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Physical Anthropology Of The American Negro.

W. Montague Cobb

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PHYSICAL ANTHROPOLOGY OF THE AMERICAN NEGRO¹

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¹ Extension of presentations given at a Conference on Negro Studies held by the American Council of Learned Societies at Howard University, March 29, 30, 1940, Bull. No. 32, Am. C. Learned Soc., Wash., D. C., Sept., 1941, and of a paper read in condensed form at the Eleventh Annual Meeting of the American Association of Physical Anthropologists, New York, May 2-4, 1940.

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I. INTRODUCTION

In this crucial present, there is no need to emphasize anew the long and well acknowledged importance of accurate and comprehensive information on the biological qualities of the world's largest minority, the thirteen million American Negroes of the United States. In degree without precedent, this present is both challenge and opportunity to American physical anthropology. Should this science prove able through its scope, depth and objectivity, to aid in the building of our future, it can make all mankind its debtor.

Thrice before, under somewhat similar circumstances, the science has had opportunities of like promise in respect to the immediate problem, but on these occasions the science was not ready, having been too young and unbalanced in its development.

When slaving was "big business," physical anthropology was hardly out of its infancy; at the time of the Civil War it was showing the uncautious ebullience of happy childhood; and by World War I it was but a none too well-knit adolescent. It remains to be seen whether it has yet come of age.

Never has the time for its voice to be heard been more propitious, never have facilities been more adequate, proving grounds more abundant, or need more urgent. The tocsin has sounded. It is up to the anthropologists to show what they have.

This presentation is intended as an aid to stimulation and coordination of efforts on one of physical anthropology's most arduous proving grounds, the study of the American Negro. An attempt will be made to show the present status of study in this field as gauged by: (1) the amount of activity, past and present, in it; (2) the laboratories equipped for and conducting such study; and (3) the knowledge yielded by published investigations. This information should indicate what phases still require attention and what profit might be expected from collaborative endeavor by cognate sciences where possible.

II. ACTIVITY

The size, character and accessibility of the literature, the number of workers and laboratories involved and the organizations concerned with promotion, may be used as basis for appraisal of activity in the field.

1. Bibliographies, indices and reviews

The treasure rooms of a literature are most readily unlocked with the keys of bibliographies, indices and periodic reviews. Each of the keys we now have will admit to some of the chambers, but none will open them all. It may be set down at once, therefore, that one item needed is a master key to the literature in the form of a comprehensive, annotated and indexed bibliography. This list should include separately, both African and American studies.

Bibliographies. DuBois' bibliography on the Negro of 1905 lists only two studies in the sphere of physical anthropology. Griffin's 1906 Library of Congress bibliography includes but one such title; that report (3)², however, does not appear in other sources. In 1906, DuBois published another reference list, "Bibliography of Negro Health and Physique," as an inclusion in Atlanta University Publication no. 11 on the same

² Reference numbers not preceded by an apostrophe refer to item number in the appendix reference table. This is to avoid unnecessary repetition in the regular bibliography.

subject. This contained 215 titles, of which 115 were of physical studies, including pathology and mortality. Work's 697 page bibliography of the Negro in Africa and America, published in 1927, carries only 52 studies under the heading, "Anatomical and Anthropological," of which 15 are listed as "in progress."

In June, 1927, Hrdlička's classified and indexed bibliography on the anthropology of the American Negro appeared. His 380 titles were subdivided as follows:

SUBJECT	NO. TITLES
General	47
Inequality of races	10
Medical and related	45
Demography	35
Mixtures	38
Anthropology	25
General	22
Physiological	3
Morphology	28
Color	12
Albinism	11
Hair	4
Eyes	3
Ears (external)	3
Nose	3
Feet and hands	3
Internal organs	7
Sex organs, pelvis	11
Muscles	10
Brain	16
Skull	16
Skeletal parts	18
Anthropometry	33
Children	15
Adults	18

Neither Work nor Hrdlička included all the titles of physical studies listed by DuBois in 1906.

Martin's bibliography on the whole field of physical anthropology which forms the third volume of his *Lehrbuch*, last printed in 1928, does not afford easy access to such references on the American Negro as it contains, nevertheless, the writer

encountered there a few titles which did not appear in other lists. Possibly thorough search of this book would yield a few more.

Loth's "Anthropologie des parties molles," was published in 1931. The bibliography of this ambitious and laudable first edition was necessarily incomplete, but it provides many references to studies on non-skeletal parts in the Negro, chiefly African, so that its consultation is necessary.

A comprehensive bibliography, which showed critical selection and embraced most of the more modern studies, was appended to Bakwin's survey on the Negro infant in 1932 (51).

In 1934 the yearbook number of the Journal of Negro Education, devoted to "The Physical and Mental Abilities of the American Negro," incorporated a selected bibliography of 244 titles of studies relating to investigations of racial differences in physical traits. This comprised the most complete coverage of recent investigations which had appeared up to that time. There was also a selected list of 319 studies since 1910, relating to mental abilities.

"The Negro's Struggle for Survival," by S. J. Holmes, (363), has a classified bibliography of particular value for references to studies of biostatistics of all kinds.

Krogman's, "Bibliography of Human Morphology, 1914-1939," contains some titles not recorded elsewhere. Here one must look under the various subject headings as well as under the caption, "Negroes."

The lists, abstracts and reviews of current literature carried regularly in the American Journal of Physical Anthropology, Human Biology, the Quarterly Review of Biology, and the Journal of Negro Education must be consulted for omissions from the specific Negro bibliographies.

Indices. The Quarterly Cumulative Index Medicus is the most dependable and comprehensive source for references on physical studies of the Negro. The necessities of sorting for subject and of searching a separate volume for each in-

dividual year makes its use, though essential, a laborious and time consuming task.

Since the American Journal of Physical Anthropology was founded in 1918, nearly every important study relating to the Negro has been either published or reviewed in this journal. A comprehensive index of the first 22 volumes of this journal covering the period 1918-1937 (Cobb, '41) should facilitate access to the material here contained. The indices of the 7 subsequent volumes are easy of consultation individually.

The Index Catalogue of the Surgeon General's Library, 3rd Series, is not at all full on the Negro.

The fact that occasional studies in the field of genetics, physical training and athletics are published in journals not covered by the Index Medicus or anthropological journals, renders a certain amount of individual sleuthing necessary where exhaustive coverage is desired.

Reviews. Several reviews of the literature, varying somewhat in aims and scope, have appeared. These have usually been intended as surveys for the appraisal of current progress and indication of directions for further efforts, much as in the present instance.

First and very noteworthy among these is a 112 page pamphlet, "The Health and Physique of the Negro American," published in 1906 under the editorship of W. E. B. DuBois as Atlanta University Publication no. 11. It contained, in addition to the bibliography just cited, competent and critical digests of available knowledge and data on race, American Negro origins, the Negro brain, his anthropometry, the phenomena of race mixture, psychological considerations, morbidity, mortality, facilities for medical care and a series of 66 photographs of subjects of varying intermixture with relevant personal information.

The contents of this publication spanned the entire problem and anticipated in their items the numerous diversified specialized studies which have appeared subsequently.

It is significant that a Negro institution under Negro leadership thus early took the initiative in espousing a detailed program for the investigation of the problems concerned with the Negro, with modern scientific methods and objective attitudes.

Three years later there was published, "Proceedings of the National Negro Conference, 1909," a small volume of 229 pages. The only article on a biological subject in this book was, "The Brain of the American Negro," by Burt G. Wilder. He reviewed the scant anatomical evidence and the commonly held beliefs, pointing out fallacies. The contribution was well illustrated and had a full bibliography.

Hrdlička's review, "Anthropology of the American Negro: Historical Notes," was published in 1927. He cited with brief commentary what had been done in the several branches of morphology and appended the bibliography mentioned above. It was apparent from this survey that twenty-one years after the Atlanta study, the extent of reliable information on physical phases was still unsatisfactory.

Volume 140 of the *Annals of the American Academy of Political and Social Science*, 1928, was devoted to a symposium on, "The American Negro." Except for the articles, "The Health of the Negro," by Dublin and, "Tuberculosis and the Negro," by Landis, the discussions were on sociological and psychological subjects.

Bakwin's review of studies on the Negro infant, (51), is a modern, comprehensive and objective résumé and critique. His accompanying reference list has been mentioned.

In connection with the frequent query as to what Negroes themselves have done in prosecution of the study of their problems, it is of interest to note that the subjects covered by the single report from Atlanta University in 1906 had so grown by the thirties as to require three separate yearbook numbers, each of about 570 pages, of the *Journal of Negro Education*, published by Howard University.

The first of these was concerned with, "The Physical and Mental Abilities of the American Negro," (Yrbk. III, 1934), the second with, "The Health Status and Health Education of Negroes in the United States," (Yrbk. VI, 1937), and the third with, "The Position of the Negro in the American Social Order," (Yrbk. VIII, 1939). Each of these volumes was planned by members of the Howard University faculty and the contributions were from leading Negro and white scholars in the respective fields. The student of physical studies will find them a valuable reference and an adequate introduction to the more recent specialized studies.

The February 1941 issue of the Tri-State Medical Journal was devoted to a consideration of disease in the Negro. The several articles treated of different subjects as seen in the light of the wealth of recorded clinical experience of the Charity Hospital, New Orleans, La. This issue is not so much a review of total experience as an acknowledgment of opportunities for study.

2. Needs of the literature

The foregoing brief exploration of sources indicates that though the scientific literature relating to the physical anthropology of the American Negro is not particularly large, bibliographic sources are of such number and variety of coverage, that a comprehensive, annotated and indexed bibliography of physical studies, embracing both African and American investigations would be a boon.

The number of titles, which now appear in bibliographies, on certain clinical subjects, such as albinism, mongolism and some rare diseases, is misleading as to the amount of investigation these subjects have received, because many of these titles refer only to case reports, useful enough in themselves but unbalancing to a general bibliography. For a number of topics, collation of case reports in a comprehensive summary would be a useful service.

Along the same line, there is a need for similar condensations covering the known facts about racial variation in certain features which have been the object of considerable research, such as anthropometry, skin-color and blood vessels.

In contrast with many documentary sources on historical and sociological aspects of the Negro, which are located in private collections to which all scholars are not admitted, the entire scientific literature on biological problems, with which we need be concerned, has been published in books or journals which for the most part are easily available to any qualified investigator.

The studies appearing in the lists of scientific literature, however, vary considerably in quality. DuBois in 1906 pre-faced his bibliography with the statement, "A large part of the matter here entered is either unscientific or superseded by later and more careful work. Even such matter, however, has an historical interest." Hrdlička wrote in his review in 1927, "The scientific anthropology of the American Negro is still barely above its beginnings. Almost everything remains to be done, or done over and better or more fully, according to present standards and requirements." The writer found no reason to dissent from either of the pronouncements. With the improvement in scientific methodology in general has come improvement in approach, method and deduction in respect to studies on the Negro so that it is quite safe to say that the bulk of reliable data on biology and morphology is of recent origin.

The amount of available data on the various phases is already of such nature and complexity that another useful aid to scholars would be a critical scientific reference volume on physical studies of the Negro, such as have been published on cytology and ageing. A popular edition of such a work for teaching and lay purposes would also be a beneficial contribution.

It would obviously be beyond the province of this paper to furnish the exhaustive bibliography or authoritative digests

that are needed. To provide a basis for a useful analysis, however, 412 studies have been arranged in the appended reference table to show at a glance, subject material, investigator, place, time, auspices and publication. Although not complete, this list is believed adequately representative of what has been done. The writer is not aware of omissions which would significantly affect the validity of the picture drawn.

Certain explanation may be made concerning entries in the list. A few studies, such as that of Gould (1) covered more than one topic. In such instances, the study was referred to separately under each topic considered, so that a few single publications receive recognition as more than one separate study in the reference list. Whatever aberration this may have induced in the list, is more than compensated by cases in which multiple titles each represent different phases of analysis of the same basic data.

In the consideration of institutional sources, (table 2), where joint auspices were indicated, credit was given both contributing agencies.

Some selection had to be made in reference to biostatistical and clinical studies, but these groups have been listed after the morphological and physiological, where the reader may appraise their import for himself.

The foreign studies listed, mostly recent, were included for such value as they may have for collateral information and as indication of activity abroad.

It would seem appropriate to state at this point that sometime after this manuscript had been submitted for publication, there appeared, as of May 12, 1942, a volume entitled, "The Biology of the Negro," by Prof. Julian H. Lewis of the University of Chicago. This book of 433 pages is divided into nine chapters captioned as follows: "I. Population and Vital Statistics; II. Anatomy of the Negro; III. Biochemical and Physiological Characteristics; IV. Medical Diseases;

V. Surgical Diseases; VI. Obstetrics and Gynecology; VII. Diseases of the Skin; VIII. Diseases of the Eye, Ear, Nose and Throat; and IX. Dental Diseases.

As these contents would suggest, this book is a valuable contribution in respect to one of the needs of the literature cited above, namely the provision of a scientific reference volume. The work treats of both the African and American Negro and brings together more information than has been assembled under one cover before.

The principal interest, in line with the author's profession of pathologist, is focussed upon facts and implications associated with disease. Some of the conclusions have been previously stated by the present writer, who regrets extremely that he had no prior knowledge of what Lewis' volume would contain.

Fortunately, Lewis' work and this paper are in many respects complementary, although different in objectives and approach. The pathological aspects, which purposely and of necessity have been sketchily treated here, have been given full attention by Lewis. On the other hand, there will be found here references to some morphologic studies and reviews which he omitted. This is an inevitable accident in treatises of this kind. Elsewhere we shall hope to give Lewis' book the extensive critical appreciation it deserves. Certainly it may be hoped that both the book and this paper will have value in their common end of stimulating scientific study and thought on the Negro.

We return now to consideration of the studies in our reference table.

3. Number of studies

The chief facts about the number of biological studies are briefly stated. The literature cannot be considered a large one. The distribution of the studies in our reference table is as follows:

CLASSIFICATION OF 412 STUDIES IN REFERENCE TABLE

Anthropometry	58
Adults	22
Children and Adolescents.....	17
Infants	4
Embryos and Fetuses	2
Special Regions	13
Body Type	5
Adults	4
Children	1
External Features	28
General	1
Eye	10
Ear	3
Nose	6
Hand and Foot	5
Dermatoglyphics	3
Integument	40
Skin	18
Skin Glands	3
Hair	13
Nails	2
Albinism	4
Skeleton	96
Skull	30
Teeth	14
Sternum and Shoulder Girdle..	7
Long Bones	12
Vertebral Column	14
Ilium and Pelvis	12
Ageing	6
Joint Cartilages	1
Muscles	15
Blood Vessels	21
Arteries	16
Veins	5
Nervous System	26
Brain and Spinal Cord	20
Peripheral Nerves	6
Vital Organs	11
Thoracoabdominal viscera	6
Endocrine Glands	5
Soft Parts and Dissections	3
Blood	19
Morphology	1
Groups	7
Chemistry	11

Cerebrospinal Fluid	1
Physiological	18
Exercise Adaptation	1
Blood Pressure	5
Vital Capacity	2
Patellar Reflex	1
Electrocardiography	1
Body Temperature	2
Taste Threshold	1
Drug Action	5
Congenital Defect or Malformation....	6
Demographic	14
Sex Ratio	3
Multiple Births	3
Fertility and Contraception..	1
Population Growth	2
Location and Demography of Materials	2
Mortality and Morbidity	3
Clinical	51
Race Traits and Tendencies...	1
Surgical Peculiarities	3
Mongolism	4
Tuberculosis and Respiratory Infection	15
Exanthemata	5
Syphilis Tests	1
Cardiovascular	7
Thyroid Disease	3
Gall Bladder Disease	1
Genito-Urinary	4
Obstetrical and Gynecological	3
Neuropsychiatric	4
TOTAL	412

Subtraction of 14 demographic and 51 clinical studies leaves 347 reports as dealing with human anatomy or physiology in some way. Since skeletal is the most abundant and available material, since living subjects are the next most ready objects of study, and since skin is the principal race differentiator, it is natural to find skeletal, anthropometric and integumentary studies in greatest frequency among the physical studies.

Table 1 shows that most of the literature is the product of the last two decades, only 42 or 10.2% of our 412 studies

having been published prior to 1920. This interest and activity as manifest in publication has progressively increased, however.

In 1923 more than 10 papers appeared in a single year for the first time, but a production level of 10 or more reports per year was maintained for every succeeding year but one until 1932, when for the first time as many as 20 papers were published. Five times in the next decade the number of 20 papers a year was exceeded.

Any optimism engendered by this recent prolificity should be postponed until the considerations amplified in the succeeding sections have been taken into account.

4. Sources of studies

For examination of the sources of our 412 studies, 39 may be subtracted as being of foreign origin and African material, leaving 373 reports as emanating from 95 American institutions. Table 2, however, shows that 253 (67.9%) of these investigations have been made by only 14 institutions, leaving 120 studies distributed among 81 institutions, an average for the latter of little more than one each. Clearly, occasional activity has been widespread, but two thirds of the reports have come from slightly more than one seventh of the institutions.

It is fortunately possible in the case of most of the leading institutions to identify the scientists whose work and influence have been principally responsible for the investigations pursued. In some laboratories the study of racial differences has been a primary interest. In others the findings have been made in connection with programs of different objective. Table 3 shows that in the 14 most active institutions, the span of activity of the individual laboratory has varied considerably in duration, intensity and continuity. Review of the chief relevant facts about the work of these 14 leading institutions will be of value at this point.

It will be noted that generally the studies have come from one or two laboratories in a given institution but that occasionally there have been several contributing departments. Usually the most active department has been influential in some measure in stimulation of study of the racial factor in other branches.

Washington University. The 44 studies of this institution have been the work of Robert J. Terry and his associates in the anatomical laboratory. They treat of the variation, in series of significant size of Negro and white cadavera, of various skeletal, muscular and vascular structures. The emphasis in the reports has been upon accurate description of the facts rather than upon attempts at final evaluations. These studies have been part of a program which has been specifically directed toward assemblage of data bearing upon the nature and variability of basic stock differences in morphologic features and the changes occurring in hybridization with the passage of time. Publication of these investigations was begun in 1921 and has continued without interruption to the present day.

Western Reserve University. This institution's 42 reports represent, except in two instances, the work of T. Wingate Todd and his associates in the anatomical laboratory. The skeleton in its metrical, topographical or developmental variation is the principal subject of investigation. Cadaver anthropometry and demography, skin pigmentation, eyeball weight and peripheral nerves have also received attention. The Reserve program has been focussed primarily upon the study of human constitution as such and the elucidation of racial differences has been only one phase of comparative studies which embraced wherever possible, all the orders of mammals. The interpretation of racial differences has been such as to emphasize the differential expression of biological phenomena and diminish interest in the practical utility of classifications of taxonomic status. The first of the Reserve studies appeared in 1920 and the most recent is in press (139). A very definite

peak of activity is evident, extending over the years 1923 to 1933.

It should be mentioned that the reference table lists but two titles for pubic differentiation, a study which embraced eight separate parts, each of which might with propriety have been entered separately. Similarly, there is only one entry each for the four parts of Todd's and Lyon's investigation of suture closure and Cameron's thirty-five separate craniometric reports. Condensation was made in the reference table for conciseness, but for the reader's convenience, the 43 additional titles which accrue from listing the appearance of each individual part are listed separately in table 3. These additions bring the total of Reserve reports to 85.

Professor Todd's recent death has curtailed the activity of the laboratory in this field somewhat, but the collections remain and their fullest use is encouraged by his successor, Prof. Normand L. Hoerr, so that it is to be expected that further data on the Negro will become available from investigations pursued in this laboratory.

Two of the Reserve studies have been in clinical fields, one in pediatrics on hernia (342) and the other in preventive medicine on the Dick test (386).

Johns Hopkins University. Several departments and a number of investigators have been responsible for the 35 studies listed from this institution. The large amount of Negro clinical and laboratory material has made the matter of race inescapable of attention. Most of the studies have been anatomical and the names of Franklin P. Mall, Adolph H. Schultz, C. F. DeGaris, Ernst Huber and Raymond Pearl are prominent in connection with them.

Mall, as a historic figure in the development of American anatomy, is important for his recognition of the desirability of the study of racial differences upon anatomical material and for the guidance and encouragement he gave others in developing methods for accomplishing this. The contributions of Bardeen and DeGaris might be said to have flowered from roots in soil of Mall's fertilization. In his critical restudy of

the brain investigation by Bean in the Hopkins laboratory, Mall showed the high value he placed upon technical perfection and objectivity in scientific work (270).

Later, in the comprehensive primate studies of Adolph H. Schultz, the Negro received his share of attention as a variant of the advanced simian, man. Racial differences were an important aspect of Ernst Huber's comparative studies of the facial musculature. Most recently, the biometric studies of Pearl have provided much valuable racial data as products of his study of man as a living organism by the statistical method.

Occasional studies from other departments include particularly Riggs' investigation of the obstetric pelvis (208) and Abel's estimates on the chemical nature and total quantity of the pigment in the skin (102).

The Hopkins studies have appeared irregularly over a long period of time though they have been more numerous since 1925 than previously.

Carnegie Institution. The 23 studies referred to have been from the Department of Genetics, by Charles B. Davenport and Morris Steggerda and their associates. The Negro has generally become the subject of study through investigations of the behavior of various traits in racial crossing. Research has been directed upon anthropometric features, skin color, hair form, and growth. The army anthropological treatise of Davenport and Love constitutes a kind of somatological inventory of the nation's soldiers of the first World War.

Implications of the collective results of these studies as to the human fitness have been in some cases expressed guardedly and objectively and in others in such manner as to require the most careful confirmation or even repudiation.

The investigations have been reported since 1909. Only four reports had appeared before 1928, but publication has been regular since that time to date.

University of Virginia. Robert Bennett Bean and Lawrence T. Royster and their aides have produced the 16 studies from this institution. Some of Bean's work of present interest has been done at Johns Hopkins, the University of Michigan and

Tulane University. He has been concerned with special features of the brain, external ear, arterial variation, visceral weights, body type and sitting heights. His results on these diverse subjects have been uniform in their implication of inferior status for the Negro. Although the complexity of each problem is emphasized, the generalized conclusions are seldom conservatively or mistakably worded.

Royster's pediatric studies have been focussed upon growth and body type through the techniques of anthropometry and roentgenography.

The study of Jordan (94) on the skin pigmentation is noteworthy because of its quality and the fact that it is one of the few studies of the earlier years involving histological methods.

The studies have made their appearance gradually between 1911 and 1936. There would appear to be no reason to anticipate many further studies from this source as part of any program now current.

Columbia University. The Columbia series consists of two early Hrdlička studies, the reports of Herskovits between 1924 and 1930, the carpal ossification study of Hess and Weinstock of 1925, Bakwin's survey of the Negro infant in 1932, Michelson's investigation of calcification of the first costal cartilage in 1934, and a clinical paper on pigmentation in the nails by Monash in 1932.

The stimulation of Franz Boas may be credited for the initiation of the studies of Melville J. Herskovits and Harry Bakwin. Boas had lent his aid in 1906 to the formulation of DuBois' comprehensive program covering the gamut of sociological aspects of the Negro. The Atlanta efforts bore only sociological fruit mainly because trained workers in the physical field were unavailable at the time.

Herskovits was the first to mark out the Negro as a province for exploration on the grand scale. From his large anthropometric surveys were developed his evidence of the surprising "homogeneity" of the American Negro. This study yielded also the extensive data on skin pigmentation analyzed by Barnes (Dr. Taeuber) (99). Herskovits' researches, largely

cultural, have taken him to West African, West Indian and South American sites in the study of origins and survivals in the New World.

Since 1927 Herskovits has been at Northwestern University.

The effects of various nutritional conditions and environmental conditions upon the human infant appear to have been the concern of Bakwin. His special survey on the Negro infant (51), would seem to form an item contributing to the evaluation of the racial factor in infant studies.

The earliest Columbia studies were the work of Hrdlička in the anatomical laboratory of G. S. Huntington.

Smithsonian Institution. These 15 studies are the work of Ales Hrdlička and several co-workers. While Hrdlička's own studies have been concerned chiefly with the skeleton, his ceaseless efforts to advance study in all phases of physical anthropology have been influential in initiating the studies of Bean and C. J. Connolly on the brain, which have been especially occupied with racial differences. Hrdlička's anthropometric study (9) is illustrative of his interest in the preparation of standard sets of data on the unmixed Negro before he becomes non-existent.

The Smithsonian studies have appeared between 1898 and 1942. Prior to joining the staff of the U. S. National Museum, Hrdlička was identified with the Pathological Institute of the New York State Hospitals, the New York Juvenile Asylum and Columbia University.

Harvard University. The anthropological laboratory of Earnest A. Hooton and the physiological laboratory of David Bruce Dill have been the sources of the 10 Harvard studies relating to the Negro.

Hooton made possible Day's unique genealogical and anthropometric monograph on Negro-white families, and he has assembled sizable Negro data in his investigations of the relationship between crime and physique.

The physiological studies of Dill and his associates on biochemical adjustments to exercise, temperature change and other environmental conditions, constitute one of the newest

and most promising avenues of investigation in physical anthropology.

The Harvard work has all appeared since 1932.

Howard University. The 10 Howard studies are the early work of Daniel Smith Lamb and more recently W. M. Cobb on anatomical subjects, Paul B. Cornely on public health and biostatistical matters, Robert S. Jason on syphilis and Howard M. Payne on tuberculosis. The organization and objectives of the anatomical laboratory have been described elsewhere (Cobb, '36). Studies from this institution may be expected to continue in the future.

U. S. Public Health Service and Children's Bureau. These Government agencies have together provided a series of useful studies on the Negro which have not been the product of a specially devised program.

Northwestern University. The 10 listed studies from this institution comprise two groups, an earlier, representing Herskovits' more recent work and a later, composed of dissecting room studies by Barry J. Anson and his associates. The Anson investigations have regularly included both Negro and white cadavera, but as the description of human rather than racial variation appears to have been the scientific objective, the findings as to racial differences have not always been stated.

The anatomical studies have been published at the rate of one a year since 1934.

New Orleans Institutions. The Louisiana State University, Tulane University and Charity Hospital of this city are grouped together, because except for Cummins' dermatoglyphic studies at Tulane, they are clinical analyses which derived their inspiration from the much quoted paper of 1896 by the distinguished surgeon, Rudolf Matas on, "Surgical Peculiarities of the American Negro." He was the first to draw attention to the value for racial studies of the clinical records of the Charity Hospital.

It will be of value for our further discussion to conclude this section with a statement of the professional occupations of 23 leading scientists associated with the work of the 14 most active institutions described above.

OCCUPATIONS OF LEADERS

1. *Anatomy* — 12: Terry, Todd, Mall, Schultz, DeGaris, Huber, Bardeen, Bean, Connolly, Lamb, Anson, Cummins.
2. *General Anthropology* — 3: Boas, Herskovits, Hooton.
3. *Genetics* — 2: Davenport, Steggerda.
4. *Pediatrics* — 2: Royster, Bakwin.
5. *Physical Anthropology* — 1: Hrdlička.
6. *Physiology* — 1: Dill.
7. *Biometry* — 1: Pearl.
8. *Surgery* — 1: Matas.

5. *Prospects for future studies*

The number of the scientists who have figured prominently in the prosecution of the Negro studies under discussion has today been so sharply reduced by death, retirement or inactivity that it is clearly apparent that the bulk of future investigations must be conducted by younger men³.

The facts brought out in the preceding section show that laboratories vary in span and intensity of activity and with the knowledge in hand of passing leadership, it would be impossible to estimate the sources and character of studies to be anticipated in the future without a careful survey of possibilities. The execution of such a survey might be stated as one of the desiderata for the sound and economical promotion of studies still needed.

Existing information does permit some appraisal of what can and should be done. It would seem incapable of challenge that the major responsibility for the prosecution of future studies should, with greatest propriety, be borne by well trained Negro scientists, and we shall shortly review briefly the opportunities for training in physical anthropology with particular note of those open to Negroes.

³ Deceased: Todd, Mall, Bardeen, Huber, Pearl, Lamb, Matas. Retired or near retirement: Terry, Davenport, Boas, Hrdlička, Bean.

Up to the present but three Negroes have published original work in this field, namely, C. B. Day (genealogy and inheritance of traits in Negro-white families), K. B. M. Crooks (color-blindness) and W. M. Cobb (various subjects).

6. *Organizations*

Because the formation of specific organizations is an ancient human custom for the purposes of stimulation of interest, consolidation of knowledge and furtherance of research in particular fields, it will be appropriate to note several widely separated efforts related to the physical anthropology of the American Negro. These have had no relationship to each other and little to show in the way of results.

The first was the First Conference for the Study of the Negro Problems, under the leadership of W. E. B. DuBois, held at Atlanta University in 1896. The specific concern of this conference was mortality, which entitles it to consideration in the biological field. The proceedings were published as, "Mortality among Negroes in Cities," Atlanta University Pub. No. 1, 1896, 51 pp., reprinted in a 2nd abridged edition of 24 pp. in 1903.

The scope of these conferences did not permit a return to physical subjects until the Eleventh Conference in 1906, the proceedings of which were published as the pamphlet, "The Health and Physique of the Negro American," Atlanta University Pub. No. 11.

DuBois wrote in his preface to those proceedings,

A study of human life today involves a consideration of human physique and the conditions of physical life, a study of various social organizations, beginning with the home, and investigations into occupations, education, religion and morality, crime and political activity. The Atlanta Cycle of studies into the Negro problem aims at exhaustive and periodic studies of all these subjects as far as they relate to the Negro American

The present publication marks the beginning of a second cycle of study and takes up again the subject of the physical

condition of Negroes, but enlarges the inquiry beyond the mere matter of mortality

Especially is it questionable at the present as to how large and important a work we shall be able to prosecute during the next ten-year cycle. It may be necessary to reduce the number of conferences to one every other year. We trust this will not be necessary, and we earnestly appeal to those who think it worth while to study this, the greatest group of social problems that has ever faced the nation, for substantial aid and encouragement in the further prosecution of the work of the Atlanta Conference.

The Atlanta Conferences themselves in time ceased, but bore important sociological fruit in the impetus they gave to the eventual establishment of centers such as the Atlanta School of Social Work, headed by Forrester Washington, the Department of Social Science of Fisk University, under Charles S. Johnson, and the Department of Sociology of Howard University under E. Franklin Frazier. In the biological sphere no continuing effort resulted.

In about 1905, according to Hrdlička ('27),

The Association of American Anatomists issued a four-page prospectus and a large blank calling for information on the negro and his admixtures. The list of subjects on which data were requested numbered 191 items and included a number of anthropometric points. The results of this inquiry, if there were any results, have never been published.

Late in 1926 a "Committee on the Negro" was formed under the auspices of the Section on Anthropology and Psychology of the National Research Council to promote anthropological and psychological studies on the American Negro. This Committee consisted of Drs. R. J. Terry, Chairman, F. Boas, C. B. Davenport, E. A. Hooton, A. Hrdlička and T. W. Todd, for Anthropology, with Drs. R. S. Woodworth and Knight Dunlap (ex-officio) for Psychology, (Hrdlička, '27).

This group formulated a set of recommendations for needed study projects and a general program, which was presented to the Council. No funds were available at the time for the execu-

tion of these recommendations and the work of the Committee thus yielded no collective results, (Hrdlička, '40).

The Daniel Smith Lamb Anthropological Society of Howard University, organized by the writer on May 26, 1939, is the only Negro organization devoted to the study and promotion of physical anthropology.

It is a student organization with a faculty advisory committee. Membership is open to the entire university community. At present there are about 30 members, all medical students.

The American Council of Learned Societies sponsored a Conference on Negro Studies at Howard University in March 1940, at which the needs in respect to physical studies were represented. This Conference recommended that a permanent Committee on Negro Studies be set up by the Council. This was duly appointed with the following membership: Melville J. Herskovits, Northwestern University, chairman; Otto Klineberg, Columbia University; Richard Pattee, United States Department of State; L. D. Reddick, New York Public Library; Lorenzo D. Turner, Fisk University; Donald Young, Social Science Research Council; D. H. Daugherty, American Council of Learned Societies, Secretary. This Committee held its first meeting on June 6, 1941.

The American Association of Physical Anthropologists has never specifically encouraged Negro studies, except as included in notation of all spheres in which investigation has been needed.

7. Summary

The foregoing analysis reveals far less than desirable activity in the field of physical studies of the Negro, as judged by the total and annual number of publications appearing, the number of laboratories and workers engaged, and the degree of organized promotion the subject has received. Most of the more valuable scientific investigations have been of recent origin. Two-thirds of the studies have come from one-seventh of the laboratories. The number of leaders responsible for

most of the past work has been sharply reduced by death, retirement or inactivity. It is apparent that the bulk of future studies must be accomplished by younger men, a large proportion of whom might properly be expected to be Negroes.

Specific needs as aids to scientists suggested by this portion of the present review are: (1) a comprehensive, annotated and indexed bibliography covering both African and American studies; (2) critical, expository reviews of subjects of complex or clinical nature upon which a sizable literature has accumulated; (3) a scientific reference volume on biological studies; (4) a popular volume based on the preceding suitable for school and general lay use; and (5) a survey of possible sources of future studies, to include in each case information on location, facilities, local program and prospects and nature of interest in investigation of the Negro.

III. LABORATORIES

1. Criteria for facilities and personnel

Physical anthropology is a biological subject, concerned with the study of human anatomy, physiology, ageing and pathology, from the standpoints of origin, evolution, comparative morphology, variation, genetics and ecology. Because the whole or any part of the human body may become the object of anthropological study, the well equipped laboratory must be able to provide facilities for study of any part or region in statistical quantity and by any established technique. This means that living subjects and human remains must be available. In our society the most advantageous location for such a laboratory is in a medical center as an adjunct of the anatomical laboratory. Here embryos, fetuses, stillbirths, cadavera and materials derived from these are at hand, and living subjects may be readily recruited (Cobb, '33). The laboratory which is otherwise located is generally limited to the pursuit of osteological and anthropometric studies.

A laboratory which fosters study of the Negro should have living Negroes and their records, and human remains, soft

parts as well as skeletal, at hand and in large series if thorough training is to be given. The field worker almost invariably requires basic laboratory work both before and after expeditions.

The direction of an ideal laboratory of this kind should be in the hands of a scientist or scientists who are thoroughly familiar with all aspects of physical anthropology and who particularly have had a considerable experience in the Negro phases.

The services of the laboratory, moreover, should be open to all qualified students and investigators who might come. Opportunities for formal instruction are as desirable as those for pursuing research because investigators are recruited from students.

By these exacting standards, there does not exist an ideal laboratory for training and research in the physical traits of the Negro. Only two laboratories in the country have large and comprehensive collections of Negro material, those of Western Reserve University and Washington University, but both of these lack readily available living subjects. The Carnegie and the Smithsonian Institutions do no teaching. The teaching benefits potentially available from certain laboratories are restricted in that they are located in universities which do not enroll Negro students. Some investigators with extensive experience with Negro material, are not now associated with laboratories housing large collections.

This would suggest inquiry into reasons for the non-existence of such a laboratory and a consideration of practicable compensatory measures. We note first, the number and vocations of workers in the field.

2. Number and vocations of workers

Despite the facts that physical anthropology is a young science and that most of the scientifically acceptable studies of the Negro are of recent origin, it might be expected that there would have been more workers in this important field and particularly more Negro workers.

The reasons for this dearth are various. In the first place, as Boas ('28) has pointed out, the general public has not yet sensed the potential significance to the welfare of mankind of well planned and executed studies in the field of anthropology, including physical anthropology. Public concept is not yet divested of the association of anthropology with the assemblage of curious information on remote peoples. General interest in the field is thus not what anthropologists would like to see it and the demand, with consequent openings, for physical anthropologists is not great.

The membership of the American Association of Physical Anthropologists in 1941 was 147. Contributions in the field maintain two journals of high standard, the American Journal of Physical Anthropology and Human Biology. According to Goldstein's analysis ('40), the former has been a medium for studies of predominately anatomical character, while the latter has served for a broader biological range of articles. Goldstein found the same preponderance of anatomy in the vocations of the contributors to these journals as in the subjects of their articles. The diversity of professional employment among present leaders has been mentioned.

Physical anthropologists thus constitute a rather small group of scientists, few of whom are professionally employed exclusively for work in that branch, the majority being associated either with medicine as anatomists, or with general anthropology as social anthropologists. Paucity of Negro investigators in such a limited group occasions no surprise, but this is not all.

3. Training requisites

The training generally held desirable or necessary for professional investigation in physical anthropology has increased in recent years along with the requirements in most other lines of endeavor. Scientific advances contributing to improvement of understanding of human biology have been so marked in the present century that increasingly broad and thorough

background has been held necessary for the development of that perspective and orientation essential to the organization and conduct of new investigations which promise significant contributions.

Because of the desirability of comprehensive background and because the medical curriculum offers a biological training of the broadest and most exacting scope commonly available, leaders such as Hrdlička ⁴, have strongly urged young men to enter physical anthropology through medicine. A more conservative view holds that the modern training of the physical anthropologist should include at least the medical basic sciences.

It will be held by some whose opinions are to be highly respected, that the consummate anthropologist is he who is well versed in the social or cultural as well as the physical disciplines. Ashley-Montagu ('40) has recently presented the case for the advantages of close alliance between social anthropology and physical anthropology.

The valuable implications of each of these phases for the other are incontestable. It must be emphasized, however, that the union between cultural and physical anthropology is functional and not organic. We cannot deduce from the finest series of artefacts left by ancient man anything of the appearance or constitution of their creators. Comparative primatology, on the other hand, is a well established approach to the interpretation of human anatomical, physiological and behavioristic variations.

The relationship between cultural and physical anthropology may be likened to the union of braincase and face. Both are located at the most forward portion of the body because this position is of equal functional advantage to the distance receptors, in association with which the brain and its capsule have developed, and to the jaws, and not because of any relationship between braincase and face. In the sharks

⁴ Dinner Address, Tenth Annual Meeting, American Association of Physical Anthropologists. Unpublished.

these two elements are separate but in the higher vertebrates a marriage of convenience has been consummated. So in the biological or physical and non-biological or social phases of anthropology a "functional" integration is necessary. This may be best achieved by close collaboration of workers in these respective phases, for the attempt by individuals at mastery of all the sub-disciplines embraced by physical anthropology on the one hand, and by social anthropology on the other, approaches the Baconian endeavor of making all knowledge one's province.

It may be conservatively stated that in the future the broadest possible biological background will be of greatest value to the new worker in physical anthropology whether acquired through medicine or other channels.

The length and cost of the requisite preparation and the doubtful prospects for professional employment must certainly be held important factors in limiting the number of students who seek careers in physical anthropology, despite the intrinsic interest of the subject. Particularly is this true of Negro students whose financial resources and prospects are generally less than average.

4. Expedients and correctives

Since there is a lack of ideal training facilities for physical studies of the Negro and of satisfactory openings for employment of those who would pursue such investigations, alternative courses and possible corrective measures may be briefly considered.

For the student, and particularly the Negro student, who would acquire the requisite training, two alternatives exist. He may obtain basic training in the techniques of the subject at those laboratories which will enroll him and then go afield or to the major collections for his Negro studies, or his needs may be met by a laboratory in a Negro institution which can satisfy all the requirements.

Training by the first alternative has been obtained by two under Boas, one under Hooton and two under Todd, but of these only one is now active in the field.

The writer has been engaged in making training through the second alternative, a well equipped laboratory in a Negro medical center, a possibility (Cobb, '36).

Stimulation of general public interest is essential, and to this end, series of expository articles on the subject in the Negro and White press by professional scientists should be of aid in creating interested and cooperative attitudes among the people most concerned, as well as in arousing the initial interest of the young from whom future scholars must be recruited.

5. Summary

An ideal laboratory for training and research in the physical anthropology of the Negro, with staff learned in the subject and with ample resources in human remains and living subjects, is not to be found. This derives from the facts that workers are few, equipment costly and difficult of assemblage, and organization intricate and not easily established. Current leading laboratories either lack Negro materials, or staff experienced in Negro studies, or bar Negro students.

Workers are few because physical anthropologists constitute a numerically small group, few of whom are professionally employed as such, most being associated either with medicine as anatomists, or with general anthropology as social anthropologists. Paucity of specialists on the Negro, particularly those who are themselves Negroes, in such a limited group occasions no surprise.

The length and cost of preparation requisite for a professional career in physical anthropology, together with present limited prospects for employment in the field, are not inducements for new students, despite the intrinsic interest of the subject.

Expedients and correctives are cited including the desirability and possibility of an adequate laboratory in a Negro

medical center, and stimulation of public interest through expository news articles.

IV. STUDIES

1. General objectives and needs

Scientific justification of the study of the physical anthropology of the American Negro centers about four principal objectives: (1) inventory of the physical, mental and ecological characters of a large segment of the national population; (2) registration of the genetic and environmental phenomena associated with the racial crossing which has produced the American Negro; (3) assessment of the biological quality of the hybrid; and (4) definition of the future possibilities of the Negro population in the light of all known facts and trends.

Obviously, the yield of intensive investigation in many related fields, pursued both separately and cooperatively, is necessary to provide such a body of information.

The description of physical characters and their variability require the specific professional contributions of the anthropometrist, the anatomist, the physiologist, the geneticist, the physical educator, the pathologist, the pediatricist, the neurologist, the dentist, the psychologist and the psychiatrist.

The collection and assay of population data are functions of the biometrist. These vital statisticians make essential routine contributions through analyses of the data of the census and those of national and local public health agencies, in addition to studies directed toward special ends.

The study of the phenomena of hybridization demands the special knowledge of the geneticist for the assemblage and interpretation of observed data, and of the historian for information on the parent stocks which entered into the formation of the hybrid and the circumstances under which the intermixture occurred or is continuing. Further enlightenment on the parent stocks is sometimes obtainable through the works of the archeologist.

Appraisal of the biological quality of the hybrid requires the careful weighing of the man against his opportunities. This requires, on the one hand, accurate measures of the physical status of the individual and his group, and on the other, reliable gauges of the possibilities for the expression and development of his capacities in the environment in which he lives.

In the determination of the various aspects of physical status, the physical anthropologist has occasion to employ the specialized knowledge and techniques of nearly every recognized branch of medicine. Conversely, every medical specialist is a potential contributor to physical anthropology, which is already indebted to experts in many branches for valuable contributions.

The evaluation of data on physical status demands information on the life habits, resources and environment of people which is best supplied by the nutritionist, the social worker and the sociologist.

The suggestion of the future possibilities of the Negro requires the consideration not only of the sum of preceding types of information but also of the indications of the trends of our law, government economy, and public opinion. Here the co-operation of the political scientist, the agriculturalist and the economist is necessary.

The assemblage of the data necessary for a full knowledge of the physical anthropology of the American Negro thus requires collateral information and assistance from many other branches. Often the physical anthropologist will borrow the tool of his fellow scientist and often his co-worker will contribute to him.

2. Definition of American Negro

Social and not scientific dictum defines an American Negro. He is a person who has any known trace, however remote, of African Negro ancestry. This usage is also generally followed by the various arms of the federal, state and municipal

governments and by the courts. The group of people so embraced do not constitute a race, because they exhibit too much diversity of physical traits. By definition, the members of a race "though individually varying, are characterized as a group by a certain combination of morphological and metrical features, principally non-adaptive, which have been derived from their common descent," (Hooton, '31). When a racial term such as "American Negro," is made to include, on the one hand, persons who appear to have none but European ancestry, and on the other, those who show evidence of only African forebears, the resultant group is not a race. It might be a race in formation and its progeny might become a race, but the present group cannot by any standard be termed a race.

The classification "American Negro" has racial significance from a biological standpoint only because the extant social system compels the people so designated to be essentially an intrabreeding group. If this condition obtains long enough, sufficient homogeneity may become established to warrant the designation "race," but the term is not applicable today.

This does not deny the obvious tendency toward the formation of a physical type intermediate between the African and the European in those traits in which the two differ most markedly, such as skin color, hair form, lip eversion, nasal dimensions and form and interpupillary distance.

This trend is strikingly apparent at any large gathering of Negroes such as a baseball game or an outdoor festival, where the color tone of the mass will be observed to be brown rather than approaching the black.

Similarly, reduced mass statistics will show an intermediate figure for significant measurements such as lip thickness, nasal breadth or interpupillary distance. This, however, has no significance for individual combinations, for one finds in American Negroes, almost every possible combination of features. Fair skin with Negroid features and hair, and the converse may be encountered. Negroid hair may be associated with Caucasoid features and vice versa. A broad nose may be

linked with thin lips and a narrow nose with thick lips, and so on.

Because of this variability in combination of traits, irrespective of the valid indications of statistical data, one cannot describe a typical American Negro in the sense that a local type might be described or represented pictorially.

Hence, an essential complement to any large scale anthropometric study of the Negro would be a photographic atlas of Negro groups, such as graduating classes, conventions, segments of spectators at parades, sporting events, etc., together with photographs of individuals presenting different combinations of physical features.

3. *Provenience*

a. The composite. The American Negro is becoming a blend of three racial stocks, African Negro, European White and American Indian. In the population as a whole, the Negro component is largest, the White lesser and the Indian least. Individuals of pure African ancestry are rare and difficult of positive identification. Persons representing all degrees of Negro-White admixture and varying degrees of Negro-White-Indian admixture are common. Individuals of varying degrees of Negro-Indian ancestry may be found but are not as frequent as the other types of admixture mentioned.

In the study of the hybrid American Negro four distinct sets of data are indicated as necessary background for interpretation of findings on the hybrid group itself: (1) the physical description of the ancestral African stocks; (2) the physical description of the ancestral White stocks; (3) the physical description of the ancestral Indian stocks; and (4) the effects of the American environment upon each of these stocks, as it has shown that these effects can be very marked (Shapiro, '40).

In respect to origins, most attention has properly been paid to the African, too little to the White and less to the Indian. The environmental aspect has received hardly more than recognition.

b. African origins. Present information on African origins is due largely to the researches of Herskovits, who has summarized his work in recent publications, (11, '35, '41).

On the basis of his findings of affirmed parallelisms in cultural characteristics and practices in West Africa and the Western Hemisphere and his evidence that modern West Africans are predominately short and stocky peoples, Herskovits has evolved the thesis that the African ancestors of the American Negro were principally derived from the Upper and Lower Guinea Coasts, and not from such widely distributed areas as had been formerly supposed.

Additional study on provenience must be held desirable because cultural parallelisms need not presume common origins and there are evidences of other than short and stocky Africans in the ancestry of the American Negro. Reference to Negroes of great size and strength is frequent in the history of the slave trade. The earliest records of pugilism indicate that tall Negro heavyweights have never been uncommon. Today in the urban and rural centers of Negro population many Negroes with apparently little or no admixture may be seen whose stature and physiognomy suggest derivation from an African ancestry other than the short peoples of the West Coast. Todd's Negro cadavera, who showed less than the average evidence of admixture, were an unusually tall group (8). It would seem that further survey of surviving Central African and West Coast peoples is indicated as background for analysis of the complex American situation.

c. European origins. Although the White component is the most obvious and widely acknowledged, it is the least documented element of the American Negro's ancestry. In view of the size and extensive distribution of the European contribution it would certainly seem that this component would have been thoroughly explored for such light as it might shed upon the hybrid. Yet it can hardly be affirmed that available sources of historical data or White standards such as those of Bean's Old Virginians, Gould's Old Americans of the South,

or Hrdlička's Old Americans, have been utilized as fully as possible in this connection.

d. Indian origins. Similarly, the Indian component in the American Negro's genealogy has received too little attention from the physical anthropologist. It is known that the bulk of the admixture was with the coastal tribes from Massachusetts to Florida, principally of the Five Civilized Tribes, (Porter, '32). Although significant new Negro-Indian admixture is not occurring, Herskovits found that nearly one-third of the subjects in his series acknowledged Indian ancestry, (11). Recently Krogman, ('34, '37) has conducted surveys of surviving groups of the Five Civilized Tribes, which should provide useful data here.

4. Somatology

In two previous papers, the findings of investigators in the field of somatology and the indicated position of the Negro, have been critically reviewed by the writer ('34, '39). No repetitions will be attempted here. The appended reference list, however, includes many subsequent studies which will be taken into account in the following commentary.

a. Anthropometry. The 62 studies listed betoken a healthy interest, but present concern is with adequacy and not number of studies. It can be said without fear of contradiction that more anthropometric studies are needed. Any techniques involving the degree of irreducible error to which those of anthropometry are subject, require great volumes of data to determine the truth. Even if the condition of the Negro were static in respect to anthropometry, many additional competently obtained series of data would be desired before the quantity of information could be called satisfactory. But changes are continually in progress.

Available are the dimensions of the military selectees of two wars, sizable samples of the general population, groups of selected degrees of admixture, samples of the socially selected such as college students and criminals, of the medically se-

lected, such as tuberculosis patients, and of series of varying adequacy, of adolescents, children, infants and fetuses.

Workers will differ as to the validity allowable to the data of the numerous investigations. Yet it cannot be denied that available information affords much better than a working knowledge of the dimensions and growth of the Negro, despite gaps and conflicts.

A few opportunities for future contributions of value may be mentioned. There will undoubtedly be available in due course anthropometric data on the recruits and conscripts of World War II. These will bring to hand data on the soldiers of three wars, the Civil War and World Wars I and II. If the gross dimensions of the Negro have changed in the past 75 years, a comparative study of these data should indicate it.

The northern mass migrations of the last World War are now sufficiently removed for the advisability of inquiry into the effects of urbanization by anthropometric in association with other methods to be considered.

Various kinds of selection operative within the Negro group require definition and investigation. Steps in this direction have already been taken by Herskovits (11, 12) and Hooton (22) in their comparisons of college and rural and of criminal groups, respectively, with different samples of the general population.

Many of the anthropometric investigations still desirable, would require considerable financial support. These might best be undertaken as part of more comprehensive surveys, such as health surveys, involving more complete medical or mental inspections. A potentially very fruitful but little tapped source of information is the routine measurement of such items as height, weight, chest girth and vital capacity, as taken at most schools and colleges. The majority of schools do not make more than elementary use of the measurements they record. Crooks ('37) has referred to measurements of Hampton students, but little else has been published.

To make these data satisfactory certain cooperative organizations between the personnel interested at the several insti-

tutions would be necessary to standardize the measurements and methodology. It may be pointed out that Pearl's habitus index ('40) requires but three measurements, stature, chest girth and abdominal girth. A general program of continuous anthropometric survey using a few carefully selected measurements in Negro schools and colleges is entirely feasible and would be very useful.

The pre-school period is particularly lacking in data and with the recent development of a number of nursery schools among Negroes, the possibilities for filling this gap are much improved.

The newer hospitals and neonatal clinics are better prepared than before to gather data on infant growth, particularly as to discovering the facts about neonatal head size.

Inventory of dimensional facts is, however, but one of the uses of anthropometry. More and more it is finding application as a technique integrated with many others in study of a complex problem. In Negro studies it is indispensable in collaborative investigations of such matters as regional differences in physique and physiognomy and the degree to which these may be associated with environmental conditions, nutritional status and family lines.

b. Integument and derivatives. Almost universal interest focusses on the racial phenomena associated with the skin, hair, nails and teeth. Upon none of these is our knowledge in a satisfactory state although, as in the case of anthropometry, most of the important areas have been reconnoitered.

A comprehensive treatise on the comparative thickness of the skin of the Negro and White is needed. Much pseudo-scientific comment has been devoted to allegation of marked generalized thickness in the Negro skin. An adequate study would show differences related to sex, age, pigmentation and region of the body. Such materials are available in suitable quantity in the collections of skin and hair samples of the anatomical laboratories of Western Reserve University and of Washington University, (Cobb, '33). The Reserve skin samples are from eleven different sites on the head and body,

(Cobb, '32). This material might also be used for further study of the effects of various kinds of radiation, correlated with quantitative and chemical estimates of amount of pigmentation.

The problems of measurement and inheritance of skin pigmentation require additional investigation. Methods of measurement have always been unsatisfactory because of the impossibility of securing constancy in the three factors involved, the eye, the color standard and the illumination.

For extensive anthropometric surveys, a satisfactory approximation of the color tone of the population can be obtained by the use of the von Luschan color scale or some modification of it. The slow and inconvenient color-top, which can be used for short periods only by the same observer, has not shown sufficient advantage over the color scale to warrant replacement of the latter for large series investigations.

Where more accurate methods are necessary, Williams' skin colorimeter ('33), is a possibility. The most promising method at the present time would seem to be the recording of skin pigmentation by the spectrophotometer which makes its observations through a photo-electric cell under constant illumination and records the color as a curve showing the amount of light reflected by skin through the range of the visible spectrum. The findings of Edwards and Duntley ('39), with this device indicate that it would not be particularly useful in the study of the heavily pigmented, but that it would be very revealing in the study of the regional distribution of pigmentation in less deeply pigmented persons.

The inheritance of skin color has not been fully explored. The listed studies of Davenport, of Barnes, and of Day have established that this cannot be explained in terms of simple Mendelian inheritance. It would appear that if Mendelian principles will apply, multiple factors must be involved, with no clear indication of dominance. Here more work must obviously be done. Of importance too, in this connection, is the discovery of whether or not a sex difference in skin color

of American Negroes, independent of selective mating effects, exists. This has been suggested by Hooton on Day's data and by Edwards and Duntley ('39), and denied by Davenport, Todd, Herskovits and Barnes. A comprehensive study of siblings should provide more conclusive evidence. There are other conflicts in existing reports which require clarification by further study.

The age changes in pigmentation from birth to old age may be said to require more detailed and ample survey.

Hair form, distribution and pattern need additional investigation. Recent work showing hitherto unrecognized variation in cross-section shape in the same hair should stimulate new research into the details and role of growth conditions in the production of hair form.

The general principle that straight hair is recessive to curved types of hair has been indicated by the results of the Davenports and of Post (Day's data). A sex difference was noted by the latter in that the hair of males was found to be curlier than that of females. Further confirmation of these interesting findings should be sought.

The facts as to the hirsutism of the relatively unmixed Negro and that of the native Indian and various Europeans should be investigated along with the hirsutism of American Negroes of varying degrees of admixture to determine what relationship, if any, exists between hirsutism and racial composition.

Gould's dignified account of the instructions given to Russell to make a kind of "peeping Tom" set of observations on Negro troops while bathing to determine the relative density and distribution of their body hair, is a gem of unconscious humor, rare in anthropological literature, (120).

The patterning of hair, particularly of the digital, pectoral and lumbosacral regions, should similarly be investigated for possible differentials.

We know no satisfactory study of the nail form of American Negroes. This would seem particularly worthy as in certain

sections there is a popular belief that the nails are of diagnostic value in the detection of Negro blood.

In respect to sweat glands also, there is a lack of studies, despite the legends current on the odors of Negroes. Homma's study of the sweat glands of 12 White and 10 Negro cadavera in 1926 is the only anatomical study yet made in the United States of which we have knowledge, (109).

No recent work on American Negro dermatoglyphics has appeared. Cummins' and the FBI's splendid coverage of this field should certainly be supplemented by a large authoritative study on the Negro phase.

Despite the abundance of casual allusions to the size and character of the teeth of the Negro, and the excellent opportunity this field affords for orthodontic and nutritional study, the literature shows that relatively little has been done except on caries.

c. Constitutional type. As several reviewers have shown, human recognition of and interest in difference in physical type is ancient. By many writers and under many names the classification of human beings as variants of the lean, the muscular and the fat, has been made and a voluminous literature has accumulated.

In recent years there has been a lively interest in this field in the United States centering in the work of the laboratories of the University of Chicago, Harvard, Columbia and Johns Hopkins.

From the Chicago-Harvard-Columbia approaches has developed the technique of somato-typing or body-typing of Sheldon and his collaborators, ('40). The basic scheme of this system denominates the customary lean, muscular and fat types, as ectomorphic, mesomorphic and endomorphic types for embryological associations.

From the Johns Hopkins studies, Pearl ('40) developed a "habitus index" which may be used for purposes similar to those of somatotyping. This index is obtained by dividing one hundred times the chest girth plus the abdominal girth by the stature.

Much clinical interest in these body types has been concerned with the study of their relationship to endocrine make-up and to predisposition to specific kinds of physical and mental diseases.

To date, we know of no studies of constitutional type which deal primarily with the American Negro adult, if we except the study of Gray (59) which treats of body build in a different way. Royster's study of body type in children (58) was prompted by his experience which showed that White height-weight norms were not consistently applicable to Negro children.

The ill-substantiated theories of Bean, which describe the Negro as an adolescent form of man, appear to have little value for reasons stated in our previous discussion, (Cobb, '34 a). Yet the field of constitutional study should yield knowledge of interest in respect to racial pathology because a fair sized literature has come into being on the discussion of the Negro's special susceptibility and resistance to different diseases. He is in general alleged to be resistant to diseases affecting chiefly tissues developed from the embryonic ectoderm (Holmes, '28), and susceptible to those principally involving the embryonic mesoderm (Moehlig, '37).

The investigation of the significance of constitutional type must draw upon data from three different fields, first, that of somatotyping itself, by some technique through which the types are identified and their incidence catalogued, second, the field of race pathology by which autopsy findings in which association of disease processes with physical type may be actually observed, and third, biometry, which supplies data in statistical quantity necessary to supplement the findings of the two preceding.

The comprehensive researches of Pearl and his collaborators have yielded invaluable information. In the Johns Hopkins laboratory the demography of various classes of patients has been analyzed and through difficult long term and correlated studies of body type, clinical history, socio-economic status and organ weight the importance of the three fundamental

variables of habitus, sex and race has been studied from very rational approaches.

The publications of Jason (390) and of Payne (381) have indicated that many current beliefs in respect to syphilis and tuberculosis in the Negro must be either discarded or revised.

In addition to the direct study of constitutional type in the Negro, a critical analysis of all the existing related and sometimes conflicting data would be helpful.

d. Physiology. In this field, as in most others, there is a paucity of data on many subjects of much interest and potential significance. The organ-weight studies of Bean (290-294) and others, have physiological implications in that they suggest smaller size of the vital viscera (heart, lungs, kidneys, liver, spleen), relative to body size in Negroes than in Whites. No data of this kind are in themselves significant because of the tremendous reserve capacity of each vital viscus. It has been demonstrated surgically that only one-third of one lung and one-tenth of one kidney are essential to the maintenance of life. The spleen may be entirely removed, and by other means it has been estimated that only about one-eighth of the liver and the cardiac capacity are required in a normal sedentary life. Endocrine therapy has shown that much less than the equivalent of the full functional capacity of the thyroid, pancreas and gonads is necessary for normal existence. On the other hand, the Negro's established abilities in hard labor and in athletics make it appear that if he really does have relatively smaller viscera, this is an asset.

Information on blood pressure is unsatisfactory. The common position based on studies of Orientals and Donnison's African study (324), has been to regard the findings of lower adult pressures in these peoples as indicative of greater inward serenity and less disturbance at outer circumstances, in contrast with worrying habits of the White engendered by the fitful pace of modern urban lives which causes the pressure to mount. Adam's survey of the pressure of white and colored workmen (326) lent no credence to this theory. He found that the blood pressures of the Negroes was higher than those

of the Whites and that the pressures after 40 years advanced in the Negro more rapidly than in the White.

Phenomena such as basal metabolic rate, normal blood picture, urinary picture, etc., also stand in need of investigation for possible racial differences because in hospitals generally, the textbooks standards, which are almost uniformly based on White subjects, are applied indiscriminately to all patients. Yet from time to time clinicians will assert the existence of racial differences in this and that feature based on the impressions of their experience.

In respect to nervous tissue, the single study of Ide (286) reported a larger cross-sectional area for principal peripheral nerves in the Negro than in the White. This implies a better conduction capacity in the former. Browne (329) found a more rapid patellar tendon reflex in Negroes than in Whites. This would lend support to the former implication. But there are other knee-jerk data of different import. More information is essential.

Other procedures in physiological investigation which would seem to hold promise of satisfactory results if applied to the elucidation of racial differences are cited in the section on "Athletes."

Since the Negro's birth-rate has been the factor to which beyond all others he has owed his continuous population increase in this country, the many standard problems of fertility present an almost virgin field to the investigator.

The age of puberty may be investigated with profit. It is a frequently encountered lay concept that the Negro matures sexually earlier than the White. The basic facts in this matter, as well as the effects of admixture and of nutrition, have yet to be explored in the United States.

We have some data on the dimensional growth of boys, which would suggest a racial differential in growth rate. Herskovits (40) reported that colored boys grew faster in height and weight to the 16th year than white boys. Davenport and Steggerda in their Jamaica study (46) found a more rapid rate of growth for their blacks than for their whites.

These findings should be supplemented not only by many additional series in different parts of the country, but by pictorial atlases such as have been published for white boys and girls by Shuttleworth under the auspices of the National Research Council.

We need to know similarly the age at the onset of menstruation of Negro girls in representative categories. To the time-honored beliefs in the effect on this phenomenon of climate and race, must now be added the undoubted effect of nutritional status and more recently, the possible existence of cyclic change over periods of years related to the weather as suggested by the work of Mills ('40).

The problem of adolescent sterility is an open one. Primate studies have shown definitely, and human observations have indicated, that the occurrence at all or at least of regular ovulation once a lunar month, is delayed approximately eighteen months after the beginning of menstruation, (Hartman, '36).

The incidence of ovulation itself can now be studied with techniques not previously available. In respect to the Negro, it would be desirable, first, to prove by adequate statistical standards, the presence or absence of racial differences in the cyclic changes shown by vaginal smears (Papanicolaou). There is no reason to anticipate such differences, as the series of changes has been shown to be essentially the same in the Old World Monkeys, the Anthropoid Apes and Man.

But having vaginal smear standards satisfactorily established, it would be enlightening to correlate with these, data on changes definitely indicating ovulation time such as the drop in rectal temperature described by Rubenstein ('38), or the electrical effects or uterine quiescence investigated by Burr et al. and Knaus respectively, (Hartman, '36).

The facts referring to the "fertile period" might also be investigated with profit by observations at laparotomies and by the menstrual history methods.

The very large scale investigations of Pearl (357) have shown no difference in the innate fertility of Negro and White

women, yet the inferential data of a mass study must always seek confirmation in objectively observed phenomena.

Pearl has himself shown in a definitely unique series of histories of 199 couples who were overtly fertile and had never at any time practiced contraception, that the number of copulations associated with one pregnancy was much higher than would commonly be thought, being 254 per pregnancy for all ages and rising from 176 for couples under age twenty to 1434 for the age group 40-49. If allowance is made for the fact that fertile coitus is possible over only a very short period each month (ca. 2 to 3 days) by deducting two-thirds of the net potentially productive copulations cited above, we still have the surprising figure of 55 per pregnancy for the age group under 20, and 478 for the ages 40-49, (Pearl, '39). This demonstrates a diminution in reproductive capacity with advancing age for which responsibility must be shared by both male and female. In the male this must be associated with progressive diminution of the number and quality of spermatozoa, and in the female most probably with cycles in which ovulation failed to occur.

It is very likely that researches along these lines might produce evidence to interpret puzzling features of life tables to which some attention has been directed. So much has been written of an incendiary nature on the sexual habits and capacities of the Negro that almost all valid scientific information would be welcomed.

It is said that the penis of the Negro is larger than that of the White ⁵. The writer's impression from ample observations is that the American hybrid has not been markedly affected in this respect by his infusion of white blood, but suitable data are lacking. Cadaver measurements are available in the files of the Western Reserve anatomical laboratory. On the other hand, the Negro vagina has been asserted to be smaller than the White. Williams ('25) alleged that in the female, the

⁵ Pruner Bey, ('63), Kopernicki, ('71), Duckworth, ('04, Hrdlička, (35), Suk, (7).

smaller size of the Negro pelvis was counterbalanced by smaller fetal size and greater compressibility of the fetal head.

The matter is not simply a racial one, however. Sheldon makes an association with body type. The size of the male copulatory organ would presumptively be associated with gonadal development. Schultz found in his studies of the testes of monkeys and apes that gland size was directly proportional to the amount of seminiferous epithelium or sperm producing tissue present, thus the larger the gland the more the germinal tissue. Increase in size is not due to connective tissue, yet in the only series available, the mentally diseased of Pearl, Gooch and Freeman (298), which is admittedly an unsatisfactory one, the testicular weight of the Negroes is less than that of the Whites.

Blood group data on the American Negro cannot be said to be adequate, as is evident from the few listed studies. Moreover, the body of literature on the racial import of blood groups contains so much of controversial nature that a comprehensive study with a critical resume of previous work appears in order.

e. Studies on Cadavera. Nearly all knowledge of the internal organs and tissues of the body, useful to the physical anthropologist, must be derived from studies on the deceased. The surgeon is unable, save in special cases, to give the kind of assistance required. The x-ray is now furnishing data from the living on some subjects, such as the progress of bone development and the form, size and position of the several portions of the alimentary tract, superior to that hitherto obtainable only from the dead, but the x-ray cannot in most instances supplant the study of the remains themselves. The dead whose bodies are available for anthropological research, fall into two principal categories, bodies which are dissected in anatomical laboratories and bodies necropsied in hospitals.

i. *Cadavera Ecology.* Because the findings of studies on such material constitute the only possible sources of information on many subjects, such as variation in vascular patterns and in muscular morphology, it is important to know the demo-

graphic characters of the populations constituted by the dead of the dissecting and necropsy rooms, to know whether as groups they present distinguishing features and whether these groups or samples of them are representative of portions of the general population with which they might be compared.

A survey of the sources of anatomical bodies in the United States and Canada (Cobb, '33) and an analysis of the death certificate and clinical data of cadavera received by the Laboratory of Anatomy of Western Reserve University over the twenty-one year period from 1911 through 1931, showed that such a population does have very definite characteristics (Cobb, 359).

It is conscripted, first of all, almost entirely from members of society who were so poorly circumstanced that no funds were available for their burial. Consequently, in the several sections of the country, the people forming the lowest economic stratum locally, furnish the largest proportion of laboratory cadavera. Thus in the South, the remains will be mostly those of Negroes; in the industrial cities of the North, foreign-born Whites, their descendants, and Negroes; in the Southwest, many Mexicans; on the Pacific coast, numerous Orientals and Filipinos.

The affections of poverty and exposure — tuberculosis, external causes and pneumonia — rank especially high as causes of death among these people. In age, sex and racial composition, the Cleveland sample reflected to surprising degree, the social and economic history of the city.

As there are operative in every community certain special selective factors, in addition to the general ones just cited, which determine the composition of the cadaver population in a given locality, it is desirable to have as much as possible of the demographic background, so as to know if such factors might affect the representativeness of the anatomical data derived from the sample.

Pearl and Bacon ('26) found the necropsied persons of the Johns Hopkins Hospital to present population characters similar in many respects to those of the cadaver group.

Although it would be very desirable to have thorough documentation of the various cadaver samples throughout the country, the cost and labor involved in acquiring and analyzing the vital data and in routine photography, measurement and recording of data on the cadaver as dissection proceeds, are so great as to be prohibitive in most laboratories. At the present time, the laboratory of Washington University, St. Louis, is the only institution at which these procedures are routinely and thoroughly performed. At Howard University it has been found possible to effect a very useful partial documentation with the aid of the regular medical students (Cobb, '34 b, '36 b). Such procedures might be applied in many laboratories to the great benefit of physical anthropology. The procedures, labor, time and cost involved in the full documentation of a cadaver have been described for Western Reserve (Cobb, '32), and Terry ('40) has described in full the measurement and photograph of the cadaver as done in Washington University.

ii. Viscera. More information is desirable on organ weights, to clarify the contradictory implications of claims cited that the Negro's viscera are relatively smaller than the white, and the evidence of superior physical performances by Negroes. This kind of data must be obtained chiefly through pathologists from hospitals because the viscera must be fresh and weighed immediately at removal on autopsy. Moreover, the pathologist's expert judgment is required to determine that the organs to be included in a series of normal weights were not themselves affected by pathology of any kind. Many Negro hospitals are today in a position to contribute authoritatively to work of this nature and efforts to secure their cooperation would be worthwhile. The biometric analyses of Pearl and his collaborators of organ weight are examples of the critical way in which such material should be treated.

Other kinds of information on viscera such as the disposition of attachments of the colon or the position of the anal valves are best conducted in the anatomical laboratory.

The tragedy of the Second World War has brought to an end a very worthwhile movement led by Prof. Edward Loth of Warsaw, to establish an international cooperative effort for the collection and dissemination of accurately recorded data on soft parts. In 1927, at the anatomical congress held in London by the British and French associations, a Comité International des Recherches des Parties Molles was formed to which were gradually added representatives of all possible nations. An early result of this work was the volume, "Anthropologie des Parties Molles" published by Loth in 1931, which despite numerous and unavoidable imperfections, showed the possibilities of such an effort. Most work of this nature must now emanate from American laboratories and it will be important for well validated data on the American Negro to be made available.

iii. Muscles. The studies of muscles, blood vessels and nerves of interest to physical anthropology must come chiefly from the dissecting room. They are mainly concerned with the morphology, variability and incidence of the respective structures. In order that basic arrangements be fully understood, it is generally necessary that not only must different varieties of man be studied but lower primates as well.

Published investigations on muscles in the Negro and white include studies of the musculature of the face and eye, of the mm. *keratocricoides*, *omohyoideus*, *deltoideus*, *pectorales major* and *minor*, *palmaris longus*, *pyramidalis*, *psoas minor*, *gemellus superior* and *gastrocnemius*, the insertions of tendons on the dorsum of the foot, the musculature of the inguinal and hypogastric regions of the abdominal wall, and two muscle formed spaces, the lumbar triangle and lumbar tetragon.

It will be observed that some muscle or group of muscles in nearly every region of the body has been the object of study, but the field is by no means exhausted. Little has been done on the study of the hand, which as the most advanced and generalized member of the body, should present features of racial interest. It will be recalled that the assumption of

the upright posture freed the human hand for infinitely diverse employment and so has been associated with the progressive development of the brain, which in turn is responsible for human dominance on this planet.

Singer once presented a paper not yet published⁶ to the writer's knowledge, stating that the webbing of the tendons on the back of the hands is more marked in the Negro than the White. This would seem to have implications for capacity in digital skills. Some musicians have had the band between the ring and little fingers cut so as to permit greater freedom of movement for these digits. If this band is naturally thicker in one person than another the inference is obvious. Whoever would describe an anatomical basis for digital skills must remember that the cultural achievements of African artisans show that the Negro has given objective evidence of development of the most difficult digital skills.

Another phase of muscle structure which has not been investigated is the way in which musculature is applied in the poorly and heavily muscled. The disposition and folding of the muscle on bones and each other in the well-endowed can be very profitably studied as a basis for judgments on body build.

iv. Blood vessels. The variation of a large number of blood vessels have been studied in the Negro and White by various authors, viz. the branching of the aortic arch and the following arteries: middle meningeal, transverse cervical, transverse scapular, subclavian, axillary, deep brachial, renal, femoral and popliteal. Veins studied include the external jugular, superficial anticubital, azygous system and the circumflex veins of the thigh.

Most of the principal arteries have been studied but important ones still omitted include the external carotid, the anastomoses about the elbow and knee and the arches of the hand and foot. We also have no series on the Negro on the level of origin of the visceral branches of the abdominal aorta.

⁶ American Association of Physical Anthropologists, N. Y.

The entire jugular complex in the neck and the saphenous group in the lower limb are important veins on which no series are available. Of particular value in connection with the study of the saphenous veins would be a survey of the incidence of the communicating veins and the number of valves in these and the saphenous veins because of the importance of these factors in the common affection of varicosity.

v. Nerves. The phrenic nerve, brachial plexus and lumbosacral plexus have been reported upon for Negro and White. The sciatic nerve has been studied both in respect to its point of separation into its two components, the tibial and common peroneal nerves and to its relation to the piriformis muscle.

The cervical plexus has not been described for racial series. More reports upon the brachial and lumbosacral plexuses are desirable. Recent investigation of these plexuses in the lower primates has afforded new background for studies of the human types.

Studies of cross-sectional area of nerves have been carried out upon the brachial plexus and median and sciatic nerves (283, 284). The technical difficulties involved in work of this kind are great, but as the available series are quite small, this should not preclude attempts to secure additional data.

vi. Brain. Perhaps the natural thrill attendant upon the possibilities of establishing a physical basis for social status, on the one hand, and the desire to rationalize what until very recently was the status quo, on the other, have led neurologically minded anthropologists recurrently to hazard premature attempts at the expression of mental capacity in terms of anatomic structure. Simultaneous full grasp of the knowledge of comparative neuroanatomy, experimental and clinical neurology, cortical cytoarchitectonics, and comparative and human psychology, appears in the past to have been a rather large order even for the anthropological brain, so anthropologists have made their chief concern the simpler cerebral features of brain weight, proportions and convolutional pattern. Competent neurological opinion today tends to deprecate

the functional importance of these individual data. The existence of alleged stigmata of inferiority is categorically denied (Levin, '37), and the gross and microscopic study of the brains of geniuses, the average and the subnormal does not today excite the interest of former years.

This does not in any sense diminish the desirability of acquiring the fullest possible information on racial variation in the brain. But in the assemblage of such data extreme care is necessary to eliminate flaws due to technical and subjective factors, as Mall's demonstration (270) of Bean's errors early emphasized without much effect.

Summation of available data on brain weight suggests that the average brain of the Negro who comes to the dissecting or necropsy table is slightly smaller than that of the fairly comparable white, as indicated by studies of weight direct and of cranial capacity. The character of these results is such as to render futile attempts at imputation of functional significance.

Hooton (22) found that Negro college students exceeded Negro criminals in cranial dimensions. Herskovits' (11) sample, which is more representative of the general Negro population than any other available, shows the high cephalic module value of 1606 cc., i.e. the sum of cranial length, breadth and height divided by 3, (Hrdlička).

In view of the highly complex nature of the problem, the extremely controversial quality of existing reports, and the indubitable lack of conclusive data, no alternative appears but the encouragement of the study of more brains from all sources — unclaimed dead, necropsies, and voluntary bequests. In no case does the importance of thorough documentation and representativeness of material loom so clearly as here.

vii. Skeleton. As would be expected, more studies have been made on the skeleton than on any other kind of human remains, since this material is the most abundant and readily available.

Reports on the skull have treated cranial capacity, suture closure, racial features, craniometry, the cranial fossae, the sella turcica, the optic foramina, craniofacial relations and

growth, the grooves of the middle meningeal artery, the internal nose, individual skull bones, the temporal bone, and shrinkage on drying.

Of the bones of the upper limb, the clavicle and scapula and the supracondyloid process and septal apertures of the humerus have received attention.

On the torso there have been studied the atlas, cervical spinous processes, thoracico-lumbar vertebrae, presacral vertebrae, the entire spine, the effects of maceration and drying on the vertebral column, accessory sacro-iliac articulations, the sternum, and suprasternal bones.

Studies on the lower extremity have dealt with the pelvis, pubic bone and femur.

The skeleton of the foot as well as its complete functional morphology deserve attention in the future. Variation in bone texture may possibly be found to have racial character.

f. Growth and development. Despite the large amount of attention which the age changes of the human body have been receiving in recent years, as manifest in institutes of child development and the newly created division of gerontology of the National Institute of Health, little has been done in new studies on the Negro.

i. Fetuses. Schultz (64) showed on 623 White and Negro fetuses from the Carnegie collection that racial differences existed as early in development as the human form could be recognized. He found that many of them became more marked with advancing growth, but some were as pronounced at 3 months as in the newborn or even the adult. He also made a special study of the development of the external nose during fetal life. Bean (74) described changes in ear index during the fetal period in Negroes and whites. Hill (223) has provided tables of the appearance of centers of ossification in fetal life based on White and Negro material.

ii. Child development. There is still an inadequate number of dimensional studies on the young. We have the studies by Baldwin (49), Dodge (50) and Bakwin (51) on the colored infant, the Woodbury standards for statures and weights of

children under 6 (38), and the anthropometric surveys of children and adolescents of Mustard and Waring, Royster and Hulvey, Davenport and Steggerda, and Herskovits.

The cranial studies already cited of Limson on the individual bones of the skull and of Royster and Moriarty on the sella turcica, were both made on young material, fetuses in the case of Limson, and children between 8 and 9 in the case of Royster and Moriarty.

It is necessary to have a larger number of studies on the young than on the adult because of the greater variables introduced by the phenomena of growth and the more rigid controls necessary.

The meticulously conducted comprehensive mammalian and human studies in measurement of skeletal progress in development by the late and deeply lamented T. Wingate Todd and his associates, have given us human standards of unique validity for the appearance of ossification centers for subsequent maturation changes and for epiphysial union. These standards are based upon white subjects, however, although sufficient exploratory examinations of small series of Negro children were made to lead Todd to the conclusion that in sub-adult skeletal maturation, Negroes showed greater divergence in age relationships than Whites.

Large scale studies of Negro children conducted with the same care and thoroughness as those of the Brush and Associated Foundations are definitely indicated to determine whether any racial differences in skeletal maturation exist.

At the present time a new longitudinal study covering mental, physical and social aspects, is being conducted at Fisk University under the direction of Dr. Charles S. Johnson ('40), with the support of the Rosenwald Foundation. In this investigation children who come from homes of least advantage are being given superior care in respect to nutrition, education and associations in an effort to determine to what degree their domestic handicaps may be overcome by these benefits.

At Howard University in cooperation with the U. S. Department of Agriculture a study of 200 young Negro boys was made from which the anthropometric data and the analyses of the ossification of the left hand will eventually be available (Cobb, '36 b).

The growth studies of Steggerda and his associates (48) on four racial groups, Dutch, Negro, Navajo and Maya, show essentially the same growth trends in both males and females. As this finding is at variance with the precocity of growth in the Negro previously reported by Herskovits (40), and Davenport and Steggerda (46), elucidation on the subject is necessary.

Very comprehensive studies of the post-natal growth changes in the head and face which include the racial phase with specific attention to the Negro have been published by Davenport (61) and Goldstein (62).

g. Athletes. A fact which has occasioned much comment in the public press is that Negroes have demonstrated superior ability in nearly all fields of athletics in numbers much greater than would be expected on a basis of opportunity or population proportion. The writer ('36 a) has shown that in track and field competition the Negro excellence was not limited to the sprints and broad jump as had been alleged, but covered the whole gamut of events. He showed further that ability was not associated with amount of Negro blood, for all degrees of admixture could be demonstrated in men who had been champions in the same event, nor indeed was the association with race at all too clearly evident because records have constantly been improved down the years and the margins separating the performances of White and Negro stars have been insignificant from an anthropological standpoint. For example, the records of a White champion today might be better than those of a Negro star 20 years ago, no matter how much that particular championship might formerly have been held by Negroes.

It was also advanced that the success of the Negro athletes was due to certain anatomical characters such as a long

calcaneus or heel bone which afforded greater leverage to the calf muscles. The writer tested these suggestions on Jesse Owens at a time when the athlete was an eminently superlative performer. He found that in all those characters presumptively associated with race or physical ability, Owens was Caucasoid rather than Negroid in type. Thus his heel bone was relatively short, instead of long; his calf muscles had very long instead of short bellies; and his arches were high and strong instead of being low and weak.

Still, popular interest in the subject will not be downed and the question remains of what is the physical basis for athletic ability. This requires an extensive body of new knowledge in the realm of physics, of anatomy and of physiology.

In the realm of physics, T. K. Cureton, of the International Y. M. C. A. College, Springfield, Mass., has shown what is involved in the mechanics of the tract racing start, track running, the shot put, the high jump, the broad jump, various swimming events, and chest expansion.

In anatomy there is much yet to be learned from the study of the physical proportions of athletes. The literature of physical education has a large amount of information on this subject, which does not have particular reference to race. The writer is convinced from observations in the dissecting room and of athletes in action that the disposition and lamellation of musculature on bones can be shown to have significance for athletic performance.

In physiology, there exists a sizable literature on athletic activities which does not give any special attention to racial factors.

The important problem is the identification of the factors which make for excellence. Their racial incidence may readily be determined. Lately, research in a number of directions has yielded results which appear promising in this connection.

The speed of the knee-jerk, or patellar tendon reflex, has been extensively investigated. Lautenbach and Tuttle ('32) showed that there is a direct relationship between reflex time and running events in track. Sprinters show the shortest

reflex time and distance men the longest, with middle distance men intermediate. Browne (329) found in a study of 82 White and 82 Negro subjects that the average reflex time of the Negroes was .0087 sec. shorter than that of the Whites. Since the difference was 5.43 times its probable error, it must be regarded as significant. Extension of this work should provide data of great value.

Very valuable findings have recently been made in the Harvard Fatigue Laboratory by D. B. Dill and his associates. In one investigation five stellar distance runners were found to have much higher oxygen intake capacity and lower blood lactic acid levels under severe work loads than control non-athletes (Robinson et al., '37). Since the oxygen-carrying capacity of the blood in the runners and the untrained was the same, the greater oxygen intake of the runners and consequent superior oxygen supply to the tissues, imply better respiratory and cardiovascular mechanisms in the athletes.

In another study Seltzer (40) found a similar association between high oxygen intake values and efficient respiratory and cardiovascular systems. He reported further that the more linear or lean in body build demonstrated greater capacity for supplying oxygen to the tissues than the more lateral or stout.

Obviously, we deal here with phenomena directly associated with speed in energy change, which is, with training, the essence of athletic superiority. Researches of this nature should be very enlightening if conducted upon Negro athletes and non-athletes, and might possibly be decisive in determining the relationship of race to athletic ability. Seltzer's finding, for instance, that greater oxygen supplying capacity was possessed by subjects with rounder heads, shorter and broader faces, and longer and narrower noses could not apply to Negroes.

Even more recently Dill has obtained results from studies of southern Negro and White sharecroppers, which show that Negroes withstand high temperatures better than Whites (321, 322, 334). The public press suggested using this physio-

logical gift to military advantage by using Negroes for tank crews, but if further confirmed the finding has much broader implications.

3. Genetics of hybridization

People are universally interested in what their children will look like. The more homogeneous a population, the greater the certainty with which the appearance of the young may be predicted. The more heterogeneous a population, the greater the variability anticipated. Since the American Negro combines many constitutional strains in his make-up, he would be expected to present considerable variability in groups and in individual families. This variability would be anticipated to be greater than that of the parent stocks only in those traits in which the parent stocks differ most markedly from each other. Herskovits and others have shown that in traits in which the ancestral groups do not differ greatly, a hybrid population may exhibit less variability than any parent stock (28). Herskovits' data on the American Negro showed further that in racial diagnostic traits, such as skin color, lip thickness and nasal breadth, this hybrid American presented greater variability than representative African or white stocks (11).

All problems which have arisen in connection with the manifestation of homogeneity and increased variability in the American Negro, might be benefitted by the analysis of new large series of data, gathered possibly through many channels. Such data would possess the advantage that they would perforce be collected 15 years, half a generation, after Herskovits' original study and thus might conceivably give indication of new trends.

The behavior of racial diagnostic traits in inheritance is a phenomenon of basic importance from a number of points of view and one which has been studied from several approaches.

Williams (16) using carefully evaluated statistical methods, identified in Negroes as traits of greatest value in determining degree of white admixture, skin color, hair form, nasal wings

searches of the same authors and Todd; and inheritance, in the work of Davenport, Day, Herskovits and Barnes.

The evidence of the several authors is in fair agreement on the point that offspring tend to approach the darker parent more nearly than the lighter in pigmentation and that the mechanism of inheritance is probably Mendelian, with multiple factors and no clear indication of dominance involved.

A larger new study taking advantage of the experience of the preceding is both desirable and possible.

b. Facial features. Here we find as much popular interest as in the inheritance of skin color and hair form. Day (14) has noted that she knew of no quadron ($\frac{1}{4}$ N, $\frac{3}{4}$ W) who might not easily "pass for white." She also recognized "dominant," resembling White more than Negro, and "recessive" mulatto ($\frac{1}{2}$ N, $\frac{1}{2}$ W) types. There were indications to her that the White facial features tended to be "dominant" over the Negroid in inheritance. These provocative results should stimulate further investigation.

c. Entrenched features. Most White Americans are familiar with or have at least heard of some of the bizarre and often amusing diagnostic traits which at some time or other in popular belief have been regarded as specific indicators of Negro blood. We may mention an index finger longer than the ring, a lunula at the base of the nails, the absence of a "split cartilage" in the nose, increase in pigmentation about the base of the neck, and pigmentation on the penis. This concept that certain individual racial features will resist modification by even very large contributions of White blood is quite widespread. Many untutored Negroes will assert that in many cases they can identify a fair-skinned female as possessing Negro blood by the contour of her legs. Todd (30) found evidence that certain features, chiefly in the face, are entrenched in the American Negro.

The existence of such problems cannot be denied, but very little has been done toward their scientific solution. Day's subjects will in many ways remain a permanently unique series because the sources of much of her data are no longer avail-

able. However, a splendid opportunity for collaboration between sociologist and anthropologist in gathering genealogical and anthropometric data on new Negro-White crosses in certain northern areas, such as Minneapolis, where the historic background is easily obtained.

4. Population problems

Since all living creatures tend of themselves to multiply without limit, the numerical strength of a given species in a given area, after adequate time for all factors to express themselves, will be the difference between the reproductive capacity of that organism and the sum of the factors tending to limit its increase, which may be termed collectively, the environmental resistance. It is well known that the reproductive capacity of the American Negro has been exceptionally good, and that his environmental resistance has been particularly strong. His reproduction has been sufficiently superior to his environmental resistance to permit his continued numerical increase in the American population but not enough to prevent his proportional decline as a population element. The physical anthropologist has a proper interest in all forces operative on both sides of this endless conflict. He does not need, however, to make special effort to gather data himself. This is very competently done for him by the specialists in the census, vital statistics, and the various special concerns of biometry and demography. The physical anthropologist has need to keep himself continuously apprised of the latest information and to bear this constantly in mind for possible applications to the interpretations of data from other branches of his field.

It may be of value to consider briefly some of the factors which affect the reproductive performance or environmental resistance of the American Negro.

a. Birth and mortality rates. Information on the degree to which annual births have exceeded deaths in the American Negro, is not enough to provide adequate basis for estimate of future population trends or to account for the peculiarities

which the increase has shown in the past. Many collateral data must be appraised and digested.

The live birth date is the net product of a great many factors. It represents in any case only a variable fraction of the potential reproductive capacity of the people on whom it is measured. Pearl's survey (357) showed that the natural innate fertility of White and Negro women is identical.

The first factor which acts to restrain Negro propagation is sterility. Satisfactory statistics on sterility in the Negro are not available and may be obtained only with difficulty. Approximations may be made, however, by indirect methods. A subtle and potentially dangerous check on Negro increase has been an unknown amount of artificial sterility produced by vasectomy in males and roentgen rays in females in institutions for law violators. Adams has compiled a list of states where sterilization laws exist and suggestive data on the number of inmates affected as an indication of the potentialities of this source of loss of reproducing elements.

Probably the greatest loss in potential reproductivity in the Negro is through reproductive wastage in the form of abortions and still-births. Pearl pointed out that such wastage is higher in the general Negro population than in the White due to the greater prevalence of venereal disease, but that in given samples such as the clientele of the Bureau for Contraceptive Advice in Baltimore, the Negro wastage may be lower. In the Negro as in the White, many abortions and stillbirths are unreported, and every measure which improves the accuracy of these data will be of value.

Another limiting factor on reproductive performance is the practice of contraception. Pearl found that the pregnancy rates among Whites who practiced contraception were reduced from 25 to more than 50%, while among Negroes, the pregnancy rates for women who practiced contraception were not significantly different from the rates of those who did not, thus a lesser efficiency with the methods was indicated. Kelley Miller, and Frazier ('39) have supplied evidence that the same effectiveness of voluntary family limitation obtains

among Negroes as among Whites with rise in economic status. Should the general status of the Negro show significant improvement as a result of federal health and housing measures, the consideration of what would happen in respect to contraceptive practice would be a most significant item for study.

Huntington (352) has produced data to show that the sex ratio of Negroes is lower than that of Whites in the United States. The ratio given for whites is 105.7 and for Negroes 100.0 (Jastrzebski). There is considerable regional variation and Huntington states that "the average difference between Negroes and Whites is only 2.0." This ratio has reproductive significance in that it indicates a larger percentage of females, who are the reproducers, in the Negro population.

Holmes (353) has directed attention to two factors which favor a more rapid reproduction in the Negro in the immediate future. One is that the age composition of the Negro population has steadily changed to favor a high birth rate, bringing more females into the reproductive age range. In 1890, 45.1% of Negro females were between 15 and 44 years. In 1930 the proportion had become 52.0%. The other factor is that because more births occur to Negroes than to Whites in the earlier reproductive years, Negro generations succeed one another more rapidly than White. Holmes and Parker estimated the length of a Negro generation to be 27.5 years, a year shorter than that of a white generation, 28.5 years.

Still another element that contributes to high reproductivity in the Negro is the fact that multiple births are more frequent in that group than in the white. The normal human litter size is so commonly one that the occurrence of twins, triplets and quadruplets would be thought to be of no significance, yet Pearl ('39) showed that, "there is a plain tendency for mean litter size to be relatively high in states where the birth rate is high, and relatively low where the birth-rate is low. This indicates clearly that litter size plays a definite role in bringing about observed differences in group fertility." In the Birth Registration Area, for the 3 years 1930-1932, a mean litter size of 1.01474 ± 0.00009 was found for Negroes

and one of $1.01146 \pm .00003$ for Whites. The difference being 35 times its probable error leaves no doubt of a significantly higher litter size for the Negro.

The American Negro birth rate is approximately one-fifth greater than the White, an advantage which is more than neutralized by the fact that the mortality of Negro children under 1 year per 1,000 live births is more than twice that of the Whites.

The number and complexity of the factors involved in birth rate thus demand the most constant attention to the securing of increase in volume and accuracy of data.

We know that the mortality of the Negro has been greatest during the reproductive years, between 15 and 44 years, a fact which has removed many potential parents from the population. The average life span of the Negro, formerly comparable to that of people in primitive and medieval times, has been lengthened in recent years, but this is sensitive to environmental conditions and there is no assurance of continued improvement without directed effort. Numerous individual cases have left no doubt of the Negro's innate ability to survive to very advanced ages. The average expectation of life for Negroes has risen from 32.54 years for males and 35.04 years for females in 1901, to 46.83 years for males and 48.74 for females in 1930 (Gover, '37). In the latter year, the life expectation for the male Negro was but $3\frac{1}{2}$ years less than that of the White, and for the female Negro, $4\frac{1}{2}$ years less than the White (Dublin, '37). The Negro today is about where the white man was 30 years ago, in this matter.

b. Morbidity rates. The anthropologist's interest in morbidity is principally in the incidence of affections which deprive the population of potential reproducing units and those which relate to constitutional susceptibility or immunity. It is well established that tuberculosis, pneumonia and external causes, which are the chief burdens of the Negro and are essentially the result of poverty and exposure, may be satisfactorily controlled by improvement in economic status and general public health measures.

Venereal disease which is also a retarding factor in reproduction may also be controlled by public health activity. Jason's finding (390) on the incidence of syphilis in Negroes of different economic level indicates a relationship to status similar to that of tuberculosis. Many special aspects of Negro morbidity require considerable special study. For example, Taeuber states⁷ that the incidence of venereal disease is greater along the banks of the Mississippi than in the hinterland. If duly confirmed, this finding which has obvious further implications, would indicate different regional treatment of data than methods now generally used.

Despite the strong positive emphasis of some writers and diligent search after evidence of others, there is little of a conclusive nature which can be said respecting constitutional predisposition to disease. Tuberculosis, formerly held to be almost a hopeless problem because of the Negro's lack of resistance, has been shown to be most responsive to modern methods of control both as to epidemiology and treatment.

Constitutional techniques are themselves only being satisfactorily developed. Sheldon's retention of the concept of the relation of the embryonic primary germ layers, ectoderm, mesoderm and endoderm, to constitutional type in his very recent classification of ectomorphic, mesomorphic and endomorphic types, indicates the entrenchment which this idea has secured. The relationship of the germ layers to disease has been stressed separately by Bean, Holmes, and Moehlig, the opinion being that the Negro is a mesodermopath, that is, susceptible to diseases affecting principally mesodermal tissues, and that he is resistant to diseases affecting the derivatives of the ectoderm. The reverse is held to be the case in the white man.

Doull ('37), in his review of the subject, concedes that the lower mortality of the Negro in diphtheria and scarlet fever appear to be due to greater resistance although the mechanism has not been discovered. Holmes ('28) regards both these

⁷ Personal communication.

diseases as affections of the ectoderm although diphtheria involves an epithelium of endodermal origin. Here apparently it is convenient to make the germ layer cover a specific type of tissue, but the urogenital system also has an epithelium, in this case derived from the mesoderm. Gonorrhoea, which is a specific infection of this epithelium, bears the same relation in the urethra to the contiguous invaginated ectoderm that diphtheria does in the throat to the lining ectodermal epithelium of the mouth. No immunity to gonorrhoea has been alleged for the Negro. Why should the germ layer hypothesis be stretched in one case to cover an exception and ignore a contradictory fact in another?

A most significant feature to be studied in respect to improvement of the health of the Negro is the relationship between decline in incidence of tuberculosis, venereal disease; infant mortality and maternal mortality, and rate of increase of the group. As the federal government has a public health program aimed at the eradication of these scourges, it might be expected that increased multiplication of Negroes roughly proportional to the success of the program might occur. As such a prolificity would raise problems all its own, the possibilities should be explored from all angles.

c. Effects of selective mating. Many non-biological factors may achieve biological importance. Status, for instance, is important in survival if, through it, essential means for continued existence, otherwise unavailable, can be obtained. Thus a group of fortunate weaklings might survive situations which would decimate a much less fortunate but better endowed group, and since generations are bred from those who survive to produce them, a progeny derived from the least fit elements of a population might gain a preponderance.

It has been reported by numerous observers that Negro men tend to marry women lighter than themselves. The effect of this single factor long continued would be to lighten the average pigmentation of the Negro population and eventually the color selection would disappear because a relative homogeneity of skin color would become established. This process

would be accelerated by the fact that a certain number of dark females would fail to secure mates, while on the other hand, a number of potential complexion lighteners would pass over into the white race. Herskovits (11) has discussed this possibility at some length.

The matter is not a simple one, however. Holmes (363) has noted that the rural Negro as a group is darker than the urban and that this color selection is less marked in rural than in urban areas. Since the rural Negro birth rate is much higher, and the population more numerous than the urban, the general population would tend to become darker and more Negroid in appearance than it is today. As this would result in a greater divergence in physical appearance from the white, many attendant problems would assume a new acuteness.

Also to be considered in this connection is the question of whether there is any tendency toward sex difference in the pigmentation of the American Negro; this has been denied by some authors, and admittedly these have the weightier evidence, and affirmed by others. It cannot be said that the truth has been satisfactorily established.

Of final importance here, is whether the attitudes which condition this mate selection are becoming more or less prevalent. Here is one case where the work of the sociologist is indispensable to the physical anthropologist.

d. Effects of living conditions. The generally unfavorable environmental conditions under which the Negro has survived in America are too well known to need citation here. Our anthropological interest is in whether his hardships have had a beneficial or deleterious effect upon his physical constitution.

Certainly, from one point of view, the Negro has had to demonstrate more adaptability and hardihood than any other American group. He has survived the rigors of the capture, the middle passage, the social disruption and heterogeneous assortment in America, the involuntary servitude, the post-bellum catastrophes and the industrial migrations of recent years. Although many other factors have played a role, the

question as to the degree to which a selection of the more fit elements has occurred during these struggles for survival is a very intriguing one, well worthy of special study.

There is no disputing the ill effect of the cultural disorganization, low economic status and poor health, which the Negro has suffered. On these there are an abundance of data. None denies the demonstrated toughness of the Negro. But has he not had to have something more in the mental sphere? We feel sure that seekers would find.

e. Gains and losses of white blood through new crossing. The American Negro is today an intrabreeding group. The importation of Africans ceased prior to 1860. Little significant contact exists between Negroes and surviving Indians. Hardly noticeable interbreeding has occurred with recent arrivals such as Mexicans, Filipinos and Orientals. Strong and generally bilateral social pressure prevents productive matings with Whites. Still, a small amount of new White blood continues to enter the Negro melting pot and some new Negro blood is regularly absorbed into the White matrix. No one has ventured any scientific opinions as to the quantitative aspects of this mutual interchange. New White blood has been introduced into the Negro group in the South principally by White fathers. During the Reconstruction some mixed marriages occurred, and in recent times some marriages of Negro men and White women have occurred in the industrial North. There is no evidence that a statistically significant number of offspring have resulted from the latter unions, however.

In the South today, attitudes and circumstances no longer favor the free cross-mating of ante-bellum days. Davis and Dollard ('40) state:

In New Orleans, and in most of the largest cities, it is possible for those colored people who can "pass" as white to change their caste position in certain fields of behavior. It practically never happens today, however, that such persons marry white individuals. There are still a few white men who establish common-law marriages with colored women, and live part of their day in a house with the colored mate and children.

They are usually outcastes as far as intimate association with whites or Negroes is concerned. The colored women in such open unions are likewise barred from intimate association with Negroes; in Natchez, for example, these women associate chiefly with each other, and are not invited to the homes of members of their former social class.

These authors have defined several social strata within the Negro group, of which lower-class is the bottom category, yet they point out that Negroes themselves relegate to a position below this level, Negro women who accept relations with white men.

On the other side of the picture, the fair American Negroes who "cross over" and do marry of necessity burn their bridges behind them, so appraising their annual number would be a very difficult task. However, a large number of highly admixed Negro families could, if they wished, supply science with the names, addresses and number of children, of relatives who have crossed to the other side and reproduced.

From the scientific point of view, it would be desirable to know in what degree, where and how blood is being interchanged between the Negro and White groups. Since adequate data are not available, a challenging problem is presented.

f. Population competition. It has been many times proclaimed on congressional floors that there are but two solutions to the race problem, amalgamation or elimination. The reasoning behind this pronouncement is that since the United States is a spatially limited territory and the indications are that its future population will be bred from the elements now residing in it, there will come a day when the heterogeneous white groups, who may freely interbreed, will constitute a single vast majority against the Negro minority, which alone is barred entrance to the melting pot. As long as the abundance of the necessities is adequate for all, doctrines of mutual interdependence may obtain, but come a shortage of food, clothing and shelter, the doctrine of "last hired and first fired" will have to be applied in more lethal form to the Negro.

The anthropologist recognizes that if present trends are continued long enough, such a majority-minority situation will exist, if it may not be said to exist at present. Any two such groups living in the same territory and requiring the same means of sustenance will be, in the nature of the case, competitors, and one group or the other will manifest an ascendancy. The white group today has the upper hand. They are superior in numbers, in reproductive trend and in status. They aggregate nine-tenths of the population; they form an increasing percentage of the population, having risen from 80.7% in 1790 to 90.3% in 1930; and they control the agriculture, industry, commerce, government and arms of the country.

It would seem that there is not one possible outcome to this population struggle, if the status quo is maintained. Excluding the consideration of plausible ways in which the status quo might be changed, this pessimistic outlook, from the point of view of the Negro, need not, however, prevail. The anthropologist is interested to note that but one factor, race prejudice, prevents the inclusion of the Negro in the American amalgam. Race prejudice has been shown not to be a biologically inherent attitude. It is a socially conditioned phenomenon. This being true, the prejudice can survive only as long as the social structure which produced and nurtures it.

There is a widespread conviction within both the majority and minority groups that our social organization can be improved. The form of the American government is designed to facilitate changes for the general welfare. The social and biological sciences together might perform a service of incalculable value to the nation by effective popularization of the import of their knowledge for improvement of the population.

On the assumption that the Negro will remain essentially an interbreeding group, attempt has been made to predict his population growth in an unlimited future. Gover (360), using the method of the logistic curve, calculated that the American population should become stationary at about the year 2100, at which time the Negro would form a relatively fixed popula-

tion proportion of 7.41%. Karpinos (361), using different statistical procedure concluded that the population proportions for an indefinite future would not be expected to differ significantly from what they are at present.

5. Summary

Studies on the American Negro have involved a wide range of professional specialties. Yet our knowledge is far from a desirable state of completeness in nearly every major aspect of interest. We do not have adequate inventory on the physical, mental and ecological characters of the Negro population. Information on the genetics and development of this hybrid people is still very meager. Techniques of appraisalment of biological status have neither been sufficiently developed in themselves nor satisfactorily applied to the study of this particular group. Science has not given the public the benefit of the guidance which present knowledge does permit, in formulating solutions of "the problem" which will be for the good of all concerned.

Extant studies have been surveyed and gaps in our knowledge specifically indicated. The specialties whose individual contributions are necessary for research in the many phases of the physical anthropology of the Negro have been cited and opportunities for collaboration mentioned. The expense and labor required in most types of investigation in this field have been noted and the potential value of possible new researches suggested.

V. PROGRESSIVE MEASURES

How can the study of the physical anthropology of the American Negro best be furthered? If some infinitely wealthy patron were to say immediately that money is available for everything that needs to be done and to proceed at once, the scientists would find themselves in the position of the nation's diverse collaborators in the defense program. The appropriations were made speedily but much time is required for preparatory activity before the instruments of war can enter

large scale production. So in physical anthropology, the preliminaries incident to commencement of an immediate comprehensive investigative program would require considerable time, were the necessary funds available now. Since this fortunate contingency does not exist, a few means by which our desired study may be promoted by slower means may be suggested.

1. The small teaching unit

Of these one of the most feasible is the development of small classes in physical anthropology, giving special attention to the American Negro, at suitable institutions of learning. Such institutions would include established centers of physical anthropology, at the two Negro medical schools and at leading Negro colleges. The courses given should be carefully prepared and comprehensive in scope and they should preferably be of graduate level and certainly not below advanced collegiate level. Thus would be created a group of interested and informed students with some specialized training from whom future workers could be drawn.

2. The small series investigation

Bad statistics with small series, common in medical and anthropological fields in past years, have been so over-corrected that today there is often great hesitancy in reporting findings that are not based on large numbers of cases. It has been emphasized many times that in physical anthropology large series are generally very difficult to obtain. Accuracy of data and uniformity of methodology are the important elements. Many educational institutions and anatomical laboratories could contribute data of many kinds in small series, if their interest were aroused. Cumulative reports would eventually reveal the wider truths, while small series studies have great exploratory value. Several such investigations by students have resulted from prize competitions in anatomy in Howard Medical School.

3. Collaborative enterprises

The collection of data on various anthropological items might be facilitated through the medium of a central depository or clearing house. Thus pathologists in many hospitals, who would agree to take organ weights according to the same technique, might furnish valuable new data on organ weights. Physical educators and school health services might supply new data on statures and weights and such procedures call for rather elaborate precautions and constant vigilance to insure validity of data, but they would be worth the effort and in growing mass tend to reduce their own error.

Regular conferences on subjects agreed upon might be held to further advancement in particular lines and the field in general, and progress notes published periodically.

A bulletin devoted to the field of Negro studies might be carefully considered. It is doubtful whether a journal for original articles could be successful as most investigators would publish their more important studies in the journals of their specialities, but a comprehensive bulletin consisting of notices, abstracts, reviews with perhaps occasional editorial comment on needs and trends would certainly be useful.

VI. SUMMARY

1. By any standard, the physical anthropology of the American Negro, in spite of its obvious importance, is an inadequately explored field, as a whole and in its numerous subdivisions.

2. From the size of its literature, the number of contributors, the number of institutions represented, and the organizations devoted to its promotion, the field cannot be stated to have shown satisfactory activity.

3. Of the laboratories most productive of studies in the past, only one today has a continuous program in operation. The enlistment of both new workers and new laboratories is needed.

4. The paucity of Negro workers in the past and their desirability for the future has been cited.

5. An ideal laboratory for training and research in the field, with staff learned in the subject and with ample resources in human remains and living subjects has been shown to be non-existent.

6. Many studies of representative quality have been published, but these do not suffice for adequate: inventory of the physical, mental and ecological characters of the Negro; registration of the genetic and environmental phenomena associated with his hybridization; assessment of his biological quality; or prediction of his future.

7. To fill gaps not only are specifically directed studies indicated, but the collaborative contributions of workers in many diverse specialties are necessary.

8. Existing studies in all spheres have been briefly surveyed and missing knowledge and its significance indicated.

9. Needed aids to scholars and the laity in improving convenience of access to present information have been described.

10. The requirements for training of personnel, both as to nature and expense, and for materials, equipment and location of a satisfactory laboratory have been described.

11. The need for public enlightenment on knowledge gathered by physical anthropology and the responsibility of physical anthropologists to perform this task have been emphasized.

12. The possible contributions which physical anthropology can make to the future of man and the declining importance of race as a subject of biological inquiry have been noted.

13. The advantages of building up a center of anthropological study at a Negro medical center have been described. Such a center would be of value not only for the study of the American Negro in particular, but for the study of human constitution in general.

14. Ways and means for promoting Negro studies have been discussed, among them the preparation on the subject of a bibliography, scientific reference volume and lay text, the institution of educational courses with special emphasis upon it, the use of the press for disseminating information for the layman, and the prosecution of investigative work through small series investigations, collaborative researches and special conferences.

15. Throughout specific opportunities for cooperation from related sciences have been indicated.

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TABLE 1
Number of studies published in each year.

Before 1860	1	1912	2	1928	16
1861- 70	6	1913	2	1929	14
1871- 80	2	1914	2	1930	19
1881- 90	1	1915	4	1931	10
1891-1900	17	1916	1	1932	20
1901	3	1917	3	1933	6
1902	1	1918	3	1934	21
1903	2	1919	4	1935	16
1904	3	1920	4	1936	26
1905	2	1921	8	1937	19
1906	1	1922	6	1938	13
1907	2	1923	12	1939	25
1908	0	1924	6	1940	23
1909	6	1925	10	1941	25
1910	2	1926	18	1942	6
1911	2	1927	16	Unpubl.	1
				Total	412

TABLE 2
Studies published by respective institutions.

NO.	INSTITUTION	TOTAL STUDIES	REFERENCE TABLE NUMBER
1.	Washington University	44	16, 121, 123, 150, 153, 175, 177, 182, 183, 186, 190, 193, 197, 198, 201, 202, 203, 207, 226, 229, 230, 232, 233, 236, 238, 239, 240, 242, 246, 247, 250, 252, 253, 256, 257, 258, 259, 260, 261, 262, 282, 283, 288, 289
2.	Western Reserve University	42	8, 30, 50, 63, 69, 96, 98, 111, 133, 136, 138, 139, 141, 142, 146, 151, 152, 158, 176, 178, 192, 193, 194, 195, 196, 199, 205, 206, 213, 214, 215, 216, 217, 218, 223, 224, 241, 285, 286, 342, 359, 386
3.	Johns Hopkins University	35	53, 54, 64, 77, 79, 83, 101, 102, 107, 109, 126, 156, 166, 187, 189, 208, 227, 231, 243, 248, 251, 269, 270, 272, 279, 284, 287, 296, 298, 299, 338, 356, 357, 362, 387
4.	Carnegie Institution	23	5, 10, 18, 19, 20, 29, 31, 46, 48, 61, 80, 81, 82, 86, 93, 95, 112, 116, 117, 118, 172, 174, 335
5.	University of Virginia	16	24, 45, 55, 56, 57, 58, 74, 76, 78, 94, 149, 290, 291, 292, 293, 294
6.	Columbia University	15	6, 11, 26, 27, 28, 40, 41, 97, 113, 125, 148, 188, 220, 225, 315
7.	Smithsonian Institution	15	9, 132, 135, 144, 145, 147, 154, 159, 160, 165, 168, 181, 184, 185, 219
8.	Harvard University	10	14, 22, 100, 115, 320, 321, 322, 334, 339, 355
9.	Howard University	10	176, 268, 307, 358, 359, 381, 383, 384, 385, 390
10.	Northwestern University	10	11, 12, 15, 99, 234, 237, 244, 254, 255, 347
11.	Louisiana State University	9	313, 319, 332, 341, 366, 367, 405, 408, 412
12.	Tulane University	8	90, 273, 329, 395, 398, 403, 404, 407
13.	U. S. Public Health Service	7	38, 42, 43, 171, 180, 360, 364
14.	Charity Hospital, New Orleans	6	67, 75, 211, 365, 400, 406
15.	U. S. Sanitary Commission	5	1, 66, 70, 120, 124
16.	New York University	6	51, 62, 169, 316, 351, 354
17.	Cornell University	4	271, 309, 373, 382
18.	Stanford University	4	32, 59, 122, 200
19.	Acad. Sci. Phila.	3	137, 264, 267
20.	Catholic University	3	155, 276, 281
21.	Henry Phipps Inst.	3	371, 372, 380
22.	U. S. Army	3	4, 5, 105

TABLE 2 (Continued)

NO.	INSTITUTION	TOTAL STUDIES	REFERENCE TABLE NUMBER
23.	U. S. Childrens Bureau	3	39, 52, 222
24.	University of Chicago	3	60, 119, 303
25.	University of Georgia	3	212, 328, 409
26.	University of Texas	3	391, 393, 396
27.	Yale University	3	71, 349, 352
28.	Cincinnati General Hospital	2	85, 410
29.	Duke University	2	388, 394
30.	Emory University	2	143, 394
31.	Hampton Institute	2	72, 73
32.	Meharry Medical College	2	317, 343
33.	New York State Hospitals	2	35, 148
34.	Provident Hospital, Chicago	2	305, 350
35.	Provost Marshall General's Office	1	2
36.	Prudential Ins. Co.	2	23, 368
37.	St. Louis University	2	179, 240
38.	Smith College	2	88, 114
39.	Tennessee Dept. Public Health	2	173, 331
40.	Touro Clinic	2	211, 406
41.	University of California	2	353, 363
42.	University of Illinois	2	44, 337
43.	University of Iowa	2	21, 49
44.	University of Nebraska	2	274, 275
45.	University of Pennsylvania	2	277, 346
46.	University of Wisconsin	2	25, 249
47.	Vanderbilt University	2	103, 333
48.	Wistar Institute	2	277, 286
49.	American Mus. Nat. Hist.	1	169
50.	Public Schools, Ann Arbor, Mich.	1	162
51.	Atlanta, Georgia	1	336
52.	Beth Israel Hospital	1	311
53.	Brandywine Sanitorium	1	376
54.	Brodnax, Louisiana	1	91
55.	Charleston, S. C.	1	68
56.	Chicago Board of Education	1	47
57.	Cleveland Board of Health	1	170
58.	Creighton Medical College	1	127
59.	Detroit, Michigan	1	209
60.	Detroit Res. Lab. Children's Fund of Mich.	1	312
61.	Freedmen's Hospital	1	389
62.	George Washington University	1	392
63.	Hahnemann Medical College	1	235
64.	Harlem Hospital	1	318
65.	Hookworm Res. Lab. Andalusia, Ala.	1	330
66.	Jefferson Medical College	1	250
67.	Kans. City, Missouri Public Schools	1	33
68.	Long Island College of Medicine	1	228
69.	Mayo Clinic	1	128
70.	Medical College of Virginia	1	399
71.	Memphis Hospital	1	210
72.	Metropolitan Life Ins. Co.	1	37

TABLE 2 (Continued)

NO.	INSTITUTION	TOTAL STUDIES	REFERENCE TABLE NUMBER
73.	Mich. Home and Training School	1	348
74.	Nat'l. Int. of Health	1	361
75.	New York, Neur. Inst.	1	369
76.	New York, N. Y.	1	163
77.	Foot Clinics of New York	1	87
78.	N. Y. Juvenile Asylum	1	36
79.	New York State Dept. of Ment. Hygiene	1	411
80.	North Caroline State College	1	304
81.	Rockland State Hospital, N. Y.	1	306
82.	New Orleans, La.	1	326
83.	Tidewater Memorial Hosp., Norfolk	1	377
84.	Tubercul. Clin., Norfolk, Va.	1	314
85.	Philadelphia, Pa.	1	397
86.	Richmond, Va.	1	323
87.	Rockefeller Institute	1	306
88.	St. Elizabeth's Hospital	1	297
89.	Santa Barbara, California	1	344
90.	Tuskegee Institute	1	19
91.	U. S. Bureau of Education	1	34
92.	University of Arkansas	1	128
93.	University of Cincinnati	1	370
94.	University of Minnesota	1	325
95.	University of Oklahoma	1	245
96.	Biometric Laboratory	5	92, 108, 131, 134, 140
97.	University of Witwatersrand	5	167, 191, 280, 295, 402
98.	Kenya Medical Service	2	278, 378
99.	Medical Services, Uganda	2	327, 340
100.	University of Warsaw	2	89, 300
101.	Colonial Medical Service, Seychelles	1	130
102.	L'Ecole d'Anthrop., Paris	1	265
103.	Faculté de Médecine de Toulouse	1	301
104.	L'Hospital de Sakabayenne, Fr. Cameroon	1	129
105.	Kaiser Wilhelm Inst., Anthropol.	1	157
106.	Krankenhauses St. Georg Hamburg	1	65
107.	Medical School of Cairo	1	204
108.	Masaryk University	1	7
109.	Med. Off., Tanganyika Terr.	1	379
110.	Municipal Clinics Capetown	1	221
111.	Nat'l. Bureau for Educ. Soc. Res., Pretoria	1	17
112.	Nairobi Prison, Kenya	1	310
113.	Royal Anthropological Institute	1	84
114.	S. Af. Inst. for Med. Res.	1	308
115.	University of Leipzig	1	104
116.	University of Capetown	1	110
117.	University of London	1	106
118.	Not stated (Italics indicates foreign source)	9	3, 13, 161, 164, 263, 266, 302, 324, 374
Counted twice		15	5, 11, 19, 128, 148, 169, 176, 211, 240, 250, 277, 286, 306, 359, 406
Total		412	

TABLE 3

Number of studies from most active institutions by year.

YEAR	W.U. 44	W.R.U. 85		JO.H. 35	CAR.I. 23	U.VA. 16	COL. 15	SMI. 15	HARV. 10	HOW. 10	NO.WE. 10	U.S.PUB. HE.BUR. 10	LA. 9	TUL. 8	CHAR. 6
		42	43												
1880	..	..	..	1	..	..	1	..	..	1	..	..	..	..	3
1900	..	..	..	2	..	..	1	1	..	1	..	..	..	..	..
1905	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..
1906	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
1907	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
1908	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1909	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
1910	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
1911	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
1912	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1913	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..
1914	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
1915	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
1916	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1917	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
1918	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..
1919	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..
1920	..	1	..	2	..	..	..	1	..	..	..	..	..	..	..
1921	2	1	4	..	1	..	..	..	..	..	..	1	..	..	..
1922	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..
1923	1	5	1	1	..	..	..	2	..	..	..	1	..	..	..
1924	1	1	..	..	..	1	1	..	..	..	..	..	..	..	..
1925	..	3	3	1	..	1	2	..	..	..	..	..	..	..	..
1926	2	2	3	3	..	2	3	1	..	..	..	1	..	..	..
1927	..	3	4	..	..	..	2	1	..	..	..	..	..	..	..
1928	1	5	9	2	1	..	..	3	..	..	..	2	..	..	..
1929	1	4	6	2	2	1	..	..	..	..	1	1	..	..	..
1930	5	4	5	1	1	1	2	..	..	..	1	..	..	1	..
1931	1	1	5	1	..	..	..	..	..	..	1	..	..	..	..
1932	4	..	3	1	..	..	2	1	3	..	..	..	..	..	..
1933	1	1	..	1	1	..	..	..	..	1	..	..	..	..	..
1934	7	2	..	3	..	..	1	..	..	..	..	..	..	1	..
1935	3	2	..	1	1	1	..	..	1	2	1	..	..	2	..
1936	..	..	..	3	1	..	..	..	..	..	..	1	3	..	..
1937	2	1	..	..	1	..	..	1	..	1	1	..	..	2	2
1938	1	1	..	..	1	..	..	..	..	1	1	..	..	..	..
1939	3	1	..	1	4	..	..	..	2	1	1	3	1	1	..
1940	2	1	..	1	5	1	2	1	1	1
1941	5	1	1	1	2	5
1942	1	1	1	..	1	1

REFERENCE TABLE ON STUDIES OF AMERICAN NEGRO.

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SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS
1 Anthropometry	2,020 N full bl. 863 N mixed 19,132 W soldiers 5,171 soldiers	B. A. Gould	U. S. Sanitary Commission	1869	U. S. Sanit Comm. Mem. (Statistics) N. Y. Hurd & Houghton 655 pp.	Also, data on strength vital cap., resp. pulse and vision
2 Anthropometry	25,828 N draftees 475,240 W draftees	J. H. Baxter	Provost Marshall General's Office	1875	Stastics Med. and Anthropol. of the Provost Marshall General's Bur. Wash., D. C.	
3 Anthropometry	N fem.	F. Kellor		1901	Arena, 510-520	Criminals
4 Anthropometry	4,923 recruits N 99,077 W recruits	U. S Surgeon General	U. S. Army	1902	Rep. U. S. Surg. Gen.	
5 Anthropometry	6,264 N troops 93,185 W troops	C. B. Davenport and Love	Carnegie Inst. U. S. Army	1921	U. S. Gov't Pr. Off.	
6 Anthropometry	5,539 N subj.	M. J. Herskovits	Columbia U.	1927	Anthrop Anz., 4: 293-316	Physical form and growth
7 Anthropometry *	1,008 S. Africans	V. Suk	Masaryk U.	1927	Am. J. Phys. Anthropol., 10: 31-64	With various physiological observations
8 Anthropometry	100 N cadav. 32 N fem. 100 W cadav. 36 W fem.	T. W. Todd and A. Lindala	Western Reserve U.	1928	Am. J. Phys. Anthropol., 12: 35-119	
9 Anthropometry	20 N males 6 N fem.	A. Hrdlička	Smithsonian Inst.	1928	Am. J. Phys. Anthropol., 12: 15-34	N full blood
10 Anthropometry	147 N males 143 N fem. 50 W males 50 W fem.	C. B. Davenport and M. Steggerda	Carnegie Inst.	1929	Carnegie Inst. Pub. No. 395.	
11 Anthropometry	3,378 N males 2,281 N fem.	M. J. Herskovits	Columbia U. Northwestern U.	1930	Columbia Univ. Press	Bibliography of additional studies on these data
12 Anthropometry	639 N subj.	M. J. Herskovits, V. K. Cameron and H. Smith	Northwestern U.	1931	Am. J. Phys. Anthropol., 16: 193-201	
13 Anthropometry	349 N subj.	F. v. Luschan		1929	Zeitschr. F. Ethnologie, 61: 337-363	Results presented by Herskovits
14 Anthropometry	126 N males 213 N fem.	C. B. Day and E. A. Hooton	Harvard U.	1932	Harvard U. Press	
15 Anthropometry *	270 N. Africans	M. J. Herskovits	Northwestern U.	1937	Human Biol., 9: 483-497	3 tribes
16 Anthropometry	928 N patients	G. D. Williams and Applewhite	Washington U.	1939	Am. J. Hygiene, 29: 61-110	Tuberculosis study
17 Anthropometry *	103 N Cape colored	H. Le Riche	National Bureau for Educ. and Soc. Research, Pretoria	1939	HUMAN BIOL., 11: 319-341	Eurafricans
18 Anthropometry	100 N girls	M. Steggerda and R. C. Bate	Carnegie Inst.	1939	Ann. Rep. Dept. Genetics, 202-205	Nos. 18, 19 and 20 appear to be different studies on the same basic data
19 Anthropometry	100 N girls 100 W girls	M. Steggerda and C. E. Petty	Carnegie Inst. Tuskegee Inst.	1940	Research Quar., 11: 110-118	College students
20 Anthropometry	100 N fem. 100 I fem. 100 W fem.	M. Steggerda	Carnegie Inst.	1940	Am. J. Phys. Anthropol., 26: 417-432	
21 Anthropometry	51 N males 51 W males	E. Metheny	State U. of Iowa	1940	Research Quar., 10: 41-53	
22 Anthropometry	4,100 N crim. Various other	E. A. Hooton	Harvard U.	1939	Harvard U. Press	
23 Anthropometry	16 N males 16 W males	F. L. Hoffman	Prudential Ins. Co. of America	1896	Race Traits and Tendencies of the American Negro. Am. Econ. Ass'n Pub., no. 11, 329 pp.	Wt. acc. to chest girth. Also data of Gould, Baxter and Surg. Gen.
24 Anthropometry	1,271 N soldiers 4,948 other groups	R. B. Bean	U. of Virginia	1922	Am. J. Phys. Anthropol., 5: 349-390	Sitting height only
25 Anthropometry	Series of Davenport and Love, Bean and MacDonald	C. R. Bardeen	U. of Wisconsin	1923	Am. J. Phys. Anthropol., 6: 355-388	Treats only relations of sitting height to stature and weight
26 Anthropometry	1,211 N boys 539 N adults	M. J. Herskovits	Columbia U.	1926	Am. J. Phys. Anthropol., 9: 87-97	Head length and breadth
27 Anthropometry	1,178 N boys 529 N adults	M. J. Herskovits	Columbia U.	1926	Am. J. Phys. Anthropol., 9: 467-470	Growth of inter-pupillary distance
28 Anthropometry	ca 1300 N children 539 N adult	M. J. Herskovits	Columbia U.	1927	Am. Nat., 61: 68-81	Variability and race mixture
29 Anthropometry	51 blacks 93 browns 50 whites	C. B. Davenport and M. Steggerda	Carnegie Inst.	1928	Eugen. News, 13: 36-37	Nasal breadth. Data from Jamaica study
30 Anthropometry	100 N cad. 32 N fem. 100 W cad. 36 W fem.	T. W. Todd	Western Reserve U.	1929	Human Biol., 1: 57-69	Special study of comparative variabilities on same materials. Entrenched features
31 Anthropometry	1 N boy 3 W boys	C. B. Davenport	Carnegie Inst.	1933	Am. J. Phys. Anthropol., 17: 333-353	Crural index, longitudinal study
32 Anthropometry	131 N males 246 W males	H. Gray	Stanford U.	1935	Am. J. Phys. Anthropol., 20: 1-4	Chest depth
33 Anthropometry	493 N boys 314 N girls	J. H. Greenwood	Public Schools, Kansas City, Mo.	1891	Ann. Rep. Pub. Health Assn., 17: 199-204	

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	34	Anthropometry	5,548 N children 17,356 W children	A. MacDonald	U. S. Bur. Educ.	1898	Rep. U. S. Commiss. Educ., I: 985-1204; II: 1281-1390	Also J.A.M.A., 32: 1140-1144, 1899
	35	Anthropometry	300 N children 1,100 W children	A. Hrdlička	Pathol. Inst. of the State Hospitals, New York, N. Y.	1898	Proc. Am. Assn. Adv. Sci., 47: 475-476 Also Am. Anthropol., 11: 347-350	Physical differences N & W children
	36	Anthropometry	92N child. 908 W child.	A. Hrdlička	N. Y. Juvenile Asylum	1899	47th Ann. Rep., N. Y. Juvenile Assn., pp. 1-86	
	37	Anthropometry	10,043 N & W children	L. Frankel and L. I. Dublin	Metropolitan Life Ins. Co.	1916	Hts. and Wts. of N. Y. C. Children, 14 to 16 Yrs. of Age. 53 pp.	
	38	Anthropometry	4,976 N child. 167,024 W child.	R. M. Woodbury	U. S. Pub. Health Service	1921	Pub., Children's Bur. U. S. Dept. of Labor No. 87, 1-117	
2000	39	Anthropometry	71 N children 3,054 W children	A. E. Rude	Children's Bur. U. S. Dept. Labor	1922	Children's Bureau Pub. 111. 84 pp. Wash. D. C.	Physical status, preschool children, Gary, Ind.
	40	Anthropometry	1,000 N boys	M. J. Herskovits	Columbia U.	1924	Am. J. Phys. Anthropol., 7: 439-446	Growth study
	41	Anthropometry	ca 300 N boys	M. J. Herskovits	Columbia U.	1925	School and Soc., 22: 86-88	Subjects from Colored Orphan Asylum, Riverdale, N. Y. Hts. and Wts.
	42	Anthropometry	1,650 N children	H. S. Mustard and J. I. Waring	U. S. Pub. Health Service	1926	Am. J. Pub. Health, 16: 1017	
	43	Anthropometry	5,170 N children	E. B. Sterling	U. S. Pub. Health Service	1928	Pub. Health Rep., 43: 2713-2774	With data relating to nutrition and physical status
	44	Anthropometry	1,466 N child.	M. Steggerda	U. of Illinois	1928	Am. J. Phys. Anthropol., 12: 121-138	Data from Jamaica study
	45	Anthropometry	4,281 N boys 4,595 N girls	L. T. Royster and C. N. Hulvey	U of Virginia	1929	Am. J. Dis. Child., 38: 1222-1230	
	46	Anthropometry	1,260 N child. 206 W child.	C. B. Davenport and M. Steggerda	Carnegie Inst.	1929	Carnegie Institution Pub. No. 395	Additional series in Jamaica study
	47	Anthropometry	455 N boys 606 N girls	A. S. Beckham	Board of Educ., Chicago	1938	Hum. Biol., 10: 124-135	Chicago adolescents
	48	Anthropometry	400 N, W, I children	M. Steggerda and M. E. Grant	Carnegie Inst.	1938	Ann. Rep. Dept. Genetics, Carnegie Inst., 66-72	
	49	Anthropometry	100 N male inf. 100 N fem. inf. 4,682 W male inf. 4,392 W fem inf	B. T. Baldwin	U. of Iowa	1924	Children. Studies in Child Welfare, Ser. I, No. 50. 411 pp.	Series on type of feeding. No Negroes series in remainder of study
	50	Anthropometry	596 N infants	C. T. J. Dodge	Western Reserve U.	1927	Am. J. Phys. Anthropol., 10: 337-345	Additional data in prep.
	51	Anthropometry	99 N male inf 88 F fem inf 608 W male inf 609 W fem inf.	H. Bakwin	New York U.	1932	Hum. Biol., 4: 12	Infant weight
	52	Anthropometry	74 N male newb. 80 N fem. newb. 1,455 W male newb. 1,314 W fem. newb.	E. C. Dunham, R. M. Jenss and A. Christie	Children's Bur., U. S. Dept of Labor	1939	J. Ped., 14: 156-160	Influence of race and sex on growth and dev.
	53	Anthropometry	66 N male emb. 60 N fem. emb. 241 W fem. emb.	G. L. Streeter	Johns Hopkins U.	1920	Carnegie Contrib. to Emb. Pub. 274, 143-170	Fetal
	54	Anthropometry	N and W fetuses and adults; No. not stated	A. H. Schultz	Johns Hopkins U.	1926	Quar. Rev. Biol., 1: 465-521	See also hand, rel. finger length. Foot, rel. toe length. Heel, projection of
2001	55	Body type	795 Afric. m. 699 Afric. fem. 2,748 Am. N m. 649 Am. N fem.	R. B. Bean	U. of Virginia	1924	Am J Anat., 33: 105-118	
	56	Body type	881 Negrito 288 Negrillo	R. B. Bean	U. of Virginia	1925	Am. J. Anat., 35: 63-80	
	57	Body type	7,507 N subj. 16,345 W subj.	R. B. Bean	U. of Virginia	1926	Quar. Rev. Biol., 1: 360-392	
	58	Body type	9,700 N children	L. T. Royster	U. of Virginia	1935 1936	Tr. Sect. Pediat., A. M. A., 133-139. Arch. Ped., 53: 259-266	
	59	Body build	248 N convicts	H. Gray	Stanford U.	1935	Zeitschr. f. Rassenk., 2: 45-52	
	60	Physical status, boys	16 N boys. Elaborate physical study	F. W. Schlutz, M. Morse, D. E. Cassels and V. Iob	U. of Chicago	1940	J. Pediat., 17: 466-480	Nutritional status; response to exercise
	61	Head	Various data	C. B. Davenport	Carnegie Inst.	1940	Proc. Am. Philos. Soc., 83: 1-215	Postnatal development
	62	Head and face	Herskovits' N data Various others	M. S. Goldstein	New York U.	1936	Am. J. Phys. Anthropol., 22: 37-89	Age changes in dimensions
	63	Face	N subj. 21 days to 19 years old	T. W. Todd	Western Reserve U.	1930	International J. Orth. Oral Surg. and Rad., 16: 1243-1270	Growth from infancy to adult
	64	External features — prenatal	623 N, W fetuses	A. H. Schultz	Johns Hopkins U.	1923	Am. J. Phys. Anthropol., 6: 389-400	75

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	99	Skin color	2,391 N	I. Barnes	Northwestern U.	1929	Human Biol., 1: 321-381	
	100	Skin color	140 N males 240 N fem.	C. B. Day and E. A. Hooton	Harvard U.	1932	Harvard U. Press	
	101	Skin color	200 N (35 with condition)	P. H. Futcher	Johns Hopkins U.	1940 1938	Bull. Johns Hopk. Hosp., 67: 372-373 Also Science, 88: 570-571	Incidence of sharp change in pig- mentation
	102	Skin and hair color	1 N cadav., whole skin removed for est. of total pigment	J. Abel and W. Davis	Johns Hopkins U.	1896	J. Exp. Med., 1: 361	Isolation and chemical analysis of pigment
	103	Skin, pigment spots	N infants W infants No. in series not stated	C. Herrmann	Vanderbilt Clinic	1907	J. Cut. Dis., 25: 201-205	Sacral spots
	104	Skin, heat absorption	2 N Afr. 1 Arab.	P. Schmidt	U. of Leipzig	1909	Arch. f. Hygiene, 69: 1	Infra-red
105	105	Skin, heat absorption	Review of miscellaneous military health data	C. E. Woodruff	U. S. Army	1912	N. Y. Med., 96: 721, 785	On blondes and brunets in tropics
	106	Skin, heat absorption	N skin samples W skin samples No. not stated	C. J. Martin	U. of London	1930	Lancet, 2: 561, 617, 673	Data in table on page 675
	107	Skin, ultra- violet permability	N skin samples W skin samples No. not stated	D. I. Macht, W. T. Anderson and F. K. Bell	Johns Hopkins U.	1928	J. A. M. A., 90: 161	Skin removed at surg. operations. White more permeable
	108	Scalp thick- ness *	513 N heads	M. L. Tildesley	Biometric Laboratory	1927	Biometrika, 19: 205	Mozambique natives, post mortems
	109	Sweat glands	12 W cadav. 10 N cadav.	H. Homma	Johns Hopkins Hospital	1926	Johns Hopkins Hosp. Bull., 38: 367-371	
	110	Sweat glands	29 N Bantu and W. Europ.	S. Glaser	U. of Cape Town	1934	Am. J. Phys. Anthropol., 18: 371-376	
	111	Human milk	27 N mothers 27 W mothers	C. W. Burhaus and D. N. Smith	Western Reserve U.	1923	Am. J. Dis. Child., 26: 303	Pat. from inf. welfare stations of Cleveland City Health Dept.
	112	Hair color		G. C. and C. B. Davenport	Carnegie Inst.	1909	Am. Nat., 43: 193-211	Only incidental reference to Negro
	113	Hair, graying of	3,000 N samples 2,000 W samples	F. Boas and N. Michelson	Columbia U.	1932	Am. J. Phys. Anthropol., 17: 213-228	
	114	Hair, white forelock	Family history, 5 generations	A. W. Cromwell	Smith College	1940	J. Hered., 31: 94-96	Inheritance of in a mulatto family
	115	Hair form		Post (Day, Hopton)	Harvard U.	1932	Harvard U. Press	
	116	Hair form	10 N subj. 10 W subj. 20 I subj.	M. Steggerda and R. B. Eckhardt	Carnegie Inst.	1940	Ann. Rep. Dept. Genetics, Carnegie Inst., 227-230	Cross section comparisons
	117	Hair form	100 N samples 100 W samples 200 I samples	M. Steggerda	Carnegie Inst.	1940	J. Hered., 31: 474-476	Excellent illustra- tions cross sec- tions. No statistical data
	118	Hair form	361 N samples 360 W samples 1,586 I samples	M. Steggerda and H. C. Seibert	Carnegie Inst.	1941	J. Hered., 32: 315	
	119	Hair weight	100 W males 100 W fem. 20 N males 20 M males	M. Bernstein and S. Robertson	U. of Chicago	1927	Am. J. Phys. Anthropol., 10: 379-386	Cf. Kneberg, A.J.P.A., 21: 279. 1936
	120	Hair, distribution	2,129 N soldiers	Russell, data quoted by B. A. Gould	U. S. Sanit. Comm.	1869	U. S. Sanit. Comm. Mem. (Statistics) p. 568	
	121	Hair distribution (facial)	11 N cadav. 25 W cadav. 516 N patien. 945 W patien.	M. Trotter	Washington U.	1922	Washington U. Studies Sci. Series, 273-289	
	122	Hair distri- bution (digital)	123 N males 208 N fem.	C. H. Danforth	Stanford U.	1921	Am. J. Phys. Anthropol., 4: 189-204	
205	123	Hair (life cycle in selected regions)	29 N subj. 50 W subj.	M. Trotter	Washington U.	1924	Am. J. Phys. Anthropol., 7: 427-438	
	124	Hair, bald- ness	2,883 N subj. 30,132 W subj.	B. A. Gould	U. S. Sanitary Comm.	1864	U. S. Sanit. Comm. Mem. (Statistics) pp. 562-568	
	125	Nails, pig- mentation of	296 N subj.	S. Monash	Columbia U.	1932	Arch. Derm. and Syph., 25: 876-881	
	126	Nail fold capillaries	Unstated no. N pat.	J. Bordley, 3d., M. H. Grow and W. B. Sherman	Johns Hopkins U.	1936	Bull. Johns Hopkins Hosp., 59: 447-448	Capillaries are visible in Negro subj.
	127	Albinism	Case report, N-W parentage	C. M. Swab	Creighton Medical College	1932	Am. J. Ophth., 15: 306-309	
	128	Albinism	Case report of identical albino twins, N parents	E. G. Wakefield and S. C. Dillinger	Mayo Clinic and U. of Arkansas	1936	Ann. Int. Med., 9: 1149-1153	In identical twins
	129	Albinism *	Case report, uni- albinism in twins	R. H. McCracken	L'Hopital de Sakabayeme Cameroun, Fr. W. Africa	1937	Am. J. Dis. Child., 54: 786-794	In African twins
	130	Albinism	2 N fam., 42 individuals	E. Christianson	Colonial Medical Serv., Seychelles	1941	Brit. M. J., 1: 556	In 2 native Seychelles families, with genealogies
	131	Craniometry *	258 N male African 90 N fem. African	R. C. Bennington and K. Pearson	Biometric Laboratory	1911	Biometrika, 8: 292-337	Racial craniometric characters

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	132	Craniometry	37 N males 19 N fem. 61 N male Afr. 61 N fem. Afr.	A. Hrdlička	Smithsonian Inst.	1928	Proc. U. S. Nat. Mus., 71: Art. 24, pp. 1-140	Measurements and descriptions
	133	Craniometry	153 N male 37 N fem. 358 W male 51 W fem.	J. Cameron	Western Reserve U.	1925- 1932	Am. J. Phys. Anthrop., 8: 143-147 (1st study) see, Cobb, W. M., Index, Am. J. P. A., 1-XXII, Pt. I	Series includes 35 studies
	134	Craniometry *	124 N skulls African	E. Kitson	Morant's Lab.	1932	Biometrika, 23: 271-314	Craniometry and form compara- tively treated
	135	Skull, racial features	56 Am. N 122 Af. N	A. Hrdlička	Smithsonian Inst.	1928	U. S. Natl. Mus., 71: 1-140	
	136	Skull, racial features	398 Am. N 277 Af. N 65 A. S.	T. W. Todd and B. Tracy	Western Reserve U.	1930	Am. J. Phys. Anthrop., 15: 53-110	
206	137	Cranial capacity	12 N skulls 62 N African Various others	S. G. Morton	Philadelphia, Pa.	1849 1850	Proc. Acad. Nat. Sci. Phila., 4: 221-224. Also Trans Am M Assoc, 3: 56-58	
	138	Cranial capacity	87 N cadav. 17 N fem. 167 W cadav. 31 W fem.	T. W. Todd	Western Reserve U.	1923	Am. J. Phys. Anthrop., 6: 97-194	
	139	Cranial capacity	661 N males 219 N fem. 1,179 W males 182 W fem.	K. Simmons (T. W. Todd)	Western Reserve U.	1942	(In press)	
	140	Cranial capacity formula	107 N male 75 N fem.	M. L. Tildesley	Biometric Laboratory	1927	Biometrika, 19: 200-206	Cranial capacity, formula for Negro and cran. dimensions
	141	Skull, facio-dental relationships	183 W skulls 113 M skulls 59 N skulls	W. M. Krogman	Western Reserve U.	1934	J. Dental Research, 14: 277-296	
	142	Skull, suture closure	149 N cadav. 365 W cadav.	T. W. Todd and D. W. Lyon	Western Reserve U.	1925	Am. J. Phys. Anthrop., 7: 8, (Parts I-IV)	
	143	Skull, thickness of	300 N head inj. 300 W head inj.	J. C. Weaver	Emory U.	1930	Surg., Gynec. and Obst., 499-502	
	144	Skull, base of	N skulls W skulls I skulls	A. Hrdlička	Smithsonian Inst.	1901 1902	Science, 13: 309. Also Am. J. Anat., 1: 508-509	
	145	Skull, fossa pharyngea	84 N skulls 4,493 others	H. B. Collins, Jr.	Smithsonian Inst.	1926	Am. J. Phys. Anthrop., 11: 101-121	
	146	Skull, shrinkage of	66 N cadav. 58 W cadav.	T. W. Todd	Western Reserve U.	1926	J. Anat., 60: 309-328 Also 57: 337-356 and 59: 180-187	
	147	Skull, fossae of	55 N cadav. 90 W cadav. 20 I cadav.	A. Hrdlička	Smithsonian Inst.	1907	Proc. U. S. Nat'l Mus., 32	
	148	Skull, sella turcica of	16 N skulls 57 W skulls	A. Hrdlička	Columbia University and New York State Hospitals	1898	Arch. Neurol. & Psycho- path., 1: 679-698	
	149	Skull, sella turcica of	50 N boys 50 N girls 50 W boys 50 W girls	L. T. Royster, M. E. Moriarty	U. of Virginia	1930	Am. J. Phys. Anthrop., 14: 451-458	
	150	Skull, sella turcica of	42 N cadav. 56 W cadav.	B. S. Pruett	Washington U.	1928	Am. J. Phys. Anthrop., 11: 205-222	
	151	Skull, optic foramina and sella turcica of	599 N cadav. 234 N fem. 1,146 W cadav. 208 W fem.	J. E. L. Keyes	Western Reserve U.	1935	Arch. Ophthal., 13: 538-566	
	152	Skull, internal nose	100 W cadav.	E. C. Pitkin	Western Reserve U.	1924	Ann., Otol. Rhinol. and Laryng., p. 24	
207	153	Skull, internal nose	100 W cadav. 100 N cadav. 5 Af. cadav.	C. M. Charles	Washington U.	1930	Am. J. Phys. Anthrop., 14: 177-253	
	154	Skull, pterion	124 N skulls 8,348 other	H. B. Collins	Smithsonian Inst.	1926	Am. J. Phys. Anthrop., 9: 343-348	
	155	Skull, location of nasion	90 N skulls Various other	C. J. Connolly	Catholic U.	1926	Am. J. Phys. Anthrop., 9: 349-358	
	156	Cranial bones	101 N fet. 62 W fet.	M. Limson	Johns Hopkins U.	1932	Cont. to Embryol., 136: 205-222	
	157	Skull, cartilaginous	3 N fetuses	R. Hauschild	Kaiser-Wilhelm Inst. fur Anthrop.	1937	Ztschr. f. Morph. u. Anthrop., 36: 215-280	In fetuses of 3rd mo. Sections and models
	158	Temporal bone	50 N males 100 W males 39 N & W young	C. C. R. Jackson	Western Reserve U.	1938	Arch. Otolaryng., 28: 561-580, 748-767	
	159	Mandible	59 N jaws Various other	A. Hrdlička	Smithsonian Inst.	1940	Am. J. Phys. Anthrop., 27: 281-308	Gonial angle and bigonial breadth
	160	Mandible	33 N jaws 4,508 others	A. Hrdlička	Smithsonian Inst.	1941	Am. J. Phys. Anthrop., 27: 383-467	Dimensions and indices
	161	Teeth	41 N Various other	Azoulay and Regnault, quoted by W. K. Gregory		1893	Bull. de la Soc. d'Anthrop. de Paris, 4: 266-269	Labial surface of incisors

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	162	Teeth	1,525 W and N children	R. W. Bunting	Public Schools, Ann Arbor, Mich.	1909	Dent. Cosmos, 61: 310-322	Percentages of caries and eruption slated. Bean anthrop. measurements
	163	Teeth	Qualitative study illustrating some three primary types of teeth in all races	J. L. Williams	New York, N. Y.	1914	J. Allied Dent. Soc., 9: 1-52	
	164	Teeth	N. subj. No. not stated	F. Schwerz, quoted by Sullivan, A. J. P. A., 3: 255		1915	Studien und Forschungen zur Menschen und Völkerkunde. Vol. 13. Stuttgart	2nd lower molar
	165	Teeth	307 N males 500 N fem. 500 W males 500 W fem. Various other	A. Hrdlička	Smithsonian Inst.	1920	Am. J. Phys. Anthrop., 3: 429-465	Incidence of shovel-shaped incisors
208	166	Teeth	Expository treatise	A. H. Schultz	Johns Hopkins U.	1925	Dent. Cosmos, 67: 1053-1063	
	167	Teeth *	196 Bantus 42 Bushmen	J. C. M. Shaw	U. of Witwatersrand	1927	Am. J. Phys. Anthrop., 11: 97-100	2nd lower molar
	168	Teeth	20 N jaws Various other	A. Hrdlička	Smithsonian Inst.	1923	Am. J. Phys. Anthrop., 6: 423-438	Lower molars
	169	Teeth	49 N Af. 119 N Am. Various other	M. Hellman	Am. Mus. Nat. Hist. and N. Y. U.	1928	Proc. Am. Philos. Soc., 67: 157-174	Racial characters
	170	Teeth, caries of	3,742 N child. 3,590 W child.	H. W. Green	Cleveland Board of Health	1931	Special Bulletin	
	171	Teeth, caries of	1,908 W and N males	W. M. Gafafer and C. T. Messner	U. S. Public Health Service	1936	Pub. Health Rep., 51: 321-332	Inmates of Ohio State Reformatory, Mansfield
	172	Teeth, caries of	599 N child. 1,358 W child. 2,825 I child.	M. Steggerda and H. Cranston	Carnegie Inst.	1936	Ann. Rep. Dept. Genetics, Carnegie Inst., 67-69	
	173	Teeth, caries of	1,117 N children 11,674 W children	P. E. Blackerby, Jr.	Tenn. Dept. of Pub. Health	1939	J. Am. Dent. A., 26: 1574-1576	Analysis of comparative conditions
	174	Teeth, eruption of	N, W, I child. No. not stated	M. Steggerda and R. B. Eckardt	Carnegie Inst.	1940	Ann. Rep. Dept. Genetics, Carnegie Inst., 227-230	
	175	Sternum, synostosis in	397 N cadav. 480 W cadav.	M. Trotter	Washington U.	1934	Am. J. Phys. Anthrop., 18: 439-442	
	176	Ossa suprasternalia and manubrium sterni	843 N cadav. 1,345 W cadav.	W. M. Cobb	Western Reserve U. and Howard U.	1937	J. Anat., 71: 245-288	
	177	Clavicle	100 N cadav. 5 W cadav.	R. J. Terry	Washington U.	1932	Am. J. Anat., 16: 351-379	
	178	Clavicle	52 N cadav. 11 N fem. 32 W cadav. 7 W fem.	T. W. Todd and J. D'Errico	Western Reserve U.	1928	Am. J. Phys. Anthrop., 41: 25-50	Sternal and acromial epiphyses
	179	Scapula	1,496 N child. 800 W and N cadav.	W. W. Graves	St. Louis U.	1924	Arch. Int. Med., 34: 1-26 and personal communication	Several additional publications
	180	Scapula	5,062 N cadav. 3,357 W cadav.	E. B. Sterling	U. S. Public Health Service	1928	U. S. Pub. Health Rep. (Repr. No. 1251): 2713-2774	
	181	Scapula	136 N bones full bl. 1,315 W bones Various others	A. Hrdlička	Smithsonian Inst.	1942	Am. J. Phys. Anthrop., 29: 73-94	Variation in principal features
	182	Humerus, supracondylar proc. of	317 N subj. 783 W subj.	R. J. Terry	Washington U.	1921	Am. J. Phys. Anthrop., 4: 129-139	
609	183	Humerus, supracondylar proc. of	515 W pat. 248 N pat.	R. J. Terry	Washington U.	1923	Am. J. Phys. Anthrop., 6: 401-403	
	184	Humerus, supracondylar proc. of	988 W cadav. 500 N cadav.	A. Hrdlička	Smithsonian Inst.	1923	Am. J. Phys. Anthrop., 6: 405-412	
	185	Humerus, septal apertures of	130 N male 66 N fem. 2,361 W male 933 W fem.	A. Hrdlička	Smithsonian Inst.	1932	Prague: pp. 10, 31-96	
	186	Humerus, septal apertures of	588 N cadav. 196 N fem. 856 W cadav. 104 W fem.	M. Trotter	Washington U.	1934	Am. J. Phys. Anthrop., 19: 213-228	
	187	Elbow, angle of	64 N and W male cadav. 24 N and W fem. cadav.	F. P. Mall	Johns Hopkins U.	1905	Am. J. Anat., 4: 391-404	
	188	Long bones and ribs	40 N skel. 1,200 W skel. 100 I skel.	A. Hrdlička	Columbia U.	1900	Proc. Ass. Am. Anat., 14th ann. sess., 55-68, Wash., D. C.	
	189	Trunk and limb skeleton	66 N 15 W	A. H. Schultz	Johns Hopkins U.	1930	Human Biol., 2: 303-438	
	190	Atlas	81 N cadav. 102 W cadav.	W. F. R. Ossenfort	Washington U.	1926	Am. J. Phys. Anthrop., 2: 439-443	

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	191	Vertebrae, cervical spinous processes *	83 N S. Afric. 39 W Europ.	L. R. Shore	U. of Witwatersrand	1934	S. African M. J., 8: 717-721	
	192	Vertebral column	16 N male 43 W male	T. W. Todd and S. I. Pyle	Western Reserve U.	1928	Am. J. Phys. Anthropol., 12: 321-338	
	193	Vertebral column	92 N cadav. 97 W cadav.	M. Trotter	Washington U.	1929	Am. J. Phys. Anthropol., 13: 95-107	
	194	Vertebral column, shrinkage of	8 N col. 12 W col.	T. W. Todd, S. I. Pyle	Western Reserve U.	1928	Am. J. Phys. Anthropol., 12: 303-319	
	195	Thoraco-lumbar vertebrae	748 N and W col.	T. W. Todd	Western Reserve U.	1922	Anat. Rec., 24: 261-286	
	196	Thoraco-lumbar vertebrae	218 N col. 632 W col.	T. W. Willis	Western Reserve U.	1923	Anat. Rec., 26: 31-40	
	197	Presacral vertebrae	100 N cadav. 101 W cadav.	R. L. Lanier, Jr.	Washington U.	1939	Am. J. Phys. Anthropol., 25: 341-420	
10	198	Presacral vertebrae	51 N cadav. 2 W cadav.	R. L. Lanier	Washington U.	1941	Am. J. Phys. Anthropol., 27: 469-478	
	199	Lumbosacral vertebrae	748 N and W col.	T. W. Willis	Western Reserve U.	1923	Am. J. Anat., 32: 95-123	
	200	Numerical variations in vertebrae	3 N col. 40 W col. 49 E. col.	C. H. Danforth	Stanford U.	1930	Am. J. Phys. Anthropol., 14: 463-481	
	201	Asymmetry of vertebral articular processes	69 N cadav. 19 N fem. 39 W cadav. 20 W fem.	C. Whitney	Washington U.	1926	Am. J. Phys. Anthropol., 9: 451-456	
	202	Sacro-iliac articulation	340 N cadav. 133 N fem. 436 W cadav. 49 W fem.	M. Trotter	Washington U.	1937	Am. J. Phys. Anthropol., 22: 247-262	
	203	Accessory sacro-iliac articulations	473 N pelv. 485 W pelv.	M. Trotter	Washington U.	1940	J. Bone and Joint Surg., 22: 293-299	
	204	Ilium *	19 N Af. ilia 66 Egypt. 61 W English	D. E. Derry	Medical School, Cairo	1923	J. Anat., 58: 71-83	
	205	Ilium	99 N cadav. 150 W cadav.	W. L. Straus	Western Reserve U.	1929	Am. J. Phys. Anthropol., 11: 1-28	
	206	Ilium	94 N cadav. 150 W cadav.	W. L. Straus	Western Reserve U.	1929	Am. J. Anat., 43: 403-460	
	207	Ilium, sciatic notch	52 N male hip bones 51 N fem. hip bones 57 W male hip bones 53 W fem. hip bones	G. S. Letterman	Washington U.	1941	Am. J. Phys. Anthropol., 28: 99-116	
	208	Pelvis	721 N pat. 779 W pat.	T. F. Riggs	Johns Hopkins U.	1904	Johns Hopkins Hosp. Rep., 12: 421-454	External measurements
	209	Pelvis	300 N pelves	R. W. Alles	Detroit, Mich.	1925	J. Mich. State M. Soc., 24: 194-197	Meas. of living
	210	Pelvis	400 N and W cases, Memphis 1,000 N and W cases, Cook Co., Chi. No racial figures given	W. T. Pride	Memphis Hospital, Memphis, Tenn.	1936	Am. J. Obst. and Gyn., 31: 495-501	External measurement and size of fetal heart
	211	Pelvis	N series W series No. not stated	W. E. Levy and Harry Meyer	Touro Clinic and Charity Hosp., La.	1937	N. Orleans M. & S. J., 89: 418	External measurements (means)
	212	Pelvis	400 N fem.	R. Torpin and L. P. Holmes	U. of Georgia	1939	Am. J. Obst. and Gyn., 38: 594-598	Inlet variation by Thom's grid method
	213	Pelvis, types of	269 N fem. 312 W fem.	W. E. Caldwell, H. C. Moley	Western Reserve U.	1933	Am. J. Obst. and Gyn., 26: 479-514	
	214	Pubic differentiation (pelvis)	90 N cadav. 22 N fem. 306 W cadav. 47 W fem.	T. W. Todd	Western Reserve U.	1920 1921 1930	Am. J. Phys. Anthropol., 3 and 4: (Parts I-IV, VI), 14: 255-271 (Part VIII)	
11	215	Pubic differentiation (pelvis)	32 W cadav. 42 N cadav.	T. W. Todd	Western Reserve U.	1923	J. Anat., 58: 274-294 (Part VII)	
	216	Femur, cartilage of	17 N cadav. 46 W cadav.	N. W. Ingalls	Western Reserve U.	1926	Am. J. Phys. Anthropol., 9: 356-374	
	217	Femur, shrinkage of	17 N cadav. 36 W cadav.	N. W. Ingalls	Western Reserve U.	1927	Am. J. Phys. Anthropol., 10: 297-321	
	218	Femur, head and condyles	17 N cadav. 136 W cadav.	N. W. Ingalls	Western Reserve U.	1927	Am. J. Phys. Anthropol., 10: 393-405	
	219	Gluteal ridge and gluteal tuberosities of	290 N 188 W	A. Hrdlička	Smithsonian Inst.	1937	Am. J. Phys. Anthropol., 23: 127-198	
	220	Ossification, carpal	131 N infants 212 W infants	A. F. Hess and M. A. Weinstock	Columbia U.	1925	Am. J. Dis. Child., 29: 347	
	221	Ossification, carpal *	100 N children 100 W children	F. H. Dommissie and C. L. Leipoldt	Municipal Clinics of Capetown	1936	S. African M. J., 10: 713-715	
	222	Ossification, carpal	130 N male newb. 141 N fem. newb. 123 W male newb. 104 W fem. newb.	E. C. Dunham, R. M. Jense and A. V. Christie	Children's Bur., U. S. Dept. of Labor	1939	J. Ped., 14: 156-160	With cooperation of New Haven and Johns Hopkins Hosp.
	223	Ossification, fetal	143 N fetuses 310 fetuses	A. H. Hill	Western Reserve U.	1939	Am. J. Phys. Anthropol., 24: 251-272	

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	224	Skeletal maturation	77 N boys 72 N girls 275 W boys 240 W girls	T. W. Todd	Western Reserve U.	1931	Child Dev., 2: 49-65	
	225	Calcification 1st costal cartilage	413 N males 663 N fem. 490 N mixed males 484 N mixed fem. 1,728 W males 1,290 W fem.	N. Michelson	Columbia U.	1934	Human Biol., 6: 543-557	Roentgenographic study
	226	Menisci of knee joint	164 N male cadav. 80 N fem. cadav. 150 W male cadav. 39 W fem. cadav.	C. M. Charles	Washington U.	1935	Anat. Rec., 63: 355-364	
	MUSCLES							
	227	Facial musculature		Ernst Huber	Johns Hopkins U.	1931	Johns Hopkins U. Press, Evolution of Facial Musculature and Facial Expression	
212	228	Eye musculature	2 N cadav.	T. H. Evans	Long Island College	1925	Am. J. Phys. Anthrop., 8: 411-423	
	229	M. kerato-cricoides	66 N cadav. 66 W cadav.	J. Hetherington	Washington U.	1934	Am. J. Phys. Anthrop., 19: 203-312	
	230	M. omohyoideus	85 N cadav. 73 W cadav.	C. L. Langsam	Washington U.	1941	Am. J. Phys. Anthrop., 28: 249-259	
	231	Mm. deltoideus and pectoralis major insertions	54 N cadav. 51 W cadav.	A. H. Schultz	Johns Hopkins U.	1918	Am. J. Anat., 23: 155-173	
	232	M. palmaris longus	318 N cadav. 1,201 W cadav.	J. W. Thompson, J. Batts and C. H. Danforth	Washington U.	1921	Am. J. Phys. Anthrop., 4: 205-218	
	233	M. pectoralis minor	200 N cadav. 73 N fem. 200 W cadav. 27 W fem.	G. A. Seib	Washington U.	1938	Am. J. Phys. Anthrop., 23: 389-418	
	234	M. pyramidalis	144 N cadav. 286 W cadav.	L. E. Beaton and B. J. Anson	Northwestern U.	1939	Am. J. Phys. Anthrop., 25: 261-270	
	235	M. pyramidalis	31 N cadav. 154 W cadav.	M. F. Ashley-Montagu	Hahnemann Med. College	1939	Am. J. Phys. Anthrop., 25: 435-490	
	236	Lumbar spaces	92 N cadav. 76 W cadav.	E. H. Burford and G. A. Seib	Washington U.	1939	Am. J. Phys. Anthrop., 24: 391-416	
	237	Abdominal muscles, inguinal and hypogastric regions	125 N and W cadav.	B. J. Anson and C. McVay	Northwestern U.	1938	Anat. Rec., 70: 211-225	Racial differences not cited
	238	M. psoas minor	250 N cadav. 250 W cadav.	G. A. Seib	Washington U.	1934	Anat. Rec., 56: 86	
	239	M. gemellus superior	150 N cadav. 104 W cadav.	R. J. Terry	Washington U.	1942	Am. J. Phys. Anthrop., 29: 47-56	Frequency of absence
	240	M. gastrocnemius	59 N cadav. 73 W cadav.	G. D. Williams, G. E. Grim, J. J. Wimp and T. F. Whayne	Washington U. and St. Louis U.	1930	Am. J. Phys. Anthrop., 14: 45-58	
	241	Foot musculature (insertions)	55 N cadav. 93 W cadav.	J. E. C. Hallisy	Western Reserve U.	1930	Am. J. Anat., 45: 411-442	
	BLOOD VESSELS							
	242	Aortic arch	70 N cadav. 80 W cadav.	G. D. Williams, H. M. Aff, H. W. Edmonds and E. G. Graul	Washington U.	1932	Anat. Rec., 54: 247-251	
	243	Aortic arch	138 N cadav. 65 N fem. 98 W cadav. 13 W fem.	C. F. DeGaris, I. H. Black, E. A. Riemenschneider	Johns Hopkins U.	1933	J. Anat., 67: 599-619	
213	244	Aortic arch	51 N cadav. 8 N fem. 149 W cadav. 8 W fem.	J. J. McDonald, B. J. Anson	Northwestern U.	1940	Am. J. Phys. Anthrop., 27: 91-107	
	245	Aortic arch	1 N newb. 1 N cadav. 1 W cadav.	D. L. Hammer and A. M. Meis	U. of Oklahoma	1941	Am. J. Phys. Anthrop., 28: 227-237	Title misleading
	246	Middle meningeal artery	148 N cadav. 64 N fem. 147 W cadav. 44 W fem.	D. Rothman	Washington U.	1937	Am. J. Phys. Anthrop., 22: 425-435	
	247	Transverse cervical and transverse scapular arteries	116 N cadav. 40 W cadav.	W. T. Read and M. Trotter	Washington U.	1941	Am. J. Phys. Anthrop., 28: 239-247	
	248	Subclavian artery	90 N cadav. 24 W cadav.	R. B. Bean	Johns Hopkins U.	1905	Am. J. Anat., 4: 303-328	
	249	Subclavian artery	87 N cadav. 52 W cadav.	C. F. DeGaris	U. of Wisconsin	1923	Anat. Rec., 26: 235	
	250	Axillary artery	127 N cadav. 129 W cadav.	C. F. DeGaris and W. B. Swartley	Johns Hopkins U. and Jefferson Med. Coll.	1928	Am. J. Anat., 41: 353-398	
	251	Axillary artery	103 N cadav. 99 W cadav.	M. Trotter et al.	Washington U.	1930	Anat. Rec., 46: 133-137	

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	252	Deep brachial artery	75 N cadav. 75 W cadav.	C. M. Charles et al.	Washington U.	1931	Anat. Rec., 50: 299-302	
	253	Renal artery	66 N cadav. 15 N fem. 65 W cadav. 7 W fem.	L. M. Lloyd	Washington U.	1935	Am. J. Phys. Anthropol., 20: 153-164	
	254	Hypogastric artery	30 N cadav. 100 W cadav.	F. L. Ashley and B. J. Anson	Northwestern U.	1941	Am. J. Phys. Anthropol., 28: 381-395	
	255	Obturator artery	320 N and W cadav.	J. W. Pick, B. J. Anson and F. L. Ashley	Northwestern U.	1942	Am. J. Phys. Anthropol., 70: 317-343	Racial differences not stated
	256	Femoral artery	59 N cadav. 107 W cadav.	G. Williams et al.	Washington U.	1930	Anat. Rec., 46: 273-279	
	257	Popliteal artery	119 N cadav. 50 N fem. 98 W cadav. 25 W fem.	M. Trotter	Washington U.	1940	Am. J. Phys. Anthropol., 27: 109-118	
11c	258	External jugular vein	70 N cadav. 24 W cadav.	S. Brown	Washington U.	1941	Am. J. Phys. Anthropol., 28: 213-226	
	259	Superficial antecubital veins	62 N cadav. 60 W cadav.	C. M. Charles et al.	Washington U.	1932	Anat. Rec., 54: 9-14	
	260	Azygos system of veins	100 N cadav. 100 W cadav.	G. A. Seib	Washington U.	1934	Am. J. Phys. Anthropol., 19: 39-163	
	261	Circumflex veins of the thigh	60 N cadav. 105 W cadav.	C. M. Charles et al.	Washington U.	1930	Anat. Rec., 46: 125-132	
	262	Circumflex veins of thigh	285 N cadav. 256 W cadav.	R. D. Baird and J. S. Cope	Washington U.	1933	Anat. Rec., 57: 325-337	Treats also of rela. to circumfl. art.
	263	Brain *	5 N Africans	T. B. Peacock		1864	Mem. Anthropol. Soc. London, 1: 67-71, 520-524	Weight; quoted by Pearl
	264	Brain	13 N brains 19 W brains	A. J. Parker	Acad. Nat. Sci. Phila.	1878	Proc. Acad. Sci. Phila., Pt. 1, 11-15, 339-340	Weight and convolution
	265	Brains	190 N brains 11,000 W brains	P. Topinard	L'Ecole d'Anthropologie, Paris	1885	Elements d'Anthropologie, Generale. Delahaye et Lecrosnier, pp. 568-574	Weight
	266	Brain *	12 N Africans	W. Waldeyer		1894	Sitzungsber. d. k. Preuss. Akad. d. Wiss. Berlin, pp. 1213-1221	Weight; quoted by Pearl
	267	Brain	Plates of brains of mulattoes and Negroes	A. J. Parker	Acad. Nat. Sci. Phila.	1896	J. Ac. Nat. Sc. Phila., 10: Pl. 36, 39-42	
	268	Brain	89 N brains	D. S. Lamb	Howard U.	1904	Am. Anthropol., 6: 364-366	Weight
	269	Brain	103 N cadav. 49 W cadav.	R. B. Bean	Johns Hopkins U.	1906	Am. J. Anat., 353-415	
	270	Brain	60 N cadav. 30 W cadav.	F. P. Mall	Johns Hopkins U.	1909	Am. J. Anat., 1-32	
	271	Brain	Data of Bean Mall Hunt Lamb Waldeyer	B. G. Wilder	Cornell U.	1909	The brain of the American Negro. Proc. First Nat. Negro Conf., N. Y., 22-66	Most extensive treatise on brain weight & convolutions in respect to Negro
	272	Brain	10 N cadav. 6 W cadav.	J. B. Murphy	Johns Hopkins U.	1910	Anat. Rec., 4: 115-120	
	273	Brain	127 N cadav. 53 N fem. 53 W cadav.	R. B. Bean	Tulane U.	1914	Anat. Rec., 8: 479-492	
	274	Brain	9 N male 3 N fem. 1 N fet.	C. W. M. Poynter and J. J. Keegan	U. of Nebraska	1915	J. Comp. Neur., 25: 183-202	
	275	Brain	ca 150 N & W brains	C. W. M. Poynter	U. of Nebraska	1917	Am. Anthropol., 19: 495-502	Report of impressions
215	276	Brain	37 N male 9 N fem. 54 W male 10 W fem. 10 Filipino	C. J. Connolly	Catholic U.	1931	Am. J. Phys. Anthropol., 15: 477-491	
	277	Brain	27 N hosp. pat. 30 W hosp. pat. 3 W scholars	W. H. F. Addison and H. A. Donaldson	U. of Pennsylvania and Wistar Inst.	1933	J. Comp. Neur., 57: 429-455	
	278	Brain	389 not Kenya brains	F. W. Vint	Kenya Medical Service	1934	J. Anat., 68: 216-223	Weight
	279	Brain	379 N sold. 24 W sold.	Pearl (Hunt)	Johns Hopkins U.	1934	Science, 431-434	Weight
	280	Brain, corpus callosum	56 N S. Afr.	G. W. H. Schepers	U. of Witwatersrand	1938	Am. J. Phys. Anthropol., 24: 161-184	Corpus callosum
	281	Brain	30 N 30 W	C. J. Connolly	Catholic U.	1941	Am. J. Phys. Anthropol., 28: 133-167	
	282	Spinal cord, termination of	105 N male cadav. 28 N fem. cadav. 91 W male cadav. 16 W fem. cadav.	J. H. Needles	Washington U.	1935	Anat. Rec., 63: 417-424	
	283	Phrenic nerve	75 N cadav. 75 W cadav.	O. P. Schureman	Washington U.	1934	Anat. Rec., 58: 86	
	284	Brachial plexus	90 N cadav. 85 W cadav.	A. T. Kerr	Johns Hopkins U.	1918	Am. J. Anat., 23: 285-395	

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	285	Brachial plexus (cross section area)	7 N cadav. 24 W cadav.	T. W. Todd, W. H. McGaw, W. M. Kuenzel	Western Reserve U.	1925	Am. J. Phys. Anthropol., 8: 281-291	
	286	Median and sciatic nerves (cross section area)	29 N cadav. 14 N fem. 21 W cadav. 16 W fem.	H. Ide	Western Reserve U. and Wistar Inst.	1930	J. Comp. Neur., 51: 457-521	
	287	Lumbo-sacral plexus	86 N cadav. 37 W cadav.	C. R. Bardeen, A. W. Elting	Johns Hopkins U.	1901	Anat. Anz., 19: 124-135; 209-238	
	288	Sciatic nerve (piriformis muscle)	114 N cadav. 117 W cadav.	M. Trotter	Washington U.	1932	Anat. Rec., 52: 321-323	
	VITAL ORGANS							
	289	Heart, foramen ovale of	250 N cadav 250 W cadav.	G. A. Seib	Washington U.	1934	Am. J. Anat., 55: 511-525	
	290	Heart and kidneys	959 N males	R. B. Bean and W. Baker	U. of Virginia	1919	Am. J. Phys. Anthropol., 2: 265-274	
916	291	Heart, liver, spleen and kidneys	1,526 N males 655 N fem. 1,512 W males 509 W fem.	R. B. Bean	U. of Virginia	1926	Am. J. Phys. Anthropol., 9: 293-319	
	292	Liver	1,377 N males 559 N fem. 1,359 W males 420 W fem.	R. B. Bean and W. Baker	U. of Virginia	1919	Am. J. Phys. Anthropol., 2: 167-173	
	293	Spleen	1,338 N males 554 N fem. 1,341 W males 441 W fem.	R. B. Bean and W. Baker	U. of Virginia	1919	Am. J. Phys. Anthropol., 2: 1-9	Autopsy records
	294	Trunk-viscera	115 N & W autop.	R. B. Bean	U. of Virginia	1917	Anat. Rec., 11: 326-328	Resume
	295	Parathyroid glands *	34 Bantu 45 W cadav.	J. F. Maingard	U. of Witwatersrand	1935	S. African J. M. Sc., 1: 91-96	European and Bantu
	296	Parathyroid glands	39 Bantus 45 Europeans	R. Pearl	Johns Hopkins U.	1937	Human Biol., 9: 245-250	
	297	Endocrine glands	262 N cadav. 161 N fem. 459 W cadav. 185 W fem.	W. Freeman	St. Elizabeth's Hosp., Wash., D. C.	1934	Human Biol., 6: 489-523	
	298	Endocrine glands	307 N cadav. 208 N fem. 564 W cadav. 228 W fem.	R. Pearl, M. Gooch, W. Freeman	Johns Hopkins U.	1935	Human Biol., 7: 350-391, 555-607	
	299	Endocrine glands	297 N cadav. 202 N fem. 549 W cadav. 224 W fem.	R. Pearl, M. Gooch, J. R. Miner, W. Freeman	Johns Hopkins U.	1936	Human Biol., 8: 92-125	
	300	Soft parts	International literature	E. Loth	U. of Warsaw	1934	Anthropologie des Parties Molles	
	301	Dissection *	1 N Martinique	H. V. Vallois	Faculte de Medecine de Toulouse	1926	Rev. Anthropol., 26: 1-14	
	302	Dissection *	1 N Mozambique	J. F. Ferreira and J. A. Martins D'Alte		1937	Folia Morph., 7: 239-240	
	303	Blood groups	270 N subj.	J. H. Lewis and D. L. Henderson	U. of Chicago	1922	J. Am. Med. Assn., 79: 1422-1424	
	304	Blood groups	500 N subj. Various other	L. H. Snyder	North Carolina State College	1926	Am. J. Phys. Anthropol., 9: 233-263	
	305	Blood groups	1,133 N norm. 121 N patients	W. W. Cardozo	Provident Hospital, Chicago	1937	Arch. Int. Med., 60: 623-653	
	306	Blood groups	19,191 N subj. 387 W subj.	K. Landsteiner, W. R. Strutton, M. W. Chase	Rockefeller Inst., N. Y., Rockland State Hosp., Orangeburg, N. Y.	1934	J. Immunol., 27: 469-472	Incidence of "P" factor
	307	Blood groups	200 N boys	M. B. Anderson	Howard U.		Unpublished	
217	308	Blood groups	1,000 Bantu	R. Elsdon-Dew	South African Inst. for Med. Res.	1934	S. African Inst. for Med. Res.	Comparison with other Negro data
	309	Blood groups *	336 N Bush, Dutch G.	M. C. Kahn	Cornell U.	1936	Trans. Roy. Soc. Trop. Med. and Hyg., 30: 377-385	
	310	Red cell count and diameters *	400 N African	H. D. Tonking	Nairobi Prison, Kenya	1936	E. African M. J., 13: 43-49	Kenya natives $\frac{1}{2}$ million lower than Europ. White
	311	Secreting factor	367 N fem. 480 W cadav.	F. Schiff	Beth Israel Hosp.	1940	Am. J. Phys. Anthropol., 27: 255-262	
	312	Blood, hemoglobin	140 N infants 335 W infants	N. Munday et al.	Res. Lab. Children's Fund of Mich., Det.	1938	Am. J. Dis. Child., 55: 776-783	
	313	Blood plasma proteins and cholesterol	16 N normals 16 N arteriosclerotic 35 W normals	J. E. Andes, R. H. Kampmeier and C. C. Adams	Louisiana State U.	1936	J. Lab. and Clin. Med., 21: 340-346	
	314	Blood calcium	44 N normals 41 N the. cases	C. L. Harrell	Tuberculosis Clinic, Norfolk, Va.	1929	Am. Rev. Tuberc., 19: 350	
	315	Blood calcium	14 N infants 14 W infants	H. Bakwin and R. M. Bakwin	Columbia U.	1930	J. A. M. A., 95: 396	Infants had tetany
	316	Blood calcium	41 N male inf. 55 N fem. inf. 96 W male inf. 108 W fem. inf.	H. Bakwin	New York U.	1932	Human Biol., 4: 7	Newborn

REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	317	Blood calcium	341 N males 38 N fem. 6 N child.	H. D. West and N. C. Jefferson	Meharry Medical College	1941	J. Lab. and Clin. Med., 26: 1644-1646	
	318	Blood phosphorus	406 N infants 103 N infants	A. Riesenfeld, I. Handelman, and A. Rose	Harlem Hospital	1925	Am. J. Dis. Child., 30: 646-658	Newborn and mothers; no racial difference
	319	Blood creatinine	298 N pat. 209 W pat.	W. M. McCord	Louisiana State U.	1941	Tri-State Med. J., 13: 2689	High level commoner in Negro. No explanation
	320	Blood and tissue volume	17 W subj. 26 N subj.	W. H. Forbes, D. B. Dill and F. G. Hall	Harvard U.	1940	Am. J. Physiol., 130: 739-746	
	321	Blood properties	35 N subj. 126 W subj.	D. B. Dill, J. W. Wilson, F. G. Hall and S. Robinson	Harvard U.	1940	J. Biol. Chem., 136: 449-460	In adaptation to climate and season
	322	Exercise adaptation	52 N subj. 8 W subj. 39 W students	S. Robinson et al.	Harvard U.	1941	Human Biol., 13: 139-158	N and W share-croppers compared with Northern Whites
818	323	Blood pressure	20 N infants 32 W infants	M. P. Rucker and J. W. Connell	Richmond, Va.	1924	Am. J. Dis. Child., 27: 6-24	Newborn. No racial differences
	324	Blood pressure *		C. P. Donnison		1929	Lancet, 216: 6-8	
	325	Blood pressure	25 N students 542 W students Various other	H. S. Diehl	U. of Minnesota	1931	Minn. Med., 14: 726-728	
	326	Blood pressure	12,368 N cases 15,853 W cases	J. M. Adams	New Orleans, La.	1932	Am. J. Med. Sci., 184: 342-350	
	327	Blood pressure *	252 N Africans	A. W. Williams	Medical Services, Uganda	1941	East African M. J., 18: 109-117, July	
	328	Cerebrospinal fluid	Preliminary report, series size not stated	F. A. Mettler et al.	U. of Georgia	1937	Psychiat. Quar., 11: 620-622	Racial variations of blood-c.b.f. in normal children and adults
	329	Patellar reflex	82 N subj. 82 W subj.	R. L. Browne	Tulane U.	1935	Research Quar., 6: 121-126	
	330	Vital capacity	172 N boys 225 N girls 252 W boys 287 W girls 100 N prisoners 60 W prisoners	W S. Smillie and D. L. Augustine	Hookworm Res. Lab., Internat. Health Bd., Andalusia, Ala.	1926	J. A. M. A., 87: 2055-2058	
	331	Vital capacity	1,254 N children 1,564 W children	F. L. Roberts and J. A. Crabtree	Tennessee State Dept. of Health	1927	J. A. M. A., 88: 1950-1952	
	332	Electro-cardiography	325 N pat. 322 W pat.	R. Ashman	Louisiana State U.	1941	Tri-State Med. J., 13: 2686	
	333	Body temperature	2 N infants 5 W infants	K. Dodd and S. J. Wilkinson	Vanderbilt U.	1927	J. A. M. A., 88: 787	Ext. heat a cause of fever in White, but not in colored infants
	334	Heat adaptation	33 N subj. 8 W subj.	S. Robinson, D. B. Dill, J. W. Wilson and M. Nielsen	Harvard U.	1941	Am. J. Trop. Med., 21: 261-287	
	335	Taste threshold	202 N subj. 125 W subj. 87 I subj.	M. Steggerda	Carnegie Inst.	1937	J. Hered., 28: 309-310	
	ACTION OF DRUGS							
	336	Drug action	Results of experience in a Negro clinic. No data	G. M. Niles	Atlanta, Ga.	1919	J. Fla. Med. Assn., 6: 118	Covers response to common classes of drug remedies
	337	Atropine	20 N pat. 20 W pat.	H. A. Paskind	U. of Illinois	1921	J. Lab. and Clin. Med., 7: 104-108	Veneral dis. patients
	338	Cocaine, euphthalmine, ephedrine	10 N pat. 10 W pat. 10 O pat.	R. K. Chen and E. J. Pth	Johns Hopkins U.	1929	Am. J. Phys. Anthropol., 13: 91-93	
210	339	Sulphonamides	Review of data in literature and author's practice	M. A. Schnitker	Harvard U.	1939	Ohio St. M. J., 35: 1204-1205	Sulfanilimid tendency to produce more hemo. an. in Negro
	340	Sulphonamides	125 N cases	P. W. Hutton	Uganda Medical Service	1939	E. African M. J., 16: 74-76	Sulfapyridine in pneumonia
	341	Hernia, all types	Charity Hosp. admissions	U. Maes and E. M. McFetridge	Louisiana State U.	1936	Am. J. Surg., 33: 5	
	342	Hernia, umbilical	1,339 N infants 798 W infants	A. G. Evans	Western Reserve U.	1941	J. Nat. Med. Assn., 33: 158-160	
	343	Hernia, umbilical	Report	J. W. Jones	Meharry Medical College	1941	Arch. Ped., 58: 294-300	Survey of incidence by questionnaire
	344	Congenital malformations	5,000 N troops 15,000 W troops	H. L. Schurmeier	Santa Barbara, Calif.	1922	Am. J. Phys. Anthropol., 5: 51-60	
	345	Congenital malformations	113 N pat. 4,816 W pat.	N. A. Dayton		1931	Proc. 55th Ann. Sess. Am. Assn. for Study of Feeble-minded	Quoted by Gesell
	346	Congenital malformations	24,071 N births 142,252 W births	D. P. Murphy	U. of Pennsylvania	1940	U. of Pa. Press, 97 pp.	
	347	"Mongolism"	2 case reports	A. C. Rambar	Northwestern U.	1935	Arch. Pediat., 52: 58-60	

REFERENCE TABLE (Continued)

SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
348	"Mongolism"	1 N case report	K. M. Whitney	Michigan Home and Training School	1936	Eugen. News, 21: 2-9	Additional references
349	"Mongolism"	1 N case report	A. Gesell	Yale U.	1936	J. A. M. A., 106: 1146-1150	Case report and review
350	"Mongolism"	6 N cases 3 N cases	R. B. Scott	Provident Hosp., Chicago	1937 1939	Arch. Ped., 54: 410-418 56: 4-18	
351	Sex ratio	U. S. Registr. Ar. 1918-1925	H. Bakwin	New York U.	1932	Human Biol., 4: 11	
352	Sex ratio		E. Huntington	Yale U.	1938	Season of Birth. J. Wiley & Sons, Inc.	
353	Sex ratio		S. J. Holmes	U. of California	1927	Biol. Bull., 52: 325-329	
354	Multiple births	U. S. Birth Registra. A. 1918-1926	H. Bakwin	New York U.	1932	Human Biol., 4: 9	
355	Multiple births	Birth Registra. U. S. 1922-1930	G. W. D. Hamlett	Harvard U.	1935	Genetics, 20	Twinning and multiple b.
356	Multiple births	Litter size for birth registra. area, 1930-1932	R. Pearl	Johns Hopkins U.	1939	Nat. Hist. of Population	Litter size
357	Fertility and conception	4,676 N fem. 13,682 W fem.	R. Pearl	Johns Hopkins U.	1936	Science, 83: 503-506	Reproductive histories
358	Locations of materials	N, W, and I mat. of all kinds	W. M. Cobb	Howard U.	1933	Am. J. Phys. Anthropol., 17: suppl. 1-45	
359	Cadaver demography	741 N cadav. 1,398 W cadav.	W. M. Cobb	Western Reserve U. and Howard U.	1935	Scientific Monthly, 40: 157-162	
360	Population	U. S. Census data 1790-1920 treated by logistic curve	M. Gover	U. S. Public Health Service	1929	Human Biol., 1: 263-273	
361	Population	Reproductive rates of birth registration area	B. D. Karpinos	National Institute of Health	1939 1941	Am. J. Hyg., 30: 79-89. Sect. A. 34: 24-27	
362	Mortality	Analyses of autopsy records, Johns Hopkins Hosp.	R. Pearl	Johns Hopkins U.	1929	Human Biol., 1: 229-249	Differential susceptibility of body systems noted
363	Mortality and morbidity	Numerous sources of vital data	S. J. Holmes	U. of California	1937	The Negro's Struggle for Survival. U. of California Press, Berkeley	Appraisal of evidence of selective action of disease and death
364	Mortality and morbidity	1,169 N cases 4,951 W cases disability	H. P. Brinton	U. S. Pub. Health Service	1939	Pub. Health Rep., 54: 1965-1977	In slaughter and meat packing industry, 1930-1934
365	Surgical peculiarities	19,239 N cases 45,182 W cases	R. Matas	Charity Hospital, New Orleans, La.	1896	Trans. Am. Surg. Assoc., 14: 483-610	Bibliography
366	Surgical peculiarities		U. Maes and E. M. McPettridge	Louisiana State U.	1936	Am. J. Surg., 33: 5-17	
367	Surgical peculiarities	Analysis literature, Charity Hosp. records in light of author's impressions	H. R. Kahle	Louisiana State U.	1941	Tri-State Med. J., 13: 2683	Seq. to Matas article
368	Race traits and tendencies		F. L. Hoffman	Prudential Ins. Co. of America	1896	Publ. Am. Econ. Assn., 11: 1-329	
369	Respiratory infection	240 N boys 168 W boys	F. Blumenthal	Neurological Inst., N. Y.	1942	Human Biol., 14: 104-109	N. Y. State Tr. Sch. for Boys, Warwick, inmates
370	Tuberculosis	1,236 N cases 1,719 W cases	C. A. Mills	U. of Cincinnati	1935	Am. J. Med. Sc., 189: 330-340	Susceptibility a race or energy level
371	Tuberculosis	916 N cases 2,677 W cases	E. L. Opie, F. M. McPhedran and P. Putnam	Henry Phipps Inst.	1936	Am. J. Hyg., 23: 530-538	Rel. racial incidence of types of disease
372	Tuberculosis	2,767 N person years exp. 7,516 W person years exp.	P. Putnam	Henry Phipps Inst.	1936	Am. J. Hyg., 24: 536-551	Racial incidence following exposure
373	Tuberculosis	38 N child. 24 Porto Rican c. 74 W child.	M. I. Levine	Cornell U.	1936	Am. J. Dis. Child., 51: 1052-1058	Response to induced tuberculosis
374	Tuberculosis	U. S. Army statistics, 1920-1936	R. B. Roth		1938	Am. Rev. Tuberc., 38: 197-204	Environmental factor in high rates
375	Tuberculosis	482 N cases 1,518 W cases	G. D. Kettelcamp, D. Murphy and D. Trumpe	Robert Koch Hosp., St. Louis, Mo.	1938	Am. Rev. Tuberc., 38: 458-465	Results of therapy
376	Tuberculosis	1,083 N children 4,867 W children	L. D. Phillips	Brandywine Sanatorium	1938	Del. State M. J., 10: 170-172	Comp. racial incidence in Delaware
377	Tuberculosis	Author's 22 years exper. and clinical survey	C. L. Harrell	Tidewater Memorial Hosp., Norfolk, Va.	1939	Va. M. Monthly, 66: 381-387	Response to therapy
378	Tuberculosis *	Progress of tuberculization	P. P. D. Connolly	Kenya Medical Service	1939	E. African M. J., 16: 62-73	In Africans
379	Tuberculosis *	Review of incidence in Afr.	W. H. Smith	Medical Officer, Tanganyika Terr.	1939	E. African M. J., 15: 318-328	In Africans
380	Tuberculosis	345 N pat. 265 W pat.	H. L. Israel and H. M. Payne	Henry Phipps Inst.	1940	Am. Rev. Tuberc., 41: 188-209	Clinical and roentgenological characters
381	Tuberculosis	2,996 N students	H. M. Payne	Howard U.	1940	Am. Rev. Tuberc., 32: 109-119	

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REFERENCE TABLE (Continued)

	SUBJECT	NO. SUBJECTS OR SPECIMENS	AUTHOR	INSTITUTION	YEAR	JOURNAL	REMARKS	
	382	Tuberculin test	420 N males 497 N fem. 70 Ind.	M. C. Kahn	Cornell U.	1936	Am. J. Hyg., 24: 456-478	Bush Negroes of Guiana
	383	Tuberculin test	3,542 N students	P. B. Cornely and E. H. Allen	Howard U.	1938	Am. Rev. Tuberc., 27: 549-555	
	384	Pterygium	138 N pat. 102 had pter.	E. A. Balloch	Howard U.	1894	Med. News, 64: 29	The rel. freq. of fibroid proc. in the dark skinned races
	385	Scarlet fever	Analysis of morbidity statistics	P. B. Cornely	Howard U.	1939	Am. J. Pub. H., 29: 999-1005	
	386	Dick test	257 N child. 272 W child.	H. H. Pevaroff and S. M. Hindman	Western Reserve U.	1934	Am. J. Hyg., 19: 749-752	Congested area of Cleveland
	387	Diphtheria	190 N child. 545 W child.	J. B. Black	Johns Hopkins U.	1934	Am. J. Hyg., 19: 734-738	
	388	Diphtheria Schick tests	1,261 W child. 518 N child. 1,644 W child. 642 N child.	D. W. Martin and J. M. Arena	Duke U.	1941	N. Carolina Med. J., 2: 348	Negroes less suscept. diphtheria; more to T. B.; higher incidence syph.
1322		Tuberculin tests	1,751 W child. 684 N child.					
		Wassermann	1,196 W child. 496 N child.					
	389	Schick test	75 N males 135 N fem.	L. T. Wright	Freedmen's Hosp.	1917	J. Infect. Dis., 21: 265-269	Nurses, interns and patients
	390	Syphilis tests	4,595 N patients	R. S. Jason	Howard U.	1935	Am. J. Syph. and Neurol., 19: 1-9	
	391	Heart disease	8,146 N pat. 17,670 W pat.	C. T. Stone and F. R. Vanzant	U. of Texas	1927	J. A. M. A., 89: 1473	
	392	Heart disease, hypertensive	91 N fem. hyper. 50 W fem. hyper. 5 W fem. controls	T. B. Dunn	George Washington U.	1940	M. A. M. Dist. of Col., 9: 271-274	Necropsies on females
	393	Coronary occlusion and ang. pect.	5,936 N pat. 4,252 W pat.	E. A. Schwab and V. E. Schulze	U. of Texas	1932	Am. Heart J., 7: 710	
	394	Coronary sclerosis	100 N male pat. 100 N fem. pat. 100 W male pat. 100 W fem. pat.	C. Johnston	Duke U.	1936	Am. Heart J., 12: 162-167	
	395	Coronary occlusion and angina pectoris	54,283 N histories 83,231 W histories	G. E. Burch and N. W. Voorhies	Tulane U.	1939	Am. J. Med. Sc., 198: 685-690	
	396	Hypertension	Prejudiced essay	V. E. Schulze and E. H. Schwab	U. of Texas	1936	Am. Heart J., 11: 66-74	
	397	Essential hypertension	2,230 N prisoners 1,766 W prisoners	M. Kesilman	Philadelphia, Pa.	1941	Med. Rec., 154: 16-19	Phila. Cy. prison
	398	Thyroid disease	40 N pat.	I. Cohn	Tulane U.	1935	South Surgeon, 4: 416-421	Rev. of literature
	399	Hyperthyroidism	37 N cases	W. B. Porter and H. Walker	Medical College of Va.	1937	Ann. Int. Med., 11: 618-625	Clinical description and impression of incidence
	400	Thyroid disease	482 N cases 470 W cases	F. F. Boyce	Charity Hosp., New Orleans, La.	1940	Surg. Gyn. and Obst., 70: 761-767	
	401	Gall bladder disease	23,016 N admissions 696 N necropsies	H. S. Alden	Emory U.	1927	South. M. J., 20: 828-829	
	402	Renal calcium plaques *	699 N necropsies 280 W necropsies 91 Hindu	V. Vermooten	U. of Witwatersrand	1941	J. Urol., 46: 193-200	
	403	Prostate gland	655 N cases 750 W cases	V. Derbes, S. M. Leche and C. W. Hooker	Tulane U.	1937	J. Urol., 38: 383-388	Incidence of benign hypertrophy
	404	Prostate gland	66,260 N admissions 97,030 W admissions	V. Derbes, S. M. Leche and C. W. Hooker	Tulane U.	1937	Urol. and Cutan. Rev., 41: 701-702	Incidence of carcinoma
	405	Prostate gland	37,717 N admissions 58,093 W admissions	R. D'Annoy, J. R. Schenken and E. L. Burns	Louisiana State U.	1939	South. M. J., 32: 47-52	Incidence of hypertrophy
1323	406	Obstetrical and gynecological cond.	30,853 N gyn. cases 28,471 W gyn. cases	W. E. Levy and H. Meyer	Touro Infirmary and Charity Hosp., New Orleans, La.	1937	N. Orleans M. and S. J., 89: 418-422	Comp. morbidity statistics of Charity Hospital with commentary on experience
	407	Uterus, fibroids	125 N fib. cases 150 W fib. cases	J. T. Witherspoon and V. W. Butler	Tulane U.	1934	Surg., Gynec. and Obst., 58: 57-61	
	408	Uterus, fibroid tumors	936 N cases 106 W cases	W. E. Levy	Louisiana State U.	1941	Tri-State Med. J., 13: 2692	Feb. 5,109 of 5,821 fibroid operations were on Negroes
	409	Neuropsychiatric conditions	Hospital statistics, N and W pat.	J. E. Greene and W. S. Phillips	U. of Georgia	1939	Human Biol., 11: 513-528	Therapeutic response
	410	Neuropsychiatric conditions	240 N admissions 705 W admissions	D. S. Wagner	Cincinnati Gen. Hosp.	1938	Am. J. Psychiat., 95: 167-183	Comp. racial admissions Cinn. Gen. Hosp.
	411	Nervous and mental conditions	993 N males 848 N fem.	B. Malzberg	N. Y. State Dept. of Mental Hyg., Albany	1936	Human Biol., 7: 471-513	
						1935	Am. J. Phys. Anthropol., 21: 107-113	
	412	Neuropsychiatric conditions	33,560 N male adm. 47,000 N fem. adm. 45,687 W male adm. 49,923 W fem. adm.	E. Wexberg	Louisiana State U.	1941	Tri-State Med. J., 13: 2694-2696	Comparative incidence, 1938-1940