Sir Thomas Horder also reminded his audience that their work, like that of the medical practitioner, was based on science. The temptation to "humbug" a patient—and there were patients who liked to be "humbugged"—must be resisted. Massage was too valuable, too integral a part of physiotherapy to be placed in the background while one talked to the patient of bones out of place, of which there was no evidence, and so forth. Many of them could double their incomes if they were prepared to substitute for good honest scientific work a certain amount of humbug. Finally, he spoke of the moral effect of the masseur's work. The encouraging manner of the masseur was of value, quite apart from what he did with his hands. Not seldom the masseur knew more about the patient than the doctor did, but he should not neglect the doctor's point of view. Lack of co-operation with his medical supervisor meant failure. If the masseur discovered anything which the doctor had not appreciated he should not tell the patient, but should tell the doctor, who would value any information given in the right spirit. Many masseurs aimed at too rapid results. They forgot that all physical methods were educational in nature. Just as a kind of mental dyspepsia could be produced by forcing the mind too quickly, so irritation and fatigue resulted from an over-keen physiotherapy. He himself was often content to find at the end of a week a result which the masseur had been disappointed not to have got within twenty-four hours. Often a masseur's work might be spoilt by disregard of the patient's psychology. One of the most frequent complaints was the perpetual talk in which many masseurs indulged while giving the treatment. He himself often employed blind masseurs, but if he had a chance of employing dumb ones he would be tempted to give all his work to them.

CORRELATION BETWEEN INTELLIGENCE TESTS AND WRITTEN AND PRACTICAL EXAMINATIONS.

BY

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ACCESS to marks gained by second-year medical students, both in academic examinations during the ordinary course of their work in physiology and in a series of intelligence tests, gave an opportunity of finding out how far skill in the one was correlated with skill in the other.

The usual examination paper in physiology calls for simple reproduction of facts which have been presented to the candidates at some previous date. To gain a good mark in such an examination it is only necessary to possess a retentive memory and a fair degree of steady application to the assimilation of facts. Intelligence tests are more or less empirical productions, yet they usually differ from the common form of examination in demanding something more than reproduction of acquired information. It is common knowledge that the type of student who excels in written examinations may fail lamentably when confronted with practical work; and that the results of intelligence tests are often at variance with the results gained by the usual methods of examination. Practical work, though of necessity greatly influenced by what is taught, makes a definite demand on qualities which can be acquired neither from books nor from teaching, nor even from actual practice, and these qualities may approximate to those tested in the course of an intelligence examination.

The ordinary course in physiology in Glasgow demands both attendance at lectures and the performance of practical work. For convenience the academic year is divided into three terms, each of ten weeks' duration, and at the end of each term there are two class examinations—one by a written paper, the other by a practical test. The sequence of lectures is uninfluenced by the terms, and the three written examinations are of exactly the same type. Each consists of a paper with three questions to be answered within one hour, and asking for a simple restatement of current physiological teaching. The practical work, however, deals with three separate aspects of physiology, the first ten weeks being devoted to experimental physiology, the second to chemical physiology, the last to histological physiology. The three practical tests, there-

fore, are alike in demanding something in addition to the power of reproducing acquired information.

The marks used in the present investigation were all obtained from the same students sitting the same examinations. The intelligence test—"Group Tests, Series 33," of the National Institute of Industrial Psychology—was given at the outset of the year's work. Attendance was compulsory, no warning was given, and over 140 students sat the paper. The 140 papers were ultimately whittled down to 108; a certain number of the students had sat the same intelligence paper in the previous year, a few several years before, and their papers were ignored. The papers of students whose native language was not English, and those from students older than the average student, were also omitted. The previous academic instruction of the students was the same in every case, and the ages varied from 18 to 20 years. The intelligence tests were left uncorrected until the students concerned had passed through the entire year's course in physiology. Thus those who corrected the class work had no idea of the intelligence test mark gained by individual students.

Correspondence between any two series of marks was estimated by finding the coefficient of correlation. The results are given in the accompanying table.

Intelligence Test Series with:	Written Paper.		Practical Test.	
	Correlation Coefficient.	Probable Error.	Correlation Coefficient.	Probable Error.
Average of all the marks ...	+ 0.19	0.063	+ 0.36	0.057
Marks in experimental term ...	+ 0.28	0.060	+ 0.28	0.060
Marks in chemical term ...	+ 0.003	0.065	+ 0.27	0.060
Marks in histological term ...	+ 0.17	0.063	+ 0.24	0.062

Correlation between intelligence test results and the results of practical work is low, but in every case significant. This cannot be said of the correlation between this intelligence test and the written papers. The correlation coefficient between the average mark gained in the three written papers and the average mark gained in the three practical tests is +0.44, with a probable error of 0.053.

Owing to the distractions of student life, it is possible that the results of written papers may not represent the true ability of a large number of undergraduates. An intelligence test for which no preparation is required presumably indicates the total ability of each candidate. In the degree examination, however, it should be otherwise, because the great majority of those who present themselves have worked reasonably well and feel fairly confident.

The correlation coefficient between the results of the same intelligence test and the marks gained by the same group of students in the degree examination at the close of the year's work was only +0.13, with a probable error of 0.067. Thus it seems that the striking want of correspondence between intelligence test results and the results of written class examinations cannot be attributed wholly to outside distractions operating inimically on the class work, with a special bias against the written papers. Incidentally, those students who had sat the same intelligence test the previous year showed without exception a definite increase in marks in comparison with their previous attempt.

Summary.

The results of written examinations, of practical examinations, and of an intelligence test obtained from a uniform group of medical students showed that the results of the intelligence test gave consistently a significant, though low, correlation with the results of the practical work; but with the results of the written papers the correlation was lower and not consistent.

It is suggested that the qualities of value in dealing with an intelligence test approximate more closely to those which are useful for dealing with a practical examination than to those which are useful in answering a written paper.

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