TABLE II

COMPARATIVE RATING FOR FIRST 29 YEARS

Country	Number of winners	Ideal quota	Per cent. attainment	Rank
Denmark	4	0.83	500	1
Sweden	6	1.4	423	2
Holland	7	1.8	400	3
Switzerland	3	1	300	4
Germany	27	15	180	5
Great Britain ...	14	8.4	167	6
France	13	9.3	140	7
Canada	2	2.3	87	8
Austria	3	3.7	81	9
Belgium	1	1.8	55	10
Italy	2	9.3	21	11
United States ...	5	27	18	12–13
Spain	1	5.4	18	12–13

the postwar populations of the countries in each table and dividing this sum by the total number of prize winners for that period. This gives the population corresponding to one prize winner. The post-war population of each country divided by the prize winning population gives the ideal quota for the respective countries.

The results calculated in this manner are tabulated in Tables I, II and III.

TABLE III

COMPARATIVE RATING FOR LAST 10 YEARS

Country	Number of winners	Ideal quota	Per cent. attainment	Rank
Switzerland	2	0.43	465	1
Holland	2	0.92	217	2
Great Britain ..	7	4.0	175	3
Austria	3	1.8	162	4
Germany	10	7.4	135	5
United States ..	10	13	78	6
France	2	4.5	44	7
Italy	1	4.6	22	8

The true leaders in the sciences now appear since the smaller countries are no longer handicapped by their small populations. Four of the smaller countries lead in Tables I and II. Great Britain and Germany have had very uniform records. In the last ten years the United States has shown a distinct improvement. Her performance is four times as high as it was in the first twenty-nine years.

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THE WITCH OF ANDOR

IN a letter to SCIENCE (Lancaster, Pa. and/or Garrison, N. Y.) of September 13, 1940, it is stated that "The use of the form 'and/or' in legal practice is well established." So is the expression "to-wit," if we mean widely rather than wisely established; but, if both these expressions can be restricted to legal usage, the English language will be better off. With a little better grasp of language, the original perpetrator would have avoided the fractional form (which as read aloud may be either "and over or" or "and-orths"). Accepted English practice is to place an alternative term in parenthesis, as "and (or)." The chief abuse, however, is not in using the expression awkwardly and inaccurately but in using it at all. We have far too much of such writing as "You may have sugar and/or cream in your tea and/or coffee, and/or pepper and/or salt on your meat and/or potatoes." When really necessary, the idea is best conveyed by saying "or either" or "or both."

E. H. MCCLELLAND

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SCIENTIFIC BOOKS

THE GEOLOGY OF CHINA

The Geology of China. By J. S. LEE. xv + 528 pp., 93 figs. London: Thomas Murby and Company. New York: Nordemann Publishing Company. 1940. $9.00.

THIS book grew out of lectures by the author in British universities during 1934–35 under the auspices of the Universities China Committee in London. It contains much valuable material, especially for those who want a rapid oversight of China's geology before studying intensively from sources of detailed information. For the geologist, the book is too brief, too inconclusive, too speculative. For the layman, it is far too full of technicalities, many of which are not needed to convey the meaning clearly. The book could be used in China as a text for students who have had their general physical and historical geology.

By far the most serviceable portion is the tenth chapter; a summary of the stratigraphy of China by regions, defining the formations and listing their chief fossils. All who are interested in the geology of Asia will welcome this chapter, which extends through 100 pages.

A lack which every geologist will immediately feel upon reading the book is the absence of a brief chapter on the history of geology in China. Strangely enough, the author gives a history of China as a nation, plausibly defending his course by claiming to show "the influence upon human geography of the natural regions which have been defined." But his history is political and cultural, and his interpretation of history—to say the least—is his own.

Lacking an account of the development of geology in China, the book gives no picture of the work of such men as Pumpelly, Richthofen, Obruchev, Loczy, Willis, Blackwelder, Fuller, Clapp, Andersson, Ting, Grabau, Wong, Berkey, Black, Teilhard—to give only a partial list. These men are casually referred to for local details; the reader must learn from other sources

what large and constructive parts they played in the development of geological science in China, in the organization of publications devoted to the science and in arousing interest in the study.

Indeed, the author seems to suppress, as far as possible, credit to foreign workers—a common tendency in contemporary Chinese writing. It springs, no doubt, from the new nationalistic spirit, and we who see its counterpart in certain European nations should not be severe about it. The habit of scrupulously giving credit for work done is accepted in America as a matter of course; and we believe that China would gain, not lose, by giving full credit to the able and devoted men who have kindled the light of science for her.

The mineral resources of China are scarcely touched upon. Copper is mentioned thrice, each time in less than a sentence. Iron, gold, tungsten, antimony, are all dismissed in eight lines on one page. Petroleum fares better, being mentioned on four pages, on one of which it enjoys a paragraph. Coal is mentioned on many pages, chiefly as a member of a stratigraphic series, rather than as a resource. Kaolin, fire-clay, alunite, are barely mentioned. Especially in a pioneer book on the geology of China, a good analytical chapter on economic mineral resources would be welcome.

The book contains 93 illustrations, of which 26 represent fossils. Of these, 14 are full-page plates crowded with pictures of index fossils. No one could use these plates to identify fossils; they serve neither the geologist, the student nor the layman, except that the last would like to see a picture of the Peking Man. I think it would have been better to refer the reader to Grabau's volumes on index fossils of China—surely the briefest *serviceable* treatment of this vast subject—and to devote these plates to maps, structural cross-sections and topographic drawings such as Fenneman and Atwood have used so successfully in describing the United States.

Seven more figures are devoted to artifacts, none of which is needed in a book on geology, especially as four of them represent early Chinese pottery. Twenty-two figures are photographic views, but of these 17 are devoted to the problem of glaciation, leaving only five pictures for all the rest of China. The book contains 22 maps, of which the first represents the geomorphologic provinces, superposed upon the political provinces. Names of both sets of provinces, plus the names of mountain-ranges, rivers and lakes, are of course necessary; but to these are added many cities and all the railroads—the latter drawn in bolder lines than are any of the features for which the map was made. Twenty-one illustrations are devoted to structure—some to generalized structures such as folds made by pushing wet paper on a smooth surface according to Tsuboi's method (to whom no reference is made); some to reconstructions of geosynclinal troughs; while others are cross-sections recorded in the field.

The book is of value, even as it stands; and the author deserves praise for a gallant assault upon a most difficult task. The reviewer has known the author for more than twenty years and bears a warm personal friendship for him; and considers that he shows his friendship best in frankly pointing to some of the many defects in the book. The reviewer sincerely believes that the book should be thoroughly revised and reillustrated; that much of the speculative discussion in Chapters VII and VIII should be omitted and separately published as papers representing the author's views.

There are ten chapters, each with a selected bibliography. The first chapter describes the national provinces of China. Most of the 19 provinces as defined by the author are true geomorphologic units, based upon structure. To the reviewer this "physiographical" chapter seems the right place to tell of peneplanes, terraces, cycles of erosion, drainage-history; but these are postponed to inadequate, and partly erroneous, treatment in Chapter IV, pages 194–207.

Among the misconceptions in the present chapter only one will be cited:

The Manchurian Plain is "an homologous feature of the North China Plain" (page 12). But the former is a warped inland basin, or group of basins, whose floor is beveled across rocks of many ages and structures. The Manchurian basin is more nearly homologous with its western neighbor, the Gobi basin, than with the North China Plain, which is a confluent delta-plain made of Pleistocene and recent silts. Manchuria's true homologue for the North China Plain is the Liao delta, not the warped basins. Again, on page 14, we read, "After being submerged in the Gulf of Pechihli the Plain of Manchuria is continued further south-west by . . . the Plain of North China." This would be true if the Manchurian Plain were warped down under the Gulf and arched up again in the south-west.

Chapter II describes the ancient rock-floor of China, divided into three systems; the Archaean, the Wutai, separated by the Lulianian Revolution from the overlying Sinian system. The discussion of the last-named system is one of the best features of the book; but much confusion clouds the description of the earlier systems.

In Chapters III and IV the author is on firmer ground as he writes of "marine transgressions and epochs of tectonic movement"—extending from Cambrian through Triassic history; and "Post-Palaeozoic formations and the Yenshan movements," wherein he writes of continental deposits whose ages range from Triassic to Recent.

Chapter V is devoted to "Cathaysian geosynclines and geanticlines"—the troughs trending northeast-southwest in eastern China. The author discusses a Palaeocathaysian geosyncline, which received the Sinian deposits of late pre-Cambrian time, and was renewed after disturbances until the close of the Permian. The author recognizes "the obscure history of the Mesocathaysian geosyncline," in which he includes late Permian and Triassic marine sediments in South China, "the northern counterpart" of which came "down from the Arctic, past the maritime province of Siberia, and probably joined the Triassic trough in northern Korea." The Neocathaysian geosyncline is taken to include the marginal mediterranean Sea of Japan, the Yellow Sea and the Tunghai. This last is not named on any map in the book; and is not so called in most atlases. It should mean the East China Sea; but the confusion is increased by the author's statement (page 259) that the eastern Tsinling Range "sinks under the Yellow Sea or Tunghai"—whereas elsewhere he distinguishes between these two confluent seas.

He describes an "inner Neocathaysian geosyncline . . . an extensive trough running obliquely across China from northern Manchuria to the central Yangtze province. . . . In the North China Plain the sediments in the geosyncline probably amount to many thousands of feet in thickness." He adds to this bold statement, "Apart from the superficial cover, nothing is known about them at present." The only evidence cited for their great thickness is that borings at Tientsin showed fresh-water deposits 500 feet below sea-level. This fact is offered as evidence of subsidence; but the author disregards the lower sea-levels of the Pleistocene and the fact that delta sediments sink by compaction as the delta grows. The depth of these fresh-water deposits is too moderate to prove geosynclinal sinking.

Chapter VI treats of "east-west tectonic zones" of folded structure. One of these is in the Tannu and Kentai mountains. "The middle part of this zone is obviously disturbed by the Khangai Mountains which more or less follow the 'Irkutsk Amphitheatre' in trend, and which are undoubtedly related to the latter. Because of this powerful disturbance thrusting in from the north, the east-west zone could not have maintained its rectilinear front" (pages 247–248). Apparently the author thinks the Tannu and Kentai ranges were continuous, and that the Khangai is overthrust upon them from the north. No trace of such a structure is known in the field, nor are the rocks of the Tannu and Kentai identical. The inference appears to rest on the author's interpretation of "trends."

Farther south, "the Inshan zone" is made to include the many small short ranges just north of the great bend of the Yellow River. The author extrapolates these folds far to the eastward to account for the node in Hokkaido, where the Tertiary ranges of the Kurile arc and the Sakhalin folds "join and give rise to a great display of vulcanicity" (page 250). This entire thesis is speculative, to say the least. The only physical evidences which the author cites are certain east-west folds in Manchurian coal-basins and a coincidence in the approximate latitude of the node in Hokkaido with that of the Inshan zone. Similar reasoning is done throughout the chapter.

Reference has been made to the still more speculative chapters VII and VIII, respectively on "Shear Forms" and "Tectonic Types and Their Related Earth Movement."

Chapter IX is a review of the evidence bearing on "Pleistocene Climate in China." The author reviews the scattered observations and concludes that in the Lower Yangtze Valley, three successive glaciations took place, separated by interglacial epochs.

Chapter X, on "Regional Stratigraphy," is referred to in the first part of this review as the best and most serviceable chapter in the book. It is a pleasure to close a review that necessarily includes some criticism with a word of well-earned praise.

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SPECIAL ARTICLES

SEROLOGICAL SPECIFICITY OF HEAVY PARTICLES DERIVED FROM NORMAL ORGANS

THE nature of certain particles separable from normal tissue extracts by relatively high centrifugal forces is under investigation in a number of laboratories.[1] In the course of studies of the virus of human influenza in this laboratory, it was found that particles of similar chemical composition could be separated from the lungs of normal, healthy mice and from the lungs of mice in the final stages of influenzal pneumonia. It has been suggested that such "high-speed sedimentable" cell components may correspond with histologically recognizable mitochondria,[2] and further,

[1] A. Claude, SCIENCE, 91: 77, 1940; K. G. Stern and F. Duran-Reynals, SCIENCE, 89: 609, 1939; C. R. Amies and J. G. Carr, *Jour. Path. and Bact.*, 49: 497, 1939; J. Furth and E. A. Kabat, SCIENCE, 91: 483, 1940; D. G. Sharp, A. R. Taylor, H. Finkelstein and J. W. Beard, *Proc. Soc. Exp. Biol. and Med.*, 42: 459, 1939.

[2] A. Claude, *op. cit.*