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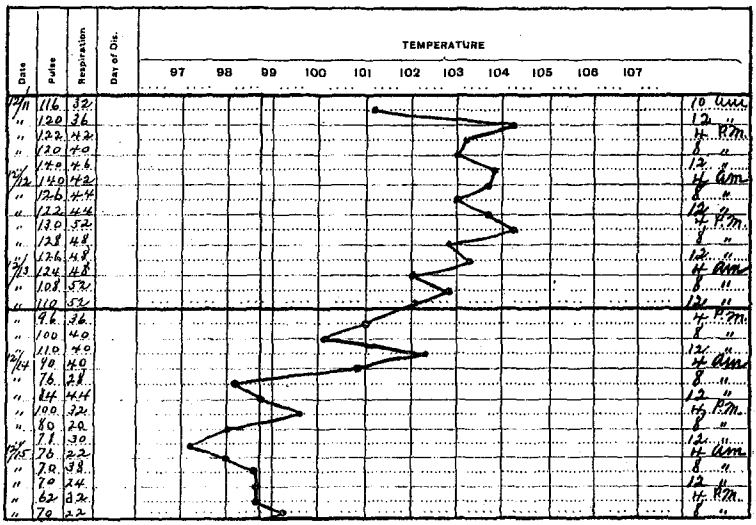
Print to 20-JPA
State Inst Gen-Rogers.

Chart of Temperature, Pulse, Respiration.

NAME..... DIAGNOSIS.....



Size 8½x13

The following certificate must be signed by a member of the Board of Health for the district in which the child resides, and in case there are none of these infectious diseases named therein in the locality, the child can be admitted and this certificate must accompany the child when it is brought to the institution.

DO NOT BRING THE CHILD if small pox, diptheria, measles or scarlet fever is in the locality of the child's residence.

GEO. MOGRIDGE, M. D., Superintendent.

State of Iowa: Institution for Feeble-Minded Children.

Certificate of Health.

I, ..., a Member of the Board of Health for the ..... of .....
CITY OR TOWNSHIP
County of .....State of Iowa, do hereby certify that
.....
NAME OF CHILD
has not, for the period of seventeen days next preceding the date hereof, been exposed to any of the following named diseases:

SMALL POX, DIPHTHERIA, SCARLET FEVER, MEASLES.

I further certify that Small Pox, Diphtheria, Measles or Scarlet Fever is not prevalent in this district.

.....
MEMBER OF BOARD OF HEALTH.

Dated this .....day of.....19....

Size 8½x5½

MODERN STUDIES IN HEREDITY

BY A. C. ROGERS, M. D., FARIBAULT, MINN.

By the announcement in 1890 of the laws of plant heredity as discovered by Mendel in 1866, a most wonderful impulse was given to the study of heredity in plant and animal life. Some of this may be had from the bibliography given by J. Arthur Thompson in his "Heredity", published in 1908, in which he lists over 700 contributions by various authors, and of which less than 200 were published prior to the year 1890; that is, about 73 per cent. of the entire list represents publications during the 19 years since the promulgation of the Mendelian laws.

In this country was organized about four years ago the American Breeders' Association, intended to bring together into one organization breeders of animals and plants, each of these two groups being represented by corresponding sections. At the present time the organization has a membership of nearly 1,000, comprising scientists, government experts, professors in agricultural colleges, experiment station workers, practical breeders of animals and plants and students interested in the scientific phases of the subjects under investigation. This membership is drawn not alone from our own states, territories, and dependencies—Alaska, Hawaii, Porto Rico, and the Philippines—but also from Cuba and Canada, while England, Scotland, Germany, France, Belgium, India, the Canaries, Mexico, Central America, Manchuria, Japan, New Zealand, and Cape Town, are represented. Many noted names appear in its roster, such as Hugo De Vries, of Amsterdam, Holland, and William Bateson of Cambridge, England. Sir Francis Galton, of London, and Luther Burbank, of California, are at the head of its honorary list.

The president of the organization is the Hon. James Wilson, Secretary of Agriculture. Its secretary and one of the most enthusiastic promoters is Hon. W. M. Hays, Assistant Secretary

of Agriculture, and formerly connected with the Minnesota School of Agriculture. Something over fifty committees and sub-committees represent the different phases of the work, and, as Prof. Hays states, "are doing much to formulate plans for successfully breeding all our economic plants and animals, ranging from bacteria to Buffalo; from fishes to forest trees; from pansies with much perfume to potatoes resistant to disease; from wine grapes to wheat."

Of course the great incentives for a majority of the members and investigators are the practical and economic possibilities involved. The oft-quoted suggestion of the value of human effort that could induce two blades of grass to grow where one grew before, seems trivial and a weak figure of speech by the side of the simple matter of fact reports of the results actually realized by intelligent application of known laws that govern plant and animal breeding for economic purposes. For example: "An aggregate expenditure of $80,000 is conservatively estimated to have yielded to the farmers $80,000,000," as a result of the breeding enterprises conducted by the Ontario and Minnesota experiment stations alone.

How fascinating the idea of producing evolution of animal and vegetable life as desired! To be able at will, not only to reforest the globe and restore the fauna of the nearly extinct species, but to produce the individual characteristics desired. The A. B. A. does not confine its activities to economic problems. A very important committee, containing among others the names of De Vries, Bateson, and Davenport (from whom we had hoped to hear at the first of our program), gives its attention to special researches in heredity. One of the most recent committees is the one on eugenics, or the science of being well born, and its duties are specified as follows:

"1. To investigate and report on heredity in the human race.

2. To devise methods of recording the values of the blood of individuals, families, peoples, and races.

3. To emphasize the value of superior blood and the menace to society of inferior blood, and

4. To suggest methods of improving the heredity of the family, the people, or the race."

This committee contains, among others, the familiar names of Alexander Graham Bell, Chairman; Dr. David Starr Jordan, Dr. Chas. R. Henderson, and Hon. W. M. Hays. It is proposed that a group or committee be organized to investigate special fields, such as the aetiology of defectiveness and delinquency.

The methods of investigation must necessarily be radically different from those applied to lower animals and plants. In the latter, individuals may be selected with reference to specific characteristics bearing assumed dominant and recessive relations to each other, and by hybridizing determine, 1. The facts as to such dominance and recessiveness and then, 2. Breed for the permanence of the desired qualities.

In man the investigation must work backwards from the individual to his ancestors. Both physical and mental characteristics are to be studied to determine, 1. The groupings of co-ordinate qualities and, 2. The relative values of qualities, desirable and undesirable, as to dominance. In other words, while the Mendelian law suggests the method for studying data, in both cases, the investigator of human heredity must determine the causes by reasoning from known effects, while the plant and the animal breeder can use assumed causes for obtaining desired results, varying the selection of causes by the results actually obtained.

In any event, the first thing required is the collection of data concerning the individual possessing the characteristics, whose cause is to be determined, as, for instance, idiocy. In the same connection, the ancentral data for each case must be obtained, and the number of cases studied must be large, with a view of possible and probable disclosure of common factors of etiological value. So far the methods of collecting data for studying human heredity are not essentially affected by the knowledge of the Mendelian laws, but the latter will materially assist in analyzing the data obtained with reference to its etiological value. Because, 1. The investigator will constantly view the various characteristics observed with reference to their pos-

sible groupings into co-ordinates of dominants and recessives. 2. The whole field for observation will be enlarged by the knowledge that a sporadic case of idocy may be expected as a recessive exhibition, the cause of which, is remote and might otherwise be overlooked.

This latter fact is both a cause for pessimism and optimism. For the former because of the very obscurity of the possible aetiological factors and for the latter because a natural inference from the Mendelian laws is that parents are not always so much to blame for the natures of their children as we are usually accustomed to suppose.

Again the Mendelian laws are liable to be "over-worked," to explain manifestations that are due entirely to environment. The long process through which the human entity passes from the period of chromosome existence to the maturity of adult life, necessitates its subjection to innumerable influences, capable of producing profound impressions and the biologist must, after all, be one of the cost important assistants in the study of human defectiveness.

The work, however, in which this association can be of most immediate service to the study referred to is the collection of data linking individual defectives to their ancestors by corresponding characteristics. The Department of Experimental Evolution of the Carnegie Institute of Washington has prepared for the section on heredity a set of blanks to be furnished investigators for recording facts as suggested above. Dr. Davenport, of Cold Spring Harbor, N. Y., is director of this section, and he has requested the organization of a committee to look after the collection of such data. The writer will be glad to receive the names of voluteers who are ready and willing to undertake such work.

As an illustration of some work done recently by Gertrude C. Davenport and Dr. C. B. Davenport, I will quote from their conclusions concerning prepotency in pigment colors. These conclusions are based upon the study of about 500 cases.

"The form of the hair, whether straight, wavy or curly is inherited as follows: Two straight-haired parents will have only

straight-haired children; if one of the parents has curly hair 'pure', the children will have curly (or wavy) hair; but if the wavy-haired parent form 'straight hair' germ-cells, half of the children will have straight hair and half wavy hair. Wavy hair is a 'heterozygous' condition indicating that the individual is forming both 'straight-hair' and 'curly-hair' gametes.

"The color of the hair offers peculiar difficulties; first, because it grows darker with age (and after certain diseases) and because black hair pigment may obscure the presence of red. Two general series of color are recognizable: brown, due to melanic granular pigment, whose amount (density) is variable, and red, due to a fatty diffuse pigment, also variable in intensity. Both series start with colorless hair; the brown series passes through yellow and yellow brown, through the shades of brown to black; and the red series passes through clear red to dark red in which latter case melanic pigment is present. Despite the graded series of melanic pigments one can discover certain laws. First, two flaxen or yellow-haired parents can have children of that type only. In general the children may have hair as dark as the darker parent or lighter, but not darker. Two clear-red haired parents have only children of the same sort, but if either has the melanic pigment the red in the offspring may be entirely obscured by brown or black pigment. Conversely, two parents with black hair and having red-haired ancestry may have children with red hair, the red pigment being masked by the black.

"In all the foregoing cases we see that the children do not gain any character in a higher degree of development than their parents. If the character (brown eye or hair pigment, curliness) is absent in the parents, it must be absent in the children also.

"If this principle holds true generally, as seems to be the case, then the marriage of two persons both defective in the same character, will result in offspring all defective in the same character and in some cases probably more defective than the parents."