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MENTAL HYGIENE AND PUBLIC HEALTH

"THERE would be just as much sense in sending the case of scarlet fever to a reformatory as in sending a delinquent schoolboy to jail," said Dr. Haven Emerson, professor of public health administration at the College of Physicians and Surgeons in New York City, at the opening meeting of the First International Congress on Mental Hygiene.

"Public health work can no longer be limited to the control of communicable disease, correction of physical defects in children or safeguarding the lives of mothers and children in childbirth. It must also include prevention of mental disease and correction of defects in nervous and emotional control.

"The health officer must begin to ask himself such questions as: Will the psychiatrist get to the mean lazy ne'er-do-well before the policeman does? Will the bully, the fearful child, the miserable man, meet a wise social worker before he is forced into an institution?

"Is it not at least as important that the suicide rate has risen from 4.9 to 19.7 per 100,000 of our people in seventy years as that the diabetes death rate has done about the same? Is there a greater need to report upon a rising death rate from appendicitis or to analyze, publish, teach and if possible prevent the conditions that have brought about a rise in the divorce rate from 26 per 100,000 to 68 per 100,000 in less than fifty years?"

If the Traveler's Aid stations at our city railroad terminals can show the number of runaway children, unwholesome homes, misunderstood wayward children, the too-heavy hand of discipline, they are as important to public health as collecting depots for diphtheria smears and typhoid cultures at our drug stores and hospitals.

It is just as much the province of the doctor of public health to concern himself with occurrence of temper tantrums as with the prevalence of rickets in a community. Perhaps the probabilities of truancy can be estimated on the basis of the records of boys who have motherless homes or breakfastless mornings.

Much improvement in the field of mental health may be hoped for through preventive measures. Only about one tenth of retarded school children owe their difficulties to such causes as heredity, mental disease or epilepsy. Dr. Emerson pointed this out as an encouraging fact when considering the possibilities of prevention. Betterment of social, emotional and material surroundings and in particular of the parental conduct of the child's life prior to school age may result in as great benefits as we have seen among babies from the almost universal use in our cities of safe water and pasteurized milk.

THE TREATMENT OF "PSYCHOPATHS"

"WE must reckon it a definite fact that 50 to 75 per cent. of our beggars, tramps, thieves and so on, show serious psychic abnormalities," according to Professor Karl Birnbaum, of Berlin, who spoke at the congress.

Professor Birnbaum discussed the social significance of those mentally and nervously weak individuals known to science as psychopaths. His studies of these types, how they develop and how they can be aided to adjust themselves to normal every-day standards of life, have made him an international authority on psychopathic personalities. So high is the percentage of mental abnormality in the repeaters lodged in county jails that these supposed prisons are in reality little hospitals for psychopaths.

Unstable individuals who can not get along with their families or employers, or with police regulations, are marked as psychopaths by several signs. They are at war within themselves, lacking psychic harmony. They are weak in resisting. Often, their personalities do not mature at the normal rate, but there is a pathological interruption of development, so that they remain betwixt-and-between, neither adult nor child, longer than most young people. At about the age of thirty, there often comes a "secondary balancing" of their troubled personalities, and they settle down to normal attitudes toward their work and their associates.

These unstable persons need individual treatment adjusted to their own needs, and they should have it at the earliest possible date. Their lives should be so directed for them that society is protected against their instability, and at the same time they should be given aid in finding suitable work and social intercourse. A small group does not respond to such individual aid and these incorrigible natures can only be taken care of through the force of safe confinement.

RECREATION AND AVOCATIONS

A WARNING against intemperance in the use of the radio, which it was suggested would produce mental indigestion comparable to the physical indigestion resulting from intemperate consumption of food, was issued by Dr. R. Sommer, professor of psychiatry at the University of Giessen, chairman of the German Association for Mental Hygiene, at the closing meeting of the congress.

"We must take a stand in regard to the modern invention of the radio, which allows the individual to expose himself to a great number of impressions," Dr. Sommer said. "To be sure there is much exaggeration here, just as in the case of overeating. But if these technical achievements are sensibly used, if people are temperate in listening to music and lectures, and do not, as often occurs, try to take in in a short time an international mixture from all sorts of cities, the radio can also be used in the problems of mental hygiene."

Dr. Sommer spoke on the meaning of recreation and avocation in mental hygiene. In a wide sense, suitable nourishment and sleep must be called recreation, since this term means a rebuilding of exhausted forces, both physical and mental.

Too much food is harmful, rather than beneficial, medical and physiological investigations have shown, and

Dr. Sommer suggests that too heavy a program of other types of recreation might also be harmful.

Speaking of sports as means of recreation, he said that their value must always be decided for the individual case, and that sports and exercise as recreation for women should be chosen carefully with due regard for the physical make-up of women.

"I have seen often that a well-regulated and intellectually interesting avocation saves people from premature petrification and, psychically, from senility," Dr. Sommer remarked in discussing the advantages of avocations as a form of recreation. "Of course, there are various kinds of preoccupation with one or more of the arts. For me, for example, it is a source of recreation to look at a picture or a statue, considering all its details; for others, the same is perhaps true in the realm of music, or they may find it in reproducing great works by playing the piano. It is no mere chance that a whole list of famous physicians have become known through their avocations—music, literature, etc. This is merely one special example in the general field of recreation after exhausting activity."

CARRIERS OF TUBERCULOSIS

FROM one half to nine tenths of the people in this country are carrying in their bodies the germs of tuberculosis, Dr. Linsly R. Williams, president of the National Tuberculosis Association, declared at the opening, recently, of the annual meeting of the organization which has for over a quarter of a century been fighting the dread "white plague."

"We must consider every person as a possible carrier of tuberculosis," Dr. Williams said. If there were but a few thousand carriers the problem might be solved, he explained. But probably one tenth of that vast portion of the population that carries the germs are what are called "spreaders," meaning that they not only carry the germs but spread them to others.

Dr. Williams outlined the scientific knowledge we now have about the disease, and said that if it could be applied to the population, tuberculosis might be eradicated.

"But we can not handle and control human beings as we do a test-tube or a guinea-pig. The human being insists on escaping from his cage, even though he be incarcerated for life. In some measure we can isolate those individuals who are a constant menace to society. It is even possible to isolate persons who constitute a definite danger because at the moment they harbor bacteria which are dangerous to others, but when it comes to the chronic carrier of tuberculosis, the case is difficult."

A plea for directing efforts at diagnosis of tuberculosis to an earlier period of life was made, based on the theory that the majority of people in this country have been infected with tuberculosis by the age of 15 and more than 90 per cent. by the age of 21. Dr. Williams urged that the entire population be watched by annual X-ray examinations so that the persons who have definite signs of disease can be put under proper treatment at an earlier age.

OCEANOGRAPHIC INVESTIGATIONS OF THE "CARNEGIE"

THERE are three different kinds of water in the ocean, scientists of the Carnegie Institution of Washington, one of whom belonged to the staff of the ill-fated, non-magnetic ship, *Carnegie*, reported on May 1 to the American Geophysical Union meeting in Washington.

Results of some of the deep sea determinations of the *Carnegie*, which was destroyed with the loss of Captain Ault in Western Samoa last November, were commented on by H. W. Graham, biologist and chemist, in a paper presented by Dr. J. A. Fleming, as follows: "These samples show that the waters may be divided into three general layers. An upper layer where an active plant and animal life is maintained, a middle layer in which a decomposition of organic remains is taking place, and a lower layer which represents water which has been conducted from polar regions. The upper layer shows high values of dissolved oxygen but low values of phosphates, silicates and hydrogen-ion concentration. The middle layer is low in oxygen but is high in phosphates and silicates and is relatively less alkaline. The lower layer tends toward conditions at the surface with again higher values of dissolved oxygen and lower of phosphates, silicates and hydrogen-ion concentration."

How a shotgun and a stop-watch were used to determine the distance to the bottom of the ocean when the sonic depth-finding apparatus broke was told by Floyd M. Soule, of the ship's staff, and C. C. Ennis. The depth-finding apparatus, which was borrowed from the U. S. Navy, is an electrical device for accurately measuring the time it takes a sound to travel to the bottom of the ocean and return. Knowing the speed of sound in water, the scientists could then quickly calculate the depth of the ocean.

"A steel breech just long enough to hold a 16-gauge shotgun shell was screwed into one end of a length of brass pipe. The pipe acted as a holder and also as a guide for a heavy steel firing pin which was dropped into the upper and open end of the pipe, the shell end being held a foot or two below the surface. The hydrophones were used to pick up the echo and a stop-watch used to measure the elapsed time. Soundings were taken in this manner twice a day. These were only roughly approximate because of the inaccuracy of the stop-watch measurement and because of the uncertainty of the velocity of a sound set up by an explosion. However, it was a case of half a loaf being better than no bread, and the device materially assisted in the routine occupation of oceanographic stations."

Sound sent to the ocean's floor behaved strangely and in unaccountable ways. Sometimes the reflection would be loud from depths and weak from shallows. Again loud echoes and faint echoes would come from places where all known conditions were similar and even where bottom samples were very much alike. The echoes from five-mile soundings were stronger than those often heard from less than one mile.

In water sound travels nearly a mile every second, more than four times as fast as it does in air. On sev-

eral occasions signals were picked up after traveling twenty-five miles back and forth between the bottom of the ocean and the surface, and once they had gone nearly fifty miles, having been reflected fifteen times when last heard.

A NATIONAL HYDRAULIC LABORATORY

A GREAT national hydraulic laboratory, the first duty of which will be to discover scientific principles essential to the construction of Boulder Dam, will be built at the U. S. Bureau of Standards, according to the bill recently passed by the Congress.

Boulder Dam will be nearly twice as high as any dam now in existence and will contain more than three times the concrete in the immense Muscle Shoals Dam and power house. Engineers do not know every detail of the building of such a huge dam so unlike anything man has ever created. Experiments must be conducted and ideas tried in the laboratory first to be sure they work before extensive construction is begun.

The engineers must find, for example, how to design spillways which, if ever used to their capacity, will have to absorb about seven times the power in the falls at Niagara. These spillways will be like huge funnels with rims 150 feet and shafts 50 feet in diameter down which water will fall more than 500 feet.

Problems of flood control on the Mississippi River are now being studied by the Water Experiment Station of the Mississippi River Commission at Vicksburg. Functions of this laboratory and the one for Washington will not overlap, it has been explained, and there will be more than work enough for both.

The Bureau of Standards laboratory will become a national research institution in a field which has been only slightly investigated in the United States and in which private concerns are not prompted to pioneer because much of the large hydraulic construction is carried on by the government. It will cost $350,000.

Such federal agencies as the Geological Survey, Federal Power Commission, War Department Corps of Engineers, Bureau of Public Roads and Reclamation Service will bring their problems to it. Among the subjects of investigation are irrigation and drainage, construction of dams, silting of streams, design of spillways, prevention of scour and resistance of bridge piers to water flow.

ITEMS

A RELAXATION in the rigor of the quarantine regulations against the Mediterranean fruit fly has been announced by the U. S. Department of Agriculture. The new ruling will permit the passage through quarantine lines of certain vegetables, notably peppers, that have been sprayed with mixtures containing copper compounds as precautions against other plant troubles. It has been found that copper salts are poisonous to the fruit fly, and in thus protecting the vegetables against other enemies the growers have prevented their infestation by the fly. The regulations restricting the movements of fruits from the fly area, however, still stand.

EIGHTEEN skeletons of prehistoric man have been found to date this season by the Beloit College-Logan Museum Expedition into Algeria, according to a check-up of the results by Dr. Alonzo Pond, leader. In addition to the human remains, several skulls of prehistoric gazelles with both horns attached have been found, together with innumerable scattered bones of other animal species.

MEASUREMENTS of the heat given off when a powder is wetted by or immersed in a liquid, important when pigments are mixed with oils to make paint, were reported to the American Chemical Society by Dr. William D. Harkins and R. Dahlstrom, of the University of Chicago. Speaking before the paint and varnish section, they told of a new method of making such measurements in which the particles in the powder had a clean surface. Because the action takes place in the outer layer of molecules in the particles, the presence of very small amounts of impurities has a great effect on the wetting of the powders.

THE speed of ultra-sound waves, vibrating 400,000 times a second, twenty times as fast as the shrillest audible sound, in various solutions of chemicals was described at Atlanta by Drs. E. B. Freyer, J. C. Hubbard and D. H. Andrews, of the Johns Hopkins University. Speaking before the section on physical and inorganic chemistry, they told of their work with the sonic interferometer. From such measurements can be determined the compressibility, or "squeezability" of the liquid. The chemicals tested were solutions of chlorides, bromides and iodides of potassium and sodium, including common salt.

REMOVING oxygen from a chemical compound by shooting atoms of oxygen at it is the paradoxical result achieved in an experiment by Professor W. H. Rodebush and W. A. Nichols, Jr., in the laboratory of physical chemistry at the University of Illinois. The effect was produced with the chemical compound known as molybdenum trioxide. Removal of oxygen is called a "reducing action" by chemists. Atoms of hydrogen have a very great attraction for atoms of oxygen and pull them out of compounds to form molecules of water. Hitherto the effect has not been obtainable with oxygen atoms, and this is the first time that oxygen itself has been made to serve as a reducing agent. The experimenters say that with the molybdenum trioxide the effects of hydrogen and oxygen are identical.

A CAT'S ability to detect high tones is about as great as that of human beings, Dr. Ernest G. Wever, of Princeton University, told New York members of the American Psychological Association at their recent meeting. Dr. Wever has settled this point by experiments with cats along the same line as the conditioned reflex experiments devised by the Russian physiologist, I. Pavlov. Three of the cats tested heard tones as high as 10,000 to 20,000 cycles per second. The human voice at its highest ranges to no more than 5,000 cycles.