THE HEALTH OF 407 NEW STUDENTS

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The publication of three recent reports on the problems of student health indicates a growing interest in this subject. Investigations have been made by the British Medical Students Association and other student bodies (1944), the Social and Preventive Medicine Committee of the Royal College of Physicians (1946), and the Conference on Student Health organized by the Nuffield Foundation (1947). These reports call attention in general terms to the existence of a good deal of ill-health among the student population and point to the need for better facilities for dealing with it. So far, however, little detailed information has been published on the nature and extent of this ill-health.

Voluntary medical examinations for students entering the University of Sheffield were introduced in 1937 and made compulsory for all new students in 1942. The aim of the medical officers who conduct these examinations in the students' first or second term has been to discover any remediable cause of ill-health and to advise them on how to obtain the appropriate treatment.

The present report describes the state of health of a group of 407 students admitted to the University in October, 1946. In addition to the medical data, certain aspects of the students' social environment are discussed in their relation to health.

Methods

The general medical examinations were conducted by a team of medical first assistants, the dental examinations by the dental registrar, and the ophthalmological examinations by the ophthalmological registrars from the Royal Sheffield Infirmary and Hospital. In addition, the woman students had a haemoglobin estimation and the medical and dental students a full-sized chest radiograph. All the students had a private "health interview" with me at the end of the various examinations. At this interview any defect or disorder requiring treatment was discussed and the student was referred to his general practitioner or, sometimes, if he had no doctor in Sheffield, to the out-patient department of the Royal Sheffield Infirmary and Hospital. During the interview a family health history was obtained and questions were asked about the student's lodgings, travel to the University, recreations, work, and sleep.

Classification of Students

In presenting the results the male students have been separated into two groups: 157 students aged 20 years and over, nearly all of whom were ex-Service men, and 153 students under 20. This separation has been effected because the ex-Service group do not constitute a normal student population and have special socio-medical problems, as is shown later. The 97 women students have not been so divided, as only 18 were aged 20 years and over. There were 372 British students, 24 European, and 11 non-European.

In order to discover whether the health of the students was related to their previous social environment the records were also classified according to the father's occupation. The Registrar-General's classification (1944) was adopted—namely, Group I, professional and upper managerial; Group II, lesser professional and managerial, retail proprietors, etc.; Group III, black-coated workers and skilled artisans; Group IV, semi-skilled workers; Group V, unskilled labourers.

Table I shows the constitution of the student group by age, sex, and occupational category of the father. The largest proportion of students (34%) were from Group III.

TABLE I.—Age, Sex, and Social Groups of the Students

Social Group (Father's Occupation)	Men Under 20 (153)	Men 20 and Over (157)	Women (97)	All Students (407)
I Professional and upper managerial	15%	10%	19%	14%
II Lesser professional, retail proprietors, etc.	25%	25%	29%	26%
III Black-coated workers and skilled artisans	41%	27%	35%	34%
IV Semi-skilled workers	10%	2%	2%	5%
V Unskilled labourers	3%	2%	2%	3%
Unclassified	6%	27%	11%	15%
Non-European	—	7%	2%	3%

Only in the men under 20 was there an appreciable proportion (13%) from social Groups IV and V. The women students tended to come from a slightly higher economic stratum than the men.

The Findings Analysed

Table II shows the chief causes of defective health found in the new students.

TABLE II.—Chief Causes of Defective Health

Type of Disorder	Men under 20 (153)	Men 20 and Over (157)	Women (97)	All Groups (407)
Dental caries requiring treatment	75%	65%	76%	73%
Defective vision: corrected with glasses or needing correction	36%	39%	35%	37%
Postural and other orthopaedic defects	38%	27%	40%	34%
Minor anxiety states or depression	16%	29%	16%	20%
Nervous breakdown, marked introversion, psychoneurosis, epilepsy, hysteria, schizophrenic	8%	6%	7%	7%
Ear, nose, and throat: chronic nasal obstruction, sinusitis, enlarged or inflamed tonsils, partial deafness, discharging ear	20%	24%	25%	23%
Skin diseases: acne, furunculosis, epidermophytosis, eczema, dermatitis	13%	6%	7%	9%
Pulmonary disease: bronchitis, bronchiectasis, pulmonary fibrosis, asthma, emphysema	6%	4%	3%	4%
Endocrine disorders: enlarged thyroid, hypogonadism, obesity, undescended testicle	6%	2%	6%	5%
Cardiovascular disease:				
Mitral stenosis	2%	1%	1%	1%
Essential hypertension	2%	2%	—	1%
Hypochromic anaemia (under 85% Haldane)	—	—	3%	—
Miscellaneous: varicose veins, dyspepsia, migraine, varicocele, hydrocele, hernia	1%	3%	5%	2%

Dental Caries.—This was easily the most common disorder—73% of all the students required treatment for this condition. A smaller proportion of the ex-Service group required treatment—65% compared with 75% and 76% in the other two groups. This did not reflect a lower attack rate of dental caries among the ex-Service group, but a greater amount of previous dental treatment. The attack rate, obtained by adding to the number of students with active dental caries those who had fillings but no caries, was 96% in the men under 20, 98% in the men 20 and over, and 98% in the women. The attack rate of dental

TABLE III.—Showing the Relationship between the Incidence and Extent of Dental Caries Requiring Treatment and the Social Grouping

Social Group	No. in Group	Incidence of Active Dental Caries	Average No. of Fillings Needed per Mouth	Average No. of Extractions Needed per Mouth
I	58	59%	1.45	0.09
II	107	74%	2.50	0.20
III	139	72%	2.20	0.34
IV and V	30	83%	3.50	0.87
Unclassified	62	80%	2.60	0.61
Non-European	11	55%	1.34	0

caries did not vary significantly from one social group to another, but both the incidence of untreated caries and the extent of the disease increased in the lower economic groups (Table III). It seems probable that financial considerations had prevented some of the students from the poorer social groups from obtaining dental treatment. The dental condition of the non-Europeans was better than that of any of the other groups.

Visual Defects.—Defective vision was second in order of frequency: 36% of the whole group had myopia, 31% had hypermetropia, and 3% had mixed astigmatism. In 37% (150 students) the defect was such as to require spectacles for its correction. Of these 150 students 100 were already wearing correct spectacles, 40 had incorrect spectacles, and 10 had no spectacles. There was no relationship between the incidence of visual defects and social grouping.

Orthopaedic Defects.—Some orthopaedic defect was present in 34% of the students. Most of these were postural defects of the spine or flat-foot. Their incidence is shown in Table IV. Postural spinal defects were commonest in

TABLE IV.—Incidence of Different Types of Orthopaedic Deformity

Orthopaedic Abnormality	Men under 20 (153)	Men 20 and Over (157)	Women (97)	All Students (407)
Minor spinal deformities (scoliosis, kyphosis, lordosis)	22%	12%	15%	16%
Flat-foot	13%	10%	18%	14%
Miscellaneous	10%	7%	19%	12%

the men under 20 and flat-foot was commonest in the women students. Two students had orthopaedic defects requiring operative treatment. Most of the orthopaedic abnormalities found were due to lack of muscle tone and physical development, and could perhaps have been prevented by better previous physical education. They emphasize again the value of adequate and easily available facilities for athletics, sports, and gymnastics as a positive contribution to student health.

Mental Health

In the reports already mentioned attention has been drawn to the frequency with which minor psychological disorders are found among students. The present investigation confirms this. All the assessments of mental health were made by me after interviewing each student. Variations in assessment due to the personal factor were therefore minimized. Some 20% were found to be suffering from minor anxiety states or depression. Table V shows that the incidence of anxiety was remarkably similar in the three main groups of students.

TABLE V.—Anxiety States and Depression (mostly minor in degree)

	Men under 20 (153)	Men 20 and Over (147)	Women (95)	All Students (395)
Anxiety states	15.0%	16.3%	14.7%	15.4%
Depression	0.7%	12.3%	1.05%	5.05%
Total	15.7%	28.6%	15.75%	20.45%

It is worth while to consider the possible causes of these anxiety states. The occupation of the student is unique in so far as it is probably the only one in which those who follow it are repeatedly subject to formal tests of their fitness to continue the work. Fear of failing to pass these tests of "fitness" provides one of the main psychological stresses to which students are subject. For the present generation, further penalties may be added to examination failure, such as the loss of grants, calling up for national

service, and the end of a university career. One of the manifestations of anxiety recorded was the presence of insomnia. This was marked as present if the student lay in bed more than an hour before he went to sleep or if he habitually lay awake in the night for an hour or more—34 (9%) had insomnia of this degree.

A large number (28%) of the students were "only" children, and the proportion of these increased steadily from the higher to the lower economic groups (see Table VI). It would appear that among children from

TABLE VI.—"Only" Children

Social Group	No. in Group	Percentage of Only Children
I	52	11.5
II	98	27.5
III	134	34.2
IV and V	30	50.0
Unclassified	53	13.8
Total	367	28.3

poorer families those without brothers and sisters have a better chance of reaching university than those from larger families. This type of student—the only child from a poor family—is especially likely to feel a heavy burden of responsibility and indebtedness towards his family which may add to his anxieties.

The following excerpts from the students' health records briefly illustrate how some of these anxiety states in students can develop.

A. B., aged 18. Father died 10 years ago. Mother goes out to work; one brother and one sister. States he is "worried about getting thrown out" if he fails his exams. Works every evening, including Sundays.

C. D., aged 28. Was in Services for 6½ years. States he has no time for recreation. Suffers from insomnia; takes an hour to get off to sleep. "It's all this studying. It's a strain getting back to work again after all this time in the Army."

E. F., aged 33. No time for recreation. "I'm not letting up on myself: I've got to complete this course. I work on at night till I can't work any more."

Depression was twelve times as common in the ex-Service group as in the other two groups of students. The interviews suggested that the chief cause of the relatively high incidence of depression in the ex-Service group was the difficulty these students experienced in adjusting themselves to civilian life. Many of them had occupied active and important positions in the Forces, and some were not unnaturally dissatisfied with what seemed to them the relatively unimportant role of a university student. Of the ex-Service group 25% were married, and half of these had children. To these responsibilities were added the difficulties associated with finding accommodation for their families in or near the city.

In addition to the cases of mild anxiety states and depression eight students were diagnosed as psychoneurotics, two as hysterics, 14 were markedly introverted, one had had a recent nervous breakdown, one suffered from epilepsy, and two showed evidence of early schizophrenia. Many of the students with the minor anxiety states and depression will probably lose these as they become adapted to university life and succeed in proving to themselves that they are adequate for the tasks before them. It is among the psychoneurotics and schizophrenics that the long-term problems are to be found.

Organic Disorders

Organic defects and disorders have been classed as major if they were considered likely to prevent the student from participating fully in university life, and minor if they were not sufficiently serious to do that.

Some major organic disorder was found in 9%, and in this group pulmonary conditions were the most frequent, accounting for nearly half. Five students had chronic bronchitis, five asthma, four bronchiectasis, four pulmonary fibrosis, and one emphysema. Most of the group stated that their illness had started with a previous attack of pneumonia. They illustrate the chronic invalidity which too often follows this disease. Next in importance came the group with cardiovascular disease. Four students (1%) had mitral stenosis and four had essential hypertension (blood pressure 150/100 or above). It is worth recording that 35 students (9%) had innocent cardiac murmurs and three had persistent albuminuria for which no cause could be found. No case of pulmonary tuberculosis was discovered among the 76 medical and dental students who underwent chest radiography or in the remaining 331 students at the general medical examination.

Among the women students and men under 20 major organic disorders were more common in those from the lower economic groups than in those from the higher groups. The men over 20 were of course a physically selected group. Six of the 19 men under 20 (33%) from social groups IV and V suffered from a major organic disorder, compared with 9% in the whole group of students. Of these six students two had mitral stenosis, one bronchiectasis, two chronic bronchitis, and one asthma.

In 40% a minor organic disorder, excluding dental caries, defective vision, and orthopaedic conditions, was found. These mostly consisted of affections of the ear, nose, and throat, or of the skin. Some 23% suffered from chronic nasal obstruction, sinusitis, enlarged or inflamed tonsils, partial deafness, or discharging ear; 9% had skin conditions such as acne, furunculosis, epidermophytosis, eczema, or dermatitis. These skin conditions occurred twice as often in men under 20 as in the other groups (Table II).

The average haemoglobin value of the 95 women tested was 98.6% (Haldane). Three cases of hypochromic anaemia were found, however, with values of 68, 80, and 84%. After treatment with iron for six to seven weeks these values became normal—102, 96, and 102% respectively.

Examples of minor disorders of the endocrine glands were not uncommon, especially in the younger groups: 6% of the men under 20, 6% of the women, and 2% of the ex-Service group had conditions such as diffuse enlargement of the thyroid, hypogonadism, obesity, or undescended testicle. There appeared to be no relationship between the incidence of minor disorders and social grouping.

Conclusions

A considerable proportion of the 407 students examined had some physical or psychological defect or disorder. Although in most cases these disabilities were not serious, they were sufficient to reduce the efficiency and well-being of many students. The findings indicate that in the development of student health schemes, in addition to medical examinations of new students, provisions for the active medical treatment and supervision of university students need consideration. The high incidence of dental disease and defective vision points to the need for special provisions with regard to these conditions. A medical officer in charge of student health may expect to be frequently consulted by students on account of anxieties often disguised by some physical complaint such as vague pain in the chest. If he is to treat them successfully it is essential that he should be interested in them not only as patients but also as individuals who are developing rapidly and are not infrequently subjected to considerable physical and psychological strain.

The frequency of postural and other orthopaedic defects raises the question of the value of compulsory physical

education such as has been introduced for freshmen in at least one British university. Routine haemoglobin estimations on women students followed by treatment of the cases of hypochromic anaemia discovered is a worth-while procedure.

There will probably always be students who enter university with serious and permanent physical handicaps such as mitral stenosis or bronchiectasis. A students' health service and the initial medical examinations should not be used to exclude such students, but rather by advice and careful supervision it should enable them to make the best use of their university career.

Finally, student health centres could become valuable field stations for university departments of social medicine. In them, for example, studies of normal variations in structure and function could be made, and methods developed for the early detection and prevention of disease in the young adult population.

Summary

The results of the compulsory medical examinations of 407 new students are presented.

Dental disease, defective vision, postural faults, and minor psychological disorders were the commonest conditions found.

The various factors contributing to the development of anxiety and depression in students are discussed together with some aspects of the students' social environment.

The need for the further development of student health services to include the provision of medical and dental treatment when required is re-emphasized.

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BIBLIOGRAPHY

- British Medical Students Association, National Union of Students, British Dental Students Association, and Scottish National Union of Students (1944). *Health and the Student*. London.
- Provisional Classification of Diseases and Injuries for Use in Compiling Morbidity Statistics, Med. Res. Cncl. Sp. Rep. Ser. No. 248, 1944. London.
- Report of a Conference on Student Health organized by the Nuffield Foundation (1947). *Lancet*, 2, 318.
- Social and Preventive Medicine Committee of the Royal College of Physicians of London (1946). *Student Health Services*.

The second edition of Mr. Harry Hill's *Pasteurisation* (H. K. Lewis, 21s.) is to be welcomed. Most of the faults of the earlier edition have been remedied, and numerous illustrations and figures have been included to clarify the sections on plant design and control. The size of the book has been nearly doubled. There is an interesting description of the Hemming-Howell heating unit for the treatment of milk in churns on the farm, though it would be interesting to know more about the effectiveness of this method under practical working conditions. Like most idealists, the author favours the adoption of the "in-bottle" method of pasteurization, and he forecasts the adaptation of the H.T.S.T. process to the heat treatment of milk in bottles. Whether he is on such safe ground in recommending the increased use of irradiated milk is more doubtful; the possible danger to adults of consuming unlimited quantities of vitamin D is not considered. This book can now be recommended without hesitation to those who want to learn something about the methods of carrying out pasteurization and the subsequent treatment of pasteurized milk. It is, however, alarming to be told in the preface and again on p. 229 that "all methods of pasteurization carried out in this country are not satisfactory." This general condemnation is surely unjustified, and we hope that what the author really means is that not all methods of pasteurization are satisfactory. Perhaps an alteration to this effect might be made in the next edition.