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Blood Typing Simplified.

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A method is presented which makes the typing of blood of an individual a very simple, quick and exact procedure. It has been used in 324 cases, resulting in an erroneous result, as judged by older procedures, in only one case.

The necessary equipment is: (1) a blood lancet; (2) two tuberculin syringes with hypodermic needles; (3) toothpicks; (4) alcohol and dry sponges; (5) potent A and B sera.

The A and B sera are prepared by sensitizing known A and B individuals by means of intravenous injection of 0.1 cc of Witebsky's A and B substance.*[1] In most individuals so sensitized an appreciable titer of anti-A or anti-B agglutinin will be present 10 to 12 days following injection. When the titers have reached a high value, in our cases 1:512 anti-A and 1:16,384 anti-B, the individuals are bled 500 cc under sterile technique; the serum is separated, complement inactivated, and stored in sterile containers in the icebox or frozen. The sera so obtained are used undiluted in the test to be described.

The right middle and ring fingers of the individual to be typed are cleaned with alcohol and dried. They are then punctured superficially so that a very small drop of blood (1 mm in diameter) can be expressed on the skin of each finger. A small drop (3 mm in diameter) of A serum is placed from a tuberculin syringe on the blood drop on the middle finger and a similar sized drop of B serum is placed on the blood drop on the ring finger. The sera and blood are mixed with the ends of a toothpick. The mixture is then agitated by snapping the tips of the fingers for a minute and the reactions then read under a suitable light. A positive test, *e.g.*, presence of A factor, is indicated by agglutination of the red blood cells to which the anti-A serum has been added.

Three hundred individuals, chosen at random from the population of the Medical School and the V-12 student body of the undergraduate school, were typed according to the above technic. They were then typed by one of the other 3 methods named in Table I. The typing done according to the glass slide method was done by a pharmacist's mate. He also carried out without difficulty some of the tests, using the author's method, under the author's supervision.

From the results shown in Table I, the reliability of the test is obvious, especially when one realizes that some of the individuals typed as belonging to Group A were later found to be type A_2 and one was proven to be type A_3. These individuals of course give weak reactions when typed by the older methods, and consequently are frequently called Group O The one inconsistent result was in the 22nd typing done by this new method. Thus there have been no errors in the last 300 typings.

The new test is rapid, so that 2 individuals schooled in the technic can type 70 to 75 individuals in an hour. An individual test can be carried out from start to finish in 2 to 3 minutes. Aside from the ease and rapidity with which the test is carried out, one of its chief assets is the fact that it is impossible to get the individual separated from his test. The individual is present and his blood group is on his fingers. It is then merely necessary to record the name and group at one sitting. Thus the test is ideal for the typing of large numbers of individuals and is so simple in technic and equipment required that the typing of one or more individuals can be carried out as an office procedure.

The M and N type of an individual can

* Supplied through the courtesy of Eli Lilly & Co., Indianapolis, Indiana.

1 Witebsky, Ernest, Klendshoj, Niels C., and McNeil, Critchon, PROC. SOC. EXP. BIOL. AND MED., 1944, **55**, 167.

TABLE I.

Method used	Individuals tested	Errors	% errors	Time required per 25 tests
4-tube	39	0	0	2 hr (estimated)
Hollow-ground slide	36	0	0	45 min (measured)
Glass slide	249	11	4.4	1 hr "
Author's	324	1	0.3	20 min "

All tests done by the author's method were checked by one of the other 3 tests, usually the glass slide method. Whenever there was disagreement between the author's method and the glass slide method the blood was retyped by one of the other 2 methods.

be as simply and quickly determined, carrying out the test as described but substituting anti-M and anti-N sera for anti-A and B sera. Thus on 4 fingers of an individual one can determine in 3 minutes or less his A, B, M, and N types. We have not been successful in using this test to determine the presence or absence of the Rh factor.

I am indebted to Lieut. George P. Heckel, M.C., U.S.N.R., for enabling us to carry out the method on the V-12 students under his care and to Miss Dorothy Miller for her interested cooperation.

Summary. A simple, rapid blood-typing test is described which requires a minimum of equipment, gives clear cut reactions and a very low percentage of error. It is especially useful for typing large groups because of the impossibility of mislabelling the bloods. It is so simple that blood typing can be made a home or office procedure.

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A Granular Body Characteristic of Certain Non-Bacterial Pneumonias of Mice.*

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Several strains of non-bacterial pneumonia readily transmissible by intranasal infection have been established in mice with throat washings or lung suspension from human atypical pneumonias.[1] The lung lesions in 3 of these strains are characterized by large spherical or oval bodies measuring approximately 12 to 30 micra in greatest diameter and composed of myriads of minute granules or short rods (Fig. 1-5). These structures will be designated as granular bodies, and their minute components as elementary particles.

The shape of the granular bodies is sharply defined by a thin capsule or membrane.

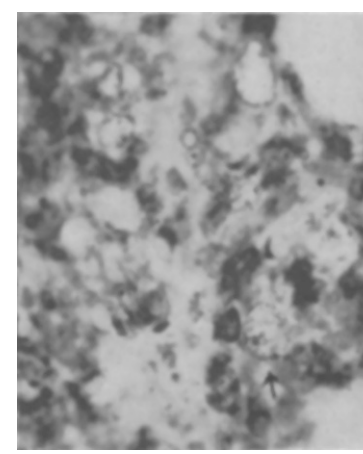

FIG. 1.

Mouse killed 5 days after infection with "mouse pneumonitis virus" (Nigg). The arrows point to 2 characteristic granular bodies. Others in the field are not well in focus. × 400.

* These investigations were made under the Commission on Pneumonia, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the United States Army.

[1] deGara, P. F., and Furth, J., to be published.