Then preventive and social medicine will pervade medical training and practice as did bacteriology, serology, and immunology when I was a medical student more than fifty years ago. However, bacteriology was not as foreign to men trained in laboratory methods and the use of the microscope as are the social sciences and social work to those who never approached these fields.

There are other difficulties—the crowded curriculum, the natural resistance of men and institutions to any change, and the trouble and expense connected with a fundamental move.

But we do not want to make the curriculum still heavier : what we ask for is a broader point of view in the existing lectures rather than additional courses. Besides, there remains from former schemes of training much that is out of date and could be abridged or omitted. Specialization also should be curbed in the student's programme. It is impossible to teach everything in a limited number of years. We can give the background, the method, the example, the essentials of medical science and practice : above all, we must try to cultivate the spirit of scientific observation and the spirit of service ; the rest will have to be acquired by and by.

The lack of medical personnel trained in the social sciences will gradually be overcome. Facilities have been given in this direction by the Rockefeller and other American Foundations, the Nuffield Provincial Hospitals Trust, and W.H.O. The chairs recently created in various countries—whether called chairs of social medicine, or preventive medicine, or human ecology as in Cambridge—will breed a new staff and spread a new spirit.

Besides these general points, there are others of special interest, among them the place of occupational health in medicine. This deals with a specialized field ; it has developed its own methods in occupational physiology, pathology, and psychology ; and has grown to a full-sized science with its own associations, periodicals, and congresses.

Other fields, such as epidemiology, demography and vital statistics, genetics, nutrition, and housing, are allotted by some to public health, by others to preventive and social medicine.

To what extent can the student health service be used in medical education ? Experience shows great differences, according to the amount of discretion which national psychology demands in personal matters. Fruitful developments may nevertheless be expected in this direction.

Pioneers of Social Medicine

The term "social medicine" was coined in 1848 by Dr. Jules Guérin, of Paris. The teaching of social medicine began in 1902 with a few extracurricular lessons given at the Berlin Medical School by Professor Martin Kirchner. The first fully fledged professors of social medicine were Edoardo Bonardi in Milan (1908), Johan Marcus Baart de la Faille in Utrecht (1918), and Alfred Grotjahn in Berlin (1920), who had taught the subject, as lecturer, since 1912. Giuseppe Tropeano, in Naples, began his optional lessons in 1910. At Nancy, when taking his chair (1920), Jacques Parisot had it styled "chair of hygiene and social medicine." In the New World, the first department of preventive medicine was created at Harvard University in 1909.

Contributions to preventive and social medicine have come from various fields : the social sciences and social work, forensic medicine, public health, and clinical medicine. These various approaches have led some professors of forensic medicine, in France especially, to teach also preventive and social medicine ; professors of public health have done the same in various countries ; clinicians are increasingly following this example. The merits of these various schemes will be weighed against those of an autonomous chair of preventive and social medicine. That these disciplines should be included in the medical curriculum no one, I think, will deny.

PHYSIQUE AND CHOICE OF FACULTY

BY

R. W. PARNELL, D.M., M.R.C.P.

Nuffield Research Physician in the Constitutional Aspects of Psychiatric Medicine, the Warneford Hospital, Oxford

In the report of the 1951 Conference of Home Universities the Vice-Chancellor of Leeds, Mr. C. R. Morris, is quoted as saying : "There is no question that, in the main medical schools, the bottom candidates are very far indeed below the bottom candidates in the special schools of, say, physics and chemistry. They are, in fact, a different order of being academically. . . . I think that these people who are very low academically may be extremely good candidates for the medical profession. I hope you will not take that as a joke, because it may very well be true. Some very good doctors with long experience think that some of these people will fill, say, 40 or 50% of the medical profession with better advantage to the nation than others with very high academic qualifications."

In the same discussion on selection of university students, Dr. C. F. Harris, Dean of St. Bartholomew's Hospital Medical College, remarked : "With one or two exceptions, if one follows the careers of winners of our open scholarships it is apparent that the method of always allowing the open scholarship to be won by examination alone fails. The scholarship winner may have matured as an examination fiend much too early, and later this ability rapidly fails, or, apart from his examination brilliance, he may have qualities most undesirable in a doctor."

These engaging comments, coming from a leader in the world of education and the dean of a medical school, command attention, and any objective evidence which may be brought forward to support or refute these contentions is therefore of interest.

Temperament and Physique

In 1951 I reported on physical characteristics and differences between men who shine at short- and long-distance running. Association of physical characteristics and physical prowess is hardly surprising. More recently, however, in the course of a long-term study of physique and university performance, it has become apparent that qualities of temperament may be closely enough associated with physique to influence academic performance (Parnell, 1952). These findings it is hoped to report in full when the men who were measured have all completed their final examinations. Their choice of faculty, however, is known, and the association between this and certain physical characteristics can be described now.

Choice of faculty is partly a matter of temperament, and since temperament has been shown by Sheldon and Stevens (1942) to correlate fairly closely with physique it was thought worth while to plot the somatotype distribution of university students according to the faculty of their choice. It so happened that Sheldonian somatotype ratings were available for some 400 Oxford men undergraduates, and that various anthropometric measurements enabling a reasonably accurate estimate of somatotype to be made were taken during routine health examination of students entering Birmingham University in October, 1952. Because of the great variety of reasons governing choice of faculty it is perhaps surprising that any correlation with physical features should be found at all ; but the results are interesting. They are given in the series of figures illustrating somatotype distribution in the

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DENTISTRY

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PHYSICS

Schematic two-dimensional projections of the theoretical spatial relationships among the known somatotypes.

various faculties.* In Figs. 1 and 2 the distribution of Oxford medical students may be compared with the general distribution at two men's colleges, and in Figs. 3 to 6 students of dentistry and mechanical engineering at Birmingham are contrasted with those reading chemistry and physics. It will be seen that Oxford medical students and Birmingham students reading dentistry and mechanical engineering have one thing in common, they are largely mesomorphic. This is in sharp contrast to the physicists and chemists, who are largely ectomorphic.

These differences in preponderance according to faculty are summarized in the accompanying Table, in which further data may be found concerning undergraduates in the faculties of English, history, chemistry, chemical engineering, physics, and mathematics. In the left-hand part of the table the

Percentage Distribution by Faculties of Somatotypes: A, According to Primary Dominance; and B, According to Mesomorphic Rating.

Faculty	No.	A			B	
		Endo-	Meso-	Ecto-	Meso-	Meso-
		No. %	No. %	No. %	No. %	No. %
Oxford						
University:						
Medicine ..	29	5 17.2	17 58.6	7 24.2	23 79.3	6 20.7
History ..	48	9 18.8	14 29.2	25 52.0	17 35.4	31 64.6
English ..	29	5 17.2	10 34.5	14 48.3	12 41.4	17 58.6
Chemistry ..	21	3 14.3	4 19.0	14 66.6	7 33.3	14 66.6
Physics ..	29	5 17.2	10 34.5	14 48.3	17 58.7	12 41.3
Birmingham						
University:						
Medicine ..	70	10 14.3	33 47.2	27 38.5	42 60.0	28 40.0
Dentistry ..	29	5 17.2	17 58.6	7 24.2	23 79.3	6 20.7
Mech. eng. ..	26	4 15.4	13 50.0	9 34.6	20 76.8	6 23.2
Chem. eng. ..	36	4 11.1	15 41.7	17 47.2	16 44.4	20 55.6
Chemistry ..	41	5 12.2	10 24.4	26 63.4	15 36.6	26 63.4
Physics ..	36	5 13.9	11 30.6	20 55.5	15 41.7	21 58.3
Both Universities:						
Medicine ..	99	15 15.2	50 50.5	34 34.3	65 65.6	34 34.4
Chemistry ..	62	8 12.9	14 22.6	40 64.5	22 35.5	40 64.5
Physics ..	65	10 15.4	21 32.3	34 52.3	32 49.2	33 50.8
Mathematics ..	39	5 12.8	13 33.3	21 53.9	17 43.6	22 56.4

* Mesomorphic where mesomorphy was rated four or more, mesopenic where rated less than four, on the seven-point scale.

physical categories are those of primary component dominance, in the right-hand part physiques are divided into those with mesomorphic ratings of four or more on the seven-point scale, and those which may be described as mesopenic with ratings of less than four. This form of classification may bring to mind Tanner's (1952) finding that Oxford students are somewhat more ectomorphic and considerably less mesomorphic than American students.

Taking both universities together, it may be seen that half the medical students were primary mesomorphs and roughly

*The somatotype is expressed as three numerals, each a rating on a seven-point scale (seven being maximal and one minimal) of three so-called primary components of physique—endomorphy, mesomorphy, and ectomorphy. Endomorphy, in brief, represents roundness of physique and the capacity to become fat; mesomorphy describes the development of bone, muscle, and other tissues of mesodermal origin; while the rating on the third component, ectomorphy, indicates the degree of linearity of physique. The third component correlates positively and closely with the ponderal index height divided by the cube root of weight; it attains primary dominance in young adults when the ponderal index exceeds 13.5 (height in inches, weight in pounds). With ponderal indices less than 13.5, weight may be present mainly in the form of fat when endomorphy is primarily dominant, or mainly in the form of bone and muscle in the case of mesomorphs. The component rated second highest is said to be secondarily dominant. Thus, apart from shared primary and shared secondary dominance, the six main groups of physique are endomorphs, both mesomorphic and ectomorphic; mesomorphs, both endomorphic and ectomorphic; and ectomorphs, both endomorphic and mesomorphic. Sometimes it is more convenient to group physiques according to the weakest component, and this is indicated most concisely by speaking of endopenes, mesopenes, or ectopenes respectively. Alternatively the degree of endopenia, mesopenia, or ectopenia may be indicated by a statement of ratings included. For full details reference should be made to *Varieties of Human Physique* (Sheldon et al., 1940).

two-thirds of them had a mesomorphic rating of four or more. This feature no doubt underlies hospital Rugby football tradition. More than three-quarters of Oxford medical students and Birmingham dental students and mechanical engineers were rated high in mesomorphy. In contrast to this over half the chemists, mathematicians, and physicists were ectomorphs, in each case more than half being rated mesopenic. In view of this striking contrast between chemists (35.5% mesomorphic) and engineers (76.8% mesomorphic) it is entertaining to find that the distribution of chemical engineers lies half-way between that of chemists and that of engineers. Oxford English students and historians belong to the only other faculties tabled but so far unmentioned. In each case about half were ectomorphic and a slight majority mesopenic.

Task of Education

That completes the physical data to be presented here. But perhaps it is worth touching for a moment on the possible bearing this has on education generally. Perennial arguments more often than not are founded on temperamental differences. Where choice of faculty is concerned these differences have now been shown reflected in physique, and it is in this way probable that battles between science and humanism are perennially provoked. It is, for example, exactly along these lines that the whole success of university education in meeting present-day needs has lately been questioned.

In the House of Lords Lord Pakenham (1952) said: "The Government should consider how to broaden the outlook of scientists and humanists. We have met the challenge of the scientific age in the wrong way. We have produced two nations—one of scientists, the other of non-scientists." The difficulty should, he thought, be tackled in the schools, and he sought to prolong all-round education during the first year at the university. Earl Wavell (1952) offered instead a mixed honours degree course as a solution to the problem. He said he was not concerned about the scientists who got a first-class honours degree. The solution would be to persuade two-thirds of those who obtained a second-class degree to read science, and he thought the time had come for the universities to do some strenuous thinking, and perhaps adapt their constitution to meet the new needs. Both speakers recognized special aptitudes, but both wanted all-round ability and interest as well.

It is therefore in order to ask two questions, in answer to which the somatotype distributions are not entirely reassuring. First, "Is there an adequate supply of central somatotypes with all-round interests and sufficient ability to satisfy demand?" If the central somatotypes cannot be "produced," then others must be persuaded to emulate them, and the universities should separately expose scientists to the genial humanizing enzymes of society, while adding scientific experiment and perhaps unpalatable precision to the diet of liberal arts men. This brings up the second question: "How effective is education likely to be in giving powers of leadership and managerial ability to mesopenic ectomorphs in whom these qualities are least often found, except possibly in academic surroundings; can education succeed in humanizing sociophobic ectomorphs who most often find easy personal relationships difficult; last, can teaching inculcate a scientific outlook in mesomorphs who, though capable as managers, are temperamentally less inclined to academic science?"

This is the task, and in both cases the genetic straw from which these particular bricks are to be fashioned will, like other raw material, greatly affect the final product. Should everyone try to climb uphill towards the central peak of university or universal education, or should impetus be added to inclination, should technical specialists be trained in their own institutes, and managerial students in theirs, with less confusion of purpose? Whichever line is taken it should be advantageous to recognize the nature of individuals who pass through the mills of syllabuses. At the present time it seems probable that too high a proportion of mesopenes

are chosen by the current machinery of selection to meet the national need for leadership in industry; after obtaining a university degree they not unnaturally prefer a niche with academic freedom to the more strenuous daily demands of industrial life.

Somatotype estimates of Oxford undergraduates were made while I was physician in charge of a pilot student health service at the Institute of Social Medicine, Oxford. Measurements on Birmingham students were made by kind permission of the senior university medical officer, Dr. R. H. Bolton, and I am indebted to his staff and to the following students who assisted me during the week of routine examinations: E. Anthony, J. A. Binnie, G. T. Brown, R. H. Cawley, H. R. Dobson, M. A. Harper, J. L. Pearce, M. G. Saunders, D. W. Theakston, G. B. White, G. T. Whitfield, and J. W. Woolley. My thanks are due also to Mrs. C. C. Standley and Mrs. S. McIntosh for their help in analysing the measurements.

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Medical Memorandum

Ileo-ileal Intussusception Due to Meckel's Diverticulum and Complicated by Volvulus

Any increase in the bulk of a segment of intestine may cause it to become twisted on its mesentery. Among the causes of this increase in bulk which have been reported as causing a volvulus are the ingestion of large volumes of cereal food (Kerr and Kirkaldy-Willis, 1946), the presence in the bowel of a mass of worms or some other foreign body, and a tumour of the bowel or its covering (Allen and Welch, 1947).

In the case reported below the increase in bulk was due to an ileo-ileal intussusception, the head of which had entered the ascending colon. The intussusception itself was caused by the invagination of a Meckel's diverticulum containing a polyp of gastric mucosa. Clark (1944) reported a similar case.

CASE REPORT

A schoolboy aged 9 was admitted to hospital complaining of abdominal pain which had started 15 hours earlier. The pain was situated to the right of the umbilicus and was of a dull and persistent nature; it had been mild at first, but had steadily grown more severe. He had eaten a meal after it started but with no enjoyment, and had been sick twice, bringing up small quantities only. The vomit contained the pulp of an orange which he had eaten 24 hours previously. The bowels had been open normally in the morning, and there was no disturbance of micturition. This was the first attack of its kind that he had suffered. There was nothing relevant in the past history.

On examination the boy was strikingly pale; his temperature was 97.4° F. (36.3° C.), pulse 90, and respirations 20. The tongue was moist but covered with a white fur; there was no fetor oris. He appeared to be most comfortable lying on his left side. The abdomen was not unduly fat, and a lump was visible to the right of the umbilicus. There was no visible peristalsis, respiratory movement of the abdominal wall was free, and acute tenderness and guarding were present over the lump, but not elsewhere. The mass, which was about 2 in. (5 cm.) in diameter, had a smooth surface and appeared to be bilobed; it was freely

mobile and slightly more resonant to percussion than its surroundings. No signs of free fluid were present in the peritoneal cavity, and bowel sounds, though reduced in quantity, were normal in character. There were faeces in the rectum, and blood was not found on the examining finger. No abnormality was found in the respiratory or cardiovascular system. Plain x-ray films of the abdomen in the erect and supine positions showed no significant abnormality.

The provisional diagnosis was not certain. The presence of a position of relief (Evans and Bigger, 1947) suggested intestinal volvulus, but intussusception was thought to be a possibility.

Operation.—The abdomen was opened through a right paramedian incision, and two purple, distended loops of intestine—one the caecum, the other a coil of ileum—presented themselves in the wound. The caecum and ascending colon were attached to the posterior abdominal wall by a mesentery 2 in. (5 cm.) long and, with the terminal ileum, were rotated on this mesentery through 360 degrees in a clockwise direction. This volvulus was reduced without difficulty and the bowel immediately resumed its normal colour. It was then found that an ileo-ileal intussusception was also present, the junction of the intussusciens and intussusceptum being about 6 in. (15 cm.) from the ileo-caecal valve, while the head of the intussusceptum was palpable in the ascending colon 1½ in. (3.8 cm.) above the base of the appendix. This intussusception was reduced with some difficulty, and it was found that there was a Meckel's diverticulum at the head of the inner layer. The invaginated intestine was deep purple in colour, and it became apparent that the proximal 3 in. (7.6 cm.) was not going to recover viability. The whole affected length was therefore resected and a side-to-side anastomosis made about 6 in. (15 cm.) from the ileo-caecal junction. The abdomen was closed without drainage.

Intestinal suction with intravenous fluid and electrolyte replacement was kept up for three days, at the end of which time peristaltic sounds became audible in the abdomen and an enema produced a good result.

The patient went home on the eighth day after operation. When seen one month later he was in good health, with the wound soundly healed.

The operation specimen was a length of ileum 12 in. (30.5 cm.) long. Apart from ½ in. (1.25 cm.) at each end, it was deeply congested with blood. At ½ in. (1.25 cm.) from the proximal end, on the antimesenteric border, was a diverticulum about 1 in. (2.5 cm.) deep and ½ in. (1.25 cm.) in diameter at the base. Arising from the interior of the tapering apex was a soft pedunculated polyp ½ in. (1.25 cm.) long and ¼ in. (0.6 cm.) in diameter. The microscopical report by Dr. John Dean stated: "Sections of small intestine show extensive haemorrhage into all coats. The polyp of the Meckel's diverticulum is covered by mucosa of gastric type with conspicuous oxyntic cells."

COMMENT

According to Harkins (1933) the mortality from intussusception due to Meckel's diverticulum is half as high again as that from the idiopathic variety. He attributes this to slowness in diagnosing the condition. The effect of the superimposed volvulus in the present case was to make the symptoms severe and the signs obvious, so that the need for operation was at once apparent.

R. E. B. TAGART, M.Ch., F.R.C.S.,
 Senior Surgical Registrar,
 Addenbrooke's Hospital, Cambridge.

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