That useful and unuseful débris occurs normally in the body needs not, we take it, be defended, for the continual breaking down of some cellular elements of short life, the red blood corpuscles, for example, set free substances whose physical dimensions enable them to be engulfed by many of the cells which we have described (occurrence of blood pigment in liver, spleen, lymph glands and bone marrow) but that this reaction needs by no means be considered as one adapted for the engulfment of bodies of this class is proven conclusively by a number of observations made very recently by Ciaccio and others which go to show that fatty acids and lipoid substances are stored by the same cells. We are concerned then with cells of great physiological importance to the organism, cells whose action in this capacity, we believe, seems proven to be conditioned by physical and not chemical forces of response.

Herbert M. Evans,
Werner Schulemann

Comparative Registration Statistics[1]

One of the greatest difficulties encountered in the compilation of comparative university statistics is found in the apparent impossibility of securing uniformity. This difficulty is owing in large measure to two factors, one quantitative and the other qualitative. An illustration of the former is furnished by the fact that the student attending six weeks of summer session is recognized as a full unit, just as much as the student of an engineering school who annually puts in thirty-six hours a week for two half-years and several weeks in camp; and similarly a person engaged in secondary teaching who registers for a single late-afternoon or Saturday morning course counts as a full unit just as well as a candidate for the doctorate who spends his entire time at the university. Again, there are the students in so-called short courses, in agriculture, for example, who receive as much recognition as those who spend the entire year at the university. As a matter of fact, the most satisfactory solution along this line would be found in adopting a student-hour unit, but this, from the very nature of the case, would be an extremely complicated procedure. A simpler solution is reached by separating the summer session and short course students from those attending the entire year, and similarly by separating the full time from the partial time students. A difficulty would arise in connection with the point at which the line between these two groups is to be drawn, but this could readily be adjusted by agreement between the institutions involved. In this connection it might also be pointed out that owing to the fact that many secondary schools graduate classes in January as well as in June, several colleges and universities are admitting new students in February; they spend only half a year at the institution, but are counted as full units. On the other hand, the number of regular students enrolling for work in the summer session in order to reduce their time of residence or to make up conditions is constantly on the increase.

So far as the qualitative distinction is concerned, it must be borne in mind that the size of a university gives no more indication of its efficiency than the population of a country does of its degree of civilization, or the size of a city does of the morals and social welfare of its inhabitants. Comparative registration statistics, as they have been published by the writer from time to time in Science and elsewhere, have therefore little qualitative significance, inasmuch as such items as standards of admission and advancement, efficiency of instruction, equipment, and the like, are necessarily ignored in the comparison. So far as we are concerned in the present instance, standards of admission constitute perhaps the most significant item. No student should, in my opinion, be counted in the enrollment of a university, who has not offered graduation from a secondary school for admission. For-

[1] Paper presented at the annual meeting of the American Association of Collegiate Registrars, Richmond, Va., 1914.

tunately the admission requirements in this country, owing to the influence of the Carnegie Foundation, the Association of American Universities, the American Medical Association and similar organizations, are being rapidly increased all along the line, but courses are still offered at several universities in which high-school graduation is not demanded for admission. The students registered in such courses should be rigidly excluded in the university total, but it is not always an easy matter for the outsider to determine who these students are, and consequently our sole dependence lies in the cooperation of the reporting officers of the institution concerned. Of less importance, though not entirely without significance, is the difference that still exists in entrance requirements for the professional schools, several of which insist upon a bachelor's degree, while others are still satisfied with high school graduation. It would seem that a student in a medical school who holds a bachelor's degree would have greater qualitative value, other things being equal, than one who has entered the school directly from the high school. The adoption by so many institutions of the so-called Columbia or combined-course plan, in accordance with which six years are devoted to work for the bachelor's and the professional degrees, is bringing about a certain amount of uniformity in this direction. Yet even where college graduation is demanded for admission to the professional schools, and more particularly to the non-professional graduate schools (political science, philosophy, pure science), some difficulty is encountered, inasmuch as the bachelor's degrees of American colleges are unfortunately not of equal value, and for that reason a number of graduate schools do not accept graduation from certain specified colleges for admission. This is a matter which only time can remedy, and fortunately there are indications that the work of these inferior institutions is slowly but surely improving. Comparative statistics of the professional schools showing the percentage of college graduates enrolled in these schools are therefore of distinct value.

A word should be said concerning the inclusion of extension students in the grand total enrollment of a university. As a matter of fact, extension students are frequently, quantitatively as well as qualitatively, on a par with summer-session students. They are, in many instances, at several institutions in most instances, graduates of high schools following work of college or university grade given by regular officers of the institution concerned, and there seems to be no reason why an extension student registered for a graduate course in literature should not be counted in the university's total with as much justification as the high school teacher who is enrolled as a candidate for the master's degree but attending only a single Saturday morning course. On the other hand, extension students are from the very nature of the case practically all partial-time students, and for this and several other reasons it is safer perhaps to keep them in a category by themselves. Auditors in attendance on a six-hour lecture course should not be included at all, as they sometimes are.

Considerable difficulty is constantly experienced in prevailing upon reporting officers to eliminate the item of double registration. The ideal table of comparative registration statistics would simply ignore this item; where it is not ignored, an element of unfairness is at once introduced. The student should be considered primarily registered in one faculty only, and if he happens to be enrolled in a combined course, he should, for example, in his third and fourth years as a candidate for the bachelor's degree, which coincides with the first and second years of his candidacy for the medical or engineering degree, be counted either as a college student or as a medical or engineering school student, but not, as is frequently done, as both. The latter method unduly swells the size of the individual faculties of the institution. Similarly, the students at Columbia University enrolled as candidates for the master's or the doctor's degree and with the major subject in education should be included either in the faculty of philosophy or in Teachers College, but not in both. In

such cases a footnote can readily be added calling attention to the actual state of affairs. Where the enrollment at a summer session is included, the item of double registration giving the number of students in attendance on the summer session who returned for work in the fall is of course unavoidable.

So far as the individual tables of statistics prepared by the office of the registrar are concerned, I consider the geographical distribution figures as among the most valuable, especially in view of the fact that these are not prepared by the Commissioner of Education. In the preparation of these statistics it should be borne in mind that students are often inclined to enroll from the town or state in which the institution in question is located, instead of from their actual home. A distinction should be drawn, for example, between the Chinese student who spends four years in this country and returns to his native land, and the student from Germany who enters one of our professional schools and contemplates remaining in this country. Statistics of birth are also valuable, although rarely compiled. This applies also to statistics indicating the vocations of the students' fathers.

In connection with tables illustrating changes in enrollment covering a period of years, attention should also be called to the *percentage* of increase (or decrease), which is usually more valuable in connection with comparative statistics than a mere statement of growth in student units.

So far as tables illustrating specific items of registration are concerned, I would respectfully recommend the suggestive tables and diagrams included in the recently published annual report of the registrar of the University of Illinois, which possess the merit of simplicity and clearness.

In my opinion the wide distribution of university statistics is just as valuable as the dissemination of statistical material compiled by the census office, only it must always be borne in mind that in connection with an educational institution size is by no means a primary consideration. Entirely as much fault may be found with an overgrown department, school or university, as with an overgrown boy, city or potato. It is always necessary, in the case of comparative figures, to read between the lines, although there is no doubt of the fact that not infrequently the large enrollment in a particular school is due to the well-deserved reputation which this school enjoys, as witness the Harvard Law School, the Johns Hopkins Medical School and the Columbia Graduate School. Any attempt, however, especially on the part of overzealous alumni, to overemphasize size at the expense of efficiency, should be deplored. In this connection the following paragraph in the last annual report of President Butler will be of interest:

> The popular mind is easily impressed with size, and particularly with large numbers. The fact that Columbia University has under its influence and instruction many thousands of students is annually heralded in the public press as entitling it to claim precedence over other institutions at home or abroad. Within the university itself no such feeling prevails. The growth in numbers so marked in recent years, is, of course, gratifying in so far as it indicates that the curriculum, the equipment, and particularly the teachers and investigators of Columbia are sought on their own account. But we deplore growth in numbers unless it were accompanied by a steady increase in the quality of the students. . . . What should concern us is the quality, the character and the homogeneity of the several units of which the total is composed.

Rudolf Tombo, Jr.
Columbia University

Arthur Henry Pierce

Arthur Henry Pierce, for fourteen years professor of psychology at Smith College, died of pneumonia, after a brief illness, on February 20, at Northampton, Mass. He was born in Westboro, Mass., July 30, 1867. He graduated at Amherst in 1888 and for two years thereafter taught mathematics in the college. His post-graduate studies in psychology were pursued at Harvard, where he received the master's degree in 1892 and the doctor's degree in 1899, and at the universities of Berlin, Strassburg and Paris, which he frequented in the years 1894–1897. He was the first holder