

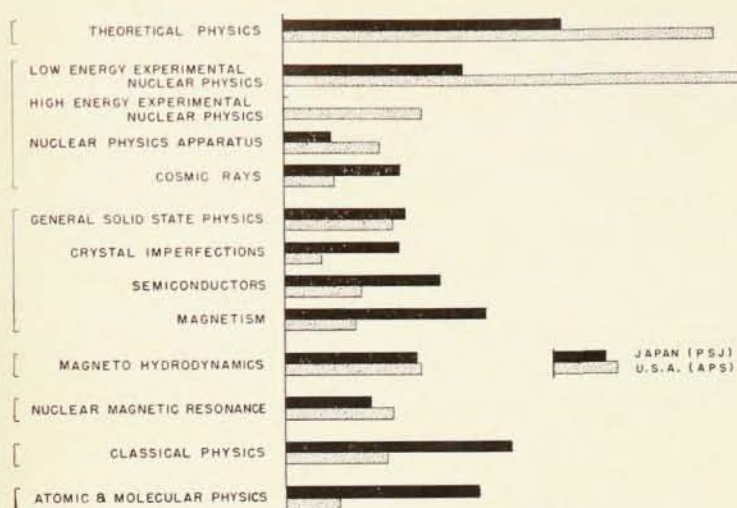


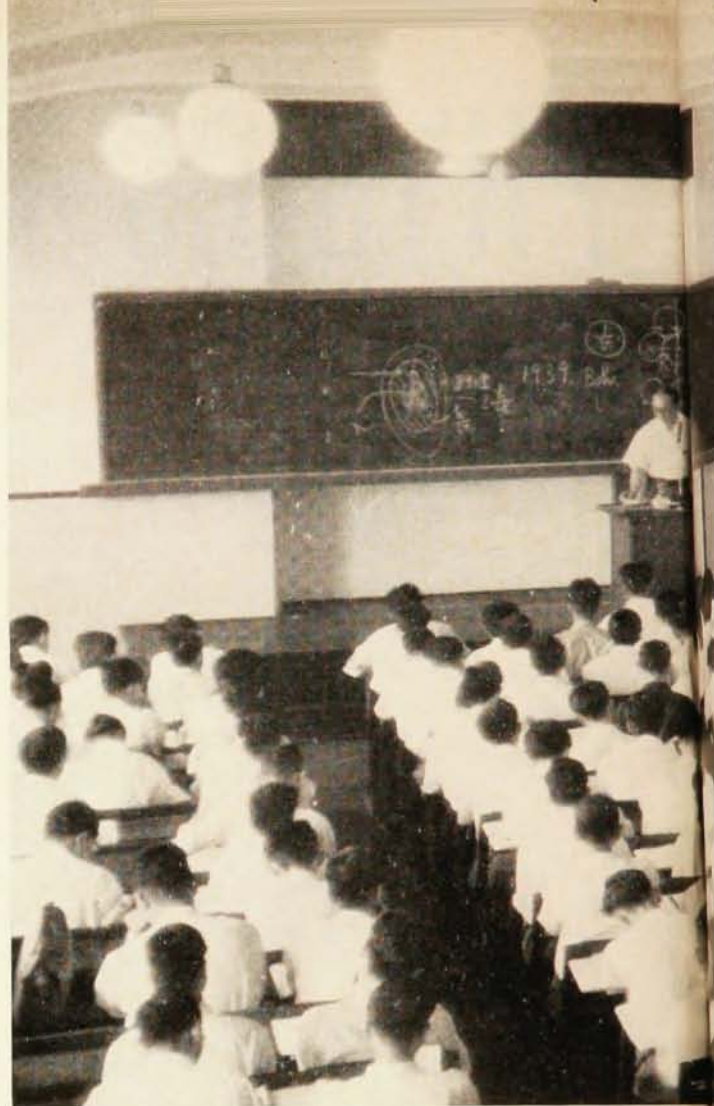
Fig. 1. Distributions (normalized to one another) in various fields of physics at the 1959 annual meetings of the Physical Society of Japan and the American Physical Society.

Annual Physical Society Meeting

JAPAN STYLE

A conference report, contrasting the modus operandi of the PSJ Annual Meeting with that of the APS.

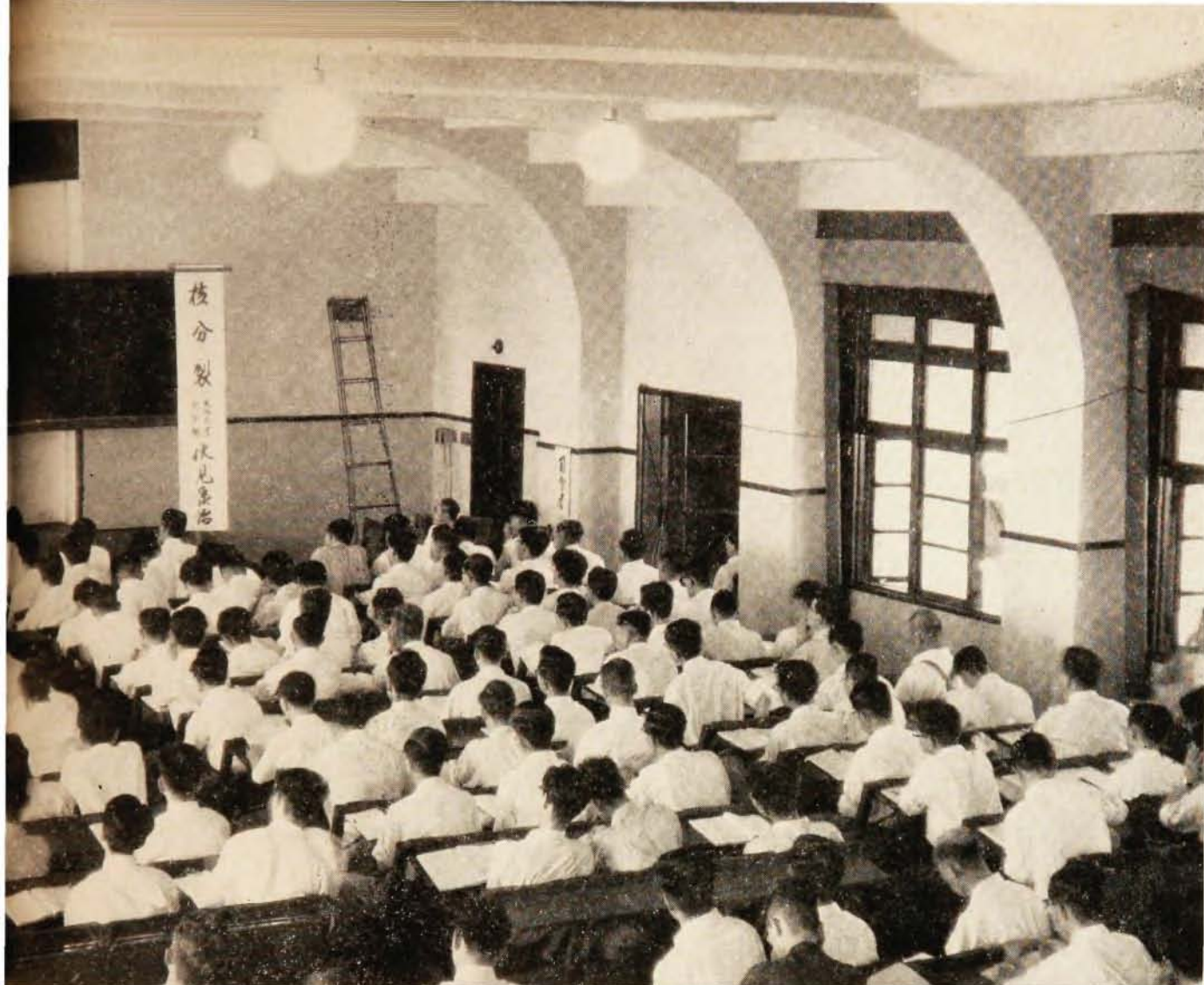
By **Marshall F. Crouch**



A SCIENTIFIC meeting is a gathering of specialists to participate in an interchange of ideas. The effectiveness of this interchange is influenced greatly by the manner in which the meeting is organized. Administrative matters such as the circulation of abstracts prior to the sessions and presentation of graphs and tables by the speakers are becoming problems of ever increasing magnitude. In the course of attending the Annual Meeting of the Physical Society of Japan held in Hiroshima October 8-12, 1959, the idea suggested itself that procedures were sufficiently different from those in the United States that a brief description might be of interest to readers of *Physics Today*, and might also hopefully suggest ideas for possible consideration.

The Hiroshima meetings featured seven hundred contributed papers, with around one thousand participants. The large number of contributed papers appears to reflect a tendency to include papers having the nature of progress reports. The distribution of these papers

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Lecture on fission given by Professor Koji Fushimi as part of program arranged by the Physical Society of Japan.

in the various fields is somewhat different from that of recent United States meetings, reflecting traditional concentration in certain fields, still-scarce accelerator facilities, etc. Strong interest in magnetism, semiconductors, and atomic and molecular physics is the notable trend. Fig. 1 shows the distribution in some detail. It should be borne in mind that sessions not specifically designated as theoretical frequently include a number of papers on theoretical subjects.

The local committee, showing true spirit of service, had arranged excellent facilities, including fifteen fine halls for sessions, several equipped with public address systems having some of the best transistorized wireless speaker's microphones yet seen. A large corps of university students had been recruited to assist the speakers and session chairmen, and these black-uniformed young men moved about the platforms in the finest tradition of the black-garbed scene changers who delight the Western visitor to the traditional Japanese theater performances. Indeed, just as the true Japanese theatergoer is completely unaware of the presence of these stage hands, it is quite possible that the Japanese physicists did not even see these students at all.

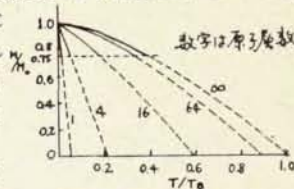
The majority of the speakers do not use lantern slides, but rather a system called "bira", which are large hand-lettered posters for graphs, equations, and tables. Wick-type poster lettering devices, only recently making extensive appearance in the United States, permit ready fabrication of figures in many bright colors. Perhaps experience in this sort of work is gained during the early undergraduate years when demonstrations are a favorite activity. The use of these "bira", which are mounted singly or stacked on special T-shaped wooden holders, permits the lectures to be staged in bright pleasant rooms which are a refreshing change from the usual dim, shrouded APS meeting halls with the interminable sequence of stacks of slides and the voices of a succession of unseen speakers droning on from the darkened rostrum. While the efficiency of the slide system cannot be denied, its soporific effect is equally undeniable, and doubtless has much to do with the popularity of informal corridor discussions at United States meetings.

The propriety of this latter custom has long been argued, and indeed it frequently seems that much painstaking effort that has gone into the preparation of the

強磁性体薄膜の研究は当初二次元結晶格子の自発磁気の可能性という興味から開発されてきたことはよく知られている。ここではこの問題について主として実験の面からの簡単なreviewを試みたい。なお後に述べるように自発磁気に関してbulkの試料との差が認められるのは約1000Å以下であるので、以下薄膜或は単に膜と称する場合は殆どこれ以下のものを指している。

1) 理論的背景。

古くはIsing model, またWeiss 或はStonerの半現象論的強磁性体理論によれば、当然二次元格子も自発磁気を持つてよい筈である。一方Bloch¹⁾はHeisenberg modelに立ちspin wave近似による三次元格子の自発磁気の計算をそのまま二次元格子に適用して、その積分項の発散することから二次元格子の強磁性の可能性を否定した。よく知られているようにKlein及びSmith²⁾はこのBlochの理論を修正し、自発磁気の大きさMは膜厚(膜面に含まれる原子層の数)に依存して変ることを導いた。第1図に膜厚(原子層の数)をパラメーターにしてK-S理論の結果を示す。M/M₀が0.75以下が点線で示してあるのは、spin wave近似の本質からM≧M₀以外の所では理論の正否さが疑わしいからである。Zener modelによる計算は未だ見られないようであるが、Heber³⁾がこのmodelで二次元格子の強磁性の可能及びCurie温度の薄膜における降下について言及していることを述べておく。



第1図 T_cはbulkのCurie温度
M₀は0°Kの自発磁化

2) 実験。

薄膜の自発磁気に関する実験はすでに1920年代にも見られるが、本格的な研究はK-S理論の後に行われてきた。実験方法も初期の弾動検流計による方法⁴⁾から磁気天秤⁵⁾、探り針⁶⁾、loop tracer⁷⁾、その他⁸⁾と使用する磁気的方法、電気抵抗⁹⁾、ホール効果¹⁰⁾等と利用する電気的方法、Kerr¹¹⁾或はFaraday¹²⁾効果を利用する光学的な方法と多岐に亘り、薄膜の製法も真空中蒸着、スパッタリング、電気鍍金その他が試みられているが、以下にその二三のものについて取上げてみる。

i.) Crittenden-Hoffman⁷⁾によるloop tracerを用いたNi薄膜についての実験はK-S理論を半定量的に立証したものとしてよく知られている。彼等の実験結果は、K-S理論のcurveに経験的修正をしたもの(T=0とT=T_cとをK-Sに揃え、途中をWeiss形にする)によく一致し、従ってCurie温度もよく一致している。第2図にその結果を示してある。

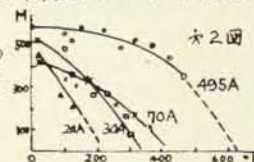


Fig. 2. A representative abstract from a solid-state physics session by K. Kuwahara of Hiroshima University. The generous sprinkling of English words is typical.

contributed papers is not properly appreciated. At times it even seems that the principal aim of such papers is little more than the establishment of a legal priority claim on one's findings. However, whatever the explanation may be, the observed fact is that most of the Japanese conferees seem to sit through entire sessions, with migration from session to session and corridor conferences during session hours being rather unusual. Perhaps this reflects in part closer acquaintanceship between researchers in a given field in Japan.

THE most notable innovation, and the one which prompted this report, is the abstract publication system. Each author of a contributed paper is furnished with a large sheet of paper ruled into light blue squares—the Japanese equivalent of our lined paper. He then hand-prints his abstract, one idiograph to a square on this sheet, which permits the equivalent of about a four-hundred-word abstract. However, if he wishes, he may

use some of the space for graphs, tables, equations (written for maximum clarity rather than to suit a monotype operator), and even photographs. These authors' sheets are then reproduced in reduced size by a photo-offset process and bound together in book form. At the Hiroshima meetings, the 700-odd abstracts were bound in eight volumes, classified as to general content, so that the conferees could purchase whatever portions were of interest to them. Photographs, incidentally, are reproduced with approximately the degree of clarity of *Physical Review* halftones. Figs. 2 and 3 are representative abstracts chosen to illustrate the abundant information content of these hand-written abstracts. In Fig. 3, for example, if one uses the APS rule that the two display formulas must be reckoned as forty words each, and combines it with the well-known saying of Confucius, the total count is something like 3280 words! To cite another example, a recent research report by Dr. Leo Esaki, describing the first studies of

