

others, and the book gives information of no other place for getting them. The American novice, for example, would have no information concerning the excellent optical houses in his own country which supply exactly what is needed; and all worry about the British "methylated spirits" might easily be avoided by explaining that ordinary alcohol or "denatured" alcohol would answer equally well.

It would be so easy to adapt a fundamentally good book of this kind to the country where it is to be introduced that it seems incomprehensible why publishers are not more awake to the advantages of such adaptation.

These suggestions are made in the most friendly spirit, and with the hope that future editions will be made the most useful possible in the new environment; for certainly no one at all familiar with the subject could read these 86 delightful pages, so full of helpful suggestions to the beginner, and so full of enthusiasm for the beautiful world which the microscope reveals, without a feeling of gratitude to the author for making so plain the way into this new realm, for uncovering a road which has no end and which has new beauties for each advancing step.

S. H. G.

*The Polynesian Wanderings. Tracks of the Migration Deduced from an Examination of the Proto-Samoan Content of Efate and other Languages of Melanesia.* By WILLIAM CHURCHILL. The Carnegie Institution of Washington. 1911. Pp. 516, 2 maps.

The wanderings of the Polynesians have long been a fascinating crux in ethnology. The peopling of an inconceivably vast area sprinkled with islands appeals to our wonder more than the settling of continents, and from the time of the earliest explorers in the Pacific attempts have been made to hit upon some clew to the dissemination of oceanic peoples. It early appeared that language afforded the best means of tracing these movements and in the gross this index has been used since the time of Hale by students of the Pacific insular races.

Philology has made great strides both ma-

terially and scientifically in recent years, however, and Mr. Churchill is foremost among those who have applied the analysis of the content of a language to the solution of the historical problems connected with the migratory movements of peoples, his method in this case being to ascertain the percentage of Proto-Samoan loan words in the Melanesian languages over the area in question and to chart the lines of migrations of the Polynesians along the lines of greatest percentage. The method thus establishes a definite quantitative basis of language research, the results of which are very gratifying.

Mr. Churchill has shown by his percentage measure that the Proto-Samoans emerged from the East Indies, passed out into the Pacific, and with various Melanesian landfalls, reached Samoa, regarded as the primary distributing focus of Polynesians, thence by diverse routes, populating other islands, and in turn streaming from several foci, completing the population of the islands where we now find Polynesians. The earliest movement, according to Mr. Churchill, appears to have taken place about 1,500 years ago.

Among its other valuable qualifications the work is a remarkable analysis of an archaic language which Mr. Churchill hopes will supply the data for the genesis of speech. This, Mr. Churchill modestly puts forward as the feature of his monumental book which will give it a continued and wide influence.

The Carnegie Institution is to be congratulated on the publication.

Two maps accompany the work, the one showing the tracks of Polynesian migration and the other the migration tracks through Melanesia.

There are three appendices, one containing data and notes, two, the southern gateway, and three, a bibliography. An adequate index is supplied.

WALTER HOUGH

#### CHANGES IN THE GERMAN UNIVERSITIES

THE former student returning to Germany finds many changes. In the development of the new Germany from the old, much that was familiar has disappeared or has been replaced

by institutions of a different type. And although the universities have altered less than the nation at large, and the national culture, they too have felt the influence of the years. In particular, the distinction between the city and the country universities has become more marked with the surprising growth of the cities themselves. This holds especially of Berlin. The old university building there remains outwardly the same—one of the few reminders in the present capital of the city we used to know. Only the statues of Helmholtz, of Mommsen, and of Treitschke, by the entrance, suggest that earlier days, and the former giants, have departed. But in other respects there are many changes. The student body has enormously increased, numbering in the last winter semester, if the *Hörer* be included, more than ten thousand souls. And such numbers create new problems of themselves. Class-rooms and laboratories grow crowded: in the summer semester of this year the Philosophical Seminary at Berlin had thirty-five members and sixty-five *Zuhörer*—a *Publicum* almost in itself. And professors are borne down by the burden of their varied engagements, rather than by the pressure of their normal work. But even this army is swallowed up in the metropolis into which Berlin has grown. Did we a generation ago fill so small a place in the life of the city? Perhaps, in the pride of youth, we exaggerated our importance, but it seems hardly possible that we were so little in evidence as the students of to-day. In any case, it is certain that we found conditions then more easily adaptable to the needs of our academic life. The old Berlin student could live reasonably near the university; now, like his professors, he must seek residence remote from the costly center of the town. Not only the price of his lodgings, but his other expenses have increased. About him, also, he finds a more commercial environment, one less in harmony with the spirit of his work. The rush, the roar, the distractions, the temptations of the city force themselves upon his notice in new, it may be unpleasant, ways. In spite of “Amerika Houses” and the several lines of communica-

tion between the university and our own institutions, the student far from home encounters problems less familiar, and more grave, than those which his predecessors had to face.

Within the universities, on the other hand, the student of to-day enjoys comforts which our generation lacked. Throughout Germany progress has been made in adapting the conditions of study to the standards of the times. New *Collegien Häuser* have been erected, for example the fine academic center at Jena. Libraries have been built on modern lines, as at Freiburg i. Br. and Berlin. New seminaries, laboratories and clinics have been completed or projected—so just now in Heidelberg one sees the extensive plans for the enlargement of this phase of the university's equipment. And the older quarters have been improved somewhat into modern forms. The change is welcome, even if to our judgment incomplete. For nothing restores one's feeling of acquaintance so quickly as an hour's attendance at a university lecture. In the fine new buildings the rooms seem designed on the familiar lines, the benches and the desks remain, in shape at least, unchanged. As of yore, they cramp the listener's body as much as his mind is expanded by the wisdom which he hears.

The students who throng the precincts of the universities seem familiar, and yet altered. Their comparative youthfulness may be ascribed to a subjective, rather than an objective change. But in certain ways the students of the present generation give real occasion for surprise. They come late to lectures—at least we noticed it in Heidelberg and Berlin—as public sentiment would never have permitted them to do in earlier days. They discriminate in their note-taking, even to the point of shorthand abstracts, whereas it was part of the old dogmatic faith so far as possible to record every word which fell from the lecturer's lips. Strangest of all to the returning veteran is the presence of women. Co-education, at least in the east of the United States, is dying out, we told our German friends. “But why? Our experience is different,” came the answer—a reply which

corresponded to the evident facts of the case. Not only is the new arrangement established, it appears, as again the Germans themselves witness, to be working with success. Statistics show the attendance, winter semester, 1911-12, of about one woman for every twenty male students in the universities, taking Germany as a whole. Except that, between hours, you see not a few pairs wandering *friedlich mit einander*, the women, further, seem to be accepted on the same footing as the men, and to feel themselves so situated. If some lecturers have enlarged the traditional formula of address into *meine Herren und Damen*, others are more polite and greet the ladies first. The only doubt we heard expressed was whether a woman is fitted by her physique to meet the demands of the highest university education. The majority of the women students, we were told, are planning to become teachers or physicians. Will they be able through the years to support the strain?

One negative experience on a visit to several of the leading universities was unexpected, the failure to meet students of English speech, in particular students from our own country. In Berlin we did meet one or two young Englishmen as they came from lecture; and one American professor was *hospitant* like ourselves. In Munich we renewed delightful acquaintance with a former pupil working for an advanced degree. Of course, there must have been many others whose paths did not cross our own, and in the summer semester the number of Americans is normally smaller than in winter. But they seem relatively fewer than of old, and the records appear to bear out the observation. For the winter semester, 1911-12, out of 57,398 matriculates in all Germany, 338 is the total number assigned to *Amerika*, under which no doubt our countrymen formed the most considerable part. And if this be compared with the statistics of former years, it will be seen that the number of American students has increased but slowly.<sup>1</sup> The

<sup>1</sup>Beginning with the winter semester, 1904-05 (when first the statistics were given in the *Deutscher Universitäts-Kalender*) the record is as follows:

Semester	Matriculates	From America
Winter '04-'05 .....	39,719	295
Summer '05 .....	41,533	259
Winter '05-'06 .....	42,051	298
Summer '06 .....	44,964	274
Winter '06-'07 .....	45,136	302
Summer '07 .....	46,655	261
Winter '07-'08 .....	46,471	304
Summer '08 .....	47,799	252
Winter '08-'09 .....	48,717	333
Summer '09 .....	51,500	298
Winter '09-'10 .....	52,407	332
Summer '10 .....	54,393	298
Winter '10-'11 .....	54,823	398
Summer '11 .....	57,200	292
Winter '11-'12 .....	57,398	338

change gives ground at once for satisfaction and regret. That opportunities for advanced training at home have so developed that there is less relative need for foreign travel, is surely ground for satisfaction. If we are really losing, as appears to be the case, the enlargement which a generation or two ago came to many of our most promising younger scholars through their residence abroad, it is a loss which will make itself felt. In spite of the unquestioned value of German scholarship, it was not always that we learned as much as we had expected in the lecture rooms, or in the seminaries themselves. But many of us gained vastly more than we had hoped from our life in a foreign land and acquaintance with continental culture. Especially was this true of the students of the "humanities." The exact sciences derive less from environment and the "intellectual climate." But the historian, the economist, the sociologist, the philosopher, the theologian, even the student of literature, if he be more than a "philologist" of the drier type, is confronted by a dilemma. He remains provincial, or he must live himself into the thought of the world. This he will rarely do with full success unless he shall have shared in foreign culture by personal contact. And the foundations of his sympathy are best laid in his "post-graduate" years.

Of things American, on the contrary, and of American scholarship, much more is heard to-day than formerly. The system of "ex-

change-professors," "Amerika Houses," and the like is familiar. Even more noteworthy this spring was the attention given to the work of American scholars. At least, this was noticeable in the writer's department of philosophy. At Erlangen, Falckenberg had recently granted a doctorate based on the study of Dewey's pragmatism. In Heidelberg, Troeltsch, beginning his course on the philosophy of religion "for members of all faculties," was discussing pragmatism (as well as the work of the English anthropologists). In Jena, Eucken's "Uebungen" were based on Wobbermin's translation of James's "Varieties of Religious Experience." It would be too much to say that this interest in recent phases of our thinking always indicates agreement. One rather gathers the impression from German scholars that the pragmatic philosophy is not gaining, but losing ground. But it was an agreeable reminder that the scholars and the scholarship of the two nations have come into closer touch. Our indebtedness to the German universities is large. And for some time yet we will continue, if we are wise, to increase our obligations, accepting more than we attempt to give in return. But it was not unwelcome to discover that some beginning of repayment had been made.

A. C. ARMSTRONG

WESLEYAN UNIVERSITY

#### SPECIAL ARTICLES

##### ANOTHER VIEW OF SEX-LIMITED INHERITANCE

AMONG results which were obtained by the writer during several years of work in crossing blond ring-doves (*Turtur risorius*) with white ring-doves (*T. alba*), was sex-limited inheritance. When the male bird is white, *i. e.*, recessive, the offspring in  $F_1$  are about equally white or blond like one parent or the other, and the white birds are *all females*. By the reciprocal cross, all of the  $F_1$  offspring are blonds like the male parent.

The blond and the white ring-doves may be distinguished by a group of characters which behave apparently as a unit, so that a simple formula may be used to represent the situation. The white ring-dove differs from the

blond bird as follows: (1) melanin pigment is almost entirely absent in the feathers; (2) there is little of this pigment in the skin; and (3) the eyes contain extremely little melanin pigment except in the iris region. In other words, the dominant characters of the blond bird are represented in the white dove in an extremely dilute or very slightly developed form, but they are not entirely absent. Their appearance suggests strongly the idea that development has been arrested.

The late Professor Whitman obtained white females in  $F_1$ , when white male ring-doves were crossed with females of the very different species, *Turtur humilis*. This result is mentioned by Bateson.<sup>1</sup> A similar result has been described by Staples-Browne<sup>2</sup> for a cross between a male white ring-dove and females of another very different species, *Turtur turtur*.

A number of other cases as well as these have the common characteristic that recessive  $F_1$  offspring appear when the male parent is recessive, and these individuals are always females. Dominant characters are borne by the  $F_1$  males and sometimes by  $F_1$  females. Thus, two dominant females were obtained by Durham and Marryat<sup>3</sup> with canaries and two by the writer with ring-doves, in crossing recessive males with dominant females.

Cases of sex-limited inheritance which have occurred in animals, and especially with birds, have been interpreted by Spillman,<sup>4</sup> Bateson<sup>5</sup> and others with the following as-

<sup>1</sup> Bateson, "Mendel's Principles of Heredity," University Press, Cambridge, England, 1909, p. 194.

<sup>2</sup> Staples-Browne, "Second Report on the Inheritance of Color in Pigeons, together with an Account of some Experiments on the Crossing of certain Races of Doves, with special reference to Sex-limited Inheritance," *Jr. Genetics*, 1912, Vol. 2, No. 2, pp. 131-162, plates VI.-IX.

<sup>3</sup> Durham and Marryat, "Note on the Inheritance of Sex in Canaries," Report to the Evolution Committee, Roy. Soc., 1909, IV., pp. 57-60.

<sup>4</sup> Spillman, "Spurious Allelomorphism: Results of Recent Investigations," *Am. Nat.*, Vol. 42, 1909, pp. 610-615.

<sup>5</sup> Bateson, "Mendel's Principles of Heredity," University Press, Cambridge, England, 1909, 396 pages.