

The background of the slide is a light gray gradient, decorated with numerous realistic water droplets of various sizes. Some droplets are large and prominent, while others are small and subtle. They are scattered across the slide, with a higher concentration in the top and bottom corners.

НАУЧНЫЕ ПУБЛИКАЦИИ И НАУЧНОЕ ПРОЕКТИРОВАНИЕ

СВИДЕРСКАЯ И.В.

ПРИКЛАДНЫЕ ИССЛЕДОВАНИЯ

- ПРЯМАЯ
КОММЕРЦИАЛИЗАЦИЯ
- СПОСОБ ЗАЩИТЫ:
ПАТЕНТЫ,
ИЗОБРЕТЕНИЯ И Т.Д.

ФУНДАМЕНТАЛЬНЫЕ ИССЛЕДОВАНИЯ

- ПРЯМАЯ
КОММЕРЦИАЛИЗАЦИЯ
КАК ПРАВИЛО
НЕВОЗМОЖНА
- СПОСОБ ЗАЩИТЫ:
ПУБЛИКАЦИИ

СИСТЕМА ПРИКЛАДНЫХ И ФУНДАМЕНТАЛЬНЫХ ИССЛЕДОВАНИЙ



СИСТЕМА ФУНДАМЕНТАЛЬНЫХ ИССЛЕДОВАНИЙ



**Финансы: н/к
фонды, частные
компании**

**Система
публикаций**

**Научно-
образовательные
организации,
частные компании**

Научные и образовательные тексты и публикации

ВЗАИМООТНОШЕНИЯ НАУЧНЫХ, ОБРАЗОВАТЕЛЬНЫХ ТЕКСТОВ И НАУЧНО- ПОПУЛЯРНЫХ ТЕКСТОВ



?

Научно-образовательные публикации

- Учебники и учебно-методические пособия
- Энциклопедии
- Справочники
- Научно-популярные статьи в массовых изданиях
- Научно-популярные статьи в научно-популярных журналах



Научная и научно-популярная литература

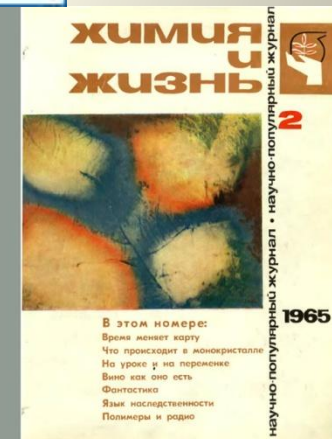
Научно-популярные
публикации

≠

Научные публикации

Научная публикация - особенности по сравнению с научно- популярными публикациями

- Не о науке, она и есть наука
- Место опубликования – научный журнал
- Для кого предназначена – для коллег по «научно-исследовательскому цеху»
- Присутствует специальная терминология
- Стил – строгий, без эмоций, почти без литературных приемов
- Структура текста - стандартная



Научные публикации – продукт профессиональной деятельности ученого

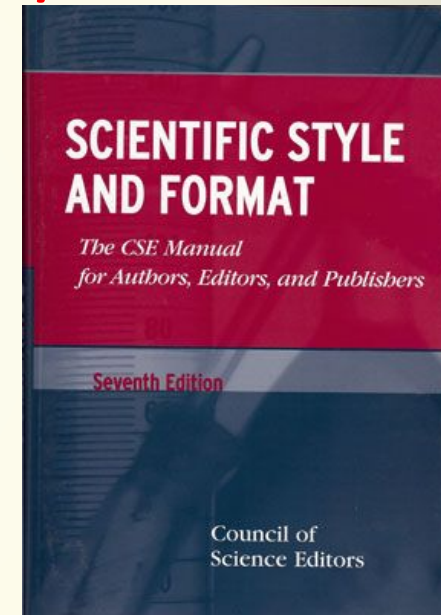
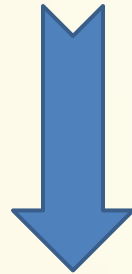
- Статьи в научных журналах
- Монографии, главы в монографиях
- Статьи в сборниках (материалы конференций, тематические сборники, сборники трудов, юбилейные сборники)
- Тезисы конференций

Основные особенности научных публикаций

1. Наибольшую ценность представляют публикации в рецензируемых журналах (peer reviewed journals). В таком журнале рукописи статей публикуются только после того, как будут критически рассмотрены и одобрены, по-крайней мере, двумя специалистами (рецензентами).
2. Большинство журналов требуют, чтобы статьи об оригинальных исследованиях были написаны в соответствии с определенным форматом: введение, методы, результаты и обсуждение.
3. Наличие иллюстраций, которые описаны в тексте.
4. В тексте публикации имеются полные ссылки на другие научные работы, так что читатель может самостоятельно найти работу, на которую сделана ссылка.
5. Присутствует подробное описание того, как результаты были получены (методик, теоретических выкладок).
6. Статистическая обработка результатов экспериментов.
7. Научные публикации должны постоянно находиться в открытом доступе для всех читателей без каких-либо ограничений.

Первичная, вторичная научная и третичная публикация/литература (valid/primary publication/literature)

The Council of Biology Editors, CBE



the Council of Science Editors,
CSE

Первичная научная литература – только один вид публикаций

- *peer-reviewed publication* - публикация статьи в рецензируемом журнале

Рецензируемый журнал

Peer-reviewed journal

- Статья принимается или отвергается на основании рецензий, написанных коллегами
- Цель рецензирования – проверки достоверности полученных результатов и улучшение рукописи

Основной тип научной публикации – оригинальная статья в научном журнале

- Письменный и опубликованный отчет, описывающий результаты оригинального исследования и удовлетворяющий определенным критериям.

Приемлемая первичная научная публикация -

первое публичное представление существенной информации об исследовании в форме, которая позволяет коллегам

- (1) оценить исследование,
- (2) воспроизвести эксперименты,
- (3) оценить интеллектуальный процесс, приведший к выводам.

Это публичное представление информации об исследовании должно быть доступно для восприятия с помощью органов чувств, размещено на постоянном носителе, доступно без ограничений для научного сообщества, а также для включения в одну или более библиографических систем поиска научной информации (например, *Biological Abstracts*, *Chemical Abstracts*, *Index Medicus*, *Excerpta Medica*, *Bibliography of Agriculture* и т.д. в США и аналогичные системы в других странах)

Характерные черты первичной научной публикации

- Место публикации – рецензируемый журнал, а значит прошла процедуру рецензирования
- Посвящена оригинальному исследованию, проведенному автором(и)
- Структурирована в соответствии со стандартами: IMRAD структура (чаще всего)
- Опубликовано только один раз
- Наличие литературных ссылок и списка литературы

Вторичная научная литература

- Обзорные статьи (review papers)
- Монографии
- Материалы конференций (conference reports, conference proceedings)
- Труды институтов, сборники статей
- Отчеты по договорным работам
- Корпоративные отчеты
- Тексты для служебного пользования
- Новости



Третичная научная литература

- Учебники
- Учебные пособия
- Методические пособия
- Энциклопедии
- Справочники
- Словари

Система международных научных публикаций

- Научные журналы (бумажные и on-line)
- Книги
- Материалы конференций
- Отчеты спонсирующих организаций и научных фондов
- Отчеты правительственных организаций

...the last but not the least

- Большая часть научной литературы на английском языке
- Если хотите, чтобы ваши статьи прочитали, то их надо публиковать на английском языке + в международном научном журнале
- Английский – язык международного научного общения
- Is there science beyond the English language?

MICROGRAPHIA:

OR SOME

Physiological Descriptions

OF

MINUTE BODIES

MADE BY

MAGNIFYING GLASSES.

WITH

OBSERVATIONS and INQUIRIES thereupon.

By *R. HOOKE*, Fellow of the *ROYAL SOCIETY*.

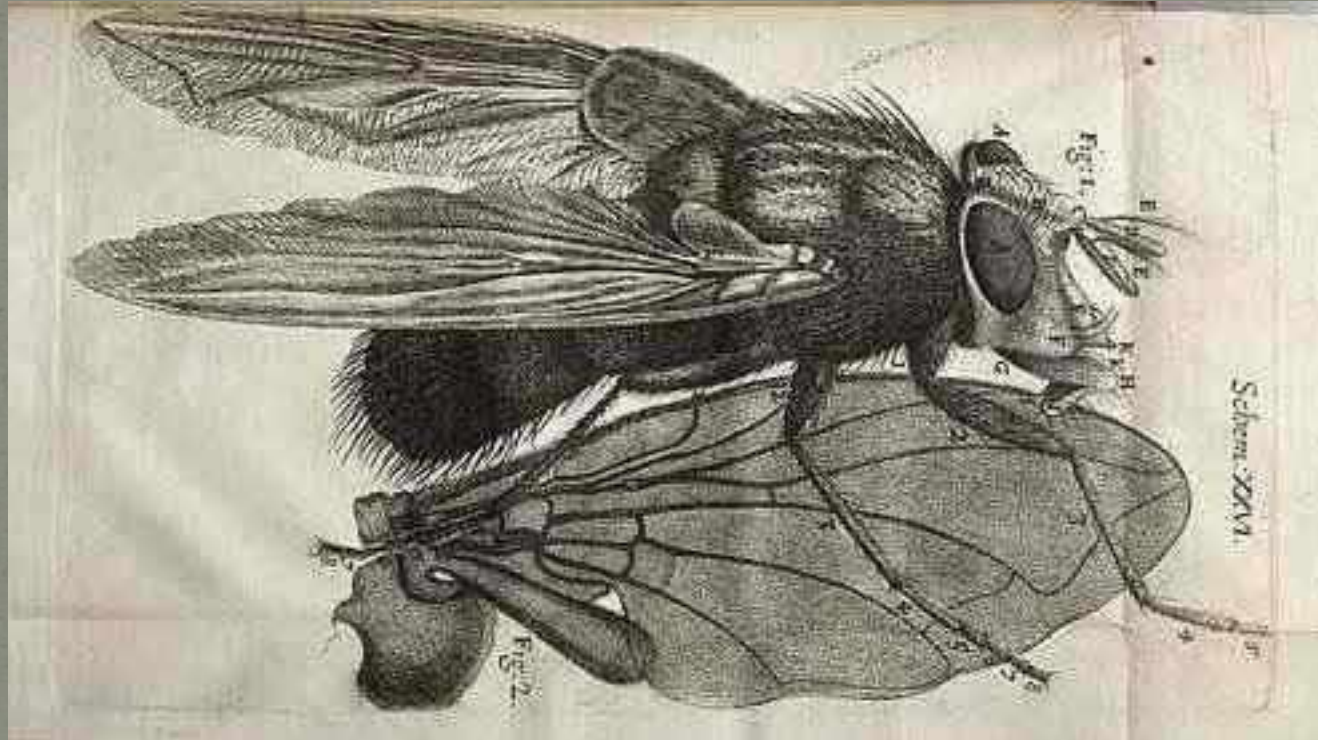
*Non possis oculo quantum contendere Linceus,
Non tamen idcirco contemnas Lippus inungi. Horat. Ep. lib. 1.*



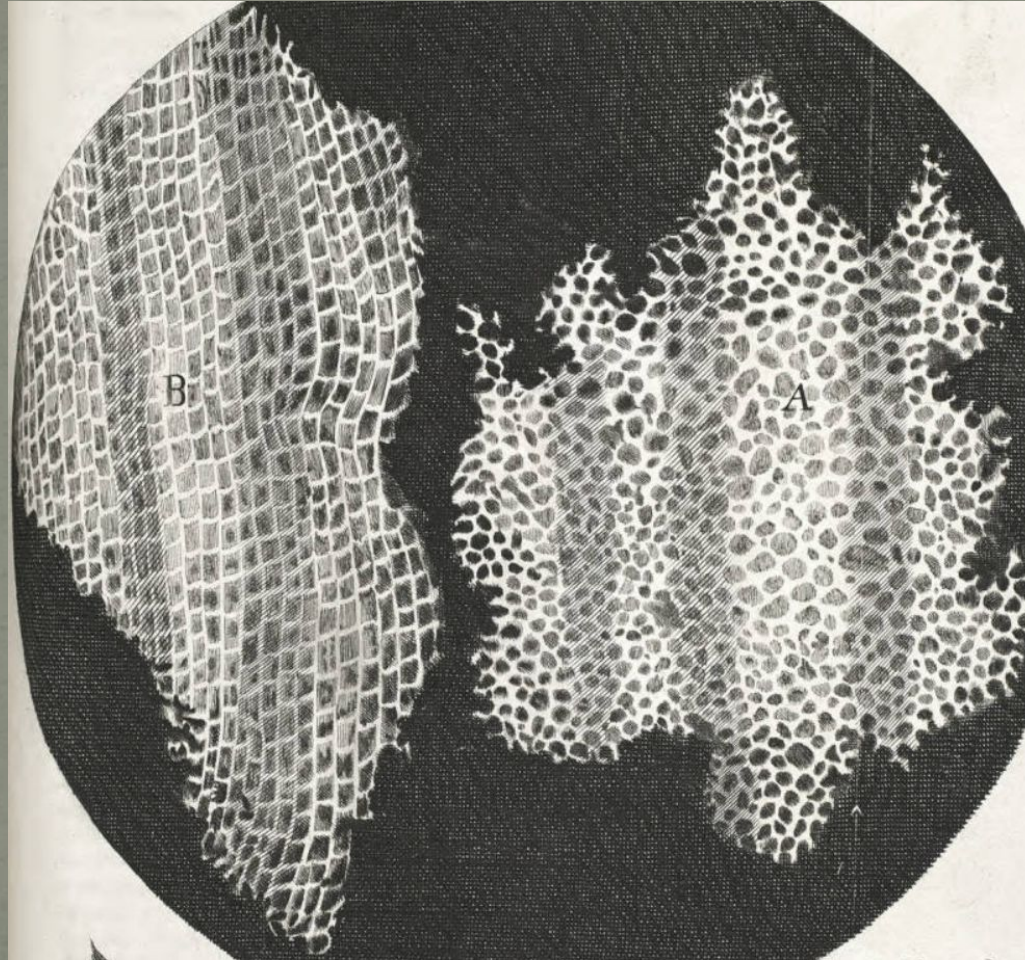
LONDON, Printed by *Jo. Martyn*, and *Ja. Allestry*, Printers to the
ROYAL SOCIETY, and are to be sold at their Shop at the *Bell* in
S. Paul's Church-yard. M DC LX V.



Муха, рисунок из «Микрографии» Гука



Клетки, коры дуба, которые увидел Р. Гук с помощью своего микроскопа



ISTORIA
E DIMOSTRAZIONI
INTORNO ALLE MACCHIE SOLARI
E LORO ACCIDENTI
COMPRESSE IN TRE LETTERE SCRITTE
ALL'ILLVSTRISSIMO SIGNOR
MARCO VELSERI LINCEO
DVVMVIRO D'AVGVSTA
CONSIGLIERO DI SVA MAESTA CESAREA
DAL SIGNOR
GALILEO GALILEI LINCEO

*Nobil Fiorentino, Filosofo Matematico Primario del Serenissimo
D. COSIMO II. GRAN DVCA DI TOSCANA.*
Si aggiungono nel fine le Lettere, e Disquisizioni del finto Apelle.



IN ROMA, Appresso Giacomo Mascardi. MDCKIIL
CON LICENZA DE' SUPERIORI.

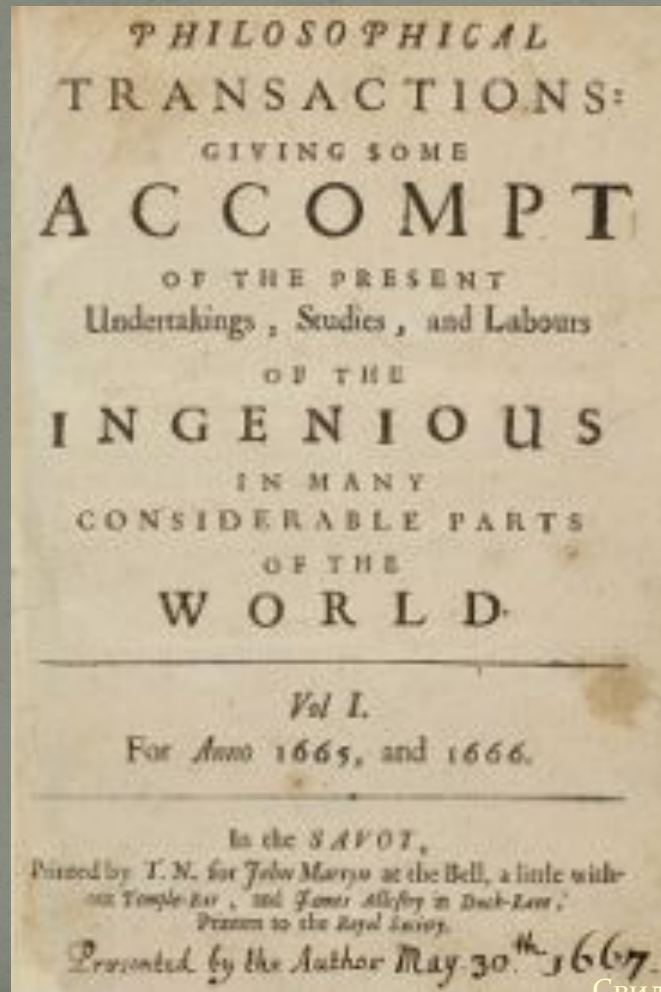


Books and learned letters



Published in 1613, Galileo Galilei's *Istoria e dimostrazioni intorno alle macchie solari e loro accidenti* (Account and demonstrations concerning sunspots and their origins), contained letters by Galileo on sunspots. By including illustrations of his observations on the same page as the text, he was able to refer to a particular spot (e.g. "La macchia A.") and the date on which he observed it.

В **1665** г. выходит первый номер первого научного журнала ***Philosophical Transactions***



(3075)

Numb. 80.

PHILOSOPHICAL TRANSACTIONS.

February 19. 1671.

C

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A Letter of Mr. Isaac Newton, Mathematick Professor in the University of Cambridge; containing his New Theory about Light and Colors: Where Light is declared to be not Similar or Homogeneous, but consisting of difform rays, some of which are more refrangible than others: And Colors are affirm'd to be not Qualifications of Light, deriv'd from Refractions of natural Bodies, (as 'tis generally believed;) but Original and Connate properties, which in divers rays are divers: Where several Observations and Experiments are alledged to prove the said Theory. An Account of some Books: I. A Description of the EAST-INDIAN COASTS, MALABAR, COROMANDEL, CEYLON, &c. in Dutch, by Phil. Baldæus. II. Antonii le Grand INSTITUTIO PHILOSOPHIÆ, secundum principia Renati Des-Cartes; novâ methodo adornata & explicata. III. An Essay to the Advancement of MUSICK; by Thomas Salmon M.A. Advertisement about Thæon Smyrnæus. An Index for the Traills of the Year 1671.

A Letter of Mr. Isaac Newton, Professor of the Mathematicks in the University of Cambridge; containing his New Theory about Light and Colors: sent by the Author to the Publisher from Cambridge, Febr. 6. 1671; in order to be communicated to the R. Society.

S I R,

TO perform my late promise to you, I shall without further ceremony acquaint you, that in the beginning of the Year 1666 (at which time I applyed my self to the grinding of Optick glasses of other figures than Spherical,) I procured me a Triangular glass-Prisme, to try therewith the celebrated *Phænomena* of

G g g g

Colours.

JOURNAL OF THE PROCEEDINGS
OF THE
LINNEAN SOCIETY.

Vol. III.

No. 9.

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LONDON:

LONGMAN, BROWN, GREEN, LONGMANS & ROBERTS,

AND

WILLIAMS AND NORGATE.

1858.

In 1858, the *Journal of the Proceedings of the Linnean Society* published brief articles by Charles Darwin and Alfred Russel Wallace in the same issue, under the title "On the Tendency of Species to Form Varieties; and on the Perpetuation of Varieties and Species by Natural Means of Selection." Darwin noted that "This sketch is *most* imperfect; but in so short a space I cannot make it better. Your imagination must fill up very wide blanks."

Луи Пастер



**Методический
раздел в
публикациях
становится
обязательным**

Появление процедуры рецензирования

- *Ethics of the Physician* written by Ishaq bin Ali al-Rahwi (854–931) of al-Raha, Syria
- *Medical Essays and Observations*, 1731, published by the Royal Society of Edinburgh

1905 - ГОД ЧУДЕС

- 1. «К электродинамике движущихся тел» ([нем.](#) *Zur Elektrodynamik bewegter Körper*).
- 2. «Об одной эвристической точке зрения, касающейся возникновения и превращения света» ([нем.](#) *Über einen die Erzeugung und Verwandlung des Lichts betreffenden heuristischen Gesichtspunkt*).
- 3. «О движении взвешенных в покоящейся жидкости частиц, требуемом молекулярно-кинетической теорией теплоты» ([нем.](#) *Über die von der molekularkinetischen Theorie der Wärme geforderte Bewegung von in ruhenden Flüssigkeiten suspendierten Teilchen*)

A. Einstein

ÄTHER
UND
RELATIVITÄTSTHEORIE

REDE

GEHALTEN AM 5. MAI 1920
AN DER REICHS-UNIVERSITÄT ZU LEIDEN

VON

ALBERT EINSTEIN



BERLIN
VERLAG VON JULIUS SPRINGER
1920

G. E. STEINER & CO.
157-159, WEST 25TH ST.
NEW YORK

equipment, and to Dr. G. E. R. Deacon and the captain and officers of R.R.S. *Discovery II* for their part in making the observations.

*Young, F. B., Gerrard, H., and Jevons, W., *Phil. Mag.*, **40**, 149 (1920).

*Langelet-Higgins, M. S., *Mon. Not. Roy. Astr. Soc., Geophys. Supp.*, **5**, 238 (1949).

*Van Aarts, W. S., Woods Hole Papers in Phys. Oceanogr. Meteor., **11** (3) (1950).

*Eklund, V. W., *Arkiv. Mat. Astron. Fysik. (Stockholm)*, **2** (11) (1953).

MOLECULAR STRUCTURE OF NUCLEIC ACIDS

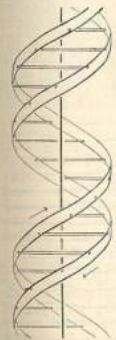
A Structure for Deoxyribose Nucleic Acid

WE wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

A structure for nucleic acid has already been proposed by Pauling and Corey¹. They kindly made their manuscript available to us in advance of publication. Their model consists of three intertwined chains, with the phosphates near the fibre axis, and the bases on the outside. In our opinion, this structure is unsatisfactory for two reasons: (1) We believe that the material which gives the X-ray diagrams is the salt, not the free acid. Without the acidic hydrogen atoms it is not clear what forces would hold the structure together, especially as the negatively charged phosphates near the axis will repel each other. (2) Some of the van der Waals distances appear to be too small.

Another three-chain structure has also been suggested by Fraser (in the press). In his model the phosphates are on the outside and the bases on the inside, linked together by hydrogen bonds. This structure as described is rather ill-defined, and for this reason we shall not comment on it.

We wish to put forward a radically different structure for the salt of deoxyribose nucleic acid. This structure has two helical chains each coiled round the same axis (see diagram). We have made the usual chemical assumptions, namely, that each chain consists of phosphate diester groups joining β -D-deoxyribofuranose residues with 3',5' linkages. The two chains (but not their bases) are related by a dyad perpendicular to the fibre axis. Both chains follow right-handed helices, but owing to the dyad the sequences of the atoms in the two chains run in opposite directions. Each chain loosely resembles Furlberg's² model No. 1; that is, the bases are on the inside of the helix and the phosphates on the outside. The configuration of the sugar and the atoms near it is close to Furlberg's 'standard configuration', the sugar being roughly perpendicular to the attached base. There



This figure is purely diagrammatic. The two ribbons symbolize the two phosphate-sugar chains, and the horizontal rods the pairs of bases holding the chains together. The vertical line marks the fibre axis.

is a residue on each chain every 3.4 Å. in the z-direction. We have assumed an angle of 36° between adjacent residues in the same chain, so that the structure repeats after 10 residues on each chain, that is, after 34 Å. The distance of a phosphorus atom from the fibre axis is 10 Å. As the phosphates are on the outside, cations have easy access to them.

The structure is an open one, and its water content is rather high. At lower water contents we would expect the bases to tilt so that the structure could become more compact.

The novel feature of the structure is the manner in which the two chains are held together by the purine and pyrimidine bases. The planes of the bases are perpendicular to the fibre axis. They are joined together in pairs, a single base from one chain being hydrogen-bonded to a single base from the other chain, so that the two lie side by side with identical z-co-ordinates. One of the pair must be a purine and the other a pyrimidine for bonding to occur. The hydrogen bonds are made as follows: purine position 1 to pyrimidine position 1; purine position 6 to pyrimidine position 6.

If it is assumed that the bases only occur in the structure in the most plausible tautomeric forms (that is, with the keto rather than the enol configurations) it is found that only specific pairs of bases can bond together. These pairs are: adenine (purine) with thymine (pyrimidine), and guanine (purine) with cytosine (pyrimidine).

In other words, if an adenine forms one member of a pair, on either chain, then on these assumptions the other member must be thymine; similarly for guanine and cytosine. The sequence of bases on a single chain does not appear to be restricted in any way. However, if only specific pairs of bases can be formed, it follows that if the sequence of bases on one chain is given, then the sequence on the other chain is automatically determined.

It has been found experimentally^{3,4} that the ratio of the amounts of adenine to thymine, and the ratio of guanine to cytosine, are always very close to unity for deoxyribose nucleic acid.

It is probably impossible to build this structure with a ribose sugar in place of the deoxyribose, as the extra oxygen atom would make too close a van der Waals contact.

The previously published X-ray data^{5,6} on deoxyribose nucleic acid are insufficient for a rigorous test of our structure. So far as we can tell, it is roughly compatible with the experimental data, but it must be regarded as unproved until it has been checked against more exact results. Some of these are given in the following communications. We were not aware of the details of the results presented there when we devised our structure, which rests mainly though not entirely on published experimental data and stereochemical arguments.

It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material. Full details of the structure, including the conditions assumed in building it, together with a set of co-ordinates for the atoms, will be published elsewhere.

We are much indebted to Dr. Jerry Donohue for constant advice and criticism, especially on interatomic distances. We have also been stimulated by a knowledge of the general nature of the unpublished experimental results and ideas of Dr. M. H. F. Wilkins, Dr. R. E. Franklin and their co-workers at

King's College, London. One of us (J.D.W.) has been aided by a fellowship from the National Foundation for Infantile Paralysis.

J. D. WATSON
F. H. C. CRICK

Medical Research Council Unit for the Study of the Molecular Structure of Biological Systems, Cavendish Laboratory, Cambridge.
April 2.

*Pauling, L., and Corey, R. B., *Nature*, **171**, 346 (1953); *Proc. U.S. Nat. Acad. Sci.*, **39**, 84 (1953).

*Furlberg, S., *Acta Chem. Scand.*, **6**, 634 (1952).

*Chargaff, E., for references see Zamenhof, S., Braverman, G., and Chargaff, E., *Biochim. et Biophys. Acta*, **9**, 402 (1952).

*Wyatt, G. R., *J. Gen. Physiol.*, **36**, 201 (1952).

*Astbury, W. T., *Symp. Soc. Exp. Biol.*, **1**, Nucleic Acid, 66 (Camb. Univ. Press, 1947).

*Wilkins, M. H. F., and Randall, J. T., *Biochim. et Biophys. Acta*, **10**, 192 (1953).

Molecular Structure of Deoxypentose Nucleic Acids

WHILE the biological properties of deoxypentose nucleic acid suggest a molecular structure containing great complexity, X-ray diffraction studies described here (cf. Astbury¹) show the basic molecular configuration has great simplicity. The purpose of this communication is to describe, in a preliminary way, some of the experimental evidence for the polynucleotide chain configuration being helical, and existing in this form when in the natural state. A fuller account of the work will be published shortly.

The structure of deoxypentose nucleic acid is the same in all species (although the nitrogen base ratios alter considerably) in nucleoprotein, extracted or in cells, and in purified nucleate. The same linear group of polynucleotide chains may pack together parallel in different ways to give crystalline²⁻⁴, semi-crystalline or paracrystalline material. In all cases the X-ray diffraction photograph consists of two regions, one determined largely by the regular spacing of nucleotides along the chain, and the other by the longer spacings of the chain configuration. The sequence of different nitrogen bases along the chain is not made visible.

Oriented paracrystalline deoxypentose nucleic acid (structure B' in the following communication by Franklin and Gosling) gives a fibre diagram as shown in Fig. 1 (cf. ref. 4). Astbury suggested that the strong 3.4-Å. reflexion corresponded to the inter-nucleotide repeat along the fibre axis. The ~34 Å. layer lines, however, are not due to a repeat of a polynucleotide composition, but to the chain configuration repeat, which causes strong diffraction as the nucleotide chains have higher density than the interstitial water. The absence of reflexions on or near the meridian immediately suggests a helical structure with axis parallel to fibre length.

Diffraction by Helices

It may be shown⁵ (also Stokes⁶, unpublished) that the intensity distribution in the diffraction pattern of a series of points equally spaced along a helix is given by the squares of Bessel functions. A uniform continuous helix gives a series of layer lines of spacing corresponding to the helix pitch, the intensity distribution along the n th layer line being proportional to the square of J_n , the n th order Bessel function. A straight line may be drawn approximately through

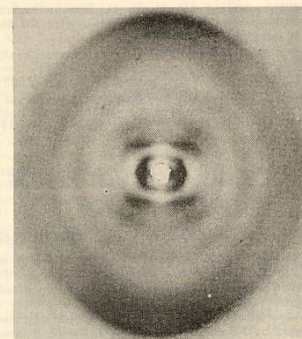


Fig. 1. Fibre diagram of deoxypentose nucleic acid from *B. coli*. Fibre axis vertical.

the innermost maxima of each Bessel function and the origin. The angle this line makes with the equator is roughly equal to the angle between an element of the helix and the helix axis. If a unit repeats n times along the helix there will be a meridional reflexion (J_n^2) on the n th layer line. The helical configuration produces side-bands on this fundamental frequency, the effect⁵ being to reproduce the intensity distribution about the origin around the new origin, on the n th layer line, corresponding to C in Fig. 2.

We will now briefly analyse in physical terms some of the effects of the shape and size of the repeat unit or nucleotide on the diffraction pattern. First, if the nucleotide consists of a unit having circular symmetry about an axis parallel to the helix axis, the whole diffraction pattern is modified by the form factor of the nucleotide. Second, if the nucleotide consists of a series of points on a radius at right-angles to the helix axis, the phases of radiation scattered by the helices of different diameter passing through each point are the same. Summation of the corresponding Bessel functions gives reinforcement for the inner-

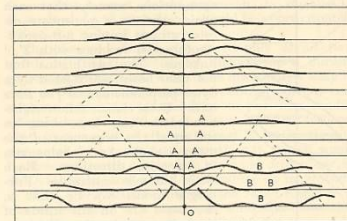


Fig. 2. Diffraction pattern of system of helices corresponding to structure of deoxypentose nucleic acid. The squares of Bessel functions are plotted about 0 on the equator and on the first, second, third and fifth layer lines for half of the nucleotide mass at 20 Å. diameter and remainder distributed along a radius, the mass at a given radius being proportional to the radius. About C on the tenth layer line similar functions are plotted for an outer diameter of 12 Å.

tiven Konstanten der Energien H und E abhängt. Wir können also setzen:

$$H_0 - E_0 = K_0 + C,$$

$$H_1 - E_1 = K_1 + C,$$

da C sich während der Lichtaussendung nicht ändert. Wir erhalten also:

$$K_0 - K_1 = L \left\{ \frac{1}{\sqrt{1 - \left(\frac{v}{V}\right)^2}} - 1 \right\}.$$

Die kinetische Energie des Körpers in bezug auf (ξ, η, ζ) nimmt infolge der Lichtaussendung ab, und zwar um einen von den Qualitäten des Körpers unabhängigen Betrag. Die Differenz $K_0 - K_1$ hängt ferner von der Geschwindigkeit ebenso ab wie die kinetische Energie des Elektrons (l. c. § 10).

Unter Vernachlässigung von Größen vierter und höherer Ordnung können wir setzen:

$$K_0 - K_1 = \frac{L}{V^2} \frac{v^2}{2}.$$

Aus dieser Gleichung folgt unmittelbar:

Gibt ein Körper die Energie L in Form von Strahlung ab, so verkleinert sich seine Masse um L/V^2 . Hierbei ist es offenbar unwesentlich, daß die dem Körper entzogene Energie gerade in Energie der Strahlung übergeht, so daß wir zu der allgemeineren Folgerung geführt werden:

Die Masse eines Körpers ist ein Maß für dessen Energieinhalt; ändert sich die Energie um L , so ändert sich die Masse in demselben Sinne um $L/9 \cdot 10^{20}$, wenn die Energie in Erg und die Masse in Gramm gemessen wird.

Es ist nicht ausgeschlossen, daß bei Körpern, deren Energieinhalt in hohem Maße veränderlich ist (z. B. bei den Radiumsalzen), eine Prüfung der Theorie gelingen wird.

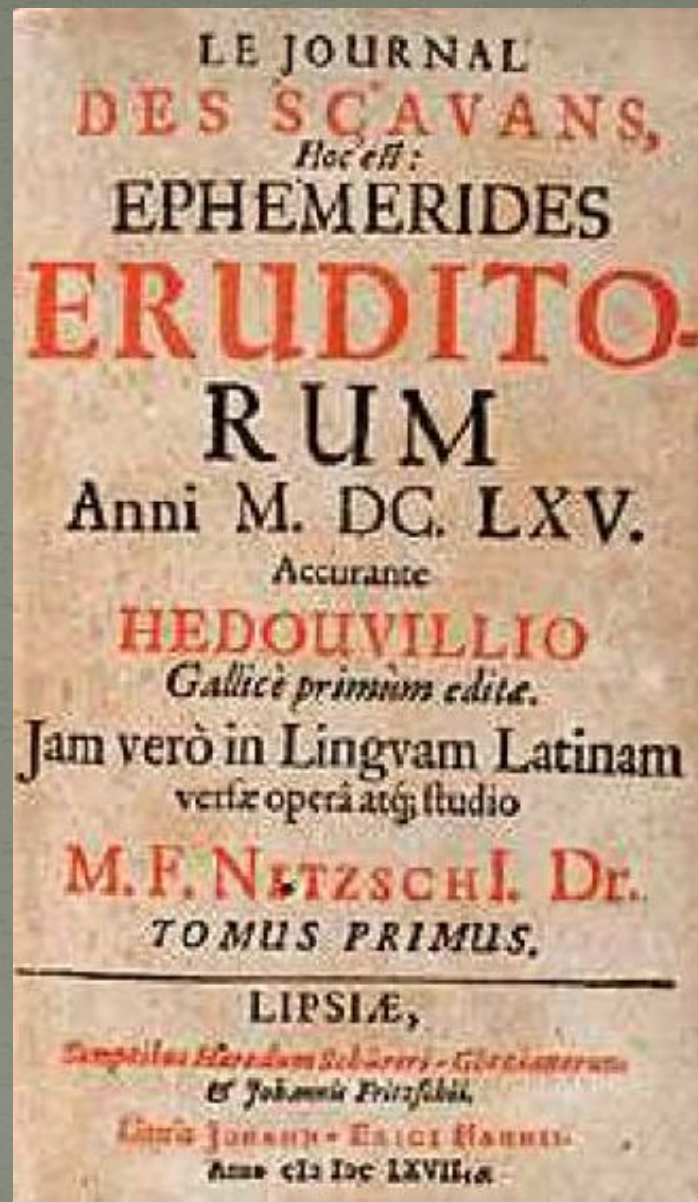
Wenn die Theorie den Tatsachen entspricht, so überträgt die Strahlung Trägheit zwischen den emittierenden und absorbierenden Körpern.

Bern, September 1905.

(Eingegangen 27. September 1905.)

Сколько научных журналов издается в наше время?

- В 1665 году : французский *Journal des Scavans* и английский *Philosophical Transactions*.
- Начало XIX века – сотня журналов
- Начало XX века – около 10000
- Сейчас?



Le Journal des sçavans was first published in 1665 by Denis de Sallo. The journal included a mix of content, not all of which was scientific, including book reviews, obituaries, the results of experiments and observations of natural phenomena, and recent court decisions. At right is the Latin edition of the journal which covers the years 1665-67.

SAGGI
DI NATURALI
ESPERIENZE
FATTE NELL'ACCADEMIA
DEL CIMENTO
SOTTO LA PROTEZIONE
DEL SERENISSIMO PRINCIPE
LEOPOLDO DI TOSCANA

E DIRETTE DAL SEGRETARIO DI ESSA ACCADEMIA,



IN FIRENZE

Per Giuseppe Cocchini all' Insegna della Stella. MDCLXVII.
CON LICENZA DE' SUPERIORI.

Saggi di naturali esperienze recorded the instruments, methods and results of experiments conducted by the Accademia del Cimento in Florence. The academy established one of the first physical sciences laboratories in Europe in order to test the discoveries of such noted scientists as Galileo and Evangelista Torricelli. "LEOPOLDO DI TOSCANA," whose name appears in red on the title page of the *Saggi* (right), was the Grand Duke Leopold of Florence, one of the society's founders.

OPUSCULA
OMNIA
ACTIS ERUDITORUM
LIPSIENSIBUS

INSERTA,

QUE AD UNIVERSAM MATHESIM, PHYSICAM, MEDICINAM,
ASTRONOMIAM, CHIRURGIAM, ET PSYCHOLOGIAM PERTINENT,

NEC NON

EPITOMÆ/ SI QUÆ MATERIA
vel Criticis Animadversionibus celebriores.

nonnullis etiam de rebus

TOMUS PRIMUS.

Ab Anno 1682. ad Annum 1687.



VENETIIS

MDCCXL

Typis JO. BAPTISTÆ PASQUALI

Superiorum permisso, ac Privilegio.

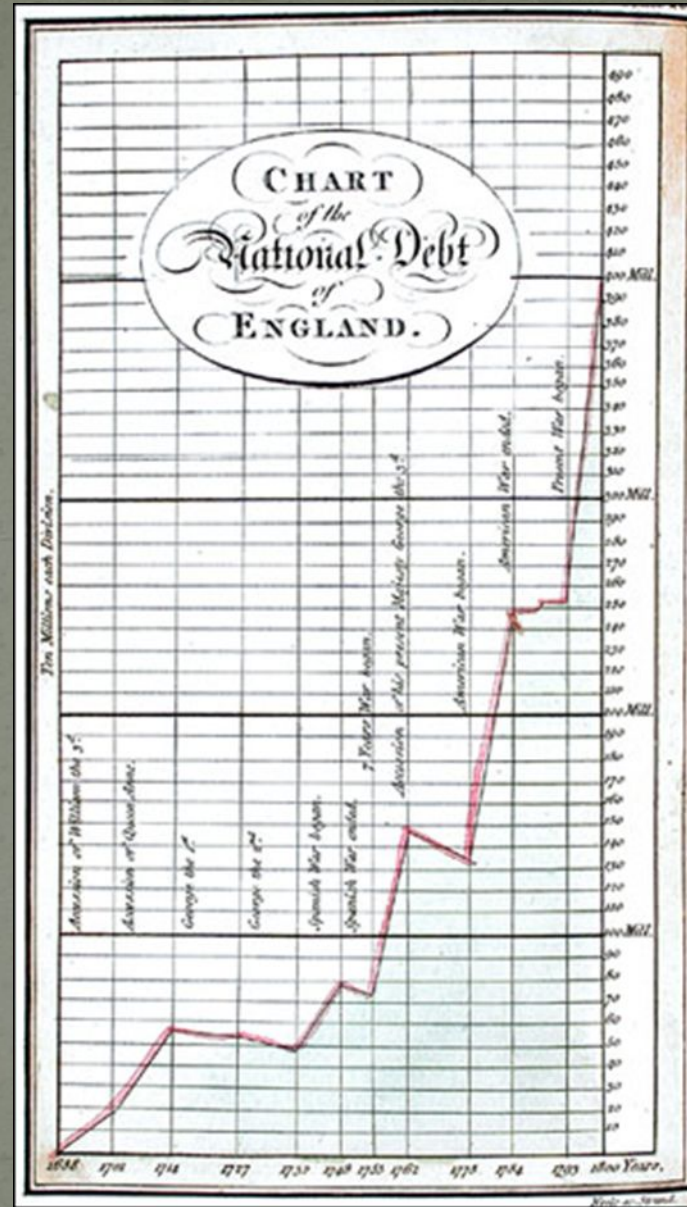
Acta eruditorum was one of the first scientific journals from Germany. Although based in Leipzig, the journal was published in Latin, rather than German, in order to reach a broader international audience. The title page at right is from a bound volume of *Acta* editions from 1682-87. The text lists a few of the topics covered in the journal, among them mathematics, physics, medicine and anatomy.

Система научно-технической информации

- Патенты
- Химические соединения
-
-
-



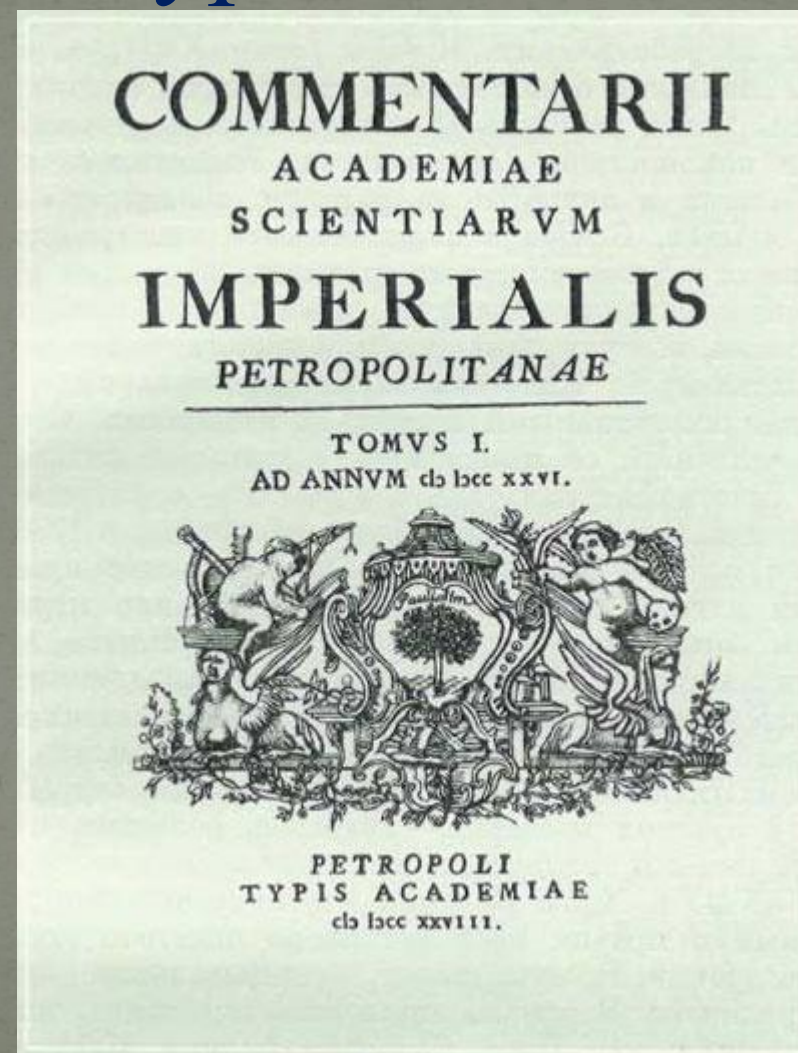
William Playfair

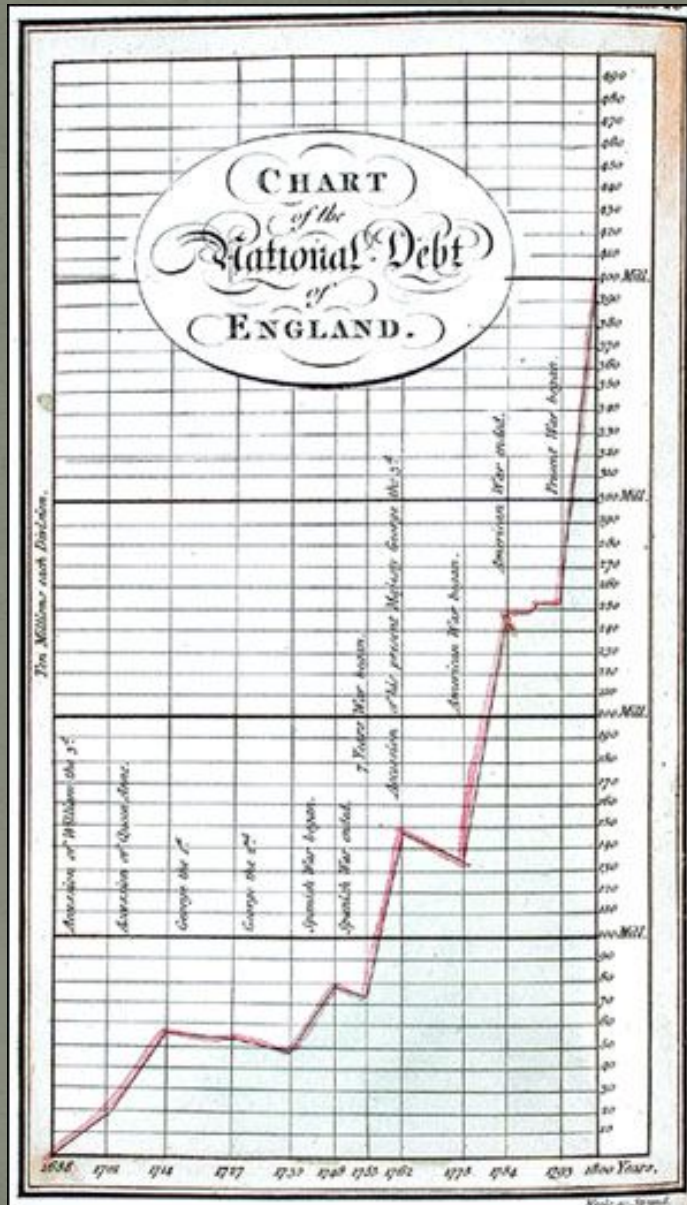


1801 г.

Первый русский научный журнал

- «Комментарии Петербургской академии наук»
- С 1728 г.
- на латинском языке.





First printed in 1786, William Playfair's *The Commercial and Political Atlas: Representing, by Means of Stained Copper-Plate Charts, the Progress of the Commerce, Revenues, Expenditure and Debts of England during the Whole of the Eighteenth Century* contains the first known use of color graphs. This image is from the third edition of the economics text, printed in 1801. The chart plots time on the abscissa, pounds (in increments of 10 million) on the ordinate, and includes major events of the eighteenth century--including the coronation of monarchs, the Seven Years' War, and the American Revolution--in the body of the chart.

National Rankings by Output in Sciences and Social Sciences, 1999-2008 (by Thomson Scientific)

	Name	Papers 1999-2008	Percent 1999-2008	Percent 1989-1993
1	United States of America	2,999,344	31.8	38.2
2	Japan	806,008	8.5	8.0
3	Germany	775,787	8.2	7.7
4	England	687,778	7.3	7.2
5	China	586,664	6.2	1.5
6	France	555,113	5.9	5.7
7	Canada	420,636	4.5	5.0
8	Italy	400,229	4.2	3.2
9	Spain	296,892	3.1	1.8
10	Russia	279,904	3.0	4.5
11	Australia	271,311	2.9	2.3
12	India	242,222	2.6	2.5
13	The Netherlands	234,947	2.5	2.3
14	South Korea	222,348	2.4	0.4
15	Sweden	176,642	1.9	1.8
16	Switzerland	170,842	1.8	1.5
17	Brazil	161,716	1.7	0.7
18	Taiwan	147,430	1.6	0.6
19	Poland	134,068	1.4	1.0
20	Belgium	127,307	1.3	1.0

Citations, January 1999 through August 31, 2009, a 10-year plus 8-month period (ranked by citations)

Rank	Field	Papers	Citations	Citations Per Paper
1	USA	2,974,344	44,669,056	15.02
2	GERMANY	766,162	9,406,841	12.28
3	ENGLAND	682,018	9,399,334	13.78
4	JAPAN	788,650	7,602,742	9.64
5	FRANCE	548,046	6,304,141	11.50
6	CANADA	424,562	5,233,211	12.33
7	ITALY	403,588	4,417,871	10.95
8	NETHERLANDS	236,344	3,419,657	14.47
9	PEOPLES R CHINA	649,689	3,404,466	5.24
10	AUSTRALIA	276,622	3,067,686	11.09
11	SPAIN	305,430	2,942,425	9.63
12	SWITZERLAND	171,248	2,693,730	15.73
13	SWEDEN	174,789	2,407,364	13.77
14	BELGIUM	128,800	1,613,458	12.53
15	SCOTLAND	106,559	1,522,948	14.29
16	SOUTH KOREA	237,652	1,515,555	6.38
17	DENMARK	92,734	1,369,297	14.77
18	INDIA	253,520	1,288,075	5.08
19	ISRAEL	109,410	1,287,435	11.77
20	RUSSIA	273,189	1,199,538	4.39

Top 20 Countries in Engineering, 1998-2008

Ranked by Citations

Rank	Field	Papers	Citations	Citations Per Paper
1	USA	202,141	1,115,430	5.52
2	JAPAN	66,882	237,154	3.55
3	GERMANY	46,643	231,381	4.96
4	ENGLAND	47,910	227,272	4.74
5	PEOPLES R CHINA	64,435	201,881	3.13
6	FRANCE	38,455	186,951	4.86
7	CANADA	34,015	149,229	4.39
8	ITALY	33,372	146,901	4.4
9	TAIWAN	27,786	96,036	3.46
10	SOUTH KOREA	30,013	91,955	3.06
11	SPAIN	21,025	88,569	4.21
12	AUSTRALIA	17,407	81,127	4.66
13	NETHERLANDS	13,727	74,175	5.4
14	INDIA	23,382	68,534	2.93
15	SWITZERLAND	10,481	67,600	6.45
16	RUSSIA	22,847	58,059	2.54
17	SWEDEN	10,608	57,944	5.46
18	BELGIUM	8,999	49,792	5.53
19	SINGAPORE	11,744	48,797	4.16
20	TURKEY	11,562	41,586	3.48



GLOBAL RESEARCH REPORT **RUSSIA**

Research and collaboration in the new geography of science

JANUARY 2010

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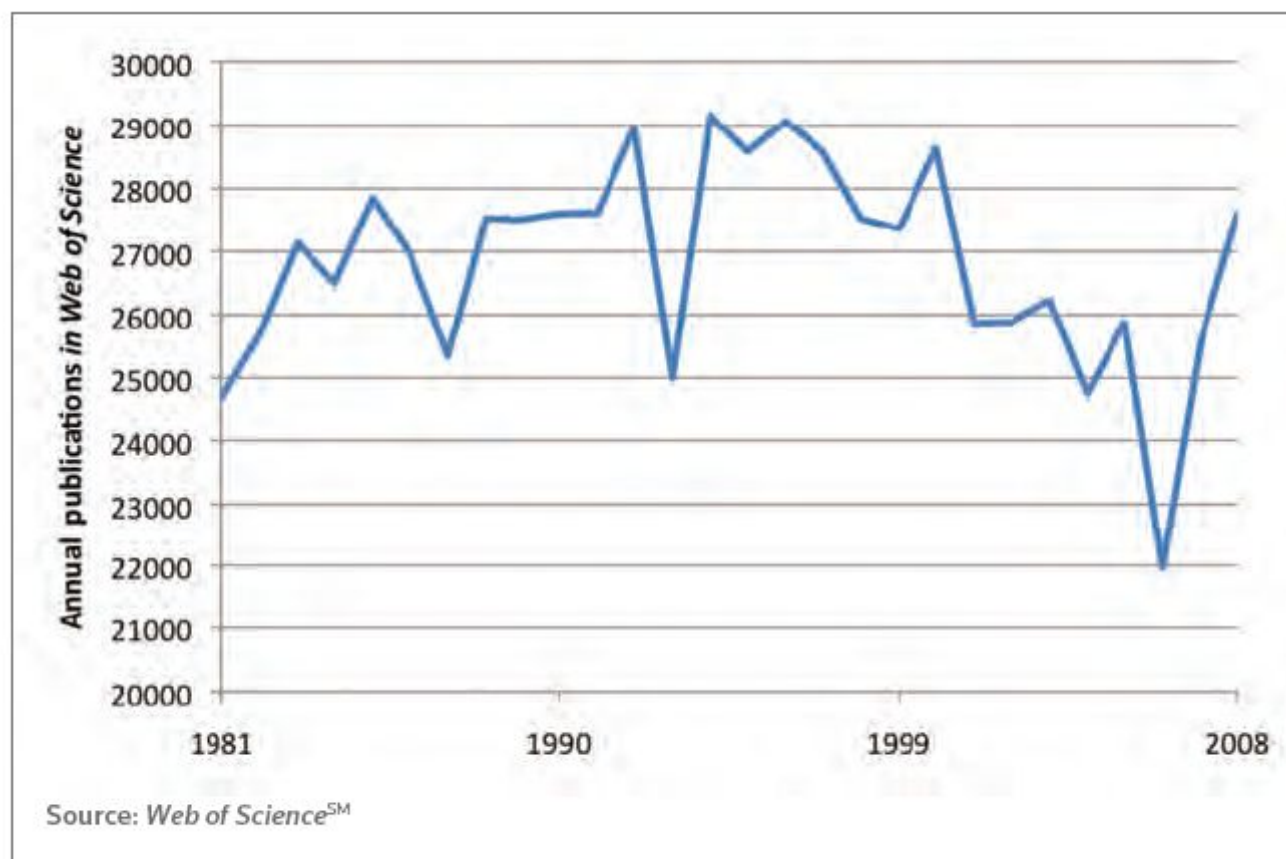


FIGURE 1

Going back to 1981, Russia's annual number of publications has fluctuated, but has never exceeded 30,000 papers

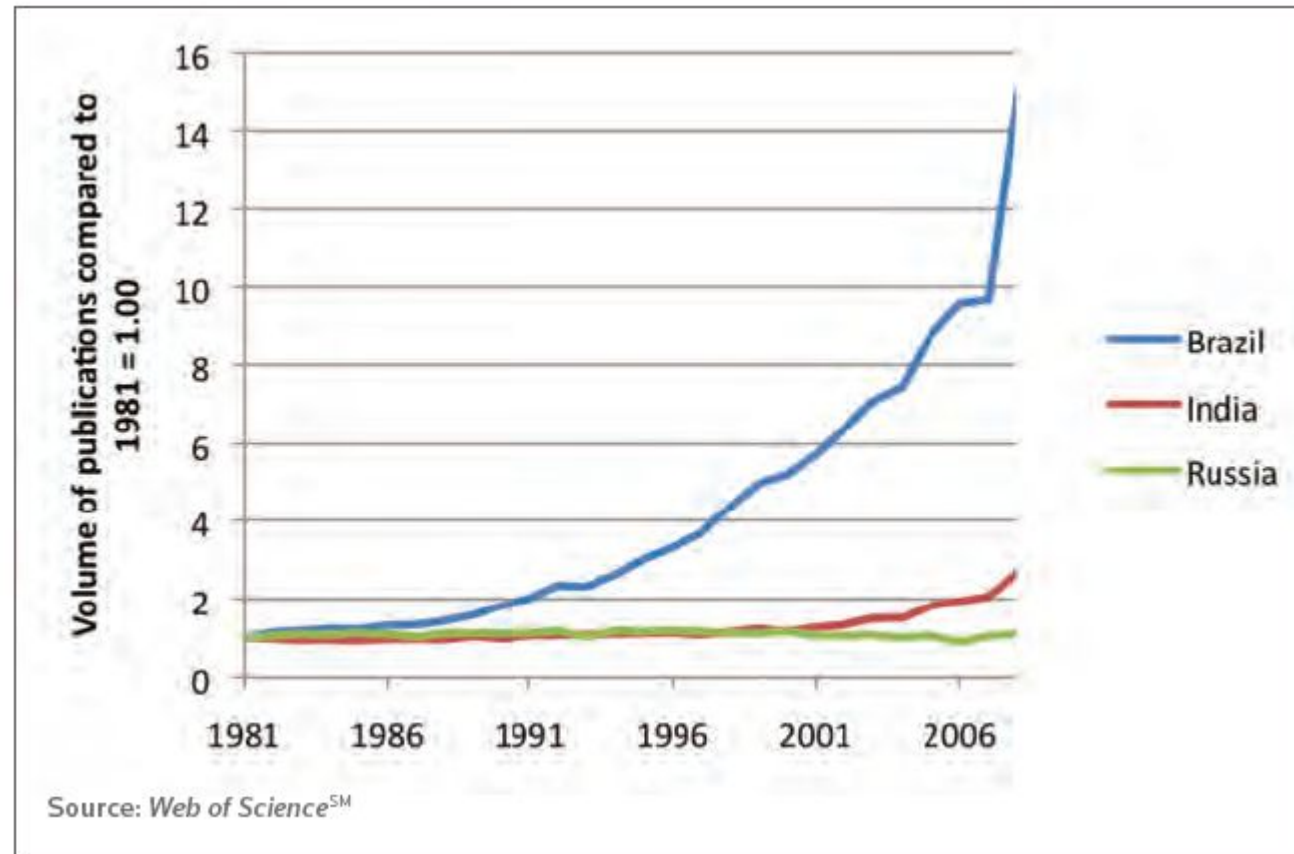


FIGURE 2

Russia's year-by-year growth lags that of two of its BRIC counterparts, Brazil and India

Как ориентироваться в океане научной информации?

- Поиск по тематическим рубрикам
- Поиск по ключевым словам
- Поиск по словам в тексте
- Поиск по авторам
- Поиск по в определенных журналах

Способы оценки научных публикаций???

- Опрос (обезличенный) среди: ученых, членов академий, научных журналистов, опрос общественного мнения и т.д. (статья года, пятилетия и т.д.)
- Номинация и голосование (типа Оскара, Нобелевской премии)
- Проведение открытого конкурса (как на гранты)

Eugene Garfield

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Derek de Solla Price

- [Derek J. de Solla Price](#) - "Networks of Scientific Papers", 1965.
- studies of the exponential growth of science and the half-life of scientific literature; together with the formulation of [Price's Law](#), namely that 25% of scientific authors are responsible for 75% of published papers
- 40% статей не цитируются в течение 1-го года ни разу
- 50% статей цитируются один раз
- 10% статей цитируются более одного раза



Science, 149(3683) : 510-515, July 30, 1965

Networks of Scientific Papers

The pattern of bibliographic references indicates
the nature of the scientific research front.

Derek J. de Solla Price

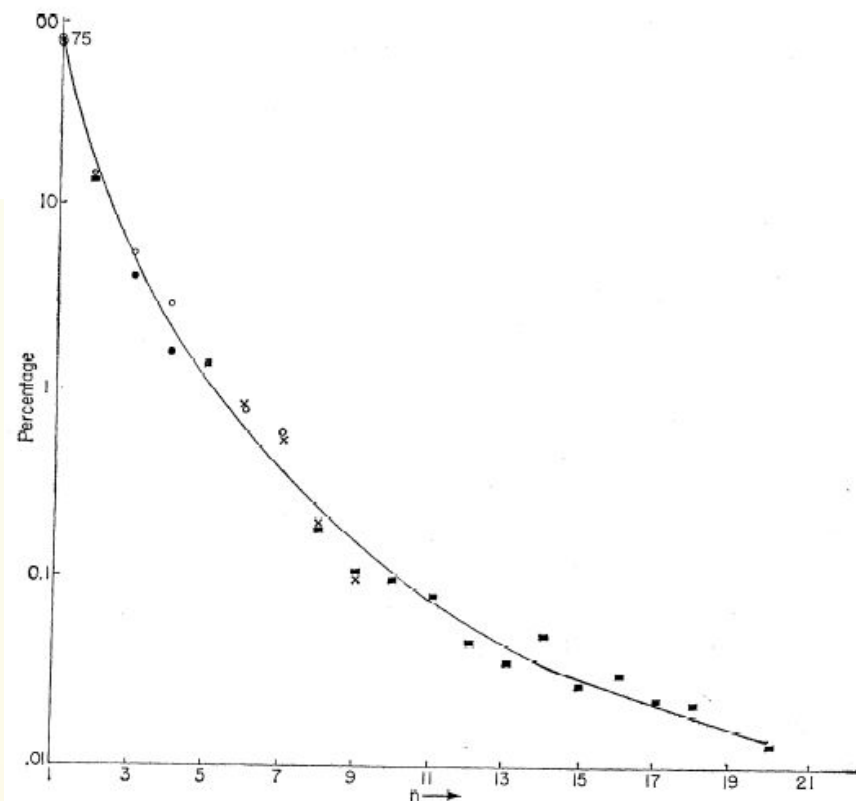


Fig. 2. Percentages (relative to total number of cited papers) of papers cited various numbers (n) of times, for a single year (1961). The data are from Garfield's 1961 *Index (2)*, and the points represent four different samples conflated to show the consistency of the data. Because of the rapid decline in frequency of citation with increase in n , the percentages are plotted on a logarithmic scale.

- [A. I. Pudovkin](#) of the [Institute of Marine Biology, Russian Academy of Sciences](#) (автоматизация анализа цитирования, учет связей между публикациями)
- Налимов. В.В., Мульченко З.М. Наукометрия.- М.: Москва, 1969.
- Хайтун С.Д. Наукометрия: Состояние и перспективы. М.: Наука, 1983. 344 с.
- Гиляревский Р.С., Мульченко З.М., Терехин А.Т., Черный А.И. Опыт изучения Science Citation Index //Прикладная документалистика / АН СССР. Науч. совет по кибернетике. — М.: Наука, 1968. — С.32-53.

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- Общее число публикаций
- Индекс цитирования
- Среднее число ссылок на статью
- Индекс Хирша

Недостатки:

Общее число публикаций

- Не учитывает качество статей (журнал, число ссылок) и число ссылок на них
- Не учитывает число авторов в статьях
- Не учитывает место автора в списке авторов
- Зависит от дисциплины (discipline-dependent)

Недостатки: Индекс цитирования

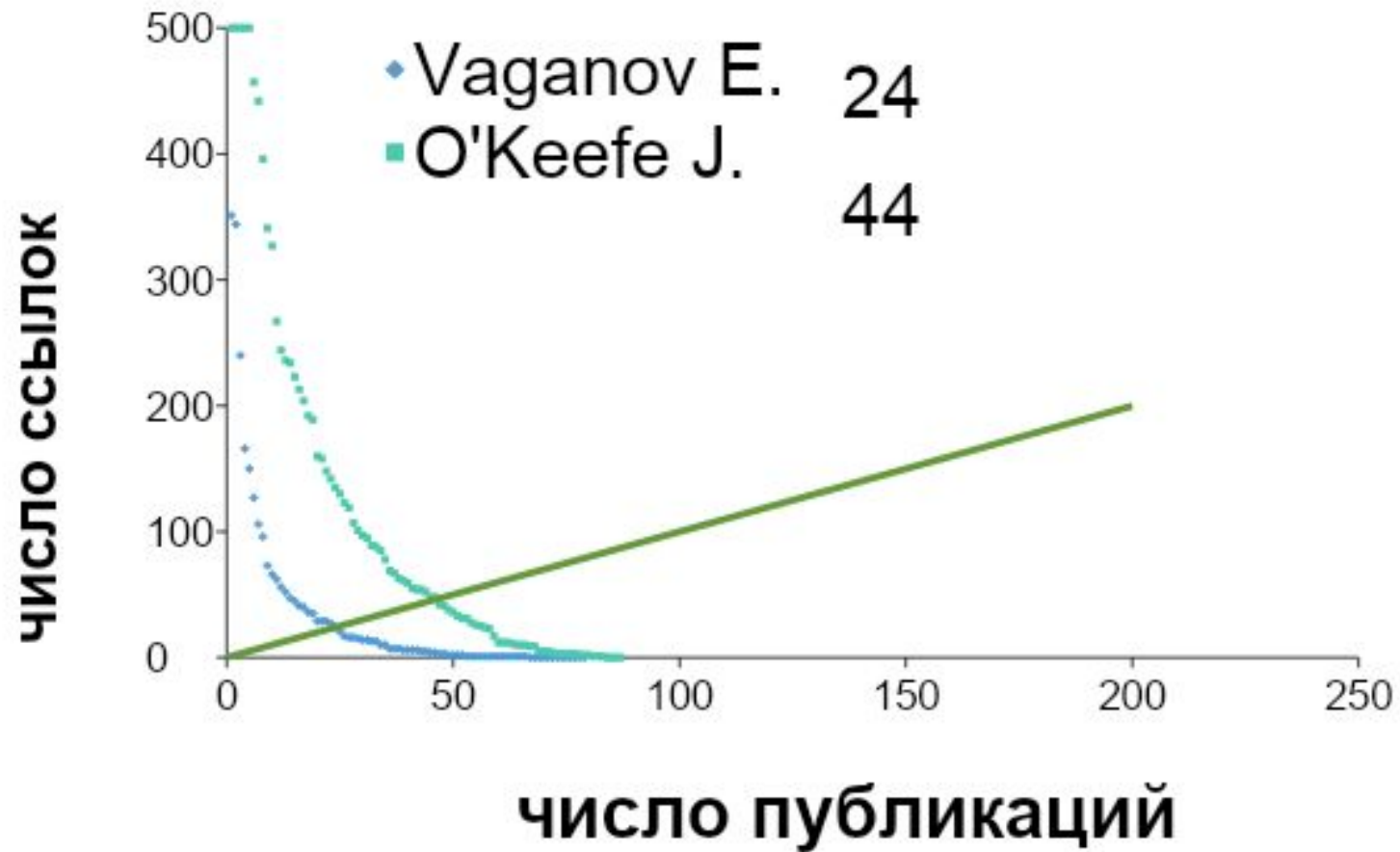
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- Не учитывает место автора в списке авторов
- Discipline-dependent
- Зависит от фазы научной карьеры

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- Не учитывает место автора в списке авторов
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- Зависит от фазы научной карьеры
- Может быть диспропорционально большим, если есть небольшое количество очень цитируемых статей (например, методических)

Индексы Хирша



Недостатки: индекс Хирша

- Не учитывает число авторов в статьях
- Не учитывает место автора в списке авторов
- Discipline-dependent (публикуемость и цитируемость)
- Зависит от фазы научной карьеры
- Сильно зависит от общего числа публикаций

Индекс цитирования и Нобелевские лауреаты (Garfield and Sher, 1965)

- В 5 раз больше статей
- Статьи пишутся постоянно и также постоянно много цитируются
- Число цитирований их статей в 30-50 раз больше, чем в среднем

Предсказание TR ISI Нобелевских лауреатов по публикациям с 2002 г.

- 2008, Гейм и Новоселов, физика, графены, получили в 2010 году
- 2009, Elizabeth H. Blackburn, Carol W. Greider, and Jack W. Szostak, физиология и медицина, в этом же году и получили
- В 2011 все Нобелевские лауреаты (9 человек) были TR ISI лауреатами цитирования в 2008 и 2010 г.

Нобелевская премия по физиологии и медицине 2014 г.



- John O'Keefe
- Университетского колледжа Лондона
- В Scopus 87 публикаций
- Индекс цитирования – 12988
- Самая цитируемая статья – 3061
- Индекс Хирша - 44



Impact Factor[©]

- Придуман Юджином Гарфилдом
- Данные приводятся в Journal Citation Report
- Количественный показатель
влиятельности журнала

IF

$$IF = \frac{A}{B}$$

IF – импакт-фактор 2014 года

A — число цитирований в течение 2014 года в журналах, отслеживаемых Институтом научной информации, статей, опубликованных в данном журнале в 2012—2013 годах

B — число статей, опубликованных в данном журнале в 2012-2013 годах¹

The complete list was removed from this website due to copy-right violations. A list of journal impact factor 2005 is available from: http://www.dote.hu/impact_factor.html

Rank	Abbreviated Journal Title	IF
1	CA-CANCER J CLIN	49.794
2	ANNU REV IMMUNOL	47.400
3	NEW ENGL J MED	44.016
4	ANNU REV BIOCHEM	33.456
5	NAT REV CANCER	31.694
6	SCIENCE	30.927
7	NAT REV IMMUNOL	30.458
8	REV MOD PHYS	30.254
9	NAT REV MOL CELL BIO	29.852
10	CELL	29.431
11	NATURE	29.273
12	NAT MED	28.878
13	PHYSIOL REV	28.721
14	NAT IMMUNOL	27.011
15	NAT GENET	25.797
16	ANNU REV NEUROSCI	24.184
17	ANNU REV CELL DEV BI	23.690
18	LANCET	23.407
19	JAMA-J AM MED ASSOC	23.332
20	NAT BIOTECHNOL	22.738

Top Ten Most-Cited Journals (All Fields), 1999-2009

Ranked by total citations, based on papers published and cited in [Thomson Reuters](#)-indexed journals between January 1, 1999 and April 30, 2009.

Rank	Journal	Papers 1998-2009	Citations	Citations per paper
1	Journal of Biological Chemistry	54,695	1,652,432	30.21176
2	Proc. Natl. Acad. Sci. USA (PNAS)	30,396	1,376,541	45.28691
3	Nature	10,549	1,242,392	117.7734
4	Science	9,369	1,125,022	120.0792
5	Physical Review Letters	31,112	884,911	28.44276
6	J. American Chemical Society	29,272	881,457	30.11263
7	Physical Review B	48,888	612,377	12.52612
8	Astrophysical Journal	26,418	581,299	22.0039
9	New England Journal of Medicine	3,564	568,698	159.5673
10	Applied Physics Letters	36,759	549,224	14.94121

Импакт-факторы некоторых российских научных журналов в 2008 г.

№ п/п	НАЗВАНИЕ ЖУРНАЛА	ИФ РИНЦ	IF ISI
1	УСПЕХИ ХИМИИ	1.151	1.717
2	ЖУРНАЛ ОРГАНИЧЕСКОЙ ХИМИИ	0.515	0.123
3	ХИМИЯ ВЫСОКИХ ЭНЕРГИЙ	0.440	0.418
4	КОЛЛОИДНЫЙ ЖУРНАЛ	0.408	0.611
5	ЭЛЕКТРОХИМИЯ	0.403	0.189
6	ЗАЩИТА МЕТАЛЛОВ	0.401	0.309
7	ВЫСОКОМОЛЕКУЛЯРНЫЕ СОЕДИНЕНИЯ	0.365	0.333
8	ЖУРНАЛ НЕОРГАНИЧЕСКОЙ ХИМИИ	0.317	0.181
9	ЖУРНАЛ ФИЗИЧЕСКОЙ ХИМИИ	0.307	0.251
10	ХИМИЯ ТВЁРДОГО ТОПЛИВА	0.287	-
11	ХИМИЧЕСКАЯ ФИЗИКА	0.271	-
12	БИООРГАНИЧЕСКАЯ ХИМИЯ	0.260	0.572
13	НЕФТЕХИМИЯ	0.247	0.191

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☐	11 NATURE REVIEWS GENETICS	29,388	36.978	0.11684
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☐	13 JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION	126,479	35.289	0.26099
☐	14 NATURE REVIEWS IMMUNOLOGY	28,938	34.985	0.09492
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☐	17 CHEMICAL SOCIETY REVIEWS	81,907	33.383	0.25235

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☐	9	REVIEWS ON ADVANCED MATERIALS SCIENCE	961	1.161	0.00179
☐	10	PETROLOGY	682	1.111	0.00157
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☐	12	RUSSIAN MATHEMATICAL SURVEYS	2,398	1.036	0.00314
☐	13	Acta Naturae	226	1.000	0.00092
☐	14	Radiophysics and Quantum Electronics	1,000	0.957	0.00213
☐	15	HIGH TEMPERATURE	1,215	0.952	0.00147
☐	16	RUSSIAN JOURNAL OF PLANT PHYSIOLOGY	1,240	0.946	0.00184
☐	17	ASTRONOMY REPORTS	1,369	0.943	0.00203
☐	18	Macroheterocycles	221	0.942	0.00066

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1	USA	2,974,344	44,669,056	15.02
2	GERMANY	766,162	9,406,841	12.28
3	ENGLAND	682,018	9,399,334	13.78
4	JAPAN	788,650	7,602,742	9.64
5	FRANCE	548,046	6,304,141	11.50
6	CANADA	424,562	5,233,211	12.33
7	ITALY	403,588	4,417,871	10.95
8	NETHERLANDS	236,344	3,419,657	14.47
9	PEOPLES R CHINA	649,689	3,404,466	5.24
10	AUSTRALIA	276,622	3,067,686	11.09
11	SPAIN	305,430	2,942,425	9.63
12	SWITZERLAND	171,248	2,693,730	15.73
13	SWEDEN	174,789	2,407,364	13.77
14	BELGIUM	128,800	1,613,458	12.53
15	SCOTLAND	106,559	1,522,948	14.29
16	SOUTH KOREA	237,652	1,515,555	6.38
17	DENMARK	92,734	1,369,297	14.77
18	INDIA	253,520	1,288,075	5.08
19	ISRAEL	109,410	1,287,435	11.77
20	RUSSIA	273,189	1,199,538	4.39

Российский индекс научного цитирования (РИНЦ)

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Related indices

Some related values, also calculated and published by the same organization, are:

- **cited half-life (only journal)**
- **immediacy index (only journal)**
- **aggregate impact factor**

Use, Misuse and Abuse



Use, Misuse and Abuse

[Eugene Garfield](#), 1999

- “Like nuclear energy, the impact factor has become a mixed blessing. I expected that it would be used constructively while recognizing that in the wrong hands it might be abused.”

Manipulation

- Тип статей
- Исключение из знаменателя формулы некоторых типов статей
- Случай протеста: в 2007 году один из журналов (его ИФ был 0,66) опубликовал одну статью от редакции, где были ссылки на все статьи из журнала за 2005-2006 гг. В результате ИФ журнала стал 1.44. Журнал исключили из базы данных за 2008 для Journal Citation Report

Тема для обсуждения: правильно ли оценивать работу ученого по числу опубликованных статей?

Юрий Стручков, члену-корреспонденту Академии наук, который с 1981 по 1990 год опубликовал 948 научных материалов – по одной статье в 4 дня.



IgNoble Prize LITERATURE

[Yuri Struchkov](#), unstoppable author from the Institute of Organoelemental Compounds in Moscow, for the 948 scientific papers he published between the years 1981 and 1990, averaging more than one every 3.9 days.

Responses

- German Foundation for Science, 2010 г. — при решении о финансировании научных исследований **He** принимать во внимание библиометрические показатели у кандидатов
- [National Science Foundation](#) (US) и [Research Assessment Exercise](#) (UK) - аналогичное решение
- [European Association of Science Editors \(EASE\)](#) — импакт-фактор использовать только для оценки журналов, но никак не исследователей и программ