United Kingdom every three weeks, or seventeen extra 2-lb. loaves per head of the population per year. This is by no means a negligible increase in the bread supply, and it is doubtless considerations of this kind that have induced the government to take action.

If, however, we examine the result rather more closely, we find that the increase in the nation's food supply may not be so great as the above figures indicate. In spite of repeated statements to the contrary, bread made from 80 per cent. flour is not so nutritious, weight for weight, as bread made from 70 per cent. flour—at any rate, for the supply of protein and energy for the general population. Although 80 per cent. bread contains on the average rather more protein than 70 per cent. bread, the digestibility of the protein in the former is rather lower, so that the actual weight of protein digested by the average individual from 1 lb. of 80 per cent. bread is rather less than the amount digested from 1 lb. of 70 per cent. bread. Again, the energy value of 80 per cent. bread is rather lower than that of 70 per cent. bread. Still one more correction must be made in order to arrive at the actual increase in the national food supply which will result from the general adoption of a milling standard of 80 per cent. It is pointed out above that the recovery of 80 per cent. of flour from cleaned wheat entails a decrease in the supply of the finer wheat offals for stock-feeding to the extent of about 600,000 tons. These finer offals are largely used for feeding pigs. Their transference to human consumption would therefore decrease the production of pork and bacon, and this must be allowed for in estimating the total effect of the proposed alterations in milling. After applying all these corrections it appears that the general adoption of an 80 per cent. standard would undoubtedly give a substantial increase in the amount of digestible food for the supply of protein and energy for the population of the United Kingdom.

The possibility that the food value of bread would be substantially increased by the adoption of the 80 per cent. standard, because the content of the mysterious constituents known as vitamines would be increased by the inclusion of a greater proportion of the germ and of the outer layers of the grain, is perhaps scarcely worth discussing in this connection. Such constituents are supplied by other items comprised in an ordinary mixed diet, so that the vitamine content of bread can have little practical significance except in the very few cases where bread forms the whole, or very nearly the whole, of the diet.

The price of wheat offals for feeding stock is now so high that the adoption of the 80 per cent. standard can not be expected to make any considerable reduction in the price of bread. Even the compulsory admixture of a considerable proportion of other cereals, such as maize, oats or barley, with wheat for bread-making would not greatly cheapen the loaf, because these cereals are not very much cheaper than wheat. The important point in raising the milling standard and in including other cereals among the breadstuffs is that it would widen the sources from which the national food supply is derived—a most desirable end under existing conditions. To summarize, the result of a compulsory 80 per cent. standard would be neither better bread nor cheaper bread, but more bread.—*Nature.*

SCIENTIFIC BOOKS

The History of Melanesian Society. By W. H. R. Rivers. Cambridge: The University Press, 1914. 2 vols. Pp. xii + 400 + 610.

Ethnologists have learned to rejoice at the sight of Dr. Rivers's name on the title page of an ethnological monograph. His work among the islanders of the Torres Straits stands as a model of painstaking research and critical method, originated in part by Dr. Rivers himself, while his elaborate study of the Todas of Southern India ranks with the best descriptive monographs of modern ethnology. In view of the author's methodological labors, moreover, one's anticipations are kindled as he glances through the pages of this newest attempt to reconstruct and interpret the history of an ethnographic district of which the cultural complexities have already taxed the ingenuity of Thilenius and

von Luschan, of Leo Frobenius, Graebner and Churchill.

The first volume of the book is wholly descriptive. It brings new data on the material culture and art, religion, ceremonial and social organization of several of the island groups of Melanesia. The data on social organization are particularly welcome, for they fill a long felt gap; unfortunately the author's own material also falls far short of being exhaustive; many details of the social systems described are lacking, nor are even the fundamentals always as definite as might be desired. Dr. Rivers, moreover, himself characterizes the descriptive part of his book not as an exhaustive treatise but rather as a preliminary survey. Further contributions covering the field are already announced: a volume on the Western Solomon Islands by Mr. A. M. Hocart and the author and a monograph by Mr. G. C. Wheeler on the islands of Bougainville Straits. Only one phase of his subject has Dr. Rivers covered almost exhaustively, the systems and terms of relationship together with the behavior of relatives. A valuable comparative list of terms used in the different island groups is appended to the first volume.

Of far greater significance and general interest is volume II. In it the author attempts a systematic albeit speculative reconstruction of Melanesian history. Whatever one may think of the author's conclusions, or even of his method, he deserves the highest credit for having conceived and carried out a logically coherent theoretical argument, at the hand of a multiplicity of concrete data, an argument which fills more than five hundred pages and, as an intellectual effort, stands unique in the whole range of ethnological literature.

In the first part of the volume the author uses the time-honored evolutionary method of historic reconstruction based on the theory of survivals. The fundamental assumption made by the author, which he uses as the cornerstone of the entire argument, is the basic and permanent character of social organization. This assumption is supplemented by the theory that the terms of relationship directly and faithfully reflect the social structure, particularly the forms of marriage. Operating with these hypothetical tools the author examines the morphology of the relationship systems of Melanesia and arguing from these to forms of social organization, particularly of marriage, he arrives at the earliest form (for the purposes of his argument, at least) of Melanesian society, characterized by a dual organization, maternal institutions, and a communism associated with a gerontocracy, the rule of old men, who tended to monopolize the women of the group and wielded undisputed authority in tribal affairs. During that remote period individual marriage gradually came into being and the relations of father and child became for the first time clearly defined. By argumentative steps which space forbids us to follow the author proceeds to carry Melanesian society through later stages, among these a totemic one, which, however, in some parts at least of Melanesia later again disappears, leaving no traces of its former existence.

The next move is a linguistic reexamination of the relationship terms of Melanesia, the result of which is a complete reinterpretation of the evolutionary process outlined above. For the author's comparative survey reveals two sets of terms: one set is very much the same linguistically in the whole of Melanesia, the other varies as one passes from island group to island group. The conclusion is that the uniform terms must belong to an ancient indigenous population, the diversified ones to a later people of immigrant origin. Thus is reached the conception of the cultural complexity of Melanesia. Follows an elaborate analysis of the secret societies of the island of Mota (Banks group). For reasons to be stated later the author ascribes these societies to an immigrant people, and detailed examination of the rituals of the societies provides a test for immigrant strata in Melanesian cultures. Supplementing this by a comparative study of methods of burial, the author finally resolves Melanesian culture into a series of strata: the most ancient culture of the dual people, followed by that of the kava people, followed by that of the betel

people. Last come certain recent influences from Micronesia and Polynesia. Polynesia, moreover, is made to participate in some of the other culture strata, so that a later Polynesian culture corresponds to an earlier Melanesian one, while the earlier Polynesian culture is given a share in the moulding of the culture of the dual people, which, therefore, also proves to be complex in character.

The remaining sections of the volume are devoted to an interpretation of the different aspects of Melanesian culture in the light of the cultural strata just outlined. Thus, linked totemism is regarded as due to two successive migrations of totemic peoples; conventionalized art is ascribed to the influence exerted by the geometrical art of one people on the realistic art of another; the origin of money is seen in the conditions which arise when two largely independent people live side by side; religion is a trait of the kava people, while the dual people were addicted to magic; sun and moon worship also come from the kava people, while stone work is due to ideas introduced by them; the bow and arrow belong to the kava as well as to the dual people, although they were subsequently lost among both; the plank-canoe was shared by the kava and betel peoples, while the dug-out originated with the dual people; the use of an inclusive and exclusive plural, finally, in some of the Melanesian languages points to the necessity of differentiating between two social strata.

In fairness to Dr. Rivers it must be said that the bare outline presented above does but poor justice to the author's amazingly complex argumentation. It will suffice, however, for the purpose of the present examination, which is not to refute the author—a task that would require a volume—but to characterize and expose his method. This restriction is the more justifiable as the author himself regards the "history" as a model of ethnological method.

In order to allow for a more deliberate analysis of the second part of Vol. II., the first part will be discussed very briefly. In it the author applies the method of survivals with little regard for probabilities. When a reconstruction based on a diagnostic utilization of relationship terms leads to the assumption of an ancient state of gerontocracy of a type hitherto unknown in concrete ethnographic experience, and of forms of marriage, such as that between individuals separated by two generations (a condition which, while it seems to occur, must certainly be regarded as highly exceptional), one pauses to think before accepting the author's conclusion. Again, although Dr. Rivers has certainly made good his contention that terms of relationship will reflect states of society, particularly of marriage—a position once held as a dogma by Lewis H. Morgan—and notwithstanding the new in part very striking evidence which the author's book brings in support of that contention, he clearly is guilty of deliberately overlooking the fact that social structure and function represent but two out of a set of factors which may and do influence relationship terms and systems. A set of terms must always remain a feature of language and as such it is subject to those influences which control linguistic changes as well as to the peculiar spirit of a particular language or linguistic stock. Again, a system of relationship, a set of terms, are phases of culture and, like other cultural features, they may spread from people to people, may be influenced by factors extraneous to the group to which they belong. While the theoretical validity of these propositions seems assured, one welcomes the fact that renewed interest in the numerous and intricate problems presented by the study of systems of relationship is manifested in a series of concrete and systematic investigations undertaken particularly by American anthropologists, investigations which have already brought valuable evidence in favor of a less one-sided attitude toward the problems of relationship systems and from which further results along similar lines may ere long be expected.[1]

But Dr. Rivers's principal error consists in

[1] *Cf.*, for instance, R. H. Lowie, "Exogamy and the Classificatory Systems of Relationship," *American Anthropologist*, Vol. 17, 1915.

the peculiar—one is tempted to say reckless—manner in which he applies the principle of the diffusion of culture in the second part of his theoretical argument. It is true, the author is not guilty of that mechanical handling of cultural features, like units of a physical mixture, which is so characteristic of Graebner's procedure. Dr. Rivers gives due weight to the psychological aspects of culture contact; he emphasizes, for instance, the observation that the very circumstances of the contact of two cultures may give rise to features foreign to both cultures before contact. He also devotes an entire chapter, perhaps the most valuable part of the volume, to an ordered consideration of the mechanisms and conditions, physical as well as psychical, of the diffusion of culture. But for all that the glaring unreality of the author's method remains the most striking feature of his book. Deliberately evading any attempt to furnish proof of diffusion in specific instances, the author erects a purely hypothetical structure, based on a bewildering maze of assumptions invariably favoring interpretations through diffusion while disregarding alternative interpretations. In the discussion of the secret societies of Mota, for instance, the author ascribes the secrecy of the societies, their multiplicity, as well as their grading in rank, to the fact that the societies were introduced by an immigrant people; they were secret because an open ritual in the presence of a hostile indigenous population (at another stage in the argument the population is assumed to be friendly to the newcomers) was dangerous; they were numerous because a constant stream of applicants for membership from the natives led to the formation of new societies; they were graded as to rank because a line had to be drawn between a society wholly of immigrant origin and one into which natives had already been admitted, and so on. Now, it is a well-known fact that religious societies such as those of Mota, whether they belong to other parts of Melanesia, to West Africa or to North America, are very commonly secret, multiple and ranked. No ground is found, in other places, to ascribe them to an immigrant people. Why, then, in Mota? The author is, indeed, aware of this circumstance. He admits the possibility of an alternative interpretation, but he rejects it in favor of his own, and proceeds with his argument (II., 213). Similarly, when discussing decorative art the author chooses to neglect the psychologically plausible and experientially verified tendency of designs to pass progressively from realistic forms to geometrical ones or of geometrical designs to become elaborated and often transformed through the addition of realistic appendages. For Dr. Rivers conventionalization is a factor "depending on the blending of peoples and of their cultures." By conventionalization he means "essentially a process by which a form of artistic expression introduced into a new home becomes modified through the influence of the conventions and long-established technique of the people among whom the new notions are introduced" (II., 383). The most striking instance of such procedure is perhaps the case of language, where the author ascribes the presence of the inclusive and exclusive plural to the necessity of differentiating between two classes of society. An inclusive and exclusive plural as well as dual occur, for instance, in quite a number of American Indian languages. In these instances Dr. Rivers himself would probably not find a sociological interpretation necessary. Why then so radical an assumption in the case of Melanesia, unless indeed it can be made something more than a mere assumption? An examination of several of the features used by the author as tests of his theory shows with great clearness how easy as well as futile it is to advance an interpretation of the facts through diffusion, unless proof can be furnished. We note a set of dual features: the sacred and the profane; higher and lower grades; chiefs and commoners; geometric and realistic designs; two communities with products to exchange; inclusive and exclusive plural; maternal and paternal descent; religion and magic. Now, it occurs at once that numerous instances could be cited where one or more of the

coupled traits coexist in the same community under conditions which preclude all possibility of ascribing one of the traits to an indigenous, the other to an immigrant culture. This being so, what justification is there for advancing such an interpretation in *any* case, unless the assumption can be supported by specific evidence? Obviously, the easier it is to explain a phenomenon in one of two ways, the more vigorous must be the proof if one of the two alternative explanations is selected.

After all, then, there is a close similarity between Rivers of the *Melanesian Society* and Graebner of *Die Melanesische Bogenkultur*. The former author takes special pains (II., 3, *seq.*) to assert his complete independence of Graebnerian method. That the author's position is in part justified, has been shown before. But in one respect the relationship of the two systems is unmistakable. Both authors utilize diffusion not as a process to be demonstrated but as one to be assumed for the purpose of hypothetical culture building. To be sure, what Rivers builds is altogether different from that which is built by Graebner, but the principles according to which the different parts of the structures are welded together are the same in either case.

Before closing it will be well to refer to Dr. Rivers's own definition of his method. We read:

> This method has been the formulation of a working hypothetical scheme to form a framework into which the facts are fitted, and the scheme is regarded as satisfactory only if the facts can thus be fitted so as to form a coherent whole, all parts of which are consistent with one another (II., 586).

The method, thus formulated, is, as a method of historical research, self-condemnatory. It may well be applied in the shaping of those hypothetical conceptual systems which are introduced by the theoreticians of the exact sciences for the purpose of providing a simplified description of the data of experience in a particular field. It does not matter how the vortex looks (or whether it looks at all), if only the functions of the ether can be readily derived from it. It may not be of importance whether the atom exists or not (with apologies to Lord Kelvin), but if it furthers a successful formulation of the facts of chemistry (a task in which of late it has conspicuously failed), its conceptual existence is vindicated. Not so in history. It has been said, with some truth, that for an understanding of society it is less important to know what has occurred than what may have occurred. But surely this does not apply to the study of history as such, nor to ethnology, in so far as its task is historical. Here the search is altogether for what has occurred, although the knowledge of what may have occurred can serve as a useful guide in the search. In the domain of ethnology, moreover, our knowledge of what has occurred will have to be increased many times before we can safely trust our intuitions as to what may have occurred.

To repeat, then, Dr. Rivers has labored fiercely against heavy odds, he has reopened an old and much trodden field; his work emphasizes once more the amazing cultural complexity of those southern seas; it is rich in subtle psychological analysis and happy formulation of theoretical principles; it also abounds in ingenious hypotheses of great *prima facie* plausibility. But we can not endorse this "history" as a model of ethnological method, for *a history* surely it is not.

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SPECIAL ARTICLES

LOBSTER MATING: A MEANS OF CONSERVING THE LOBSTER INDUSTRY

During the summer of 1914 the writer, working under the auspices of the Biological Board of Canada, attempted to rear lobster fry to the crawling stage, using the now familiar apparatus of the Rhode Island Commission. The site chosen for the repetition of the celebrated Wickford experiments was St. Mary's Bay, Digby Co., Nova Scotia. The attempt proved a complete failure due chiefly to the extreme cold water (50° F. to 60° F.) and to the extensive development of diatoms which soon closed up the mouth parts of the fry and caused an exceedingly high death rate.