found in her rats. The *bactrianus* mice (1) show a lower proportion (2.84 ± 0.53%) while the percentage of the hybrids (3) which were born dead is intermediate. This may be the result of small numbers or it may be an indication of the innate vigor of the F_1 fetuses, since Little[4] found significantly fewer stillbirths resulting from human interracial than from intraracial matings. The most illuminating figures are those for the 2 types of back-cross matings (4 and 5 in the table). These two types have the same genetic constitution so the great difference in the percentage of stillbirths (8.23 ± 0.84) must be due to the mother and exhibits the remarkable degree to which heterosis is present in the female hybrid.

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Oxydative Blood Destruction and Blood Pigments Protection.

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Contrary to the generally accepted idea that destruction of blood pigments occurs gradually it could be demonstrated by newer experiments that any oxydate destruction up to colorless end products may occur directly with the oxyhemoglobin (hematin acid, succinic acid) and that intermediary products (methemoglobin, hematin, porphyrin) do not appear.

This result can be proved: (1) by bacteriological examinations: Using agar prepared with boiled blood, it can be found that the destruction of blood pigments occurs with formation of peroxyd by certain bacteria and with decolorization of hematin. (2) by spectroscopical examinations. Blood containing hematin loses its color instantaneously if combined with H_2O_2. No intermediary products can be found with spectroscopical examination.

For the assumption of an oxydative destruction two different factors have to be taken into consideration. (1) A protective factor has to be assumed. This must be a product that is close to catalase. According to our last studies very small amounts of fresh blood are sufficient to protect the blood pigments (hemoglobin, methemoglobin, hematin) from an oxydation by H_2O_2. This protective action can be increased when different media are used. The

[4] Little, C. C., PROC. SOC. EXP. BIOL. AND MED., 1919, **16**, 127.

smallest effect will be found by a dilution of water, normosal acts more effectively and still more intensive is the effect in urine; serum and bile show the most intensive action. The pH is here of great importance.

The oxydative action of H_2O_2 can be increased hypernormally if no blood-pigment protection is present. Proof has been found in the following experiment: A dilute methylenblue solution will not be altered by H_2O_2; it remains blue. If one adds "unprotected" (free from catalase) hgb. or Ht. crystals it is seen that not only blood pigment solution loses its color but also the methylenblue solution becomes water clear. The destruction of blood pigments therefore occurs only under the influence of oxydation. Peroxyd (H_2O_2) destroys very rapidly the blood pigments if the protective ferment has been destroyed.

This occurs as demonstrated: (1) Under bacterial influences (staphylococci, f. i. destroyed in blood agar cultures). (2) Under the influence of high temperature. The human "protective substance of blood pigments" will be destroyed if a temperature of 73°C. is reached, and furthermore a decoloration becomes evident under the influence of H_2O_2. With animals the destructive temperature differs from that in men. Dog's blood for instance will be destroyed at 50° C. while pigeon blood is destroyed at normal temperature. Similar to H_2O_2 is the effect of peroxyd-like influence of living bacteria. This can be easily demonstrated if pneumococci are cultivated on agar that has been mixed with boiled blood. According to Wieland it has to be assumed that O_2 in the metabolism will be changed intermediary into hydroperoxyd and that the catalases have the function of almost instantaneously destroying the H_2O_2. It is possible that the blood-pigment protective body has under such conditions been destroyed previously.

Observation with blood containing urine in cases of gas bacilli septicemia leads to the opinion that a loss of the blood-pigment protective body may, under certain conditions, take place in the body itself.