

Somatometry—A Second Look

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It is a great honour to be elected President of this Association; and I am deeply appreciative of it.

The circumstances in which I have come to be elected are rare but not unprecedented; I cannot let this occasion pass without adding my personal tribute to the memory of Walter Maclay, in whose place I stand so fortuitously today, to the collective expressions of sorrow and appreciation in which we have all already joined. His realistic grasp of the broad sweep of evolving psychiatric services, his ability to see the simple issues underlying apparently complex affairs, his directness, tact and tolerance and above all his warm friendly humanitarianism got through to us all. We have suffered a grievous loss in our strivings and in our friendships.

INTRODUCTION

A Presidential Address is traditionally one that encompasses a general, philosophical, historical or administrative topic. It is unusual to invest it with a clinical or scientific mantle, possibly for the reason that one is not obliged to submit one's observations to the test of discussion. By the title that I have chosen for this Address I do not mean to suggest that I intend to introduce anything that has not already been subjected to critical examination elsewhere. Rather is it my purpose to invite you to look again at some scientific work, the crude gist of which is widely known, to offer some observations which I hope may help towards refining some of the knowledge of it that we already have, and to suggest to you how we might more fruitfully deploy it in the

clinical and research fields. I refer to the use of physical anthropometry in psychiatry.

For the past four years it has been my duty from time to time to try to assess the amount of learning that has been acquired by defenceless young men and women who have aspirations towards obtaining a certain diploma that is still widely sought in furtherance of a career in psychiatry; of them I imply no criticism whatever in any of my subsequent remarks. But, since my turn of duty has now ended, I trust that I may, without any impropriety, draw in a general way on my experiences to give point to my reasons for asking you to take a second look at somatometry.

It is easy to slip into the unwarranted assumption that what is quite clear in one's own mind as a result of working on a particular subject is equally clear in the minds of those who have only read about it. For this reason one tends, in the interests of fairness, not to probe too deeply with one's questions into subjects in which one has a special practical interest. The answers that I have had to quite elementary questions, however, about the relationship between physique and personality, though they revealed an adequate knowledge of early theories and findings in this field, have shown that the changes in concepts, techniques and clinical applications which have evolved since the 1930s and 1940s are less widely known and less clearly understood than they might be.

Nearly all the candidates whom I questioned knew about Kretschmer's (1936) work, many knew about that of Sheldon and his colleagues (1940, 1942), few knew about Parnell's work (1958); and it was strangely uncommon to



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encounter anyone who knew about the Rees-Eysenck body build index (1945) or Tanner's androgyny scale (1951), considering the extent to which information about these has been published in easily accessible journals widely circulated in this country.

What struck me most forcibly, however, was the widespread impression that Kretschmer, Sheldon and Parnell were all saying much the same thing, but merely using different words to describe it.

When I ventured rather diffidently to sound some of my contemporaries and other colleagues, who did not happen to have a special interest in this subject, I found that a similar impression was prevalent. The extent to which workers in this field have moved away from the older "type" concepts, and from the relatively simple idea of an association between physique and diagnosis, towards the concept of measurement of graded characteristics and the relationship between the relative preponderance of these and the onset and course of illness, whatever its form, has not, I think, been fully appreciated. I propose, therefore, to outline briefly the changing pattern of these studies and their clinical implications.

EVOLVING TECHNIQUES AND PRINCIPLES

Kretschmer was concerned primarily with physique and form of mental illness; he relied heavily on clinical impression and skeletal measurements; and he was much taken with the idea of "types".

Sheldon was interested primarily in physique and temperament in healthy subjects; he relied considerably on visual impression which he quantified from photographs of his subjects, taken under standard conditions, and by measurement. He took the soft tissues as well as the bones into account, and he moved away from the idea of rigid types by devising a seven-point rating-scale for each of three graded physical characteristics. In this way the varied proportions of these characteristics in the build of one man could be compared with those of another, as well as with standard scales of reference; and there was no need either to force an individual into an arbitrary category or to

be content with describing his build as indeterminate. Sheldon, in fact, was beginning to find a way of answering the question "to what extent has this man got the physical attributes of what Kretschmer would call a pyknic type, to what extent those of an asthenic or athletic type?"

Sheldon used the word "somatotyping" to denote his technique and the word "somatotype" to denote the respective proportions of the physical characteristics that it estimated. But this seems to perpetuate the idea of "types" and the word "type" has come to be equated with "category" or "class", which in turn implies a sharpness of demarcation that, in nature, does not exist. His well-known codifying of his findings as a three-numeral index makes it clear, however, that this was not his intention. Sheldon was careful to explain that by "somatotype" he meant the best estimate, on available evidence, of what the morphogenotype is believed to be; and by "morphogenotype" he meant the structural genotype of the individual, which has its own natural history throughout life and is assumed to exist because of the persistence of structural individuality—in short, because like begets like.

Sheldon's concepts were, therefore, dynamic; but you might think that his choice of words was in some respects imperfect if not, at least to the less diligent student of his work, misleading in some of its theoretical implications.

Parnell, using English instead of Greek terms to describe the physical attributes of his subjects, relied on physical measurements of the body, not photoscopic estimates, though he used these for comparative and confirmatory purposes. He was concerned with the "here and now" of measurements which, like Sheldon's somatotypes, indicated the shapes of his subjects. He called his technique "somatometry". It consisted of taking three measurements of subcutaneous fat, two of bone-width, two of limb-girth, and height and weight. From the two last-named measurements he derived a ponderal index (height in inches divided by the cube-root of the weight in pounds) to denote a characteristic which he called "linearity". Thus the outcome of these measurements was to show the relative preponderance of *fat*, *muscularity* (including bone measurements) and *linearity*.

These three characteristics are akin to, but not identical with, those which Sheldon called "endomorph", "mesomorph" and "ectomorph" respectively. A seven-point standard scale may be constructed for each characteristic and the relative preponderance of each of them expressed as a three-numeral index, just as in Sheldon's somatotyping. Parnell referred to the characteristics that he measured as constituting a "phenotype"—not a somatotype—to make clear that he was describing only what he could see and measure, without any theoretical implications or inference behind it. But cautious inferences may be made from such measurements, provided that one takes into account the state of health, the recent nutritional and exercise history, and if possible the past weight history of the individual concerned.

Parnell's phenotypes may be crudely indicated by letters which stand for the two most dominant characteristics. Thus, a man of muscular build whose next best developed characteristic is fat might be designated Mf; but precise numerical assessment is more informative.

I hesitate to suggest adding yet another new word to our overburdened vocabulary; but I am trying to clarify and simplify our means of communication on this subject; and if a new word would get rid of the confusing implications that have come to surround the word "type" it might be justifiable. Since "somatotype" and "phenotype" refer to an index of the *shape* of the body, might we not instead denote this by the word "*morphogram*"? Thus in practice we might convey what we mean by saying, for example, that an individual is of muscular-fat (Mf) build and his morphogram is, say, 362. The letters indicate the pattern of his build, or shape; and the numerals quantify it.

Be that as it may, I submit that one of Parnell's (1962) most novel and important contributions, so far, has been to emphasize that while there is a frequent, though inconstant relationship between physique, personality and form of mental illness, there is an even closer relationship between physique on the one hand and response to treatment and outcome of illness on the other; and this, in the series of patients so far reported, is remarkably constant.

This finding, if confirmed, introduces a new conception into our studies of physique. We may have been barking up the wrong—or at least less fruitful—tree in supposing that the value of these studies is primarily linked with causation or diagnosis. It is possible that the main thing that is reflected in physique is the potential reactivity, the responsiveness and the viability of the individual when he is assailed by stress, be it physical, psychological or social, or by the onset of a formal illness, however caused.

EXTENSIVE RESEARCH: TARDY APPLICATION

I have picked out the works of Kretschmer, Sheldon and Parnell respectively, because these seem to me to be significant milestones in the evolution of our studies of physique. But there are many other workers and many intriguing findings in this field. The literature on the subject of physique and mental disorder is indeed vast. It has been comprehensively reviewed and compendiously annotated by Linford Rees (1960) in his highly informative chapter in Eysenck's *Abnormal Psychology* and I need not attempt to go into it in wider detail here. But surprisingly little of this material has found its way into general text-books of psychiatry. One or two of the better known large text-books in this country do summarize accurately the main positive findings and evolving principles to date and give an indication of trends for future development. But there are others which are less inclusive and more cursory. I quote from one of them, admittedly a more elementary text-book, published in 1964: "On the whole, all one can say about body build and insanity is that the thick-set are more often found among manic-depressives and the thin and ill-thriven among schizophrenics; but there is a marked overlap."

This may be all that the beginner need be told, but it is by no means all that there is to be said. If it were so, there would be little point in pursuing our studies of this topic; and one could side with those who would drop it because, they say, they cannot see how it is going to get us anywhere. Perhaps this coolness springs in part from the excessive theoretical disputations that have surrounded the methodology of the subject

in recent years, in part from over-sanguine early expectations, if not actual claims, about the relationship between physique and traits of character, and in part from objections that might be raised (though in fact they seldom are) to being photographed in the nude. This last objection does not apply to Parnell's somatometry, which is a quick and simple technique readily carried out in the course of ordinary physical examination, and certainly entailing no added embarrassment.

ILLUSTRATIVE CLINICAL APPLICATIONS

When somatometry was originally applied for research purposes, it was chiefly to show trends in groups of individuals, and it was not claimed that reliance could be placed on its results when applied to a particular individual in the same way, for instance, as one could rely on an individual I.Q. But in my experience it has turned out to be capable of giving information that is helpful in the practical management of many individual patients. I was fortunate in witnessing, over a period of twelve years in daily association with Parnell, the clinical application of somatometry to my own patients. May I give some illustrative examples? In doing so, I am eclectic; and although I regard Parnell's somatometry as a sheet-anchor, I am prepared to take into account any other techniques or supplementary procedures which are clinically useful.

Most of us have seen lanky manic-depressives and fat schizophrenics, as well as muscular subjects suffering from each of these illnesses, who give the lie to any hard and fast relationship between diagnosis and physique, though that is not to deny a frequent relationship which may be an influential but cannot be an indispensable causal one. What is less well recognized is that, within these diagnostic groups respectively, lanky patients of poor musculature take longer to get well than plump subjects of good musculature; and this relationship is directly proportional.

Aside from formal illness, somatometry can provide a useful guide to prognosis in biological adaptation. It is helpful in assessing, for instance, the degree of toughness or the vulnerability to stress in young adults, such as students, going

through a difficult phase of life under high academic or other career-wise pressures. If such a man, though he may have a first-class intellect, has a weedy physique, most poorly developed in respect of bone and muscle (*mesopenia*) he is less likely to stay the course and more likely to come to grief if he tries to do so (though a calculated risk may be advised) than is a possibly less highly intellectual man who has average or nearly average bone and muscle development, especially if fat, not linearity, is his next most dominant physical characteristic.

If to an evaluation of the three main components in physique one adds information derived from Tanner's androgyny scale (a measure of the ratio of the widths of shoulders and hips) prognosis may be made with greater confidence still, though I do not, of course, suggest that other factors in prognosis should be disregarded. Thus one feels less pessimistic about a lanky mesopene if his position on the androgyny scale is close to the mean for men than one does if it is, say, two standard deviations towards the feminine side and is approaching the mean for women, making due allowance for the general pattern of his build. A man whose position on the androgyny scale is markedly towards the feminine side may never have shown any overt homosexual interests and there may be no clinical indication for going deeply into his psychosexuality. But this position may be, and in my view frequently is, an index of inherent proclivities which add to his difficulties of social adjustment; and many of his peculiarities may fall into an intelligible pattern if it is tentatively assumed that he has more than the average man's share of femininity in his make-up.

Another illustration, relevant to personality reactions, is seen in the case of the somewhat muscular woman, much given to wearing the trousers, who although apparently fulfilling the role of a wife and mother is in some ways ill-equipped to do so; and marital problems happen gradually to have become apparent. If such a woman has a position on the androgyny scale that is nearer to the mean for men than to the mean for women, with due allowance for the general pattern of her build, anyone who

accepts her for psychotherapy is likely to be in for a very long commitment indeed.

Apart from their value in prognosis, physical measurements provide information that is relevant to management. For example, the adolescent schoolboy who has difficulty in getting on easily with others and in asserting himself and is becoming more bookish and solitary than is good for him, is frequently told that he should take a more active interest in games or go for a three-mile run two or three times a week. Most of us have seen patients like this showing a kind of sensitivity reaction, with feelings of failure, heightened self-consciousness, ideas of reference and psychosexual problems; it may or may not be a prodrome to formal illness. It is worse than useless to exhort such a boy towards athletic performance, especially in the competitive atmosphere of a school where games have high prestige value, if he simply has not got the amount of bone and muscle needed to do at least moderately well in it. All that happens in such a case is that the unfortunate youth may force himself, or be forced, to attempt something in which he has no chance whatever of keeping up with others; and so, inevitably, his sense of failure and of being odd man out is enhanced, and he is driven further towards esoteric solitary pursuits or even into formal illness if he has the seeds of it within him. Some other way of dealing with such a boy must be found, even if it means considerable changes in the lines on which he is being educated.

You might think that the clinical applications I have outlined would by themselves justify a more widespread use of somatometry. There are several others, though I do not intend to expound them here, for my aim is to stimulate interest in this subject rather than to review it comprehensively. For example, it is important to discriminate between the preponderance of fat or muscle in the middle-aged, overweight, hypertensive depressive or alcoholic, in relation to his treatment, especially that part of it that aims at reduction of weight. Such considerations lead us towards possible practical applications in the field of internal medicine as well as in psychiatry; and there is already some evidence suggesting that it may be of value there too. The important principle that emerges is that if

we are to implement the aphorism that we should look at the *whole man*, surely we should look at his physical constitution as well as at his personality and the physical signs and symptoms of any disease from which he may be suffering; and if we take the trouble to measure what we see we can have little to lose and may have much to gain.

FURTHER RESEARCHES

While I plead for more widespread practical use of somatometry in everyday clinical work, I am aware that we are only beginning to see its potential usefulness. I make no sweeping claims for it, nor do I suggest that it is any kind of panacea capable of useful practical application in every case. If the measurements of a man's physical constitution all lie close to the mean, we do not expect its influence to be prepotent, though it is useful to have this information, in the same way as it is useful to know, for example, that an I.Q. lies within average range. But if one or more of such measurements is far from the mean—perhaps as much as two or three standard deviations—then the degree of deviation may be taken to indicate the strength or weakness of certain proclivities which may with advantage be taken into account in the management and treatment, and may have a powerful effect on the course and outcome, of a formal illness or a personality reaction. Much more research is needed. What forms might it take?

Normals

First and foremost we need more information about healthy people. Sampling by sex and age groups is an obvious relatively short-term project. It might be undertaken with the help of industrial medical officers and those in charge of accident wards. We also need cohort studies which will give us a follow-through at progressively increasing ages, though this is a much longer-term project, and might be very difficult to organize. Members of the Services or Public Services and their families might possibly provide some, though not fully representative, material. But any information on these lines is better than none.

Prospective Surveys and Possible Prophylaxis

If we could persuade Local Education Authorities to have their school-leavers measured, and if these measurements could be included on their medical cards—after all it is only a 3-numeral index which cannot mean anything to an uninformed person and cannot possibly give offence or cause embarrassment—then eventually we should be able to compare physical measurements with liability to various illnesses. If, as there are already grounds for believing, physical measurements prove to be an index of vulnerability, then something might be done in the social field to protect, or at least offer special help to, those of a subsequent generation whose physical measurements are known to bespeak vulnerability. This is, I know, a very long-term project; but it would not, by comparison with some other research projects, be a very costly one. We are as much in need of tact, patience and doggedness as we are in need of money to carry it out; but its benefits might be very great.

Other Research Possibilities

Genetics and family studies are obvious areas in which somatometry may have much to contribute. Meanwhile the method itself continues to need critical scrutiny, research, and possibly modification in the light of experience. There are many possible lesser research projects using somatometry, such as one I have indicated in relation to excessive weight, which could be carried on as operational researches at relatively

small cost. But we shall not get far with any researches until the techniques of somatometry are more widely known and used by clinicians in everyday practice. I know there are some places where demands for service are so great in relation to available staff that there is not the time to take on anything new. But if even a few centres would record measurements regularly they could make a worthwhile contribution to the further collection of data and the confirmation or modification of work already published. The figures involved in somatometry are easily gleaned, and, once its principles are grasped, easily interpreted; it can hardly be denied that, with further research and exploitation, these figures may yet merit inclusion in what may properly be called vital statistics.

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