of the leucocytes, in great numbers, in the adenoid tissue during digestion; and, also, to certain proofs of the ability of the leucocytes to combine with peptones in a loose form of combination.

The similarity of these two functions of the colorless corpuscles, as determined by Hofmeister for peptones, and by Zawarykin for fats, cannot fail to suggest the probability of a very definite and important function of these corpuscles in general nutrition. Possibly, also, the anomalies observed in the absorption of saccharine food, and in the glycogenic functions of liver and muscles, may in time receive some explanation through the functions of the colorless corpuscles.

It seems as if we were, at last, beginning to obtain an idea of the functions performed by these important cells, whose close connection with the life of the organization has been generally recognized, though but vaguely understood. J. M. S.

HUMAN PROPORTION.

Human proportion in art and anthropometry: a lecture delivered at the National museum, Washington, D.C. By Robert Fletcher, M. R. C. S. E. Cambridge, *King*, 1883. 37 p. illustr. 8°.

From the earliest ages, man has found his standards of measurement most conveniently in some bodily measure, like the digit, the palm, the span, the foot, or the cubit. As these measures necessarily vary with the size of the individual, the attempt to ascertain their average led to the first systematic measurements of the human body: hence have sprung the innumerable schemes of human proportion devised by artists and anatomists, all founded on the belief that some one part of the body was a standard of measurement for all its other dimensions. The Egyptians first developed a canon of proportion as early as the thirty-fifth century B.C., which was twice subsequently changed. Their last canon adopted the length of the middle finger as the standard, reckoning it precisely one-nineteenth of the entire stature. But in the 'canon of Polykleitos,' the famous sculptor who flourished about 450 B.C., was embodied the highest rule of Greek art in its most flourishing period. This has fortunately been preserved in a well-known passage of Vitruvius, and is illustrated by a recently discovered drawing by Lionardo da Vinci. The restless spirit of modern life has not remained content with this, as more than a hundred different attempts bear witness by men of all nations, including the celebrated English sculptor Gibson and our own Story. All these methods have been based upon the theory that there is a fixed relation between some one portion of the body and all its other dimensions; and their number proves the fallacy of the idea. Anthropometry, on the other hand, measures with the strictest scientific accuracy the living man, and from an immense mass of measurements obtains the mean of the human form, and thus arrives at the perfect human type. The father of this science is the Belgian Quetelet, and the enormous number of measurements rendered necessary by the draft during our civil war have greatly advanced it. By its tests many a time-honored dogma bearing upon human proportion has been exploded. Thus it has been proved that the length of the outstretched arms is somewhat greater than, and not exactly equal to, the height of the body; that not eight, but seven and a half heads make up the entire stature; and that only in the negro skeleton can be found the length of humerus bestowed upon the Apollo Belvedere.

All these matters the author has illustrated with great learning and in a clear and animated style. We have noticed, however, that his knowledge of archeology is sometimes at fault, — as where he calls the '*crux ansata*' in the hand of the Egyptian standard figure 'a key,' which is really a cross with a loop or handle attached to it, and is the symbol of eternity; or suggests that the 'golden fleece' was in reality 'the secret of Egyptian art;' or states that the Doryphoros of Polykleitos was 'a beautiful youth in the act of throwing a spear,' instead of its being one of the 'spear-bearers,' the body-guard of the Persian king. The most marvellous statement, however, is, that "prior to the time of Phidias, the face, hands, feet, or other exposed parts of the body were carved in marble, and fastened to a wooden block, which was covered with real drapery." This is a complete misunderstanding of the nature of the archaic ξόανα, or wooden statues, which in Greece preceded those made of stone or metal.

WARE'S MODERN PERSPECTIVE.

Modern perspective: a treatise upon the principles and practice of plane and cylindrical perspective. By William R. Ware, Professor of architecture in the School of mines, Columbia college. Boston, *James R. Osgood & Co.*, 1883. 321 p. 12°.

Professor Ware's Modern perspective is in substance a series of papers printed two or three years ago in the *American architect*, but with additions which extend its range, and give it more the scope of a scientific treatise. Scientific it is, both in its idea and its methods; though its treatment is naturally freer than would be given it for scientific uses alone, — freer, perhaps, than the author would have given if it had originally been written as a formal

treatise. The purely geometrical method comes out most clearly in the chapters added in the revision, particularly in two (xvii., xviii.), in which, after going over the ground of practical perspective, Professor Ware sums up, first the principles and relations, and then the chief problems, in the most abstract and generalized form. This portion is, therefore, scientifically the essence of the book, and is that which a reader versed in pure mathematics, but unacquainted with perspective, might properly read first. Such a reader would find pleasure in its neatness and comprehensiveness of statement, and in the skilful way in which the whole subject is cast in condensed and logical form; every phenomenon or process being first presented in its most general aspect, — against the usual habit of books on perspective, — and particular cases deduced from it afterwards. These chapters make a sort of inner treatise, whose appeal will be to the geometer and the special student. They are probably too abstract and too concise to be acceptable to the ordinary student, and he may be left to skip them.

The methods of the book are naturally those of descriptive geometry. We could wish Professor Ware had held to the received terminology when he names the perspective of the vanishing-line of a plane its 'trace,' and diverts the word from its received sense as the intersection of the plane with the plane of projection. What in descriptive geometry is called the trace, Mr. Ware calls the 'initial line' of the plane: the point where a line pierces the picture-plane, which might by proper analogy be called the *trace* of the line, he calls its 'initial point.' The use of 'horizon' for the actual vanishing-line of any system of planes is happier. The subscript notation employed is the author's own, and is cleverly contrived to suit the manner of his exposition. It contains in itself a symmetrical record of the principal data and relations, and its neatness and efficiency make one the more regret that the author has not cared to follow an accepted terminology where there is one.

The phenomena of planes in perspective are first discussed, according to the author's uniformly analytical method: first oblique planes, then parallel and normal. So much of the perspective phenomena of lines is accounted for by treating them as intersections of planes, that their separate consideration is much shortened by anticipation; and by the time the point is reached, its discussion is reduced to a minimum. In like manner, instead of confining the discussion of points of distance, as is common, to points in the horizon-line, or the prime vertical, the most general case is first considered, and the circular locus of all the points of distance of a given line is determined. We miss the categorical statement, — implied, to be sure, but worth making distinctly, — that the points of distance are the same for all parallel lines; as in another place it is apparently taken to go without saying, that the vanishing-point of a line, or the vanishing-line of a plane, is enough to determine problems relating to its direction, even when its position is unknown. The chapter of abstract problems presents pretty much all the problems of descriptive geometry, so far as concerns planes and right lines, applied in perspective, and therefore covers, except for a few special cases, all the elements of perspective practice. Here, again, generalization and condensation are carried very far: some, indeed, of the problems in which many alternatives are grouped together are perhaps too succinct and comprehensive to be satisfying to the student.

The same method and quality are found in the other chapters of the book, so far as suits with its practical purpose. Thus parallel perspective, usually taken first, is postponed, and treated as a special case. There is throughout a watchful eye to the needs of the architectural draughtsman and the painter. The work is made interesting by observation of natural and pictorial phenomena, many of which are, so far as we know, new to the books. Some special topics which are taken up in the advanced treatises are here hardly mentioned, — the perspective of curved surfaces and of solids of revolution, for instance; even vaulting being left untouched, and the problems not going beyond plane figures and solids with plane faces. But within its limits, the discussion is very complete; and some subjects are enlarged upon which it is usual to dismiss with slight mention, — the perspective of reflections, and of shadows by both parallel and divergent light, and especially the chapters on the perspective of the circle, and on perspective distortions and corrections. The method of the perspective plan is made much of, as it deserves; and some space is given to M. Adhémar's ingenious devices for avoiding remote vanishing-points, and carrying on all the operations on a small sheet by means of what Mr. Ware calls 'small-scale data,' — points of fractional distance, scales of depth, marginal co-ordinates, and the like, — a method which is much less known than it deserves to be. Mr. Ware adds an ingenious alternative for M. Adhémar's device of enlarging the remote parts of the perspective

plan by planes of successively steeper inclination.

The plates which accompany the book are as thoughtfully and ingeniously composed as the text. We commend the whole treatise as the most complete, so far as we know, and the most interesting and instructive for practical use, that has been published in this country.

SEEBOHM'S VILLAGE COMMUNITY.

The English village community, examined in its relations to the manorial and tribal systems, and to the common or open field system of husbandry: an essay in economic history. By Frederic Seebohm. London, *Longmans, Green, & Co.*, 1883. 464 p., 13 maps and plates. 8°.

It is now many years since G. L. von Maurer wrote his Introduction to the history of marks and manors. Since then the subject has attracted many students, and has been much looked into and talked about. Many books have been written upon it; those of Nasse, de Laveleye, and Maine being the best known to American readers. The impression conveyed by these writings is, that the mark or village community, though almost always found upon a manor, under manorial overlordship, was in its origin independent. Manorial overlordship arose, we are told, in later times. The village community was drawn under it, and became subject to it. It has been the work of modern times to restore it to its ancient independence. This is the theory of von Maurer and his followers, which we have gathered from their books. Objections to this theory are from time to time raised. It is urged that the village community is usually found under manorial landlordship; that it is, therefore, an open question whether the village community, or the landlordship over it, is the earlier institution. In Mr. Seebohm's book, which now lies before us, it is maintained that landlordship is more ancient than the village community, that the village community arose under landlordship, as a community of slaves or serfs, that it has been slowly emancipated from slavery and from serfdom in the course of centuries. Our economic history, we are told, begins with the serfdom of the masses under manorial landlordship. Looking through the records, back to the earliest period, we find no free village communities, only manors with village communities in villenage upon them. The argument upon this point is almost conclusive. The existence of a manorial system during the Saxon period of our history is established beyond doubt.

But there were parts of Britain which were not manorial, where village communities (the village community being considered a part of the manor) did not exist. What was there in the parts of Britain where there were no manors? By the side of the manorial system was a tribal system more ancient, perhaps, than the manorial system. Then follows an account of the tribal system of the Welsh and Irish, which is extremely interesting. It is not clear at first, why, in a work upon English economic history, so much space should be given to the institutions of the Welsh and Irish; but we find out directly: it is that we may the more clearly understand the statements of Caesar and Tacitus regarding the Germans. It is well known that the statements of Caesar and Tacitus are very vague; that they become intelligible only in the light of extraneous evidence. We ourselves should not have presumed to draw this evidence from the Welsh laws, nor from the Brehon tracts. It has always seemed to us best to keep the records of different peoples quite distinct. We should, therefore, have turned from Caesar and Tacitus to the German folk-laws, formulae, and documents. The tribal system of the Germans is very well described in the German records. It happens, however, that the tribal system of the Germans resembles very closely that of the Welsh and Irish: so, though we do not follow all the steps of Mr. Seebohm's argument, we come, at last, to very nearly the same conclusion. What we have in the time of Caesar and Tacitus, and afterwards in many places where the manorial system has not been developed, are tribal households (to use Mr. Seebohm's phrase), — isolated farmsteads, occupied by groups of descendants and heirs; the land being held by them as an undivided inheritance for two or three generations, and then divided, several households arising where there was but one before. Mr. Seebohm finds a vestige of this system in the custom of Gavelkind in Kent, where we have divisions among male heirs, with traces of the right of the youngest to the original homestead. Almost everywhere else in England the tribal system has quite passed away.

Already, however, in the time of Tacitus, the manorial system was germinating. The free tribesmen who lived in the tribal households here and there — *ut fons ut campus ut nemus placuit* — had slaves who cultivated the land for them. These slaves were distributed by the tribesmen in village communities, in regard to which they were very much in the position of the later manorial