

itself, to such an individual, acts which violate the social and moral code are committed.

Akin to the criminally insane is the insane criminal—a person who has committed a crime when sane or supposed to be in normal mind and found to be insane or to have developed mental irregularities subsequently. In this paper we shall consider these two states as belonging to the same class.

These doubly unfortunate should be provided for, in ample buildings, fireproof, and constructed on modern hygienic lines and equipped with all modern methods for the treatment of mental diseases. The buildings should be situated on a tract of land of about 2,500 acres, on which there is wood and water, good natural drainage, and reasonable railway facilities. The hospital should be supervised by a man of executive ability, a man trained in the modern treatment of mental diseases and preventive medicine, and a student of sociology—a man who can see with an eye, single to the truth.

It is just recently that, as a people, we paused, invoiced our stock, and began to conserve our resources. With our delinquent classes, up to the present time, we have been treating symptoms in the individual, involving an enormous economic waste of time, energy, earnings, efficiency, and of life, to say nothing of suffering. We cannot treat disease successfully nor economically until we know its etiology and pathology, neither can we cope with the social disease, crime, until we know its cause or causes beyond peradventure.

The solution of the problem with which we are dealing is one of preventive medicine, in its practical and inevitable application. It involves an operation upon the masses. What that operation shall be, can, I think, be devised in time by an institution for the criminally insane, if properly equipped and directed.

The institution I have in mind should be equipped with two modern working laboratories, each presided over by a man learned in that branch of knowledge to which the laboratories are devoted, these men to work under the supervision of the superintendent of the institution. One laboratory will be devoted to the investigation of the sociological and psychological causes of crime; the other to work up the abundance of valuable material which will be available. The findings to be utilized for the better understanding of mental diseases and their treatment, and means devised for the prevention of crime.

Thorough scientific laboratory work is the only rational means of solving this great problem—what shall we do with our criminally insane and the disease crime?

Up to the present time the custodial function, in the care of the criminally insane, has been the one employed and our legislation is based upon that aspect of the work. That this is so is not per se the fault of our legislators. They have made use of the information at hand, and have acted accordingly. If we expect to successfully cope with the situation it is up to us to emphasize the necessity of investigating the cause of the conditions that are such a drain upon our exchequer and social happiness, and to apply our treatment at the most vulnerable point, that is, to the etiological factors.

Preventive medicine has solved just as difficult problems as the one of the criminally insane. The great scourges of mankind during the Middle Ages and the centuries following are practically unknown today. It was but yesterday that it pointed the way and applied the remedy that made one of our island possessions habitable and prosperous, and removed the stigma from the so-called lazy man of the South by demonstrating that his laziness was but a symptom of a disease due to the parasite *Unoinaria Americana*. Who dare say that preventive medicine cannot solve our questions if given a chance? When we are ready to demonstrate to our legislators the futility and enormous waste of money in treating the symptoms, without knowing the cause, the appropriations for an institution for the care and study of the criminally insane will be gladly voted.

It may be a long, or it may be a short, time until we can apply the proper treatment to the cause. Until that time, we must make provisions for our constantly increasing criminally insane population, and care for them in the best manner we know how. Those that are dangerous to themselves and caretakers must be kept under strict restraint. The milder cases should have work and be trained to make use of the faculties which they may have and not allowed to become helpless charges through non-use of any useful faculty.

They should be made as near self-supporting as possible, and nowhere can this be done to such advantage as upon a farm of ample size and suitable soil where fruits, vegetables, milk, meats, etc., can be procured in abundance.

There is no form of exercise better adapted for this class of people than agricultural work. The fresh air and sunshine, the changing scenes, and the sedative influence of outdoor work are great factors in keeping their bodies in good physical condition and relieving their minds of delusions. With regular hours, wholesome food, recreation, and proper care, these diseased people can be made comfortable and in a measure, happy. House them properly, direct their faculties, give them a chance to produce their livelihood until we have discovered the cause of their delinquency, and applied the antidote.

THE PROBLEMS OF A PSYCHOLOGICAL RESEARCH DEPARTMENT IN A SCHOOL FOR FEEBLE-MINDED.

BY DR. A. B. KUHLMAN, SCHOOL, FOR FEEBLE-MINDED, FARIBAULT.

The duties of a research department in a School for Feeble-Minded may be regarded from different points of view, and according to the point of view taken, the specific character of its work will vary over a considerable range of activities.

Scientists the world over have been for many years, and still are, divided on the question as to whether research should always be directed with the view of discovering facts that we hope to apply immediately in practical life, or whether it should aim solely at contributing to science without thought of its application. The difference involved here is sometimes described as the difference between "practical science" on the one hand, and "pure science" on the other, expressions that are often mis-

leading, because of the erroneous implication they carry with them. For in the first place, practical science cannot accomplish its ends without the methods and technique that pure science has and is all the time furnishing; and, in the second place, the results of pure science have in a very large measure found practical application. The difference between the two is not so great as their popular designations indicate, when taken literally. The difference in attitude, however, of the two classes of scientists is of fundamental importance, because it leads to a difference in the kinds of problems the two attempt to investigate. This is seen clearly in their different points of view of research, when stated more fully, with the arguments usually given in favor of each. But a very brief statement here will suffice for our purpose.

The view of the pure scientist is that research has nothing, and should have nothing, to do with the application of its discovered facts. Its sole aim is to advance human knowledge as rapidly as possible. To do so the investigator must constantly train his energies towards the development of methods and the special technique in each particular field. If the results of his work find a practical application, well and good. However, this should never be his immediate aim. In fact, practical science tends to defeat its own ends, in that it sacrifices the development of the very means by which facts can alone be discovered that might be applied to life.

The view of the practical scientist, on the other hand, is that no science has any reason for its existence, any further than its discoveries can find an application in practical life.

What excuse can there be for devoting our energies to attain a knowledge that we cannot use after we have it? Research should be directed always with the end in view of attaining a practical knowledge. A science that is not practical, as regards the application of its discoveries, is not a science. In my own efforts to really understand these two apparently opposing views, and to appreciate the arguments advanced, I have never been able to see that the ultimate outcome of a science would necessarily have to be very widely different no matter which of these two points of view scientists took. But there is, I believe, a great and very important difference between the ultimate and the immediate outcome, according to the view taken.

Practical men are well aware of the fact that a large share of our present scientific discoveries are merely a matter of science. They see no use for them. No one is wise enough to predict how much of this will ever find its application; but, on the other hand, scientists have a well-grounded faith that most of it will ultimately become practical knowledge. That faith is well grounded because time and again seemingly useless facts have suddenly become of the greatest practical value; and further, because our material and spiritual progress rests as yet almost entirely on the results of pure science. But, granting that every discovered fact or truth will have its practical value ultimately, the practical scientist works for the good of the immediate present, and herein lies, it seems to me, the only important difference.

Every generation is, and ought to be, primarily interested in itself, and much less in the generation of the future. Science therefore, should aim, first to serve the present, with a minor interest in the future. More-

over, political, social, industrial and all conditions of life changing from one age to another, as they do, each has in a large measure its own problems. The live questions of today are not those of yesterday and new ones will arise tomorrow. The pure scientist can neither predict what those of tomorrow will be, nor would he aim to solve them if he could.

Now what application do these general considerations have in a discussion of the problems of a research department in a school for feeble-minded? They have a direct and important application. The pure scientist as a director of such a department would aim to contribute in his research to our general knowledge of psychology, the study of feeble-mindedness being merely a branch of the general field. The practical scientist would aim to investigate the problems of immediate practical importance. Both might be working on two quite different sets of questions. Let me not be understood to mean that the pure scientist in such a department would not be a paying investment. I think he would, but the other would be more paying, and his views would be in harmony with the demands of an American public.

In outlining the specific problems that I wish to present in this paper I shall take a slightly revised view of the practical scientist, revised at least from the extreme form in which I have just stated it. My personal view is that the investigations of a research department in this kind of an institution should always aim at the discovery of facts to be applied; that it should have no place in its program for a science for science's sake merely, which leaves the application of its discoveries to the chance developments of the future. But practical research can in a measure, and should look towards the future as well as to the immediate present. This is particularly true of some aspects of the study of feeble-mindedness, as will appear in a moment.

What, then, are our problems from this point of view, I shall state them in the logical order in which they present themselves in the actual work of the institution. They fall thus into three groups: (1) Problems of commitment; (2) Problems of care and training; (3) Eugenic and related problems.

(1 Problems of commitment: (a) The relative number of defectives.

The first question concerns the determination of the number of defectives in the community at large. This number is naturally always much larger than the general public is aware of. Parents will not, as a rule, report their children as feeble-minded until circumstances force them to do so. The general census reports do not give the full number. The public schools have only the milder cases. Many remain at home, in society at large, or in various institutions without a public knowledge of their existence. If we grant, as I think we all do, that all defectives should be specially provided for, the initial task of discovering their existence and determining their number is not a small one. Knowing the facts as we do, the discrepancy between the total number of defectives that are available, statistics show that the estimated number has always been considerable.

The number of defectives per one thousand of the general population reported in our census from 1850 to 1890 is as follows:

1850.	1860.	1870.	1880.	1890.
.681	602	6316	1:533	1.526

Now, we have no real reason for supposing that the relative number of defectives has more than doubled during these forty years. The apparent increase is undoubtedly due to an improvement in the census methods of reporting or discovering their existence. But it has been estimated (Fernald, 1890) that instead of 152 defectives per one thousand, there are probably at least 2. Upon the basis of this estimate we have 160,000 feeble-minded children in this country for a general population of 80,000,000. Likewise, Minnesota has a total of 4,400 feeble-minded for a population of 2,200,000. About 1,500 of these are provided for at Faribault. The remainder are elsewhere; their existence unknown to the public, and yet they constitute one of the main sources of the future generation of mental defectives.

(b) The problem of developing methods of diagnosing mental defect.

Determining the number of defectives existing involves the finding of adequate methods of determining the presence of mental defect in the individual in the first place. This is a perpetual problem, not one that, from the nature of the case, can ever be solved once and for all time. We have always been able without special skill or scientific methods to tell the difference between gross defect and the normal. When society had neither skilled men nor science in this matter, the line was necessarily drawn correspondingly roughly, and the higher grades of what we now classify as defective were then not included. With the development of skill in judgment in persons constantly associated with the feeble-minded, the line has been drawn more closely. We have now in addition to this skill a scientific system of mental tests that enables us to do much better than we have ever been able to do before. But we are already beginning to see minor defects in the system, which means that we are already seeing ways of improving the best that we have ever had. The special institution for feeble-minded and the public schools are coming into contact at this point. We are beginning, with our new methods, to draw the line between children in the public schools, and the latter are clamoring for methods that will enable them to do this more adequately and with more confidence. But the public schools are not equipped to develop these methods, because they lack the trained scientists and the laboratories necessary for the work; nor are our colleges and universities, because they lack the material on which to try their tests. The problem of developing methods of diagnosing mental defect is one that belongs to the research of the school for feeble-minded, although these methods will find application and are demanded outside its borders as well as inside.

(c) Questions of public education and legislation on commitment of mental defectives.

What I wish to call attention to in connection with these questions needs no more than a brief mention before this Board; nor am certain that all would properly come within the sphere of a research department. The main thing to emphasize what I believe to be a fact, viz: that no community would long tolerate present conditions in regard to non-com-

mitment of defectives, such as exist in every state, if it were properly informed of the facts and of the importance of commitment. To determine the number of defectives in the state and diagnose the degree of their defect would obviously be of little avail in accomplishing practical ends, so long as the results of this work are not brought fully and clearly before the public, in order to bring about necessary legislation. Perhaps the research department could co-operate with the proper authorities in this very essential work.

(II.) Problems of care and training. Society is, in the ultimate analysis, mostly, if not entirely responsible for the existence of feeble-minded children. If it gives them the most and the best of which it is capable in return, it will pay but a small portion of the debt that it owes them. Humanity, if not social justice, demands our utmost efforts to make them at least as happy as their conditions will permit. The problems that face us in our efforts to improve the methods of their care and training are so numerous and varied that I shall not attempt to even list them here, but will discuss them only in a general way.

(a) General study of their nature and practical results. The conditions of feeble-mindedness has been recognized as far back as recorded history goes. But the first effort at a special treatment and training is hardly a century old. The first development of special methods was the direct and immediate result of the work of the first students of feeble-mindedness, and it can be said that in a fairly parallel manner progress in the methods of care and training has gone with the growth of our knowledge of their special nature.

It has been stated that no great progress has been made in the general principles of training since Seguin published the results of his studies in 1846. But this is no indication that we are approaching our limits in this direction. We have had no students of the feeble-minded equal to Seguin since his day, nor have the conditions for developing such students been favorable in the last half century.

The institutions for the feeble-minded have grown to such a size that the administrative duties of those in charge have left no opportunity for further scientific study of the children. Furthermore, a fallacy coming from the anatomists has had a strong and prolonged dampening influence in the efforts to improve methods of care and training. Anatomical studies have long ago shown that in general the brain in feeble-mindedness is structurally defective in brain cells and often in blood vessels. There can be no reasonable doubt that the mental condition is due to the structural defect. And since it is also known that we cannot create brain cells that have failed to develop or have degenerated, nor replace blood vessels that have been destroyed by disease processes, it has been argued that any effort to train the feeble-minded must necessarily be wasted. Since this argument first appeared practice has repeatedly demonstrated its error. We have been training the feeble-minded for fifty years; the results leave us no grounds for further argument on this question. The argument has in the first place overlooked the fact that much may be done with what is left of a defective brain if the right methods are found and applied. In the second place, the results of more recent studies on the structural development in the nervous system have considerably changed the older view

of the relation between structural and functional growth. It was thought, that functional activity was not essential to completion of structure, but apparently this is not so. Deprive a developing nerve cell of all activity and it will not only stop developing, but will finally degenerate. Excite it to unusual activity and it will structurally develop faster than it will under normal conditions. Thus it would seem that we have given the possibility of in some small measure aiding even the structural development of the brain. As far as merely the number of brain cells is concerned, the brain is practically structurally completed during the first several years of childhood. But these first years are important, and are often responsible for the difference between the feeble-minded and the normal person. We are not yet in a position to say what special methods of care and treatment may be able to do for the defective had we adequate methods of determining the smaller degrees of defect at birth; but the question surely seems worthy of our attention. When all this is said and admitted, there remains the contention, also often made, that you cannot with any amount of training make the feeble-minded more intelligent; you cannot improve his common sense or innate reasoning capacity. This may be entirely true, but that the intelligence cannot be improved in any measure is not an established fact. Granting that it is entirely true, the reply is that neither do you any more improve the intelligence of the normal child by giving him an education. You merely teach and train him.

If these considerations have made clear the fact that we have in the general study of the nature of feeble-mindedness an open field for the investigation of methods for improving the care and training of the feeble-minded, I may proceed with the next general question that we meet.

(b) Classification of defectives. (1) Grading intelligence. I have spoken before of the constant need of improving our methods of diagnosing the presence of mental defect. The same need exists for determining the degree and special nature of the defect, after the case is admitted into the special institution.

Practice has long ago taught us that the kind of training any individual defective child is capable of depends entirely upon the degree and nature of his defect, and that this varies over an exceedingly wide range. The sooner we can make this determination after admission, the less time and energy will be wasted both for the institution and for the child in question. And the more accurately we can make it, the more the child will benefit by our efforts to train him.

The usual procedure in institutions has been to let the person most skilled in judging mental defect give an initial estimate of the child, and on the basis of this send the child to the department where he seems to belong. After a varying period in that department he may be transferred to another, because a closer acquaintance with him proved that he had been misplaced at first. I do not believe that there is an institution in this country or elsewhere where some children do not have to be thus transferred even several years after admission. The appearance of a scientific system of tests for grading the intelligence of children, of which I have spoken already in connection with diagnosing the presence of defects, is helping us very materially in doing this work more easily and more accurately. The comments made previously on the perpetual problem of con-

stantly improving and refining our system of testing apply equally well here.

(2) Determination of special characteristics. Merely grading the general intelligence of the child is not sufficient. Intelligence is a complex of many factors, and they are not always equally affected in the defective intelligence. A group of defective children of the same general intelligence may be quite different from each other, because in each individual a different factor is mainly at fault. More than this, the mind is not all intelligence, and the feeble-minded child may be mentally defective in other ways than through the intelligence. Thus our problem becomes doubly complex. Children of the same general intelligence cannot always be given the same kind of training because of these special characteristics of the individual case. Methods of training must be adapted to these special characteristics. A scientific study of these has as yet hardly begun. We have simply recognized the most prominent ones in common observation and made the adaptation in training that obviously followed from such observation. We come to the third group of problems.

(3) Eugenic and related problems. The questions of this group are undoubtedly ultimately of the greatest importance. And the first that requires our attention is that of the causes of feeble-mindedness.

(a) Causes of feeble-mindedness. The first aim in the study of the causes is to prevent or limit the occurrence of feeble-mindedness. We have as yet but little definite and positive information in regard to them. We know in a general way that they are mostly congenital, and that particularly parents who are affected by insanity, nervous disease, or are themselves feeble-minded, are most likely to produce feeble-minded children. We know, too, that some of the congenital causes are strictly hereditary and may be transmitted directly through the germ cells for several generations, while others are what have been called parental causes that affect the child before birth, but which are not hereditarily transmitted through the germ cells. We know, further, that a lesser number are acquired, appearing after birth and affecting the child only. But when we come to study the individual case of feeble-mindedness, with our present available data, we may be confronted with a host of conditions all or none of which may have been responsible for the result so far as we know definitely, or we may have an entirely negative family history in which nothing appears to which we can attribute the defect. Furthermore, children of the same parents, reared under the same conditions, so far as we can determine, may range from the state of profound idiocy to that of the entirely normal mind. The same prenatal diseases in parents and the same post-natal diseases in children may in the one case produce idiocy, while in the other it will leave development apparently unaffected. In the midst of this chaos it has become apparent that our methods of studying the causes, which have been mostly statistical, have not been adequate. And the knowledge that we have gained concerning the requirements for gathering these statistics now largely explains why we have not succeeded better heretofore. We must evidently take this problem much more seriously, nor hope to contribute much to its solution without a prolonged and most painstaking inquiry at our command. Instead of relying on merely our case-book records, to which persons unqualified in various ways to give in-