body builds, their heights ranging from 5 to 5 ft 11.5 in. and weights from 90 to 158 lb.

The average error of the values computed from the formula as compared with the measured values worked out to be 1.5%, the mean error – 0.5%, and the standard deviation of the errors 1.8%.

Statistical analysis of the errors leads us to the conclusion that for all practical purposes Du Bois height-weight formula can be made use of for computing the body surface of Indian subjects also.

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References

1. DU BOIS, D., and DU BOIS, E. F. *Arch. Internal Med.*, **17**, 863 (1916).
2. ———. **15**, 868 (1915).
3. SAWYER, MARGARET, STONE, R. H., and DU BOIS, E. F. *Ibid.*, **17**, 855 (1916).
4. RODAHL, K. *J. Nutrition*, **48**, 359 (1952).

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The Scientist and the Library Cataloguer

Mr. Roger Poulin has commented (SCIENCE, **117**, 538 [1953]) on the difficulty of classifying a book so as to satisfy everybody: ". . . one man's orderly arrangement may be another's hodgepodge," he quotes. He is right, but to suggest that the author of a book should state where it is best classified does not ease the difficulty, for the author is himself only one man. The best place to classify and shelve a book will vary from one special library to another, according to the interests of the readers served.

But this is not the end of the story. A general library has to cater for varied interests. It must be admitted that simple classification alone, putting a book at one point in a unidimensional arrangement, cannot do this effectively. It is the function of a library catalogue to bring out alternative positions in the arrangement which a book might occupy, and so to make up for the limitations of the classification.

The essential point about the book cited by Mr. Poulin (Rugh's, *The Frog: Its Reproduction and Development*) is that it is not simply about either frogs or embryology: the subject is compound. Both aspects must be recorded in the catalogue, so that readers are led to this book and associated books whether they are interested in amphibians or embryos. The cataloguer will be helped in this task if the classification of the book already clearly reveals the compound nature of its subject. An enumerative classification like that of the Library of Congress fails to give this help: the book must be labeled either QL668.E2 (Salientia) or QL959 (vertebrate embryology).

A synthetic classification, on the other hand, sets out separate schedules for each of the various aspects of biology, and forms its class number by linking together numbers drawn from two or more appropriate schedules. Thus the Colon Classification of the Indian Ranganathan would number Rugh's book K9325: 7, where 9325 (Anura) is drawn from a taxonomic schedule, and 7 (ontogeny) from another schedule. The cataloguer can immediately translate these two parts of the number into appropriate subject headings.

The working out of sets of independent schedules of primary terms that can be combined to represent compound subjects is occupying the minds both of classificationists and of punched-card users, as the latter combine terms in a very similar way. It is in this work that the scientist can help greatly, for the value of any classification scheme rests on the accuracy with which its basic schedules reflect modern knowledge.

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A Collecting Device for Obtaining Blood Samples at Various Intervals from an Intra-Arterial Catheter

THE development of polyethylene catheters suitable for insertion into arteries provides a convenient method for repeated or continuous sampling from these vessels. It is desirable to keep the catheter as small as possible, not only to facilitate insertion but also to minimize the chance of hematoma formation after the catheter is withdrawn. When this technique was applied to the collection of arterial blood in the determination of cardiac output by the Evans' blue method as described by Hamilton, it was found that sufficient blood could not be collected through the small polyethylene catheter (outside diameter, 0.965 mm; inside diameter, 0.58 mm) in the 2-sec sampling

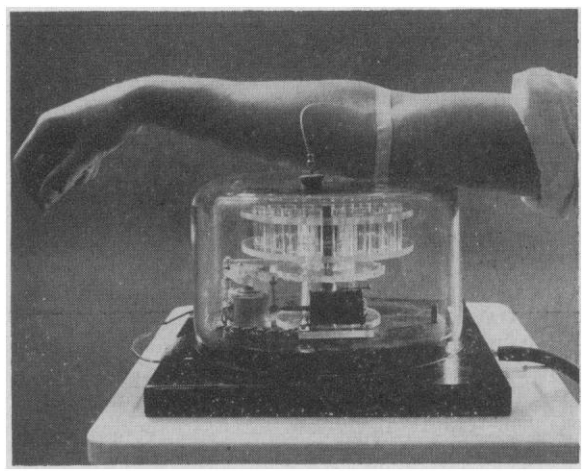

FIG. 1. Complete collecting device ready for operation. The tubing at the right is the connection to the vacuum pump. The relay for activating the ratchet is at the left, under the tube carrier. The solenoid, for returning the ratchet to its resting position, is centrally located, also under the tube carrier.

interval chosen for collection. A device to facilitate collection under these circumstances was therefore developed.

It consists of 5 main components (Fig. 1): (1) a wooden base through which protrudes the open end of a brass tube connected on the outside to an evacuation pump; (2) plastic spools to carry 21 tubes for collecting blood; (3) a ratchet system for moving the spool; (4) a modified antenna relay and solenoid to provide thrust and retraction to an actuating arm operating the ratchet; and (5) a glass battery jar fitted tightly to the wooden base and provided with a 10-mm opening, placed directly over the circumference described by the collecting tubes, and fitted with a rubber stopper.

The modified antenna relay Type 314 has a quick thrust and no appreciable lag when operated at a voltage slightly in excess of its normal rating. A solenoid was found to be more satisfactory than a spring for providing reverse movement to the relay arm since the spring tension contributed materially to the lag. The system may be manually operated by a pushbutton switch or by an electronically controlled timing device. The timing device can be regulated to give various intervals between thrusts.

Blood is collected by inserting the arterial catheter through a rubber diaphragm that covers the hub of a needle of suitable size that in turn is introduced through the rubber stopper in the battery jar. Arterial flow is in the form of a series of regular drops; and, under the conditions described, about 0.2–0.3 ml of blood can be collected every 2 sec. As little as 0.1 cc of blood is adequate for dye determinations if whole blood, instead of serum, is employed (*1*). The negative pressure inside the battery jar is equal to approximately 4.5 cm of mercury, and is constant.

The device can be used, with or without the vacuum, for the collection of other biological specimens at various time intervals. For collection of samples at intervals of less than 2 sec, however, a spool constructed according to the design of Asmussen and Nielson (*2*) is preferable to the one shown.

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References

1. Chapman, C. B., and Fraser, R. In preparation.
2. Asmussen, E., and Nielson, M. *Acta Physiol. Scand.*, **27**, 217 (1953).

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Book Reviews

Structure Reports for 1949, Vol. 11. A. J. C. Wilson, Gen. Ed.; C. S. Barrett (Metals), J. M. Bijvoet (Inorganic Compounds), and J. Monteath Robertson (Organic Compounds), Section Eds. Utrecht: Oosthoek, 1952. (For the International Union of Crystallography.) 477 pp. Illus.

In 1931 P. P. Ewald and C. Hermann published the first *Strukturbericht.* This was followed by six more volumes up to 1939. These were issued as special supplements to the *Z. Kristallographie,* containing a thorough critical review of structure work. The war interrupted this work and at the Cambridge, Massachusetts meeting in 1948, the Crystallographic Union decided that one of its goals would be to continue the critical review of structures. Thus we have now this first postwar volume of structure reports, issued with the financial help of UNESCO, British and American research organizations, and industrial firms.

The present volume, a discussion of recent work, is supposed to be followed by a complete digest of the work between 1939 and 1947 to fill Volumes 1 to 10 to make the structure reports complete.

One should not miss this occasion to express the gratitude of all scientists, not only to the present group, but particularly to P. P. Ewald, who first realized the great importance of a critical review of crystal structure analysis in the *Strukturbericht.* The words of thanks with which he sent this new volume into the world, "One should not forget what the world owes to the patient, meticulous, and expert editors, who often set aside their own interests in order to build up this work for the common good of all their fellow workers," should go also to Ewald himself and his original group of collaborators.

The present volume is divided into three sections: "The Structure of Metals," edited by C. S. Barrett (184 pp.), "The Structure of Inorganic Compounds," edited by J. M. Bijvoet (340 pp.), and the final section on organic compounds (226 pp.), edited by J. Monteath Robertson. The editors had the help of some 30 abstractors.

Structure reports do not contain abstracts in the usual sense, but a careful analysis is made of all the information regarding structure, so that it is not necessary to look up the original papers. If the new group of editors is going to follow the procedure of Ewald and his collaborators, then one may frequently find in their analysis information the author himself may have overlooked.

The arrangement of metals is strictly alphabetical: they are not included in the subject and formula indexes. In some cases there is a cross reference when similar structures are listed together (e.g., Al_3U,