894), , , .
2. *Nature* 26
1893 . (. 615 – 616).
 μ_n μ_3/μ_2
3. (1921, . 309) ,
(Cramer
1946/1948, . 541).
4. *Nature* (24
. 1935, . 296),
5. ,
(
6.) .
7. [86] . 10.
8. 1823 .
(2013, § 10 4-7),
(1947),
9. (),
10. (E. S. Pearson 1990, § 5.4.5,
. 60 – 65). . 6.
- 11.
12. [121]

13. (. 23) ,

14. , , , , ,

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: , 1506 – 1582, ,
, 1545 – 1567, .

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C. Radhakrishna Rao, Statistics must have a purpose. The Mahalanobis dictum.
Sankhya, Indian J. Stat., special vol. A55, pt. 3, 1993, pp. 331 – 349¹

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$$Y_t = Y_0 \{ 1 + \frac{1}{1} \frac{1 + 2}{1} [(1 + \frac{1}{1})^t - 1] \}$$

$$Y_t \quad t, \quad 0 -$$

0,3,

18%,

(: i) ()

1, 2 3.

$$N - \quad , \quad j - \quad j - \quad j, n_j$$

$$N = n_i + n_1 + n_2 + n_3,$$

$$A = n_i \quad i + n_1 \quad 1 + n_2 \quad 2 + n_3 \quad 3,$$

$$E = n_i \quad i \quad i + n_1 \quad 1 \quad 1 + n_2 \quad 2 \quad 2 + n_3 \quad 3 \quad 3.$$

1/3

j j

20
3.6.

10

(1961)

$(x_1, y_1), \dots, (x_n, y_n) - n$

$(x_{(1)}, 1), \dots, (x_{(i)}, i), \dots, (x_{(n)}, n),$

$(\bar{x}_{(1)}, 1), \dots, (\bar{x}_{(k)}, k), n = kg,$

$$\bar{x}_{(1)} = (x_{(1)} + \dots + x_{(g)})/g, \bar{x}_{(2)} = (x_{(g+1)} + \dots + x_{(2g)})/g, \dots$$

$$\bar{x}_{(j)}, j, \quad j = 1, \dots, k,$$

Rao (1975)²¹.
4.

1945 ..
- 1951 ..
- 1952 .., 1954 . 1959 ..

(1957),

(1961)

(1963).

1944 .

1963 . 70- Deviprasad
Sarvadhikari 1957 . Durgaprasad Khaitan 1961 .
Srinivasa Ramanujan 1968 .

(1935)

1957 - 1958 ..
1950 ..

Padmavibhushan

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1961 .

1948 . [?]. 1931 .
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Sankhya, Indian J.Stat. (

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1920-
 (Rao 1973).
 1920- 1972
 (Mahalanobis
 1965)

1. *(Bull. Intern. Stat. Inst., No. 1, 1993, pp. 21 – 36.*
- 2.
- 3.
- 4.
5. Multiple time series.
Dodge (2003).
- 6.
- 7.

- 9, (, 1971 – 1974).
8. (: 1993 (. § 3.2), 29 1993 .) -
- 9.
- 10.
11. § 3.2 (1978),
12. , , : 1835 . , (Bru 1981, § 2.2.2), 1912 . :
13. -
14. ,
15. [vii], 1903 . 162, 1933 1934 .
16. Uniformity trial: ?
17. ?
18. § 3.3.
- 19.
20. , Christ (1968). Tilbergen (1939).
- 21.
- 22.

Bose R. C., Roy S. N. (1938), The distribution of Studentized D^2 statistic. *Sankhya*, vol. 4, pp. 19 – 38.

Boudreau R., Rao C. R. (1984), Diversity and cluster analysis of blood group data on some human populations. *Human Population Genetics: the Pittsburgh Symposium*. A. Chakravarti. New York, pp. 331 – 362.

Mahalanobis P. C. (1922), Anthropological observations on the Anglo-Indians of Calcutta. Analysis of the male structure. *Records of the Indian Museum*, vol. 23, pp. 1 – 96.

--- (1928), On the need for standardization in measurements on the living. *Biometrika*, vol. 20A, pp. 1 – 31.

--- (1930), On test and measures of group divergence. Theoretical formulas. *J. Proc. Asiatic Soc. Bengal*, New Ser., vol. 26, pp. 541 – 588.

--- (1933), Revision of Risley's anthropometric data relating to the tribes and castes of Bengal. *Sankhya*, vol. 1, pp. 76 – 105.

--- (1934), Revision of Risley's anthropometric data relating to the Chittagong hill tribes. *Sankhya*, vol. 1, pp. 267 – 276.

--- (1936), On generalized distance in statistics. *Nat. Inst. Sci., India, Proc.*, vol. 2, pp. 49 – 55.

- (1940a), A sample survey of the acreage under jute in Bengal. *Sankhya*, vol. 4, pp. 511 – 530.
- (1940b), Application of statistical methods in physical anthropology. *Sankhya*, vol. 4, pp. 594 – 598.
- (1944), On large scale sample surveys. *Phil. Trans. Roy. Soc.*, vol. B231, pp. 329 – 451.
- (1950), Why statistics? Presidential address. Third Pakistan Stat. Conf. Poona.
- (1956), Statistics must have a purpose. Presidential address, Third Pakistan Stat. Conf. Lahore.
- (1961), *Fractile Graphical Analysis*. RTS Mimeographed ser. No. PG1-9. Ind. Stat. Inst. Calcutta.
- (1963), *The Approach of Operational Research for Planning in India*. Calcutta.
- (1965), Statistics as a key technology. *Amer. Statistician*, vol. 19, pp. 43 – 46.
- Mahalanobis P. C., Majumdar D. N., Rao C. R.** (1949), Anthropometric survey of the United Provinces, 1941. A statistical study. *Sankhya*, vol. 9, pp. 90 – 324.
- Majumdar D. N., Rao C. R.** (1958), Bengal anthropometric survey 1945. A statistical study. *Sankhya*, vol. 19, pp. 201 – 408.
- Muckherji R. K., Rao C. R., Trevor J. C.** (1955), *Ancient Inhabitants of Jebel Moya*. Cambridge.
- Rao C. R.** (1939), p -statistics or some generalizations in the analysis of variance appropriate to multivariate problems. *Sankhya*, vol. 4, pp. 381 – 396.
- (1945), Information and accuracy attainable in the estimation of statistical parameters. *Bull. Calcutta Math. Soc.*, vol. 37, pp. 81 – 91.
- (1952), *Advanced Statistical Methods in Biometric Research*.
- (1954), On the use and interpretation of distance functions in statistics. *Bull. Intern. Stat. Inst.*, vol. 34, No. 2, pp. 90 – 97.
- (1973), P. C. Mahalanobis. *Bibl. Mem. Fellows Roy. Soc.*, vol. 19, pp. 455 – 492.
- Rao C. R., Matthai A., Mitra S. K., Ramamurti K. G.** (1975), *Formulas and Tables for Statistical Work*. Calcutta.
- Roy S. N.** (1939), p -statistics or some generalizations in the analysis of variance appropriate to multivariate problems. *Sankhya*, vol. 4, pp. 381 – 396.
- Bru B.** (1981), Poisson, le calcul des probabilités et l'instruction publique. Métivier M., , *Poisson et la science de son temps*. Paris, pp. 51 – 94.
- Christ C. F.** (1968), Econometric models, aggregate. : Kruskal & Tanur (1978, pp. 181 – 188). **S, G**, 59.
- Dodge Y.** (2003), *Oxford Dictionary of Statistical Terms*. Oxford.
- Kruskal W. H., Tanur J. M.,** (1978), *Intern. Enc. of Statistics*, vols 1 – 2. New York.
- Mahalanobis P. C.** (1963,), . . . 1958.
- Rao C. R.** (1978), Mahalanobis. Kruskal & Tanur (1978, pp. 571 – 576.
- Tilbergen J.** (1939), *Statistical Testing of Business Cycles Theories*, vol. 2. Geneva.
- You Poh Seng** (1951), Historical survey of the development of sampling theories and practice. *J. Roy. Stat. Soc.*, vol. A114, pp. 214 – 231. : Kendall M. G., Plackett R. L., , *Studies in the History of Statistics and Probability*, vol. 2. London, 1977, pp. 440 – 457.

IX

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1894 . () ,

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 (Thalheimer 1958, .
 69),
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 Halasz (1955).
 Thalheimer (1958, . 69):
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 1896 .
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 (1991; 1994). , ,
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 (Thalheimer 1958, . 69)
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Thalheimer (1970) (),
 3:2 70 – 75%,
 60%,
 4:1 90%.
 1904 Charavay, 1894
 (Whyte 2005, 269).
 (1897 – 1898)
 1897, 771,
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 1897, 773,
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 1897, 776,
 1898, 7,
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 () (améliorations)
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1899 .

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[. . . 1843 .],

C.-M. Bernard M. G. Paraf-Javal

2 1904 . (Thalheimer, 1958, . 70):

[...].

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[...].

Whyte (2005),

(. 370 – 371).

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Die Welt.

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1897 .

The Dreyfus affair revealed [...] such an accumulation of hatred against the Jews that one could not divine an opinion who bore responsibilities for it. [...] Do people really believe that the devourers of Jews will be content with a single victim? They have acquired a taste for blood and will ask for more.

([...])

, [...]. , ?)

4 1982 . -

Herzl [...] watched the Dreyfus case and came to the conclusion that a Jewish state had to be established in the National Historical homeland of our people.

([...])

(1908 – 1913),

Bertillon A. (1897 – 1898), La comparaison des écritures et l'identification graphique. *Rev. Scientifique*, sér. 4, t. 8, No. 25, pp. 769 – 783; t. 9, No. 1, pp. 1 – 10.

Halasz N. (1955), *Captain Dreyfus*. New York.

Sheynin O. (1991), Poincaré's work in probability. *Arch. Hist. Ex. Sci.*, vol. 42, pp. 137 – 171.

--- (1994), Bertrand's work on probability. , vol. 48, pp. 155 – 199.

Thalheimer S. (1958), *Macht und Gerechtigkeit*. München.

Whyte G. R. (2005), *The Dreyfus Affair. A Chronological History*. Pelgrave Macmillan.

X

. .

? ,

Rao C. R., Has statistics a future? If so, in what form?
Advances in Statistics, Combinatorics and Related Areas.
River Edge, New Jersey, 2002, pp. 211 – 246.

2005k:62007 *Math. Rev.*, Jon Stene

2002 .: C. C. Heyde,
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XI

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(albertsh@mi.ras.ru),

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[Intelligence Quotient,]
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R. A. Fisher (1948), What sort of man is Lysenko?
Coll. Works, vol. 5. Adelaide, 1974, pp. 61 – 64

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XII

, 1887 – 1960

Eberhard Fels, Oskar Anderson, 1887 – 1960.
Econometrica, vol. 29, 1961, pp. 74 – 79

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12 1960 .

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1947 .

Mitteilungsblätter f. mathematische Statistik (Metrika) (Anderson 1954a), [1962].

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(specification, observation and propagated errors).
: ...

13, ?

1920- , 14

(Anderson 1994; 1932; 1926 – 1927).

, Valvanis (1959, c. 180), (1954a/1957, c. 178 – 180).

, Friedman (1956), Anderson (1931),

1930 .?

1920- (Anderson 1929), (1957, c. 315) [. 7].

, Anderson (1947; 1949c),

(

, Anderson (1949d; 1952), ()

[],

(Anderson 1955; 1956).

1. ()
2. -
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4. (1954 /1957), [xiii]. ()
(1909/1959, . 37).
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(1957, . 298, 315, 317).
5.
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. : (1959)
6. (. 5) , (1958, . 183).
(. . . .)
(. . . .)
(. . . .)
1958
(1990/2010, . 202 – 203).
7.
. [. . . .]
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(1927)
1931 1938
(1990/2010, § 5.1). 1923
. (. . . . 1988). (,
1929) : (,
8. -
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. 1952

- (1957, . 317)
9. [xiii, . 655].
10.
11. 50
12. : (1949 ; 1950).
13. [xiii]
Tintner (1961).
14. (1949b).
(You Poh Seng 1951).
-
- 1935**, *Einführung in die mathematische Statistik*. Wien.
- 1938**, *Struktur und Konjunktur der bulgarischen Volkswirtschaft*. Jena.
- 1954a**, *Probleme der statistischen Methodenlehre in den Sozialwissenschaften*.
Würzburg, 1957, ; Würzburg, 1962,
-
- 1963**, *Ausgewählte Schriften*, Bde 1 – 2. Tübingen.
- 1914**, Elimination of spurious correlation due to position in time or space.
Biometrika, vol. 10, pp. 269 – 279.
- 1926 – 1927** , Über die Anwendung der Differenzenmethode – Variate difference
method – bei Reihenausgleichungen, Stabilitätsuntersuchungen und
Korrelationsmessungen, , vol. 18, pp. 293 – 320; vol. 19, pp. 53 – 86.
- 1929**, Zur Problematik der empirisch – statistischen Konjunkturforschung;
kritische Betrachtungen der Harvard-Methoden. *Veröff. d. Frankfurter Ges. f.*
Konjunkturforschung, No. 3, pp. 1 – 39.
- 1931**, *Ist die Quantitätstheorie statistisch nachweisbar?* *Z. f. Nationalökonomie*,
Bd. 2, pp. 523 – 578.
- 1932**, Über ein neues Verfahren bei Anwendung der ‘Variate difference’
Methode. *Biometrika*, vol. 15, pp. 139 – 149.
- 1947**, Zum Problem der Wahrscheinlichkeit a posteriori in der Statistik. *Schweiz.*
Z. f. Volkswirtschaft u. Statistik, Bd. 83, pp. 489 – 518.
- 1949a**, Der statistische Unterricht an deutschen Universitäten und Hochschulen.
Allg. stat. Arch., Bd. 33, pp. 71 – 83.
- 1949b**, *Über die repräsentative Methode und deren Anwendung bei der*
Aufarbeitung der Ergebnisse der landwirtschaftlichen Betriebszählung vom
31.2.1926. München.
- 1949c**, Die Begründung des Gesetzes der großen Zahlen und die Umkehrung des
Theorems von Bernoulli. *Dialectica*, Bd. 3, pp. 65 – 77.
- 1949d**, Mehr Vorsicht mit Indexzahlen! *Allg. stat. Arch.*, Bd. 33, pp. 472 – 479.
- 1950**, Und dennoch mehr Vorsicht mit Indexzahlen. , Bd. 34, pp. 37 – 47.
- 1952**, Wieder eine Indexverkettung? *Mitteilungsblatt f. math. Statistik*, Bd. 4, pp.
32 – 47.
- 1954b**, Über den Umgang mit systematischen statistischen Fehlern. *Statistische*
Vierteljahresschrift, Bd. 7, pp. 38 – 44.
- 1955**, Eine nicht parametrische [...] Ableitung der Streuung [...] der Multiplen
[...] und Partiellen [...] Korrelationskoeffizienten [...] *Mitteilungsblatt f. math.*
Statistik, Bd. 7, pp. 85 – 112.
- 1956**, Verteilungsfrei [...] Testverfahren in den Sozialwissenschaften. *Allg. stat.*
Arch., Bd. 40, pp. 117 – 127.
- . . . (1957),
- , . 3, . 282 – 317.
- . . . (1958),
- 4, . 70 – 78.

- .. (1909), .., 1959.
- Friedman M.**, (1956), *Studies in the Quantitative Theory of Money*. Chicago.
- Schumpeter J. A.** (1954), *History of Economic Analysis*. London.
- Tintner G.** (1961), The statistical work of Oskar Anderson. *J. Amer. Stat. Assoc.*, vol. 56, pp. 273 – 280.
- Valvanis S.** (1959), *Econometrics: Introduction to Maximum Likelihood Methods*. New York.
- .. (1988), .., 9, . 61 – 63.
- .. (1927), .., 4, . 1 – 33.
- .., **Sheynin O.** (1990), .., .., 2010.
- (2008), Bortkiewicz' alleged discovery: the law of small numbers. *Hist. Scientiarum*, vol. 18, pp. 36 – 48.
- (2013), .. **S, G**, 11.
- Anderson O.** (1926, ..), Zum Gedächtnis an Professor A. A. Tschuprov (junior). : Anderson (1963, Bd. 1, pp. 28 – 38). **S, G**, 25.
- (1932), Ladislaus von Bortkiewicz. : Anderson (1963, Bd. 2, pp. 530 – 538). **S, G**, 25.
- (1946, ..), .., 4 . Archiv, Ludwig-Maximilian-Univ. München, II – 734. **S, G**, 20.
- (1959), Mathematik für marxistisch-leninistische Volkswirte. *Jahrbuch f. Nationalökonomie u. Statistik*, 3. Folge, Bd. 171, pp. 293 – 299.
- You Poh Seng** (1951), Historical survey of the development of sampling theories and practice. *J. Roy. Stat. Soc.*, vol. A114, pp. 214 – 231. : Kendall Sir Maurice, Plackett R. L., (1977), *Studies in the History of Statistics and Probability*, vol. 2. London, pp. 440 – 457. **S, G**, 51.

1921 .
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1924 – 1934 .
(1929 .
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1932 .
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(1935). 1935 .
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, . [5]
(1954).
(1929d).
1915 .

1914³. (intercorrelation),
interregression⁴ . . .

$$x_t = P(t) + \epsilon_t, t = 0, \pm 1, \pm 2, \dots \quad (1)$$

$$P - \quad t, \quad t -$$

(1937; 1950 ; 1952). 1920-
(1929b).

(1935; 1954a):

(1949d; 1956).

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1950-
1956b). (1953 ; 1955b;

1930-

(1931),

$$M_i = KP_i + \epsilon_i; P_i = (1/K)M_i - (\epsilon_i/K). \quad (2a, b)$$

$M_i - P_i - i - , K -$
(Störung)

(2b)

(. 538 - 541)

(2b)

(2).

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[8].

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$M, . .$

$M P P$

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1954). (1929 ; 1931b) (1935;

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(2 - 2b)

8.

$$y_t = \epsilon_{t-1} + \epsilon_t, E(\epsilon_t | \epsilon_{t-1}) = \epsilon_{t-1}, t = 0, \pm 1, \pm 2, \dots, \quad (3)$$

$$y_t = y_{t-1}$$

$$y_t = \epsilon_{t-2} + \epsilon_t, E(\epsilon_t | \epsilon_{t-2}) = \epsilon_{t-1}, \epsilon_t = \epsilon_t + \epsilon_{t-1}. \quad (4)$$

(4)

[10].

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1958 „

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2. [1] – [4],
3. [6] (1914) (1929 , . 53).
4. [7].
5. [xii, . 7].
6. [16].
7. XVIII . . .
8. [11] [12]. [14] – [16].
9. [13].
10. [vii, § 2].
- 11.
12. ? . . .

[1] **H. Kellerer**, Zum Tode von Oskar Anderson. *Allg. stat. Archive*, Bd. 44, 1960, pp. 71 – 74.

[2] **H. Strecker**, Im Gedenken an Oskar Anderson. *Schweiz. Z. f. Volkswirtschaft u. Statistik*, Bd. 96, 1960, pp. 238 – 241.

[3] = [xii].

[4] **S. Sagoroff**, Nachruf für Oskar Anderson. *Metrika*, t. 2, 1960, pp. 89 – 94.

[5] **Cappelli**, Oskar Anderson. *Bibliografie con brevi cenni biografici. Biblioteca di statistica*, t. 2, 1959, pp. 28 – 31.

1963, *Ausgewählte Schriften*, Bde 1 – 2. Tübingen.

[6] “**Student**”, Elimination of spurious correlation due to position in time or space. *Biometrika*, vol. 10, 1914, pp. 179 – 180.

[7] **G. Tintner**, *The Variate Difference Method*. Bloomington, Ind., 1940.

- [8] **K. Pearson**, On lines and planes of closest fit to systems of points in space. *London, Edinb. and Dublin Phil. Mag.*, ser. 6, vol. 2, 1901, pp. 559 – 572.
- [9] **H. Working**, Price relations between May and new-crop wheat futures at Chicago since 1885. *Wheat Studies*, vol. 10, 1934, pp. 183 – 230.
- [10] . . . , , 1933 , 1974. 1933
- [11] **J. Tinbergen**, Econometric business cycle research. *Rev. of Econ. Studies*, vol. 7, 1940, pp. 73 – 90.
- [12] **T. C. Koopmans**, , *Statistical Inference in Dynamic Economic Models*. New York, 1950.
- [13] **H. Wold**, Casual inference from observational data. *J. Roy. Stat. Soc.*, vol. A119, 1956, pp. 28 – 61.
- [14] **H. Wold**, Ends and means in econometric model building. *Probability and Statistics. The Harald Cramér Volume*. U. Grenander, pp. 354 – 434. New York, 1959.
- [15] **H. Wold**, A generalization of causal chain models. *Econometrica*, vol. 28, 1960, pp. 443 – 463.
- [16] **H. Wold**, Unbiased predictors. *Proc. Fourth Berkeley Symp. on Probability and Statistics*. Berkeley, 1961.
- Strecker H, Strecker Rosemarie** (2001), Oskar Anderson. C. C. Heyde, E. Seneta, , *Statisticians of the Centuries*. New York, pp. 377 – 381.
- Oskar Anderson**. (1963) (1, 1 – 11).
- 1914**, Nochmals über *The elimination of spurious correlation due to position in time or space*. *Biometrika*, vol. 10, pp. 269 – 279 (1, 1 – 11).
- 1923**, Über ein neues Verfahren bei Anwendung der *Variate Difference Methode*. , vol. 15, pp. 134 – 149 (1, 12 – 27).
- 1925**, , 1925, . 9 – 27.
- 1926a**,
- 1926b**, () (1, 28 – 38).
- 1927a**, Über die Anwendung der Differenzenmethode (variate-difference method) bei Reihenausgleichungen, Stabilitätsuntersuchungen und Korrelationsmessungen. *Biometrika*, vol. 18, pp. 293 – 320; vol. 19, pp. 53 – 86 (1, 39 – 100).
- 1927b**, 11, 1927, . 60 – 90.
- 1927c**, On the logic of the decomposition of statistical series into separate components. *J. Roy. Stat. Soc.*, vol. 90, pp. 548 – 569 (1, 101 – 122).
- 1928a**,
- 1928b**, 27, . 239 – 254.
- 1929a**, J.
- 1929b**, Zur Problematik der empirisch-statistischen Konjunkturforschung. Kritische Betrachtung der Harvard-Methoden. *Veröff. Frankfurter Ges. f. Konjunkturforschung*, Bd. 1 (1, 123 – 165)
- 1929c**, Die Korrelationsrechnung in der Konjunkturforschung. , Bd. 4 (1, 166 – 301).
- 1929d**, , Über die repräsentative Methode und deren Anwendung bei der Aufarbeitung der Ergebnisse der bulgarischen landwirtschaftlichen Betriebszählung vom 31.12.1926 (1, 302 – 376).
- 1930**, Theory of probability and economic research (1, 377 – 405).
- (.)

- , 1930.
- 1931a**, Ist die Quantitätstheorie statistisch nachweisbar? *Z. f. Nationalökonomie*, Bd. 2, pp. 523 – 578 (1, 415 – 470).
- 1931b**, „Corrélation et causalité. (2, 471 – 529).
- 1931c**, Ladislaus v. Bortkiewicz. *Z. f. Nationalökonomie*, Bd. 3, pp. 242 – 250 (2, 530 – 538). 1932 .
- 1932**, .
- 1933**, „. 12. . 1 – 18.
- 1934**, Statistics: Statistical method. *Enc. of the Social Sciences*. G. R. A. Seligman. Vol. 14, pp. 366 – 371 (2, 539 – 544).
- 1935a**, „Statistical Institute for Economic Research, Organization and aims. , pt. 1, pp. 5 – 13.
- 1935b**, „On the scissors of prices in Bulgaria. , . 28 – 41 (2, 545 – 558).
- 1935c**, „Again on the problem of the scissors of prices in Bulgaria. 2 – 3, . 61 – 88 (2, 559 – 586).
- 1935d**, *Einführung in die Mathematische Statistik*. Wien.
- 1936a**, Provisional note on the question of the construction of an internationally comparable index of production. League of Nations. Committee of Statistical experts. Subcommittee on Indices of Industrial Production. CES (75 CES) SC Prod./14. Geneva.
- 1936b**, „Some theoretical aspects of the business cycle movements in the South-East European agricultural countries (2, 587 – 603,).
- , 1936, 1, . 5 – 21.
- 1936c**, „The statistical technique of business cycle investigations. , . 55 – 88 (2, 604 – 627,). . 1927b
- 1937**, „On the question of the construction of an internationally comparable index of industrial production. , . 1, . 121 – 131 (2, 628 – 638,).
- 1938**, *Struktur und Konjunktur der bulgarischen Volkswirtschaft*. Kieler Vorträge. A. Predöhl, No. 52.
- 1939a**, „. , . 38, . 3 – 25.
- 1939b**, Les problemas fundamentales de la economia de Bulgaria. *Veritas*, Edicion Extraordinaria. Buenos Aires, pp. 235 – 237.
- 1941a**, „. , . 3, . 79 – 82.
- 1941b**, Saisonbedingte Indexziffer für die Lebenshaltungskosten? *Allg. stat. Archiv*, Bd. 30, pp. 263 – 269 (2, 647 – 653).
- 1942a**, Statistik über Langlebigkeit. , pp. 368 – 379 (2, 654 – 665).
- 1942b**, Die Messung des realen Austauschverhältnisses im Außenhandel. *Weltwirtschaftliches Archiv*, Bd. 55, pp. 215 – 231 (2, 666 – 682). (.)
- 1945**, Die UdSSR als Getreideproduzent. Eine statistische Untersuchung [...] zu Beginn der Kriege. Kiel, 1945. Bibl. Inst. f. Weltwirtschaft, Kiel.
- 1947**, Zum Problem der Wahrscheinlichkeit a posteriori in der Statistik. *Schweiz. Z. f. Volkswirtschaft u. Statistik*, Bd. 83, pp. 489 – 518 (2, 683 – 714).
- 1948**, Zur Frage der Umkehrung des Theorems von Bernoulli. Eine Erwiderung. , Bd. 84, pp. 178 – 180 (2, 715 – 717).
- 1949a**, Zur Frage der Umkehrung des Theorems von Bernoulli. Ein Schlusswort. , Bd. 85, p. 70 (2, p. 718).
- 1949b**, Theorie der Glücksspiele und ökonomisches Verhalten. John von Neumann, Oskar Morgenstern (1947), *Theory of Games and Economic Behaviour*. Princeton, 1947. , pp. 46 – 53 (2, 719 – 726).

- 1949c**, Die Begründung des Gesetzes der großen Zahlen und die Umkehrung des Theorems von Bernoulli. *Dialectica*, vol 3, pp. 65 – 77 (2, 727 – 739).
- 1949d**, Der statistische Unterricht an deutschen Universitäten und Hochschulen. *Allg. stat. Archiv*, Bd. 33, pp. 71 – 83.
- 1949e**, Mehr Vorsicht mit Indexpzahlen. , pp. 472 – 479 (2, 740 – 747).
- 1949f**, Um Aufklärung wird gebeten. Zum Problem des Wärmetodes. *Mitteilungsbl. f. math. Statistik*, Bd. 1, pp. 131 – 139.
- 1949/50a**, Die Grundprobleme der Stichprobenmethode. , pp. 37 – 52, 81 – 89; Bd. 2, pp. 1 – 16 (2, 748 – 789).
- 1949/50b**, Über die Neuberechnung von Indexpzahlen der Lebenshaltungskosten in Deutschland. Mit Nachwort. *Weltwirtschaftliches Archiv*, Bd. 62, pp. 175 – 197; Bd. 65, pp. 310 – 312 (2, 790 – 815).
- 1950a**, Nochmals zum Problem des Wärmetodes. *Mitteilungsbl. f. math. Statistik*, Bd. 2, pp. 1 – 16.
- 1950b**, Einige Bemerkungen zum Aufsatz von Dr. Arnold Schwarz. , Bd. 34, pp. 10 – 15 (2, 830 – 835).
 , 1950 – 1952.
- 1950c**, Und dennoch mehr Vorsicht mit Indexpzahlen. *Allg. stat. Archiv*, Bd. 34, pp. 37 – 47 (2, 816 – 826).
- 1950d**, Ein Schlusswort zur Diskussion über die Unsicherheitsspanne bei der Berechnung der Indexpziffern der Lebenshaltungskosten und des Reallohns. , pp. 224 – 226 (2, 827 – 829).
- 1951a**, Über den Genauigkeitsgrad wirtschaftsstatistischer Daten. *Weltwirtschaftliches Archiv*, Bd. 67, pp. 8* – 15* (2, 836 – 843).
- 1951b**, Zur Axiomatik der Wahrscheinlichkeitslehre. *Festschrift f. W. Britzelmayr*. Freiburg i. Br. – München (2, 844 – 847).
- 1952**, Wieder eine Indexverkettung? *Mitteilungsbl. f. math. Statistik*, Bd. 4, pp. 32 – 47 (2, 848 – 863)
- 1953a**, Ein exakter nicht parametrischer Test der sogen. Null-Hypothese im Falle von Autokorrelation und Korrelation. *Bull. Intern. Stat. Inst.*, t. 34, No. 2, pp. 130 – 143 (2, 864 – 877).
- 1953b**, Moderne Methoden der statistischen Kausalforschung in den Sozialwissenschaften. *Allg. stat. Archiv*, Bd. 37, pp. 289 – 300 (2, 878 – 889).
- 1954a**, *Probleme der statistischen Methodenlehre*. Würzburg. , 1957.
- 1954b**, Über den Umgang mit systematischen statistischen Fehlern. *Stat. Vierteljahresschrift*, Bd. 7, pp. 38 – 44 (2, 890 – 896).
- 1955a**, Bibliographie der seit 1928 in Buchform erschienenen deutschsprachigen Veröffentlichungen über theoretische Statistik und ihre Anwendungsgebiete. *Einzelschriften d. Deutschen stat. Ges.* No. 7. München.
- 1955b**, Eine nicht parametrische [...] Ableitung der Streuung [...] des multiplen [...] und partiellen [...] Korrelationskoeffizienten im Falle der sogen. Null-Hypothese, sowie der dieser Hypothese entsprechenden mittleren quadratischen Abweichungen [...] der Regressionskoeffizienten. *Mitteilungsbl. f. math. Statistik und ihre Anwendungsgebiete*, Bd. 7, pp. 85 – 112 (2, 897 – 924).
- 1955c**, Wann ist der Korrelationsindex von Fechner gesichert (significant)? , pp. 166 – 167 (2, 925 – 926).
- 1956a**, Der derzeitige statistische Unterricht an den Hochschulen der Bundesrepublik Deutschland. *Allg. stat. Archiv*, Bd. 40, pp. 45 – 57.
- 1956b**, Verteilungsfreie [...] Testverfahren in den Sozialwissenschaften. , pp. 117 – 127 (2, 927 – 937).
- 1957a**, Statistik: Theorie; Mathematische Statistik. *Handwörterbuch der Sozialwissenschaften*, Bd. 10, pp. 46 – 52 (2, 945 – 951).
- 1957b**, Induktive Logik und statistische Methode. *Allg. stat. Archiv*, Bd. 41, pp. 235 – 241 (2, 938 – 944).
- 1961**, Das Als Ob in der statistischen Methodenlehre. *Studi in Onore de Corrado Gini*, t. 1. Istituto di Statistica, Univ. Roma (2, 952 – 960).

XIV

• •

O. B. Sheynin, Anderson.
Dict. Scient. Biogr., vol. 1, 1970, pp. 154 – 155

12 1907 ., 1960 ., 2 1887 .

1912 .

1914

().

(, ,). 1912 1920 ., . .

. 1915 .

1918 .

1929 .

1935 .,

1938 .

1936 .

1942 .

1947 .

Einführung in die mathematische Statistik. Wien, 1935.
Struktur und Konjunktur der bulgarischen Volkswirtschaft. Jena, 1938.
Probleme der statistischen Methodenlehre in den Sozialwissenschaften, 1954.
 Würzburg, 1962,

63 ()
Ausgewählte Schriften, Bde 1 – 2. Tübingen, 1963.

1
 15 , 2 , 32

Capelli, (1959), Bibliografie con brevi cenni biografici. *Biblioteca di Statistica*, t. 2, pt.1.

Kürschners deutscher Gelehrten-Kalender. Berlin, 1961.

Fels [xii]. Kruskal W., Tanur J. M., (1978),
Intern. Enc. Stat., vols 1 – 2. New York, pp. 1 – 3. 1968

Tintner G. (1961), The statistical work of Oskar Anderson. *J. Amer. Stat. Assoc.*,
 vol. 56, pp. 273 – 280.

Wold [xiii]

1918 . . . , 1919

. , 1925, . 9 - 27.

. 11, 1927, . 60 - 90.

. , 1930.