Physical examination

The Medical Examination in Vocational Guidance

by

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It is not enough for a child to be attracted by a trade or profession, to take it up because he has a vocation for it or the appropriate aptitudes ; he must also have the necessary physical constitution. This may appear evident, and yet how many workers have entered an occupation only to be obliged to give it up because of ill-health. Hence the value of undergoing a medical examination before embarking on an apprenticeship or a course of advanced study. But, as the author of this article shows, a medical examination, besides revealing handicaps, can also supply the vocational guidance counsellor with useful information on the physical and mental characteristics of the examinee.

VOCATIONAL guidance consists in studying the mental, manual, personal and physical aptitudes of an adolescent and, in the light of his own preferences as well as the wishes and means of his family and the employment opportunities open to him, in giving him reasoned advice on the choice of the trade or occupation in which he may well spend the whole of his adult life. The word " advice " is important. Guidance must never be imposed since its chief aim is to find the work for which the adolescent is best suited, in which he will be most successful and, as a result, contented with his lot. It should be stressed that vocational guidance caters first and foremost for the individual ; however, if it achieves its aim it serves society too, for an individual in the right job is a happy and therefore a useful member of the society to which he belongs. In other words guidance is quite different from selection, in which the individual has already chosen his trade or specialisation and the task facing the undertaking, factory, workshop, college or government department is to choose the best

candidates and weed out the weaker ones. Selection, it will be seen, involves a competition between individuals with the same training.

Role of the Vocational Guidance Doctor

A vocational counsellor can hardly express an opinion and advise on the course to be taken unless he first makes allowance for any handicaps the child may have. For example, an individual who is blind in one eye cannot perform a job requiring the sense of relief given by binocular vision, a person with eczema cannot wet his hands and handle products he is allergic to, while an asthmatic cannot become a baker.

In its early stages vocational guidance medicine was, it must be admitted, confined to noting these handicaps, but even this called for a doctor who had specialised in the work.

But it gradually became clear that the doctor had a wider duty to perform, a duty that could not be discharged in an interview conducted by a guidance counsellor, however thorough. In examining an adolescent's physical condition the doctor has to assess not only his handicaps but his aptitudes.

This aspect of the doctor's role in vocational guidance was, and still is, a subject of controversy. In countries with an organised school medical service it has been asserted that the medical examination given at school should be adequate. This is a mistake since school medicine is concerned with prevention : it watches over the schoolchildren's health, tries to limit contagious infantile diseases, arranges for compulsory vaccinations and checks cutireactions and the administration of BCG. If attempts have been made to identify vocational guidance medicine with school medicine this is perhaps primarily for reasons of administrative and financial expediency.

Nor should the role of the vocational guidance doctor be confused with that of the industrial doctor who is concerned with the health of workers who have already specialised in a trade. His aim is to prevent occurrences and accidents arising in the performance of this trade. For example he keeps a check on the blood formula of printers, on skin diseases among cement workers, etc. Lastly, the family doctor, where he still exists, is not trained to rule whether an adolescent is fit to perform certain jobs. In France when a vocational guidance doctor categorically states that a person suffering from nephritis should not become, for example, a fitter, the family doctor, not wishing to thwart the desires of the family, may in fact send the vocational guidance centre a certificate stating that a child with this disorder can perform the job. If the vocational guidance doctor is not so unhelpful as to forbid this

course and the family ignores his advice, the youth will inevitably be obliged to give up his apprenticeship after only a few weeks. The family doctor, whose task it is to treat the sick, cannot be expected to know that an apprentice fitter does a tiring job standing at the work bench and often in poorly heated premises, i.e. in just the conditions likely to bring on a further attack of nephritis.

The Special Function of the Medical Examination in Vocational Guidance

What is it that makes a vocational guidance medical examination a special and unique procedure ? First and foremost it is the nature of the human material under study. An adolescent who has finished his schooling goes on, after he has been given vocational guidance, to learn the trade in which he will normally spend the whole of his life. In France at the present time the age for guidance is 14. This is the difficult age of puberty when the adolescent is still developing physically ; though he has left childhood behind him he is not yet an adult. Moreover, although the biotype is determined at birth, it is hard to judge from his weight, height and physical development (and it is here that a doctor needs experience) what he will be like in a few years, when he has passed through the change—we may almost say the upheaval—of puberty. It is not uncommon for a child who, at 14, is an undersized weakling, to gain nearly six inches in height and over 20 lb. in weight in a single year. When the vocational guidance doctor is confronted with a sickly child who has not yet entered on the stage of puberty he will be wise, particularly if the child proposes to enter an arduous job, to postpone the consultation for a year, by which time the child's growth will have caught up. The doctor should also find out about the child's parents, older brothers and sisters and country of origin, since race and heredity can account for his physical characteristics and subsequent development.

The second characteristic feature of vocational guidance medicine is that it must make a prognosis on the basis of any pathological defects discovered or noted during the examination.

For example, in dealing with acute myopia (—5, —6 diopters) it is necessary to find out whether this myopia, which is usually a family trait, is likely to vary ; if the doctor is confronted with a case of albuminuria following a clinical analysis, a scoliotic posture, a cardiac murmur, a case of asthma occurring around the age of ten or a sharp decline in hearing, he must make a prognosis. How will the lesion evolve ? Will it remain stable ? Will it worsen or improve ? In such cases it is advisable to obtain the opinion of a specialist and to make laboratory tests before coming to any

conclusion as to the inadvisability of working in the conditions entailed by certain trades.

In the third place the vocational guidance doctor must be familiar with trades and working conditions and during his training be should spend some time in, or at least visit, workshops, factories and apprenticeship centres, where he should analyse jobs, subsequently making a synthetic study of the conditions in which they are performed. For the vocational guidance doctor a job is made up of—

(a) the atmosphere in which it is performed—the open air, a confined atmosphere, daylight, artificial light, a damp or dusty atmosphere, etc. ;

(b) the movements involved and tools used—the fitter's file and repetitive movements, the watchmaker's tweezers, the coachbuilder's hammer, the baker's oven-peel, etc. ;

(c) the pace and hours of work—whether the pace is set by the individual or a conveyor, whether there are rush periods and whether there is a fixed working day, three 8-hour shifts or night work ; and

(d) contact, or lack of it, with other workers or the public.

It may be argued against this that industrial progress is such that the workers of tomorrow will merely be required to watch the machinery and that this will greatly reduce the physical aptitudes and the skills they need. But even assuming that this is true for countries with large-scale industries, there are many countries in which small units and handicrafts can be expected to survive for some time.

One piece of work which should be carried out by vocational guidance medicine is the compilation, from a strictly medical standpoint, of trade monographs specifying the physical defects that should be grounds for advising against entering the trade concerned, e.g. acute rheumatism of the joints or chilblains in the case of glass cutters and finishers, whose hands are constantly in water.

The Elements of the Examination

As in all other medical examinations, the doctor follows a well-tried procedure. He pays special attention to the individual's family and personal history and to such details as are of particular interest to vocational guidance—affections of an allergic character (asthma, urticaria, eczema, migraine), diabetes, acute or degenerative rheumatism of the joints, heart diseases, myopia, etc. Obvious-

ly, however, he is not very interested in such infantile diseases as measles, chickenpox, etc.

All medical examinations, whatever their purpose, are based on inspection, palpation and auscultation. But one point is important. A vocational guidance doctor should, if possible, have X-ray equipment available, for pulmonary auscultation, particularly in noisy surroundings, is somewhat futile when an X-ray can give a clear idea not only of the state of the lungs but also of the appearance of the heart, the movement of the diaphragm and the conformation of the thorax (which is important in diagnosing the biotype).

Experience over the past 26 years has shown that in vocational guidance medicine some aspects of examination are particularly important.

Morphological Study of the Examinee

It is helpful to establish the biotype as it accounts for certain physical qualities (or defects) and their accompanying temperamental characteristics and it also incidentally acts as a pointer to the psychosomatic nature of the individual (and his pathological tendencies). Irrespective of the morphological classification employed, the practical conclusions are the same. The time available for vocational guidance medical examinations is too short (we always exceed it) and Sheldon's morphological diagnosis " on sight " is extremely valuable ; with practice we manage to spot at once the dominant characteristics of the type, and later the various secondary features.

For vocational guidance purposes the classification of individuals as mesomorphs (somotonics), endomorphs (viscerotonics) and ectomorphs (cerebrotonics) appears to be satisfactory. Our experience has shown that Sheldon's opinion regarding the relation between temperament and morphological type is of considerable value. We have also confirmed it by cross-checking with various personality tests.

It is difficult, for example, to impose sedentary work on a mesomorph, arduous work on an endomorph or purely manual work on an ectomorph. We have been able to prove this view to be correct by means of another experiment. While examining a number of groups of workers in various trades from the standpoint of industrial medicine in the Seine-et-Oise département we were struck by the fact that each trade has quite a well-defined morphological type. Among pork butchers the endomorphic type predominates, while stone-masons are mesomorphs, fitters and mechanics are ecto-mesomorphs and housepainters and electricians are ecto-endomorphs. These conclusions are merely put forward as

clinical impressions and in no way as scientific rules. But if an adult likes his job and makes a success of his career, it is probably because his aptitudes fit the requirements of his trade ; and it is not therefore surprising to find similar physical types and temperaments in similar trades. Nor can it be asserted that morphology is governed by occupation since it is determined at birth, like the colour of the eyes and the type of hair.

Examination of the Neuro-Motor System

The standard reflex tests are of no positive value in dealing with individuals usually classed as normal. On the other hand an examination designed to reveal any stiffness or synkinesis and assess the co-ordination and precision of the individual's movements can yield a great deal of information. The child should be made to walk with his arms hanging loosely and to perform the standard finger dexterity tests. These exercises are revealing indications of the state of the neuro-motor system—of its quality : co-ordination or lack of it, precision or imprecision in performing delicate movements ; its dominance : left-handedness or right-handedness ; and its evolution : development of the mature motor system if there is little or no synkinesis by effort or imitation. This simple examination makes it possible to diagnose constitutional clumsiness, which is fairly uncommon but which, where it exists, is a serious, if not a complete, handicap as far as many manual jobs are concerned. Examination of the neuro-motor system also gives an insight into the child's personal adaptability : any awkwardness in adapting himself or any mental constraint has an effect upon the child's motivity, but in such a case the prognosis regarding the motor system will be favourable provided the problems troubling the child are eliminated.

The results of medical examination of the neuro-motor system are usually in agreement with the results of vocational psychology tests. But if there is any discrepancy the medical examination may often provide an explanation. For example, acute uncorrected myopia detected in a medical examination often explains the poor test results of an examinee with a sound neuro-motor system ; bad results in the manual tests have been found to be caused by left-handedness and emotivity.

Clinical Examination of the Urine

For vocational guidance purposes clinical tests of the urine should be a regular procedure.

After testing the urine of some 4,000 children seeking guidance we have confirmed the fact that postural albumin, or that resulting

from fatigue, is common among thin, longilinear, ectomorphic individuals. It is found in 10 per cent. of cases in Paris and is particularly common when tests are made during the third term at the time of the end-of-year examinations. This is an index of proneness to fatigue which should not be neglected although, as is well known, adolescent albuminuria disappears around the age of 20. Nevertheless, some kidney specialists are now inclined to think that this may indicate an affection of the kidney which may develop or recur much later.

Sugar is rarely found in the urine but it should be tested for in the case of fat children and those who are found to have a family history of diabetes.

Sight Testing

Eyesight should be tested very thoroughly. It is not enough to find out the standard of eyesight at 15 feet since myopia is not the only thing to look for. Hypermetropia is very common among adolescents and it should be tested for by using lenses of +1 and +2 diopters at 15 feet. If it exists it rules out certain jobs involving concentrated close work, since once adulthood is reached it will be accentuated by presbyopia. The vocational guidance doctor must be able to foresee this development in order to avoid a change in the individual's classification at a later date. Astigmatism can be detected from a faulty reading of the letters on the board.

By examining the motor muscles of the eye, it is possible to discover intermittent strabismus (a sign of proneness to fatigue); heterophoria may exist and this can affect binocular vision, which is important since a sense of relief is needed in certain jobs.

If the vocational guidance doctor discovers these defects of vision, even if they are only minor, he must ask a specialist to make a precise diagnosis and to state what development can be expected.

At the National Vocational Guidance Institute in Paris an eye clinic was the first specialist department to be opened by Piéron (vocational guidance centres in the Seine département send individuals to this clinic for advice and a thorough test of their eyesight).

We have found it necessary to pay particular attention to defects in colour vision. Following research covering a large number of individuals we have found that 10 per cent. have slight troubles or characteristic defects. Good colour vision is necessary in the navy, airforce and those trades that require a good eye for shades of colour (e.g. colourists in the dye industry, workers in the film industry, etc.).

One point to which we are devoting particular attention is the extent to which minor defects of colour vision are compatible with

employment in certain jobs. On the other hand it is a mistake to make too many allowances, as fatigue and bad lighting can accentuate even minor defects of colour vision.

These special and routine medical examinations of various organs enable us to gauge an adolescent's sturdiness and resistance to fatigue. " Sturdiness " is a somewhat vague term for a clinical impression that is hard to define. It means a bright complexion, a tonic even if not greatly developed musculature, a good posture in repose—in short the signs of good health in contrast to those of proneness to fatigue, e.g. pale complexion, hunched posture, curved spine and muscular hypotonia.

An individual's sturdiness will obviously be affected by any defects that may be revealed in the course of the organic examination. A cardiac lesion, asthma or bronchial fragility and skin infections, such as acne or eczema, all impair an individual's sturdiness. The endocrinic condition, any morphological backwardness, the existence of a gap between chronological and physiological age, thyroid inadequacies (or hyperthyroidism), hypercorticism (even if only transitory), all affect an individual's general physique.

These developments often occur during the period of puberty. It is important to determine whether such pathological manifestations are lasting or temporary.

Study of Character and Personality

In addition to the medical examination proper the vocational guidance doctor must study another side of the examinee, namely his character and personality. We are now fully aware of the vital effect of personality upon physical condition and adaptability to defects. Dr. Hollier-Larousse, an ophthalmologist at the French National Vocational Guidance Institute quotes the typical example of twin girls who are both very myopic but react quite differently to their handicap, one of them leading a normal life while the other is so timid and diffident that she is to all intents and purposes an invalid.

Examination of young diabetics has led to the conclusion that in finding the right work for them we must bear in mind not only their aptitudes and the equilibration of their diabetes, but also their character. Some are meticulous in carrying out their treatment, analyses and diet, and show determination and a certain dogged courage, while others are anxious and fearful, or are careless and run the risk of the complications resulting from inadequately treated diabetes.

These examples lead to the question of compensation, an aspect of guidance that both counsellors and doctors would do well not to neglect. A physical defect can be minimised or offset by a physical compensation (muscles can be trained to help out paralysed muscles), by mental qualities or by sheer willpower. I recall a remark made to me by an achondroplastic boy who wished to enter a watchmaking school. As I was examining his deformity he said: "There is nothing you cannot do if you want to". Unquestionably this admirable determination counteracted his handicap and made it possible for him to have a job and a place in society.

Faced with a true vocation such as this vocational guidance counsellors and doctors know that they must give way and ignore the results of their tests and examinations and any objections they may feel inclined to make. A strong overpowering desire to enter a trade or occupation will certainly win in the end. Willpower, inclination and sentimental reasons will prevail. I have known an injured youth who had only two fingers left on each hand but was determined, despite the handicap that this imposed upon him, to become a draughtsman. He succeeded completely in this aim. But true vocations are uncommon.

Value and Future Importance of the Medical Examination

It may well be asked whether the medical examination we advocate for vocational guidance purposes is worthwhile. There are two ways in which its value can be checked. In the first place, since the advice is not binding it sometimes happens that parents neglect it and ignore all warnings. When the child is unsuccessful in the trade of his choice he comes back for a second consultation. The most usual cases of this sort involve children suffering from acute rheumatism of the joints, the consequences of nephritis and poor general physique, with proneness to fatigue and bad eyesight.

Secondly special investigations may be carried out. Such an investigation was recently made in the apprenticeship centres of the Seine département to find out whether pupils had been obliged by reason of their health to abandon their apprenticeships. Out of 11,500 pupils, 35 had had to drop out for medical reasons. The distribution was as follows:

tuberculosis, 10; haemorrhages, 1; mental disorders, 3; general fatigue, 5; bad eyesight, 5; asthma and eczema, 4; albumin, 2; heart, 3; sequelae of fractures, 2.

While showing the points on which the vocational guidance doctor should concentrate, this inquiry also showed how few

mistakes in guidance had been made. Apart from the 35 individuals who left for medical reasons (which had not perhaps been overlooked at the medical examination but may have been ignored by the family), a further 529 left for personal or family reasons, 216 for academic reasons and 35 for disciplinary reasons.

It should not be assumed that vocational guidance and vocational guidance medicine are accepted without question.

When, a few years ago, I interviewed a prominent personality in the field of education in the United States on the subject of vocational guidance he made this remark : " Our best pupils do what they want to do, the worst become labourers and we concentrate on giving guidance to the intermediate group ". This seemed to me a very questionable attitude since, in the first place, there is not always a connection between school results and success in a job ; there are great differences between school life and the working world. And in the second place, those at the top of the class may have physical handicaps, which bar them from the occupations they might have chosen. As far as those at the bottom of the class are concerned, it is all very well to say that they can become labourers, but as we showed in a paper prepared for the Berne Psychotechnic Conference in 1949, those at the bottom of the class, while including a number with a low I.Q., also include children with the highest I.Q. of all. They do badly at school because they are personally maladjusted (either at home or at school). School gradings often bear little relation to a child's fundamental aptitudes, and when the educational system is reformed it is to be hoped that vocational guidance doctors and counsellors will be consulted over the treatment of those approaching school-leaving age.

Critics of vocational guidance and vocational guidance medicine often object that before 1925, when vocational guidance was in its early stages, workers managed to earn their living in trades they had chosen quite haphazardly. But at that time it was less difficult to find a job and above all no importance was attached to the disillusionment and disappointment of those who had to change their jobs, or who vegetated all their lives in situations that were well below their abilities.

Another doubt that is raised, even in France where vocational guidance medicine appears to be more highly developed than elsewhere, is : " Is it necessary to examine the so-called ' normal ' children so thoroughly ? " e.g. those on whose cards the school doctor notes " nothing unusual ". Paradoxical though it may seem, I would contend that it is precisely those children who are described as " normal " who require our full attention and take longest to examine. A clear physical defect completely rules out a number of occupations while in the case of the child who appears

to be normal it is necessary *(a)* to detect minor defects (such as hypermetropia, faults of colour vision, neuro-vegetative instability, and various forms of colitis), either by means of a long, exhaustive examination, or by prolonged questioning; and *(b)* to ascertain the physical aptitudes and personal characteristics that can be ranked as assets. In the future, vocational guidance medicine will probably concentrate on this assessment of assets, coupled with a thorough study of the individual's personality.

Vocational guidance medicine has its place not only in the world of today but in that of tomorrow. Even if the factory worker of tomorrow is only required to watch machines, without needing any very special psychological and physical aptitudes, it is nevertheless true that the handicraft industries as they exist today, with their small-scale processes, multifarious trades and tiny units, can still derive some benefit from vocational guidance. The range of trades that has to be borne in mind by the counsellor or doctor varies according to the country and area. In the big industrial centres we have to guide young people into such standard occupations as those of mechanic, fitter, lathe operator or office worker. On the other hand each region has its own particular set of trades, e.g. cheesemakers in the Jura, potters at Vallauris, cotton workers in the Vosges, and silk workers at Lyons.

Vocational guidance counsellors and doctors can perform yet another service by advising schoolchildren on their studies and on the possible choice of a profession.

The middle class, which supplies the entrants to the professions, is somewhat hostile to the idea of guidance. But if the educational system is finally democratised and the prejudice that still attaches to manual jobs disappears, there can be no doubt that guidance will become more widespread to the greater benefit of all concerned. At the present time the overcrowding of the professions entails some kind of selection, but this does not appear to be efficiently done since it is based not on a study of each individual's aptitudes but upon social and financial considerations.

We once made three sets of medical examinations of schoolchildren and students involving *(a)* examination of children aged 11 about to enter secondary school, *(b)* examination of young persons wishing to prepare for the Arts et Métiers (advanced technical colleges) and *(c)* consultations over a period of 18 months at the University Statistical Office. The results in our view show conclusively that systematic medical examination by a doctor who is specialised in vocational guidance reveals a number of points such as colour blindness, constitutional motor debility, albuminuria, etc., which may have been overlooked by the family doctor or during compulsory school medical examinations because the

purpose in view is not the same. By devoting considerable time to these children and their families, we are enabled to detect signs of maladjustment at home or at school which accentuate any defects. By spotting simple psychological difficulties and bringing them to light, we are sometimes able to solve them, so that a tangible benefit results from our consultation.

When giving guidance to schoolchildren, we have to judge the child's physical ability to withstand sustained mental effort and the possibility of late nights and a sedentary life, all of which call for special physical and personal qualities.

Conclusion

To sum up, vocational guidance medicine tries to draw up a balance-sheet of defects and aptitudes showing the advantages and disadvantages for each individual of apprenticeship to a given trade or occupation.

One of the difficulties of the work is that it involves giving an opinion on an adolescent who is passing through the stage of puberty and is about to undertake an apprenticeship lasting for three to four years in manual trades and five to ten years in the professions. This period of apprenticeship or study is often more arduous than the actual exercise of the trade or profession. Moreover the physical fatigue caused by long periods at the work bench is increased in large towns by the fatigue of travelling ; sometimes an adolescent also finds it hard to settle down in a world that is very different from his family and school background. All these problems must be borne in mind by the vocational guidance doctor. As a result, when we consider that the child needs time for his physical development, we occasionally propose postponing our recommendation for a year.

These various medical questions are such that vocational guidance medicine represents a new departure, a special branch of medicine with its own techniques and aims that cannot be replaced by any other branch. The child himself is in the forefront of our minds but we see him against the background of a wide range of trades and occupations and try to find which type of job will be best suited to his physical development and will correspond to his physical capacities and personal leanings. This special branch of medicine came into existence hardly more than 25 years ago when vocational guidance itself developed under the impulse given by Piéron and Laugier. The writer has been able to follow the progress made during this short period. In the early days we only looked for contra-indications, but it gradually became clear that it was important to study the individual's aptitudes, bio-

type, neuro-motivity and personality. Some specialists conducted research into the development of lesions according to the trade performed (by means of cardiology, ophthalmology and endocrinology). Opportunities have now been created by the establishment of an electro-encephalographic clinic at the National Vocational Guidance Institute in Paris which will enable us to study the pace of work peculiar to each individual and, from the research standpoint, will make it possible to establish a relationship between the electro-encephalogram and certain features of the personality. The Medical Vocational Guidance Society in Paris has a large field of research open to it.