

Intemperance in Study. By D. HACK TUCKER, F.R.C.P.

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Having met from time to time with cases of brain-fag, and also actual insanity, arising from excessive mental work, I wish to direct attention to-day to this cause of disordered mind, not because it is so wide-spread a cause as many others, but because for this very reason it is in danger of being treated with indifference, whereas at the present moment I regard it as a serious evil, although comparatively restricted in its operation in consequence of the great mass of the people falling under opposite influences; still I fear that it is in schools and colleges as well as in the cottage of the labourer and manufacturer, among students as well as among those who delve and spin, that we must seek for the causes of mental disturbance if we wish to understand them thoroughly.

It would occupy too much time to detail the cases to which I refer; I must ask you to take them as "read." For my present purpose it is sufficient to say that they have taken the form of brain-fag, mental excitement, depression of spirits (sometimes suicide), epilepsy, and chorea. I have recently known a case of acute mania distinctly due to this cause, confinement in an asylum becoming necessary. Of suicidal melancholia I could cite some painful instances, and as regards epilepsy, I could detail the history of some marked cases resulting from over-work; and I may state that at the National Hospital for Epilepsy in London, pupil teachers have been admitted labouring under this disease, brought on by mental strain. Two medical officers, resident in the institution at different times, spontaneously drew my attention to the fact.

I fully admit that in many instances of mischief from excess of study, this results from anxious worry as well. The subject "preys on the mind," as people say; but then it was the study of too large a number of subjects or of subjects beyond the power of the student to master within a given time which was to blame for this harass.

Here I wish to anticipate an objection which may be raised to my own observation and experience on this question. How is it—it may be fairly said—how is it that, if over mental work is often to blame for attacks of insanity, there are not

more statistics at hand to prove it? To this I would reply:—

1st. The principal statistics in regard to the causes of insanity are derived from asylums for the uneducated classes.

2nd. An attack of excitement caused by mental strain in the young is often temporary, and is treated privately.

3rd. When suicide is successful before the patient reaches an asylum, the case is not to be found in lunacy statistics.

4th. Cases of epilepsy often remain at home; and the same remark applies, of course, to brain-fag and general nervous exhaustion.

In regard to one of these points I would observe that when I have been able to examine into the causes of cases of insanity admitted into non-pauper asylums, I have found a considerable number traceable to excessive mental work either as a predisposing or an exciting cause. No doubt this is often associated, as I have just said, with anxiety and other emotional states. It is sufficient, however, for our present purpose if it be admitted that a considerable number of attacks occur in connection with over-work, although complicated with emotional excitement. It must be remembered that the mischief thus done is only one part of the evil wrought by the intemperate pursuit of knowledge. The lungs and other organs also suffer. Dr. Andrew Clark writes to me:—"I am a witness to the grave, and sometimes irreparable, mischief done at schools and in working for competitive examinations. As an illustration," he adds, "of the evil effects of over-work for competitive examinations, I can say that of the young men passing the Civil Service Examination for Indian service, and afterwards sent to me by the Civil Service Commissioner for health certificates, 10 per cent. during the last three years have had temporary albuminuria."

I have before me tabular statements of the school hours and the subjects taught in some of the principal English public schools, as well as in private seminaries. It is utterly impossible to present them to you in the brief period allotted me; I can therefore only offer a few general remarks upon them, and refer to two or three by way of illustration.

The number of hours actually spent in school does not (as a general rule) appear to be excessive in our large public schools. There are exceptions, but this evil, and the multiplicity of subjects taught apply rather to the private schools. Where the chief danger seems to lie in most schools is in the

encroachment made on the play hours. In some day schools the lessons set to learn at home are absurdly long and tedious. I find that in other schools, public and private, a great deal of work is done during the period nominally allotted to recreation only. This is a very important part of the actual school system, and one which requires great care on the part of masters. I will now take the school hours of the 6th Form in one very excellent school for the middle and higher classes. There is an hour's work before breakfast, three hours in the morning, four hours in the afternoon, and two hours in the evening; making a total of ten hours for study. Between breakfast and supper there are about two hours allowed for recreation. While it must be remembered that when we speak of boys being engaged in study for ten hours, those who are lazy are not closely and continuously engaged in their work, and that if the master is not strict the strain is not necessarily severe, I cannot but think that it would be better for the health of the scholars in this school if the total amount of time engaged in school or study did not exceed eight or at most nine hours. I am quite alive to the danger attending too liberal an amount of time being left at the disposal of school boys; they do not find it difficult to get into mischief. Still, under proper supervision, three hours' relaxation between 9 a.m. and 9 p.m. does not seem to me an extravagant allowance for growing lads.

I have referred to the encroachment of book-work on play hours. Having taken great pains to get at this point in various schools, my conclusion is that what with back lessons, impositions, and extra subjects, this encroachment becomes in many instances a serious burden. I have been puzzled at first to explain the ill-health of some boys when I examined the time-table, and did not succeed in explaining the mystery till I discovered how much of the play time was really spent by them in work. This is, no doubt, often the fault of the boy, who has not properly learnt his lessons, and has to re-learn them when he might have been at play. It would be well, however, if the masters would consider whether they do not sometimes, by the amount of work set the boys, render it difficult to those who have only average ability to do all that is expected of them without encroaching on the time of recreation.

In one school I find, as might be expected, that some boys do and some do not complain of the pressure put upon them

out of school. I believe this arises in these instances from a difference in facility of learning and not indisposition to work. One pupil, who has left school, and loyally observes, in writing to me, "I feel bound to stand up for a system to which I owe so much," reluctantly admits that the number of lines of poetry and prose which have to be committed to memory is quite unreasonable. The danger of over-tasking the brain is here, I believe, by no means an imaginary one. The repetition, which goes on gradually accumulating during the term, of some 16 or 18 lines of Greek or Latin verse at each lesson, becomes at last a heavy load for the memory; and my informant adds—"At the end of term I have known over 1,000 lines demanded, with only a day's time to look them over in, the usual amount being 400 to 700 lines in the upper forms on the classical side." Another scholar, in a different school, writes:—"I have never known more than 30 new lines of Greek or Latin set for one lesson. No time is specified for learning the lines, but they have always to be done between evening school one day and morning school the next, unless the master chooses to set the lesson before." Here we see how important it is, if we wish to estimate the real amount of brain activity in the 24 hours, to enquire into the out-of-school tasks, for while, when looking only at the timetable, we may picture to ourselves a boy comfortably asleep in his bed, he may in reality be engaged in hammering his Greek lines into his brain. The same pupil writes:—"The extreme variableness of the work makes it not improbable that some boys (as I did myself at one time) have to work the whole day without intermission (*i.e.*, of course during whole school days), and many, especially in winter, work all the evening, from a quarter past six to ten o'clock, with only an interval for supper."

A teacher of languages in England complains that his son, who is at the Grammar School at —, has lessons given him to learn which occupy him until ten at night. A gentleman in Devonshire informs me that his boy brings home from school, tasks which frequently keep him up till midnight. At a High School in a large town, I know that some of the pupils have suffered from over work; two in one family have recently died from "brain fever," due, it is considered by a medical man, to this cause. Dr. Fayette Taylor, of New York, has drawn a graphic picture of what the Americans are suffering from intemperance in study, and we should do well to take warning from it. "Girls arrive at 12

or 14, and at the threshold of the most important period of existence, utterly unfitted for passing through it. Excitable, with wide-open eyes and ears for every sight and sound which can excite feeling, vapid and intense in mental activity, with thin limbs, narrow chest, and ungainly back; we meet these 12-year-old products of civilization going to school with an average of thirteen books under their feeble arms—for I have found by actual count that thirteen is the average number of studies which they 'take' now-a-days."

I may here record the hours of a school for girls, which appear to me to exceed what is wholesome, and to be well calculated to lessen their mental elasticity and interfere with their healthy development. These girls rise at 6.25; prayers are at seven, and breakfast at a quarter to eight. Their studies commence at a quarter past eight and last till twelve, with a break of a quarter of an hour; then dinner, during which silence is enjoined and a book read aloud; then an hour's recreation is allowed. Needlework and school work follow for two hours; half an hour's recreation succeeds, and then come two hours and a half of study and instruction of various kinds. The next meal after the twelve o'clock dinner is at half-past six, and this is the last. It is succeeded by half an hour's recreation, and this by half an hour's study. Prayers end the day at half-past eight. Here we have nine and a half hours (including religious exercises) of sedentary occupation and only two hours and a quarter for recreation and one hour and a half for meals. I think we shall be agreed that a little less school and a little more play would be desirable, and that there need be no cause for surprise to find that many of the scholars suffer from headaches, anæmia, arrested development, and various manifestations of exhausted nerve force.

Then there are the school *examinations*, and these, I am satisfied, require great care, while most useful means of rendering the knowledge acquired by the pupils definite. A former pupil in the Sixth Form writes:—"With regard to examinations, an hour's examination in each subject was supposed to take place once a month. At the end of the term we had from a week to a fortnight's examination in all subjects prepared during the term. *Making fellows learn up all their repetition at end of term, and keeping them back if they fail to say it, I consider a piece of barbarism.*" I believe that in many schools the examinations

at the end of the term embrace so many subjects, and lead to so much cramming of minute details, that from these causes and the spirit of emulation excited, the brain is often unduly stimulated, and a state of commotion induced which is highly undesirable. It is true that a long holiday then comes to the scholar's relief, but even an extremely long holiday does not render it safe to undergo extremely severe mental strain. I suspect that with some it is thought to do so, but it is most important that this error should be clearly pointed out. A schoolmaster recently remarked to me that a boy would sometimes answer the first paper in the examination *very well*, the next *not so well*, and by the time he was engaged in the last questions he would be *muddled and stupid*—"He seemed to have got to the end of his brain," as the master aptly expressed it.

I wish now to refer to the present system of *medical* education. How can it be otherwise than injurious when we consider that during recent years the amount of knowledge which it is necessary to master has prodigiously increased in every department, while the length of time in which to acquire it remains the same?

In regard to some examinations, a tremendous burden is laid upon the memory. There is a long period of strain, the climax of which is reached when the period of examination arrives, during which the student's mind has to hold in solution the details of knowledge on many subjects. It is often a solution saturated with minute facts and figures, many of which are of no permanent use, and, indeed, cannot be remembered any longer. The mind is cramped and narrowed by this mischievous cramming, as must necessarily happen when the issue of an examination is made largely to hang upon a retentive memory.

While no one proposes to go back to the old system of medical education, it may well be doubted whether the character of these examinations is calculated to develop the best practitioners or physicians, loading the memory, as they too often do, at the expense of breadth, depth, and originality. The lectures delivered in the medical schools are, of course, influenced by the examinations, and is it not notorious that these now give so many different hypotheses and enter so much into detail that the student is often perplexed? And (if report may be credited) the lecturer himself sometimes becomes perplexed also.

Too rapid an acquisition of knowledge—the attempt to

master too many subjects—is a part of that Jehu speed at which we are now driving, whether in business or science. Knowledge so gained “proves but of bad nourishment in the concoction, as it was heedless in the devouring.” So said Milton in his day. What would he have said now? Competition is not confined to trade. Our examination boards have, in truth, not escaped from its influence. It is melancholy to see that the errors we deplore are perpetrated by men whose knowledge of physiological laws ought to have prevented them pursuing so disastrous a course. Professor Humphrey has protested in terms of strong disapproval against the system of examinations now too generally pursued, and we of all men ought to join our voice with his in the endeavour to stem the current of this excessive and indiscriminate brain-stuffing. “Knowledge grows, but man stands still; that is to say, the intellect and powers of man are no greater now than they were in any of the known past ages; in the days, for instance, of Homer or of Plato, of Confucius, of Buddha, or of Moses; no more powerful to mould the material at hand, whereas the material has vastly increased. . . . Had Hunter been trained upon the present system, had he been weighed down by tightly compressed facts when a student, and subsequently, by out-patient-seeing, on the one hand, and pupil-cramming on the other, it is scarcely to be supposed that even his mind could have burst the iron fetters, and could have regained its elasticity and love of work, or that even he could have found time for those reflections which gave such impulse to the science and practice of surgery.” (“Hunterian Oration,” Feb., 1879). One source of mischief lies in the fact that an examiner constantly forgets that the department in which he examines is only one of many, and hence he requires a degree of perfection which is simply absurd—one which, however suited to honours, is totally unreasonable in a pass examination; and it must be remembered that the severity of an examination cannot be gauged by a reference to the questions which happen to be asked at a particular examination. The student has to prepare himself for all possible questions, ranging over very wide areas of knowledge, and involving an acquaintance with a multitude of speculations put forth by Continental as well as English writers. Hence it is not surprising if, in the anxiety to pass the ordeal, success is too often won at the risk of prolonged mental prostration. Failure, on the other hand,

involves besides this, the dangers arising from disappointment and chagrin.

I should not have thought it at all probable when I commenced this paper that before I concluded it I should have listened to far stronger remarks than any I have indulged in, in an assembly of medical teachers and practitioners in London at a meeting of the Metropolitan branch of this Association, under the presidency of Dr. Andrew Clark. On this occasion Mr. Huxley said that to expect students to pass an examination in the subjects on which they are now examined, after only four years' study, was little short of "*criminal*." He characterised the attempt "to cram the student with all these subjects as utterly preposterous. The amount of work expected is simply gigantic." Mr. Hutchinson said, "The best memories stagger under the present load." "That after four years' study a student can be expected to bear his subjects in mind is simply an *absurdity*."

But it is time to ask, What is the remedy for these evils?

First of all it is necessary to make them widely known. Educators and examiners must at least have no chance of sinning from ignorance, although, as I have said, some who know most of the laws of physical and mental health are the chief culprits. It must be insisted that they are oftentimes putting too heavy a weight upon the camel's back, and it is for them in the first instance to consider in what way they can best diminish the tension, and as regards medical education, re-arrange the curriculum. What I complain of is that at the present moment the tendency in certain quarters is to render this curriculum, and consequently the examinations, harder and harder—more and more unpractical; so that many can feelingly unite with the Earl of Ellesmere, who said to a friend shortly before his death, that he was not sorry to go. The world was clearly becoming very disagreeable; everybody was going to examine everybody, and he was sure *he* should be plucked!

In the second place there must either be a change in the character of medical examinations, or the period of time occupied in study must be extended. I believe that the first is absolutely necessary, and that the second is in any case highly desirable. As regards the change in the character of the examinations, it should be in the direction of lessening the demands made upon the memory; and as regards length of time, I think a year more than is now required

would be a great advantage. It would also be an immense gain to the student if, while he is engaged in hospital work, he should have no examinations hanging over him, except "medicine" or "surgery." This means the sub-division of medical examinations.

Mr. Hutchinson proposes that students should be thoroughly examined during their curriculum (by hospital teachers or travelling examiners) on the various subjects, and bring up certificates of proficiency to the Examining Boards. These would accept the certificates as proofs of competency in details, and would give a good, general, practical examination before granting a diploma. If this course be adopted, and is not overdone, it will certainly be an immense improvement on the present system, and would prevent students leaving too much of their work undone till the last year.

Thirdly, it seems to me of great importance that the number of subjects examined upon at the same time should, in some instances, be reduced. The original idea of the London University in arranging the subjects for the examination of M.D. was excellent—namely, to spread them over a sufficient number of years and to present them successively in a natural order of gradation. But now that the mass of knowledge demanded has so vastly increased, this division of labour only partially meets the difficulty of the student, for he has now to be prepared to answer questions in the course of a few days which demand a painful retention of an enormous number of facts in the memory. Some relief would be obtained here by a longer interval being allowed between the days of examination on different subjects.

In the recent discussion on medical education to which I have referred, Mr. Huxley urged that one mode of relieving the present strain would be to make the preliminary subjects (in an elementary form) necessary parts of school education. Thus a boy ought to know a bone or a muscle when he sees it. My fear is that by so doing we should intensify the labours of school work, unless it is on the distinct understanding that these subjects are not added to, but take the place of some which are now taught at school; otherwise it is merely cutting off one end of the plank and fastening it on to the other. Mr. Huxley's proposition assumes, of course, that it is well to introduce these studies into schools as a part of the education of all, whether intended for the medical profession or not.

Fourthly, whatever course is adopted, it is, I would hope,

unnecessary to say that the crotchets of individual examiners should not tinge the questions, or rather the judgment formed of the answers. If the questions which are now asked are not too severe when taken alone, they are regarded by many competent judges as frequently too severe when taken in combination with the other subjects examined upon, and also that they are sometimes calculated to puzzle the student, from the form in which they are worded. Not long ago an examiner at the London University, speaking to another examiner, boasted of the puzzling questions he had been ingenious enough to ask, whereupon the other replied, to my great satisfaction, "You should try and find out *how much*, not how little, the students know." I should have no fear of the questions being unreasonable when put by a wise, common-sense Professor like this, whereas some learned men expect a student to reach in a few months the level of their own mature knowledge.

I would adopt the language, once more, of Professor Humphrey, and say, "With Democritus 'we should strive not after fulness of knowledge, but fulness of understanding;' that is, that we should strive for good, clear, solid, intelligent, producible and available knowledge, of the kind that will be useful in after life; not so much the *refinements* of chemistry, anatomy and physiology, which stupify and then pass away like chaff before the wind, but the essential fundamental facts and principle, welded together, and so woven into the student's mind that he can hold them firmly, and wield them effectually; and that he is conscious of them, not as the goods of other men, or as dogmas which he has because they were imposed upon him, but as his own possession, of which he appreciates the value because he knows how to use them."

In conclusion, I would express the hope that the expression of opinion in the Psychological Section of this Association will strengthen the hands of the Metropolitan branch, which has taken up this question with much earnestness, and although starting from a different standpoint from my own, has been equally impressed with the evils attending the present system of medical education. I am moved by the conviction that its influence upon the mind is injurious; *they* by the fear that it fails to produce the best men, and the belief that it is altogether unreasonable.