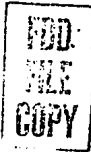


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REVIEW OF FIRST TEN ISSUES OF "REFERATIVNYY ZHURNAL,"  
MATHEMATICS, PHYSICS, AND ASTRONOMY SERIES

The three series (Mathematics, Physics, and Astronomy) of the new Soviet abstract journal, Referativnyy Zhurnal, are quite effective in keeping the Soviet scientists informed about Western scientific developments. In general, more than half the abstracts are those of Western works; for example, 65 percent of the abstracts in the Mathematics series, for ten issues, are of Western articles and books. These abstracts, generally of high quality and scientific accuracy, are often rather long and detailed, more so than English-language abstracts of Soviet works.

Unlike the various abstract journals in the West, Referativnyy Zhurnal is not averse to abstracting or annotating minor Western works of a popular nature. The abstracts, frequently written by a top-ranking Soviet scientist in his field, are often characterized by an easy-going style, facilitating comprehension by young Soviet scientists; further, the abstractor does not withhold criticism of the work being abstracted. Besides the well-known scientific Western journals and books, relatively minor organs of certain Western institutions can be found abstracted. A perusal of the latest issues shows that new subject headings are constantly being added to the Referativnyy Zhurnal, with Western sources being in greatest evidence; for example, the latest issues of the Astronomy Series include geodesy.

The new Referativnyy Zhurnal series probably will not change Soviet scientists' reading habits -- they will continue to read Western abstract journals and allied publications. The older Soviet scientists, including many distinguished ones, will still read the German, French, and English journals; and the younger Soviet scientists will still read the various Russian-language Uspehi (progress reports) containing surveys of Western scientific work, as written by their more cosmopolitan senior scientists.

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An analysis of the Referativnyy Zhurnal may reveal Soviet scientists' major interests and emphasis. For example, in the ten issues of the Mathematics series, in articles by Soviet mathematicians, papers on differential equations are significantly greater in number than those devoted to any other subject. The following table, which is a statistical breakdown of references in Referativnyy Zhurnal -- Matematika by subject and nationality, covers issues No 1-3 of 1953 and 1-7 of 1954.

<u>Subject</u>	<u>Total</u>	<u>Soviet</u>	<u>US and Great Britain</u>	<u>French</u>	<u>German</u>	<u>Others</u>
General questions	166	31	51	10	24	50
Foundations of mathematics	74	9	39	6	7	13
Theory of numbers	260	50	136	11	27	36
Algebra	364	72	160	47	46	39
Topology	122	23	54	17	5	23
Functions of a real variable	215	81	71	22	14	27
Functions of a complex variable	233	71	76	24	35	27
Differential equations	424	176	141	30	32	45
Integral equations	56	29	15	3	7	2
Calculus of variations	23	9	7	2	--	5
Analysis (other questions)	277	47	108	17	43	62
Functional analysis	126	39	50	10	8	19
Probability theory	366	70	197	31	25	43
Geometry	507	111	144	57	90	105
Numerical and graphical methods	256	54	120	23	39	20
Algebra of electrical networks	11	--	10	--	--	1
Mathematical instruments	689	13	584	24	40	28
History of mathematics	111	32	16	12	20	31
Total	4280	917	1979	346	462	576
Percent	100	21.4	46.2	8.1	10.8	13.5

Included in the column labeled "Others" are 167 articles originating in various Orbit nations. This is 3.9 percent of the over-all total. The preponderance of articles on differential equations shows that the majority of

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Soviet mathematicians are devoting their time to the problems of contemporary mathematical physics, which reduces eventually to the study and solution of differential equations. Mathematical physics subsumes nuclear physics, astrophysics, meteorology, and many other disciplines of a theoretical nature.

Of the articles by non-Soviet (mainly Western) mathematicians abstracted by the Soviets, nearly half are by US and English mathematicians, and fully 30 percent of these (584 articles) deal with mathematical instruments mostly electronic computers. This preponderance of foreign work on computers and the fact that the Soviets covered only 13 of their own articles on this subject may indicate either the inadequacy of Soviet research in the important field of computer technology or the possible classified nature of the subject.

In the Physics series, as shown by numbers and length of abstracts, considerable attention is focused on Western works on theoretical and practical physics, including nuclear physics, especially its industrial applications.

In the Astronomy series, no noticeable emphasis appears to be placed on any particular subject.

If one analyzes statistically the abstracts covering Orbit literature in Referativnyy Zhurnal, one notes that the emphasis seems to be on minor, semi-popular subjects, such as history, philosophy, personalities, and similar non-technical subjects. In general, Orbit literature, mostly represented by the GDR and Poland, with a smattering of Czechoslovak, Hungarian, and Chinese works appeared to be of small volume and of a lower scientific level when compared with that of the USSR.

Orbit literature covered in Referativnyy Zhurnal is available in the West. Even the Chinese literature, which is of more restricted availability than Czechoslovak, Polish, GDR, or Hungarian literature, reveals only a few titles unavailable in the West.

The average time lag between publication of a Western article and its abstract in Referativnyy Zhurnal is 6-8 months.

Of interest is a statistical comparison by subject of the Physics series of Referativnyy Zhurnal with a comparable Western physics abstract journal, Physics Abstracts (Section A of Science Abstracts). In general, these Soviet and Western abstract journals cover the same subjects and in roughly the same proportions; e.g., both journals give about a third of their space to the general field of electricity, magnetism, and electronics, and another third is devoted to theoretical and nuclear physics. In short, Soviet emphasis in physics abstracting generally coincides with that of the West, as shown in the following table:

	Percent of Space Given to Subjects in the Physics Series of " <u>Referativnyy Zhurnal</u> "	Percent of Space Given to Subjects in "Physics Abstracts" (British-US) Journal
Theoretical physics	4	9
Nuclear physics	29	20.1
Electricity, magnetism, electronics, radio	30	32.6
Optics	18	16.6
Acoustics	10	12.3
Molecular physics, solid-state physics	9	9.4

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The above figures for Referativnyy Zhurnal are based on the first four issues in 1954; those for Physics Abstracts, on four issues in mid-1954.

It is noteworthy that the Physics series of Referativnyy Zhurnal regularly contains a fixed, round number of abstracts for each subject; for example, recent issues contain exactly 100 abstracts on acoustics, 130 on solid-state physics, 220 on optics, 330 on electricity and magnetism, 40 on theoretical physics, and 290 on nuclear physics, giving a total of 1,100 abstracts per issue. The earlier issues did not show this regularity.

It may be concluded from these figures that a conscious effort is being made in the USSR to cover world progress in nuclear physics. Here, "world progress" means "Western progress," for if there are any Soviet works on nuclear physics, especially in its practical industrial aspect, they never appear in Referativnyy Zhurnal; purely theoretical mathematical works that may relate to nuclear physics, such as would appear in Doklady Akademii Nauk SSSR, appear freely enough in Referativnyy Zhurnal. In this connection, we can say that generally, Referativnyy Zhurnal gives no more information on Soviet science than was already given in the usual Soviet publications before the appearance of the abstract journal.

An exact comparison between the Physics series of Referativnyy Zhurnal and Physics Abstracts is difficult because of the usual arbitrary manner in which subject classification is handled. Thus, the Soviet journal includes cosmic rays in nuclear physics, whereas the British-US journal includes it in electricity and magnetism.

Also of interest is a comparison of the Mathematics series of Referativnyy Zhurnal with a comparable US mathematics abstract journal (Mathematical Reviews, Lancaster, Pennsylvania).

The following table gives the percentages of the two above-mentioned abstracts devoted to the indicated subjects.

<u>Subject</u>	<u>Mathematical Reviews</u>	<u>Referativnyy Zhurnal</u>
General questions	0.0	3.9
Foundations of mathematics	3.4	1.7
Number theory	7.9	6.1
Algebra	15.1	8.5
Topology	5.6	2.9
Functions of a real variable	4.6	5.0
Functions of a complex variable	6.3	5.4
Differential equations	9.8	9.9
Integral equations	1.7	1.3
Calculus of variations	0.7	0.5
Analysis (other questions)	8.5	6.5
Functional analysis	5.4	2.9

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<u>Subject</u>	<u>Mathematical Reviews</u>	<u>Referativnyy Zhurnal</u>
Probability	9.0	8.6
Geometry	12.8	11.8
Numerical methods	6.6	6.0
Algebra of electric networks	0.0	0.3
Calculating machines	0.0	16.1
History of mathematics	2.6	2.6

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An examination of the table reveals that the only significant difference in abstract coverage between the two journals is encountered in the subject of calculating machines. The fact that Referativnyy Zhurnal presents more reviews on this subject than on any other indicates a desire to keep the Soviet scientist abreast of developments in this field. The vast majority of abstracts on calculating machines was taken from US and British articles.

Only one other significant difference is to be noted between US and Soviet abstracting techniques. Referativnyy Zhurnal has a separate series for astronomy, whereas US astronomy abstracts are included in Mathematical Reviews as a separate section. Some astronomy abstracts are also occasionally found in Chemical Abstracts. The Soviets appear to consider the study of astronomical phenomena sufficiently important to issue a separate journal devoted mainly to this subject.

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