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From the Researcher's Notebook

Russian Journals in Global Informational and Analytical Resources

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The Russian segment of scientific journals, which is largely associated with the Russian Academy of Sciences, is considered within the global informational and analytical resources Scopus and Web of Science and the respective bases of statistical data Scimago and Journal Citation Reports. Special attention is paid to analysis of the indicators of Russian journals in foreign informational resources, as well as to problems of the thematic attribution and clustering of journals proceeding from the subject categories of Scopus and Web of Science, the OECD rubricators, and the State Rubricator of Scientific and Technical Information (SRSTI). A question is posed concerning the assessment and ranking of journals using bibliometric indicators that constitute the basis for making administrative decisions on the development of Russian scientific periodicals.

Keywords: Russian scientific periodicals, informational and analytical resources, bibliometric indicators, ranking, thematic attribution, Scopus, Web of Science, Scimago, Journal Citation Reports.

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Scientific journals first appeared 350 years ago; the earliest of them—the French *Journal des Savants* and the English *Philosophical Transactions of the Royal Society*—were founded in 1665, the latter surviving to the present day [1, 2]. The world's first peer-reviewed edition was *Philosophical Transactions*; the first Russian edition of this type was *Kommentarii Peterburgskoi akademii nauk* (Comments by the St. Petersburg Academy of Sciences), which was first published in 1728 as an annual collection of articles in Latin [2]. Scientific journals have covered a long path of evolution [3], which still continues, and have made an invaluable contribution to the establishment and development of modern science. We do not know conclusively the number of scientific journals that are published worldwide today [4]. The specialized resource Ulrich's Periodicals Directory (UPD) [5] attributes about 70 000 editions from the approximately 361 000 periodical and serial editions registered in it, which are associated with 90 000 publishing organizations and are published in 200 languages, to active academic, or scholarly, refereed, or peer-reviewed journals.

The current world practice in assessing science, including its main communication medium, journals, widely employs a formalized approach based on so-called bibliometric indicators. Its popularity is due to the unprecedented complexity of modern scientific knowledge, which significantly hinders understanding the true significance of a large number of studies. Bibliometric indicators offer a practically universally acceptable method. They are empirical values based on quantitative characteristics of various elements of publications, such as articles, references, and so on, and reflect latent, i.e., directly unobservable, variables. For example, the number of references to a given work is a bibliometric indicator of the latent variable *scientific contributio*n, while the number of publications is an indicator of the latent variable *scientific productivity* [6]. For scientific journals, the main bibliometric indicator is the impact factor, which is a variant of citation indexes. Starting from 1979, the impact factors of the most significant journals in their subject areas have been counted annually and placed in the Journal Citation Reports (JCR) database (DB), based on Web of Science (WoS).

Initially, impact factors were considered as only an auxiliary criterion to form library subscriptions; later, however, they began to be used actively to estimate the effectiveness of scientific research, which often led to uncritical and erroneous conclusions. Numerous

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Table 1. Characteristics of bibliometric indicators [22]

Indicator	Period, yr		Includes self-citation	Subject normalization	Source	Subject area coverage in DB
	publications	citation				
2-IF	2	1	+	+	JCR	–
SNIP	3	1	+	+	Scopus	+
SJR	3	1	max 33%	+	Scopus, Scimago	+
CPD	2	1	+	–	Scimago	–
IPP	3	1	+	–	Scopus	–
5-IF	5	1	+	–	JCR	–

examples are given in [7–11] (we intentionally cite relatively old works to emphasize that the problem was recognized long ago). This is a consequence of the ubiquitous failure to understand that a qualitative characteristic like research significance cannot be replaced by a single quantitative indicator, the impact factor. Moreover, a recent bibliometric study of approximately 200 international scientific journals on economics has demonstrated a substantial discrepancy between the main bibliometric indicators used to assess editions [12].

Another bibliometric study investigated the indicators of approximately 150 Russian journals indexed in 1995–2010 in the JCR DB [13]. The authors arrived at the conclusion that the domestic flow of scientific articles had stagnated. The analysis of the present-day Russian segment of scientific journals in the leading global informational and analytical resources Scopus and WoS and the Scimago and JCR DBs, based on them, is actual for at least two reasons. First, this is the necessity to characterize objectively those domestic scientific periodicals that are represented in secondary sources (analytical abstract databases), which are most accessible to the international scientific community. Second, today the majority of domestic scientific journals are interested in obtaining state financial support; moreover, the prospects of further existence of domestic scientific periodicals actually depend on this support [14]. In these conditions, we face the task informational support the rational choice of the journals that the state—the main administrator and sponsor of Russian science—should support on a centralized basis.

The state management of Russian science has been reduced of late to ill-considered attempts at its structural reorganization, including the use of ranking procedures based on bibliometric indicators [15–17]. It is assumed that individual scientists, RAS institutes [18], and universities will be ranked. To all appearances, domestic journals, mostly associated with the Russian Academy of Sciences—more than half (~54%) of original Russian journals in the Scopus DB and almost three-fourths (~73%) in the WoS DB are published or established by RAS organizations—will not escape it either. However, the ranking of scientific journals is a complex problem [12]; it can be solved by many methods. We will consider some aspects of this problem in this article.

Bibliometric indicators. Our study of the problems of ranking Russian journals represented in the global informational and analytical resources Scopus and WoS uses the indicators of the JCR DB [19], Scopus Journal Metrics [20], and Scimago Journal & Country Rank (Scimago) [21], which include two- and five-year impact factors (IFs) according to JCR (2-IF and 5-IF, respectively) and are calculated on the basis of WoS, and journal metrics CPD (Cites per Documents, 2 years), IPP (Impact per Publication), SJR (Scimago Journal Rank), and SNIP (Source Normalized Impact per Paper), which are calculated on the basis of Scopus (Table 1). Other potentially useful indicators [14–17] were not employed.

The JCR IFs of journals are well known, while the Scopus and Scimago journal metrics are not so popular thus far and need a brief commentary. CPD is the average citation rate of a journal publication over a two-year period, which is calculated as the ratio of the number of references in the current year (Y) received by the journal's publications in the preceding two years (Y–1, Y–2) to the number of publications issued over the previous two years (Y–1, Y–2). IPP is the ratio of the number of references in a certain year (Y) received by publications of the journal in the preceding three years (Y–1, Y–2, Y–3) to the total number of publications issued by the journal over these three years (Y–1, Y–2, Y–3). SJR fixes the average number of weighted/normalized references received by a journal's publications in a certain year (Y) issued over the three preceding years (Y–1, Y–2, Y–3). References receive a weight (are normalized) depending on the prestige of the citing journal. This indicator also normalizes differences in citation practice in different subject areas. Finally, SNIP is calculated as the ratio of the number of references to the number of journal publications and the total number of references in its subject area. This ensures direct comparison of journals from different subject areas (a reference in a subject area with a low citation rate becomes more valuable than a reference in an area with a high citation rate).

The properties of the bibliometric indicators used have been analyzed more than once [15–17]. It is assumed that the advantages of the SJR and SNIP indicators compared to the IF indicator are thematic invariability as a consequence of normalization, the three-year period of calculating references, resistance to manipulations, and the wide coverage of the problem. It is desirable to use IPP, SNIP, and/or SNIP and SJR instead of IF for journals that have no JCR IF, as well as in the following three cases: for subject areas with a low citation rate, to compare areas with different average citation rates and/or basic and applied areas (SNIP and SJR), and in studying multidisciplinary areas (SNIP and SJR).

Manipulations with IFs to increase them through unjustified self-citation or mutual citation by journals issued by the same publisher are quite widespread. However, this practice can be revealed, and, if manipulations are disclosed, the journal is excluded from international informational resources [13]. In 2013, 66 editions were removed from the JCR DB for this reason [23].

According to the opinion long-established among specialists, the best approach to ranking in science is by combining quantitative indicators and expert estimates. The recent large-scale comparison of the IF, SNIP, and SJR with an independent assessment provided by 700 experts for nearly 21 000 scientific journals showed that expert estimates correlate well with all three indicators, particularly with SNIP [24, 25]. This shows that it is possible to use the SNIP indicator as the main one, at least in the first approximation, for the bibliometric ranking of journals. Nevertheless, final decisions should be made by experts, who, if necessary, proceed from bibliometric information.

Methodology. The Russian segment of scientific journals in the Scopus and WoS DBs was identified using geolocation. Bibliometric indicators for journals were collected for the period 2008–2013: the SJR and SNIP indicators for interdisciplinary comparisons and two- and five-year IF, CPD, and IPP for intradisciplinary ones. To conduct intradisciplinary comparisons, the journals were grouped into thematic clusters, in each of which leader journals were identified with the highest (top ten) values of one of the indicators. This made it possible to obtain a more objective picture than when using a sole indicator, which was therewith calculated on different arrays. Then quartiles and ranks were engaged.[1] Journals are annually ranked by quartile on the basis of their 2-IF values in the JCR DB. Since one edition often corresponds to several subject areas, each journal is ranked separately in each of its respective subject areas. Scimago similarly ranks journals by quartile every year on the basis of the values of indicators in subject areas relevant to the editions. Journals' indicator value ranks in Scimago are determined for SJR relative to thematic categories as well.

The Russian segment of scientific journals in Scopus and JCR. The identification of Russian journals in Scimago and JCR based on geolocation is not as trivial as one might assume. Many journals are represented in these DBs by translated versions, for which not the Russian Federation (Russia) but the country of the publisher that issued the translation is specified as the place of publication. Problems also exist with international journals published in English. An indicative example is the journal *Laser Physics Letters*, for which the country and publisher are specified as follows: Russia and IOP Publishing Ltd. in the JCR DB; Russia, the Institute of Physics, and IOP Publishing Ltd. in the Russian Science Citation Index (RSCI); the Scopus DB does not specify the country, indicating Wiley-VCH Verlag as the publisher; and the Scimago portal specifies Germany and Wiley-VCH Verlag, respectively. Moreover, the Astro Ltd., which is registered in the United States but is actually located in Hong Kong, is the copyright owner and copublisher of the journal. Overall, the JCR DB attributes to Russia only 143 out of 164 Russian journals (87%); on the Scimago portal, 225 out of the 331 Russian journals (68%) are attributed to Russia. Cases of fully erroneous attribution are quite numerous: in particular, the Scimago portal attributes the Russian journals *Russian Aeronautics* and *Russian Chemical Bulletin* to the United States, *Russian Chemical Reviews* to the United Kingdom, *Russian Geology and Geophysics* to the Netherlands, and *Russian Journal of Genetics: Applied Research* to Germany. In our study, we used RSCI to specify the affiliation of journals.

The RSCI data also made it possible to assess the total volume of the Russian array of journals and its representation in Scopus and WoS (Table 2). Overall, the information at our disposal allows concluding that Scopus referees 336 Russian editions and WoS, 164. This is somewhat different from the RSCI data (see Table 2).

The number of original/nonidentical journals is 324; more than half of them (175, or 54%) are published by the Russian Academy of Sciences. Over 60% (208) of refereed periodicals are represented by translated versions; a number of journals are published as both original and translated versions; and 32 journals (10%) are initially published in English. Some journals are bilingual and publish articles in both Russian and English. Some journals are translated on a selective basis and form, together with other similar journals, new English-language editions.

[1] Quartile (Q) is a quarter of a variable's values observed, in this case, the values of an indicator, in empirical static distribution: Q1 is the upper quarter of the distribution of values, Q2 is the quarter between the top 25 and 50%, Q3 is the quarter between the top 50 and 75%, and Q4 is the lower quarter of the distribution. Rank (R) is the position of a given value of a variable (in our case, the value of a bibliometric indicator) in the ordered series of all its values, designated by an ordinal 1, 2, ..., n, where n is the total number of values.

Table 2. Domestic journal array by the RSCI

Journals	Number
Currently issued in Russia	8426
Have full texts in eLIBRARY.RU	3602
Publication language, Russian and English	8042/1129
Fully translated	209
Indexed in RSCI	4419
Indexed in WoS/Scopus	171/325
Indexed in English in WoS/Scopus	156/233
Indexed in Russian in WoS/Scopus	17/106
Translated version indexed in WoS/Scopus	155/252
Partially indexed in WoS/Scopus	37/76
Not indexed in WoS/Scopus	8106/7893

Dated May 16, 2015.

As was mentioned above, the specialized resource UPD [5] currently attributes to scientific refereed journals approximately 70000 editions—30500 printed and 32 100 electronic ones, 5700 of which have no printed analogs. Russian printed scientific periodicals recorded in the UPD resource currently number 2068, and electronic ones, 1842. Therefore, UPD-registered printed periodicals constitute 24.5% of the national array of journals as they are represented in Russian Science Citation Index (see Table 2) and only 6.8% of the world array of printed scientific journals.

Thus, the visibility of Russian scientific periodicals for the international community is low. To change this situation, it is necessary to take organizational measures; in particular, a positive role should be played by the competition for state support for programs of the development and promotion of scientific journals [14, 26], which was held in 2014 by the National Electronic Information Consortium jointly with the Russian Ministry of Education and Science within the Federal Target Program [27].

The thematic structure of the Russian segment of scientific journals in Scopus and WoS. Consideration of the thematic structure of the Russian array of scientific journals in global informational–analytical resources is hindered by the absence of an unambiguous definition of the notion *specific subject*. Each definition leads to bibliometric results different from those that could be obtained using another definition. As an example, let us mention the situation with Bradford's law, which describes the distribution of publications by specific subject over journals [28]. The situation becomes even more complicated owing to the fact that the boundaries between areas in contemporary science are often obscure, which inevitably introduces obvious uncertainty into any thematic classification of editions. Nevertheless, one cannot but use various rubricators of scientific–technical information [29].

The WoS DB uses 22 thematic categories of Essential Science Indicators (ESI), 21 of which correspond to concrete branches of knowledge and the 22nd is multidisciplinary. Each journal is associated with only one category [30]. Figure 1 shows the comparative thematic structure of two journal arrays by ESI categories—the domestic one, which includes 164 editions, and the world array, which in WoS consists of 11300 editions; i.e., it exceeds the Russian one by 65 times. In the Russian array, dominant are editions on chemistry, physics, Earth sciences, mathematics, and space sciences, while in the world one, social disciplines, agricultural and allied sciences, medicine, and economics prevail.

In Scopus, the Russian array includes 336 journals and the world one, 21 700 journals, exceeding the Russian segment by 64 times, practically as in WoS (Scopus totally indexes 29 400 editions). As opposed to ESI, a journal in Scopus can be attributed to several subject areas. The analysis of the thematic structure of the Russian and world arrays by subject area leads to the same conclusions as in the case with the WoS DB. For journals alone, exact and natural sciences (physics, medicine, technology, mathematics, biochemistry and allied disciplines, Earth sciences, materials science, and chemistry) prevail in the Russian array; dominant in the world array are medicine, the humanities, and social sciences. If we take into consideration all the editions in Scopus, the situation is different most noticeably in computer sciences and technology (Fig. 2).

It is possible to compare on a common basis the thematic structure of the arrays of Russian journals in Scopus and WoS and that of all domestic journals in the RSCI using the State Rubricator of Scientific and Technical Information (SRSTI). In the RSCI array, the dominant fields are medicine and health care, as well as social sciences and the humanities in the aggregate; biology is gaining momentum, while physics, mathematics, chemistry, and geology are moving to the back burner (Fig. 3).

Interdisciplinary comparisons. As was noted above, the journal IFs are inapplicable for interdisciplinary comparisons; it is better to use the SNIP indicator. The SNIP value varies quite widely, reaching >70. In 2013, only 17 domestic editions attained a SNIP higher than 1, the maximal value being 1.807 (*Russian Journal of Mathematical Physics*). Table 3 ranks these journals in accordance with their SNIP value, as well as specifies their thematic affiliation according to the ESI categories and the Scopus subject areas. The table principally comprises journals on physics (six), mathematics (five), materials science (two), and geology (two); the social sciences and humanities are represented by one edition each; and medicine is not represented by any. Note that 5 out of the 17 journals are not accounted for

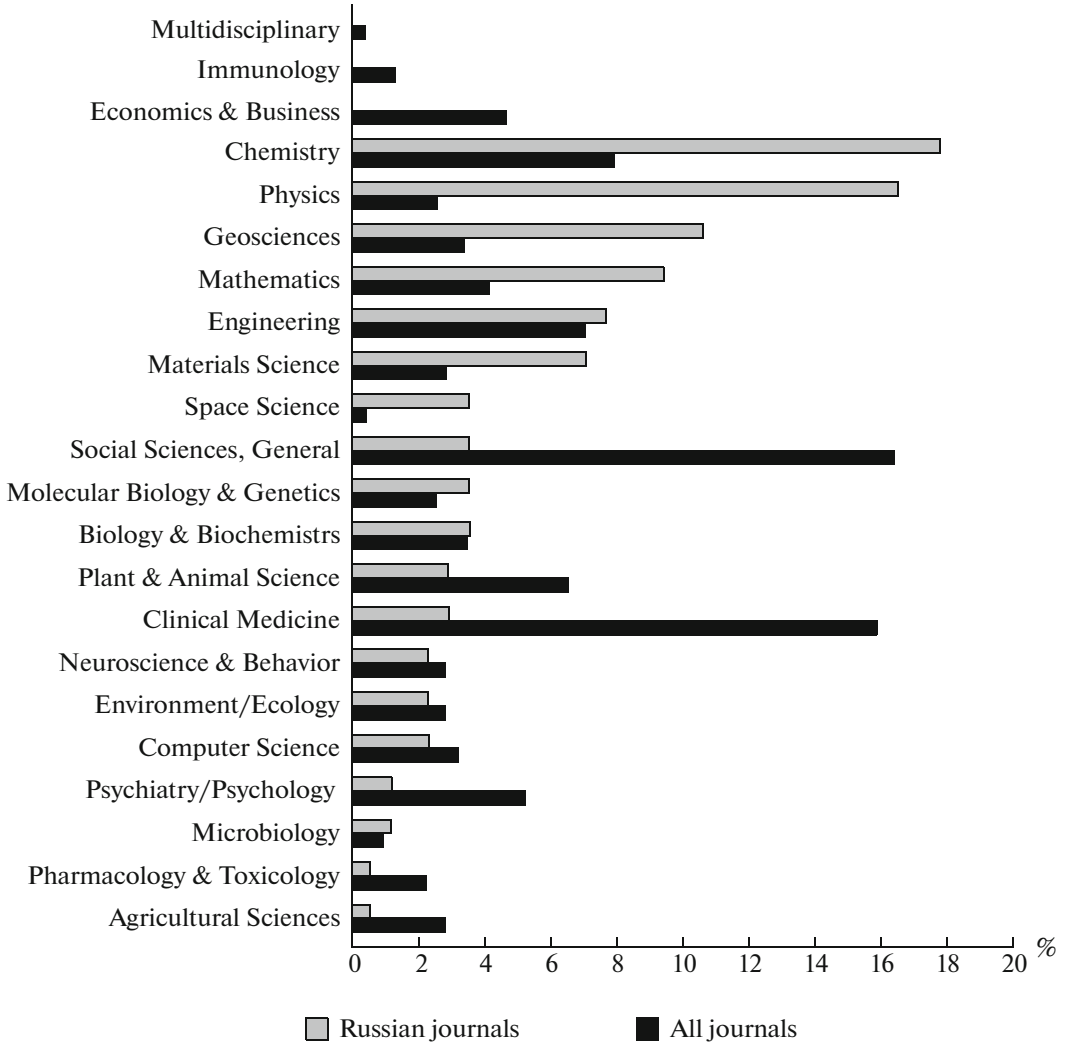

Fig. 1. Thematic structure of domestic and global journal arrays in the WoS DB by the ESI rubricator.

in the RSCI (italicized in the table). The SNIP threshold value is 1, which is rather low. For the sake of comparison, Table 4 shows 22 foreign journals with a SNIP >10, among which editions on medicine (six), physics and astronomy (six), and computer sciences (four) prevail.

The RSCI has also developed an indicator that neutralizes thematic differences and makes it possible to conduct interdisciplinary comparisons, the Science Index (SI). The highest SI values (>5) are observable for 16 Russian journals (Table 5), five of which (italicized in the table) are absent in Scopus and WoS. Thematically, five journals represent geology; chemistry, biology, and state and law theory/legal sciences are represented by two journals each, while only one journal represents physics.

We may conclude that, in using indicators that enable interdisciplinary comparisons, different informational resources form compositionally different groups of leaders. It would be useful if the RSCI calculated not only SI but also SNIP. This would make the RSCI a convenient platform for nationwide ranking of domestic journals, implying the possibility to determine directly their international status.

Intradisciplinary comparisons. Along with SNIP-employing panoramic interdisciplinary analysis of editions, a more detailed thematic ranking based on intradisciplinary indicators is necessary. In this case, it is desirable to conduct ranking within certain thematic categories. In our study, the array of Russian journals represented in Scopus and WoS was divided into 14 thematic clusters on the basis of the subject categories of JCR, Scopus, SRSTI, and the OECD rubricator. Transfer to the OECD rubricator for journals represented in JCR and Scopus was made using the respective classifications [31, 32]. A typical problem was the absence of an unambiguous mutual correspondence between thematic categories/rubrics of JCR and Scopus in a number of cases [33]. The clusters formed are shown in Table 6.

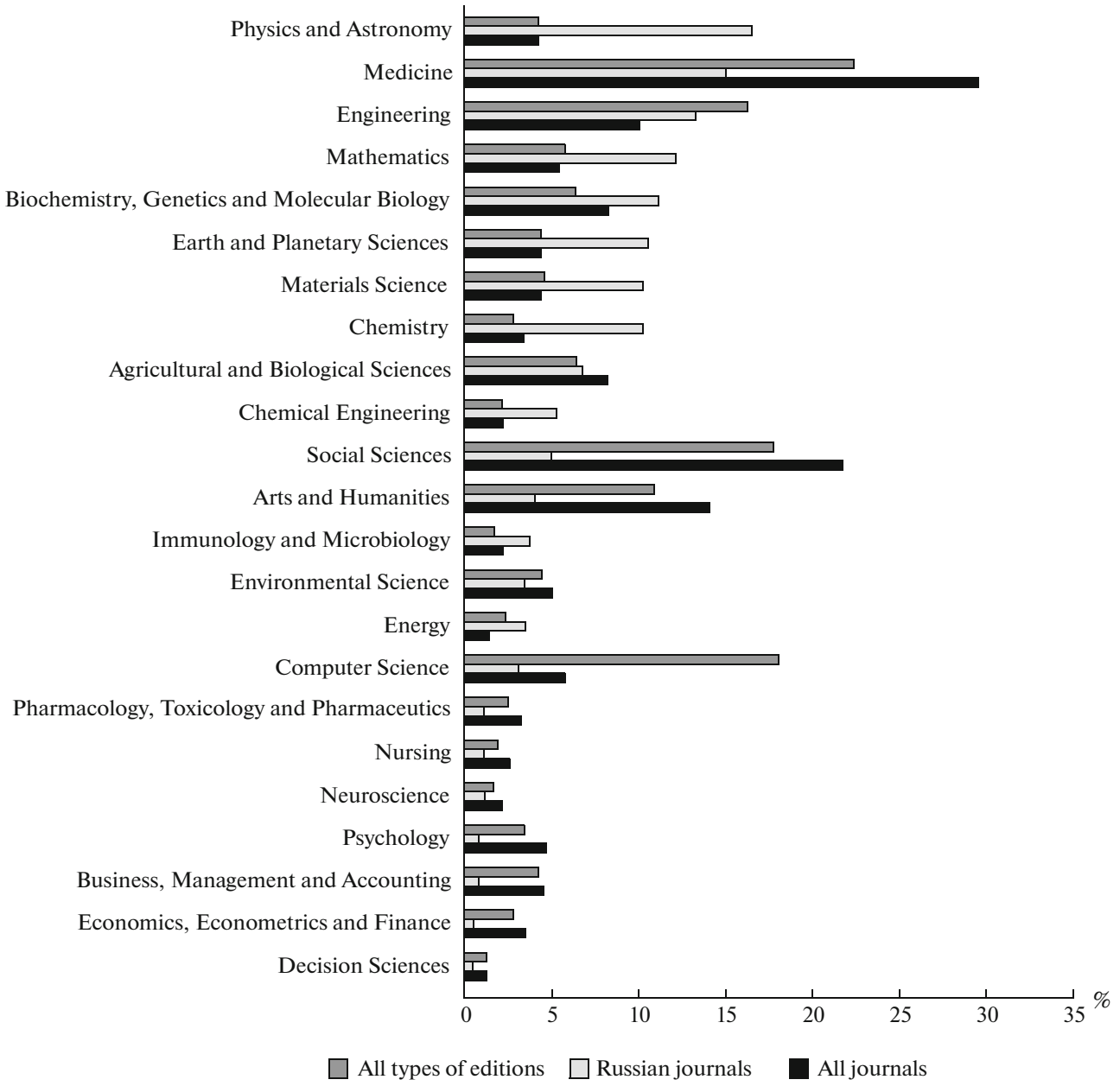

Fig. 2. Thematic structure of domestic and global journal arrays in the Scopus DB.

Naturally, the use of different rubricators entails different grouping of editions into clusters. In addition, there exist situations when the original and translated versions of Russian journals are attributed to different subject areas or Scopus categories. For example, 15 pairs of original and translated editions on biological sciences have been identified, the originals and translations of which either fall into different subject areas or are attributed to different categories within the same subject area. For example, the original versions of the journals *Biomeditsinskaya khimiya* (Biomedical Chemistry; the English-language version is *Biochemistry (Moscow) Supplement Series B. Biomedical Chemistry*), *Biofizika* (*Biophysics*), *Izv. Akad. Nauk, Ser. Biol*. (News of the RAS. Biological Series; the English-language version is *Biology Bulletin*), *Molekulyarnaya genetika, mikrobiologiya i virusologiya* (*Molecular Genetics, Microbiology, and Virology*), *Fiziologiya cheloveka* (*Human Physiology*), and *Tsitologiya* (Cytology; the English-language version is *Cell and Tissue Biology*) are assigned to medicine, while their translated versions are attributed to biochemistry, biophysics, molecular biology, genetics, etc.

Table 7 shows the number of journals in various thematic clusters. The largest of them include more than 40 titles and relate to areas such as physics and

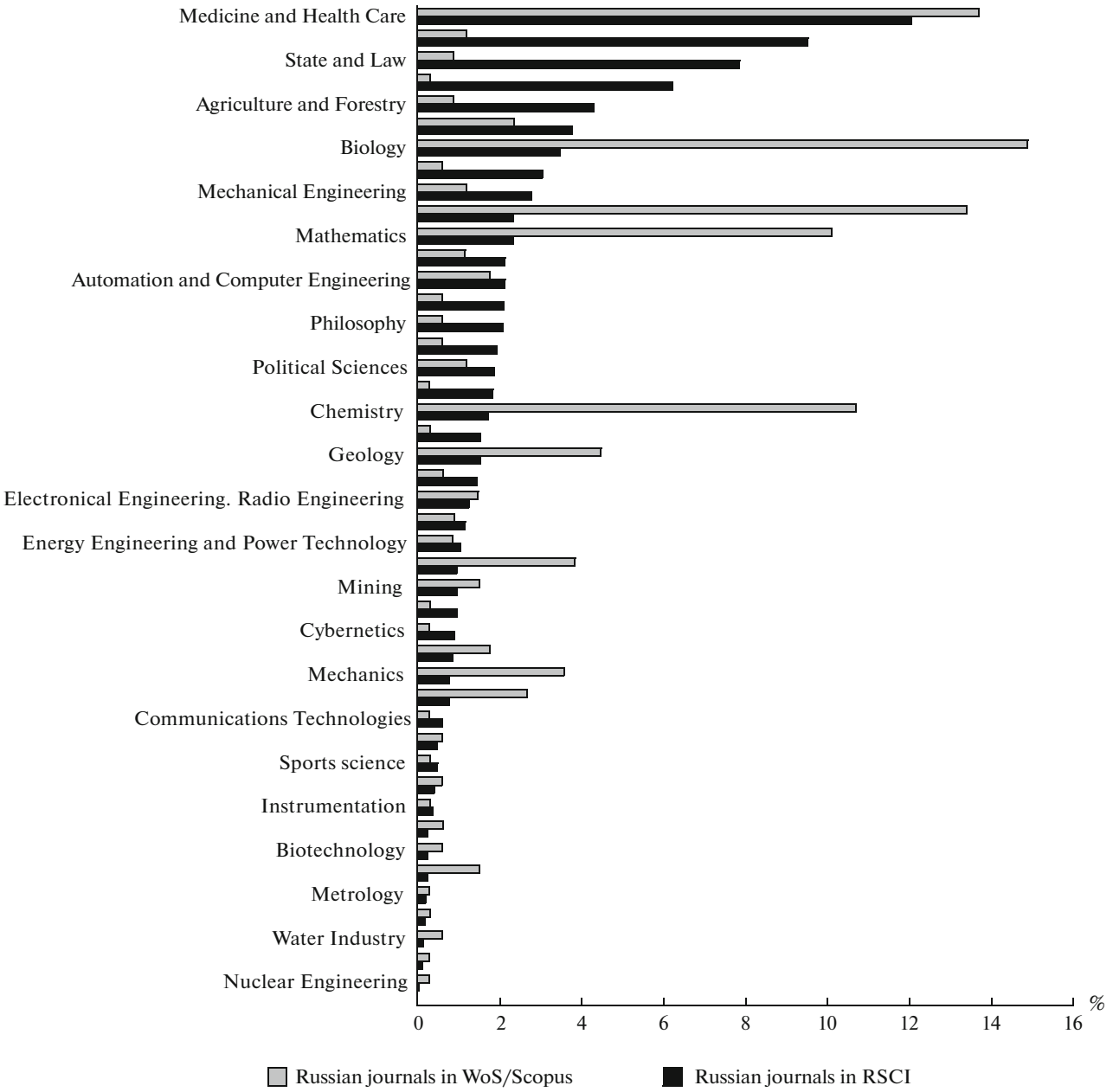

Fig. 3. Thematic structure of domestic journal arrays in the Russian Science Citation Index (RSCI), Scopus, and WoS by the State Rubricator of Scientific and Technical Information.

astronomy, medicine, engineering/technical sciences, chemistry, biological sciences, materials science, and mathematics. The clusters related to ecology, power engineering, and informatics and computer engineering turn out to be smaller.[2]

For the totality of the values of six bibliometric indicators (Table 1), the leading Russian journals in thematic clusters were identified, i.e., those whose rank varies from 1 to 10 by one of the indicators. By each criterion, the best ten journals were selected in each cluster and then nonidentical ones were chosen from them. Journals with the maximal bibliometric indicators in their clusters are shown in Table 8 (for 2013).

Note that, in almost all clusters, Russian journals ranking from 1 to 10 by one of the indicators are represented by English-language versions, either translated or original, either in JCR/WoS or in Scopus/Scimago, or, sometimes, in both resources and the related DBs simultaneously. In the "Medicine" cluster, 15 out of the 25 leading journals are repre-

[2] Full information about thematic clusters and the respective bibliometric indicators is given in deposited manuscript [34].

Table 3. Russian periodicals with the SNIP indicator >1

Title in the original language	SNIP	Category ESI	Subject area Scopus
*Russian Journal of Mathematical Physics**	1.807	Physics	Mathematics; Physics and Astronomy
Acarina	1.725	–	Agricultural and Biological Sciences
*Laser Physics Letters**	1.710	Physics	Physics and Astronomy
Uspekhi fizicheskikh nauk	1.660	Physics	Physics and Astronomy
*Problemy peredachi informatsii**	1.581	Computer Science; Engineering; Mathematics	Computer Science
Kriminologicheskii zhurnal Baikal'skogo gosudarstvennogo universiteta ekonomiki i prava	1.367	–	Social Sciences
Uspekhi khimii	1.265	Chemistry	Chemistry
Geotektonika	1.148	Geosciences	Earth and Planetary Sciences
Neftyanoe khozyaistvo	1.147	–	Energy
Fiziko-tekhnicheskie problemy razrabotki poleznykh iskopaemykh	1.139	Geosciences	Earth and Planetary Sciences
Matematicheskie trudy	1.131	–	Mathematics
Regular and Chaotic Dynamics	1.085	Mathematics	Mathematics
*Kvantovaya elektronika**	1.067	Physics	Physics and Astronomy; Engineering; Materials Science
*Moscow Mathematical Journal**	1.057	Mathematics	Mathematics
Funktsional'nyi analiz i ego prilozheniya	1.037	Mathematics	Mathematics
Fizika metallov i metallovedenie	1.032	Materials Science	Materials Science; Physics and Astronomy
Akusticheskii zhurnal	1.016	Physics	Physics and Astronomy

* Journals not included in the RSCI.

sented in the original Russian versions. The clusters "Social Sciences, the Humanities, and Economic Sciences" and "Agricultural and Allied Sciences" have three leader journals in the original Russian-language versions each; the cluster "Earth Sciences/Geosciences" has one such journal.

All the journals with a 2-IF or 5-IF > 1 are translated or original English-language editions. The highest 5-IFs belong to the journals *Uspekhi khimii* (*Russian Chemical Reviews*; 3.340, the cluster "Chemistry"), *Laser Physics Letters* (2.783, the cluster "Physics and Astronomy"), *Geologiya i geofizika* (*Geology and Geophysics*; 1.320, the cluster "Earth Sciences/Geosciences"), *Biokhimiya* (*Biochemistry*; 1.269, the clusters "Biological Sciences" and "Medicine"), *Russian Journal of Mathematical Physics* (1.161, the cluster "Mathematics"), and *Laser Physics* (1.075, the cluster "Engineering/Technical Sciences"). Editions with the highest 2-IFs are also within the above clusters, plus the "Materials Science" cluster. The highest 2-IFs >2.5 belong to the journals *Uspekhi khimii* (*Russian Chemical Reviews*) and *Laser Physics Letters*.

Note that, for journals with a 2-IF >1, the CPD indicator is also >1. Overall, these indicators agree, except for the journal *Uspekhi matematicheskikh nauk* (*Russian Mathematical Surveys*), whose 2-IF = 1.357 and CPD = 0.60. By the CPD indicator value, the leaders are *Laser Physics Letters* (2.964, the cluster "Physics and Astronomy"), *Uspekhi khimii* (*Russian Chemical Reviews*; 2.583, the cluster "Chemistry"), *Biokhimiya* (*Biochemistry*; 1.353, the clusters "Biological Sciences" and "Medicine"), *Uspekhi matematicheskikh nauk* (*Russian Mathematical Surveys*; 1.357, the cluster "Mathematics"), *Reviews on Advanced Materials Science* (1.287, the cluster "Materials Science"), *Geologiya i geofizika* (*Geology and Geophysics*; 1.409, the cluster "Earth Sciences/Geosciences"), *Fiziologiya rastenii* (Plant Physiology, the English-language version is *Russian Journal of Plant Physiology*; 0.759, the cluster "Agricultural and Allied Sciences"), and *Teplofizika vysokikh temperatur* (Thermal Physics of High Temperatures, the English-language version is *High Temperature*; 1.156, the cluster "Engineering/Technical Sciences"). The same clusters contain journals with an IPP > 1.

By the SJR indicator, the leaders are *Laser Physics Letters* (1.700, the cluster "Physics and Astronomy"), *Problemy peredachi informatsii* (*Problems of Informa-*

Table 4. Foreign journals with the SNIP indicator >10

Journal	SNIP	Country	Category ESI*	Subject area Scopus
CA – A Cancer Journal for Clinicians	71.662	United States	Clinical Medicine	Medicine
National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System	21.515	United States	–	Social Sciences
Reviews of Modern Physics	20.360	United States	Physics	Physics and Astronomy
Foundations and Trends in Machine Learning	17.015	United States	–	Computer Science
Annual Review of Fluid Mechanics	15.243	United States	Physics	Physics and Astronomy
New England Journal of Medicine	15.122	United States	Clinical Medicine	Medicine
Physics Reports	14.207	Netherlands	Physics	Physics and Astronomy
Journal of Engineering Education	13.976	United States	Engineering	Engineering; Social Sciences
Foundations and Trends in Information Retrieval	12.962	United States	Computer Science	Computer Science
Progress in Materials Science	12.916	Britain	Materials Science	Materials Science
Advances in Physics	12.860	Britain	Physics	Physics and Astronomy
Chemical Reviews	12.809	United States	Chemistry	Chemistry
Progress in Energy and Combustion Science	12.573	United States	Engineering	Chemical Engineering; Energy
ACM Transactions on Intelligent Systems and Technology	12.305	United States	Computer Science	Computer Science; Mathematics
Journal of Scholarly Publishing	11.789	Canada	Social Sciences, General	Engineering; Social Sciences
Progress in Polymer Science	11.781	Netherlands	Chemistry	Chemistry; Physics and Astronomy; Materials Science
Lancet	11.295	Britain	Clinical Medicine	Medicine
Foundations and Trends in Computer Graphics and Vision	11.077	Singapore	–	Computer Science
Nature Materials	10.307	Britain	Materials Science	Chemistry; Engineering; Materials Science; Physics and Astronomy
Physiological Reviews	10.228	United States	Biology & Biochemistry	Biochemistry, Genetics and Molecular Biology; Medicine
Clinical Microbiology Reviews	10.101	United States	Microbiology	Immunology and Microbiology; Medicine
Journal of the American Medical Association	10.022	United States	Clinical Medicine	Medicine

* Only one subject area is given.

tion Transmission; 1.581, the cluster "Informatics and Computer Engineering "), *Algebra i logika* (*Algebra and Logic*; 1.297, the cluster "Mathematics"), and *Acarina* (1.003, the cluster "Agricultural and Allied Sciences").

The highest SNIP values are characteristic of editions that belong to the clusters "Mathematics," "Physics and Astronomy," "Agricultural and Allied Sciences," "Social Sciences, the Humanities, and Economic Sciences," "Chemistry," "Earth Sciences/Geosciences," "Power Engineering," "Engineering/Technical Sciences," and "Materials Science." Although they are mainly translated and originally English-printed journals, noteworthy are the high SNIPs of original Russian-language journals—

Table 5. Russian journals with the SI indicator >5 (RSCI DB)

Journal	SI	SRSTI rubric
Uspekhi khimii	32.507	Chemistry
Uspekhi fizicheskikh nauk	21.857	Physics
*Voprosy ekonomiki**	19.975	Economics. Economic sciences
Voprosy filosofii	18.713	Philosophy
*Molekulyarnaya meditsina**	8.831	Biology. Medicine and public health
Petrologiya	7.146	Geology
Geotektonika	7.071	Geology
*APK: Ekonomika, upravlenie**	7.064	Agriculture and forestry
*Zhurnal rossiiskogo prava**	7.018	State and law theory. Legal sciences
*Vestnik Vysshego arbitrazhnogo suda RF**	6.553	State and law theory. Legal sciences
Geokhimiya	6.433	Geology
Vestnik Rossiiskoi Akademii Nauk	6.187	General and complex problems of science and the national economy
Biokhimiya	6.078	Biology; Medicine and public health; Chemistry
Stratigrafiya. Geologicheskaya korrelyatsiya	5.370	Geology
Geologiya rudnykh mestorozhdenii	5.226	Geology
Polis. Politicheskie issledovaniya	5.225	Politics. Political sciences

*Periodicals not included in the Scopus and Web of Science DBs.

Table 6. Thematic clusters of Russian journals

Cluster	Category ESI	Subject area Scopus	OECD rubric
Biological sciences (biology, biochemistry, and allied sciences)	Biology & Biochemistry; Microbiology; Molecular Biology & Genetics	Biochemistry, Genetics and Molecular Biology; Immunology and Microbiology	1.6. Biological sciences
Informatics and computer engineering	Computer Science	Computer Science	1.2. Computer and information sciences
Mathematics	Mathematics	Mathematics	1.4. Mathematics
Materials science	Materials Science	Materials Science	2.5. Materials engineering
Medicine	Clinical Medicine; Neuroscience & Behavior; Pharmacology & Toxicology	Medicine; Pharmacology, Toxicology and Pharmaceutics; Neuroscience	3.1. Basic medicine; 3.3. Health sciences; 3.5. Other medical sciences
Earth sciences/Geosciences	Geosciences	Earth and Planetary Sciences	1.5. Earth and related environmental sciences
Social sciences, the humanities, economic sciences	Psychiatry & Psychology; Social Sciences, General	Arts and Humanities; Social Sciences; Psychology; Business, Management and Accounting; Economics, Econometrics and Finance	5.1. Psychology; 5.2. Economics and business; 5.9. Other social sciences; 6.4. Art (arts, history of arts, performing arts, music)
Agricultural and allied sciences	Agricultural Sciences; Environment & Ecology; Plant & Animal Science	Agricultural and Biological Sciences	4.1. Agriculture, forestry, and fisheries
Engineering/Technical sciences	Engineering	Engineering	2.3. Mechanical engineering; 2.2. Electrical engineering, electronic engineering, information engineering; 2.11. Other engineering and technologies
Physics and astronomy	Physics; Space Science	Physics and Astronomy	1.3. Physical sciences
Chemical technology	Chemistry; Engineering	Chemical Engineering	2.4. Chemical Engineering
Chemistry	Chemistry	Chemistry	1.4. Chemical sciences
Ecology	Environment & Ecology	Environmental Science	1.5. Earth and related environmental sciences
Power engineering	Engineering; Geosciences	Energy	2.7. Environmental engineering

Table 7. Number of journals in thematic clusters

Cluster	Number of journals	
	total	with the highest indicators (original version)
Physics and astronomy	74	21
Medicine	62	25 (15)
Engineering/Technical sciences	46	24
Chemistry	45	20
Biological sciences	44	13
Materials science	41	18
Mathematics	40	19
Earth sciences/Geosciences	34	17 (1)
Social sciences, the humanities, economic sciences	27	12 (3)
Agricultural and allied sciences	26	17 (3)
Chemical technology	24	17
Ecology	14	13
Power engineering	12	12
Informatics and computer engineering	11	10

Kriminologicheskii zhurnal Baikal'skogo gosudarstvennogo universiteta ekonomiki i prava (Criminological Journal of the Baikal State University of Economics and Law; 1.367, the cluster "Social Sciences, the Humanities, and Economic Sciences") and *Neftyanoe khozyaistvo* (Oil Management; 1.147, the cluster "Power Engineering").

Therefore, just like in using indicators that admit interdisciplinary comparisons, different informational resources form compositionally different groups of leaders when applying intradisciplinary indicators as well. Hence, it is desirable to rank journals not even within a whole thematic cluster but within its individual sections—Scopus and JCR thematic categories.

When quartiles by the 2-IF value are used, only two Russian journals fall into the JCR BD Q1—*Uspekhi matematicheskikh nauk* (*Russian Mathematical Surveys*; the cluster "Mathematics") and *Laser Physics Letters* (the cluster "Physics and Astronomy"), the latter being attributed by JCR to two categories: "Optics" and "Physics, Applied." Q2 comprises six journals from four clusters: "Mathematics" and "Physics and Astronomy" (two journals each) and "Materials Science" and "Chemistry" (one journal each).

By the SJR indicator, 7 Russian journals from 5 thematic clusters attributed to 8 Scopus/Scimago categories fall into Q1 (Table 9). As for Q2, it includes 56 journals, which correspond to 50 categories and relate to 13 of the 14 thematic clusters. Journals from the biology cluster, except for *Acarina*, appear only in Q3, while the leader is the "Physics and Astronomy" cluster (14 journals in 9 categories). Then follow "Materials Science" (12 and 7), "Engineering Sciences" (8 and 5), "Earth Sciences" (7 and 8), "Mathematics" (6 and 6), and "Chemistry" (5 and 2). The clusters "Informatics and Computer Engineering" (five categories), "Social Sciences" (three categories), "Agriculture and Biological Sciences" and "Power Engineering" (two categories each), and "Chemical Technology" (one category) are represented by three journals each.

Most of the domestic Russian-language journals represented in Scopus in the clusters "Biological Sci-

Table 8. Journals leading in thematic clusters by the 2013 indicators

Cluster	Journal	Version	2-IF	CPD	IPP	5-IF	SJR	SNIP
Biological sciences	*Biokhimiya*	Translation	**1.353**	**1.40**	**1.226**	**1.269**	**0.397**	0.570
Informatics and computer engineering	*Problemy peredachi informatsii*	Translation	**0.371**	**0.72**	**0.613**	**0.676**	**1.581**	**0.436**
Mathematics	*Russian Journal of Mathematical Physics*	English original	**1.049**	**1.10**	**1.225**	**1.161**	0.949	**1.807**
Materials science	*Reviews on Advanced Materials Science*	English original	**1.287**	**1.40**	**1.115**	**0.920**	0.544	0.962
Medicine	*Biokhimiya*	Translation	**1.353**	**1.40**	**1.226**	**1.269**	**0.397**	**0.570**
Earth sciences/Geosciences	*Geologiya i geofizika*	Translation	**1.409**	**1.31**	**1.298**	**1.320**	**0.845**	0.905
Agricultural and allied sciences	*Acarina*	Translation/English original	–	**1.26**	**1.100**	–	**1.003**	1.725
Physics and astronomy	*Laser Physics Letters*	English original	**2.964**	**3.34**	**3.151**	**2.783**	**1.700**	1.710
Chemistry	*Uspekhi khimii*	Translation	**2.583**	**2.13**	**2.143**	**3.340**	**0.836**	**1.265**

Best indicators in the cluster are boldfaced.

Table 9. Russian journals in Q1 on the Scimago portal

Journal	Version	Scopus category
Laser Physics	English original	Industrial and Manufacturing Engineering
Arkheologiya, etnografiya i antropologiya Evrazii	Translation	Cultural Studies
Acarina	English original	Insect Science
Laser Physics Letters	English original	Instrumentation
Laser Physics Letters	English original	Physics and Astronomy, miscellaneous
Uspekhi fizicheskikh nauk	Translation	
Pis'ma v Zhurnal eksperimental'noi i teoreticheskoi fiziki	Translation	
Uspekhi khimii	Translation	Chemistry, miscellaneous

ences" and "Medicine" have middling bibliometric indicators. A possible explanation is that information on the citation of some medical journals is entered into Scopus from the Medline DB without specifying the organizations affiliated with the authors and lists of references. This also agrees with the fact that the indicator of international collaboration in publications (collaboration percentage) is shown only for translated versions and is absent for original ones [35].

* * *

The above study of the Russian segment of the global informational and analytical resources Scopus and WoS and the Scimago and JCR DBs based on them shows that Russian scientific periodicals are represented in these systems very scantily, by 324 journals in total. More than half (~54%) of original Russian journals in the Scopus DB and almost three-fourths (~73%) in the WoS DB are associated with organizations of the Russian Academy of Sciences. Thematically, the Russian array of periodicals demonstrates the dominance of exact and natural sciences, while social sciences, agricultural and allied sciences, medicine, and economics prevail in the global array, which, to all appearances, reflects the current global scientific priorities.

The Scopus and WoS DBs attribute a number of translated Russian journals not to Russia but to the country where the translated version is published; this is why Russia's aggregate bibliometric indicators are probably understated both in Scimago Country Rank and in Thomson Reuters periodical reviews. In addition, the bibliometric indicators of some Russian journals can be adjusted negatively because the same journal can be represented in nonidentical varieties.[3] Attributing the original and translated versions of journals to different subject categories and even subject areas can also lead to understated indicators and, hence, erroneous conclusions. Since the use of several resources and, respectively, different bibliometric indicators or their sets exposes different groups of leaders, it is desirable to elaborate a reliable universal algorithm for the bibliometric ranking of journals. It seems promising to create aggregated ratings based, for example, on the use of collective choice theory and the resultant multistep procedure of selecting the best editions [12]. In any case, to identify leaders is a complex task that probably has no unambiguous bibliometric solution.

In discussing the state support of scientific journals, it is necessary to formulate the main objectives in the first place. In our opinion, one of them should be the preservation of the *Russian-language scientific communication environment*, the loss of which will delay both the development of science in our country and the transfer of scientific knowledge to the next generations. Targeted support within an integral state policy should be granted not only to journals with high bibliometric indicators but also to less successful (in terms of this criterion) editions, which, nevertheless, consider problems important for the country's scientific–technological advance. New journals that deal with novel areas of advanced studies, particularly inter- and multidisciplinary ones, also need support. In making decisions on granting support to journals, we should not overemphasize the significance of quantitative indicators, both existing and newly developed aggregate ones. The qualitative concept of the scientific significance of a journal cannot be reflected by a single quantitative criterion—the value of a bibliometric indicator. Moreover, according to Goodhart's law, which was formulated back in 1975, a numerical indicator loses its properties and destroys natural motives for activity as soon as it becomes a target measure, which is proved by the examples of manipulating various indicators. No effective system of supporting periodicals is possible without thorough expert work.

The dominant orientation at foreign journals, to which the system of indicators of scientific effectiveness, proposed by the present-day administrators of Russian science, de facto leads, is a path to the stagna-

[3] This situation probably goes beyond the Russian array. In particular, a search by ISSN on the Scimago portal for the well-known international journal *Synthesis*, which is published in Germany by the Thieme Publishers, showed its presence in three bibliographically nonidentical varieties and, moreover, in different quartiles.

tion and disappearance of domestic editions. References to Western European countries that have abandoned publishing scientific journals in national languages in favor of all-European English-language editions (for example, *European Journal of Inorganic Chemistry, European Journal of Organic Chemistry*, etc.) do not work: Russia's sociocultural and socioeconomic situation is different.

In addition to state support, primarily in the form of grunting full-fledged budgets, a key role in improving the situation is played by journals' editorial boards, which should organize operational and high-quality reviewing, introduce state-of-the-art online technologies, and improve the rate and quality of translations to attract wider audiences of authors and readers. Journals should be a motor and not a brake on the path of presenting Russian studies to the world community.

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