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FIFTH ANNUAL REPORT

OF THE

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CHARTERED IN 1895

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A PUBLIC ZOOLOGICAL PARK
THE PRESERVATION OF OUR NATIVE ANIMALS
THE PROMOTION OF ZOOLOGY

NEW YORK
OFFICE OF THE SOCIETY, 11 WALL STREET
JUNE 1, 1901

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Duncan, A. Butler.....1 Fifth Avenue
*Duncan, John P.
Duncan, Stuart.....392 Canal Street
Dunham, Edward K.....25 East 69th Street
Dunham, G. H.....19 West 81st Street
Dunham, James H.....27 East 36th Street
Dunham, Lawrence.....Wakefield, N. Y. City
Dunlap, Robert.....111 West 72d Street
Dunn, Isaac L.....680 East 175th Street
Dunne, Edward B.....54 West 30th Street
Dunne, James.....31 Nassau Street
Duryea, Harry H.....80 Madison Avenue
Duryea, Gen. Hiram.....80 Madison Avenue

* Deceased.

DUTCHER, WILLIAM.....525 Manhattan Avenue
EDGAR, D.....Noroton, Conn.
EDGAR, MISS JULIA L.....28 East 39th Street
EDGAR, NEWBOLD.....28 East 39th Street
EDGELL, GEORGE S.....192 Broadway
EDMONDS, JOHN W.....128 East 44th Street
EGERTON, M.....9 Seamore Place, May Fair, London, Eng.
EGLESTON, D. S.....166 South Street
EIDLITZ, ROBERT JAMES.....995 Madison Avenue
ELDER, MRS. MATILDA A.....25 East 30th Street
ELLSWORTH, DUNCAN S.....Watkins, N. Y.
ELLSWORTH, JOHN MAGEE.....Calumet Club
ELLSWORTH, WILLIAM.....16 Lafayette Avenue, Brooklyn, N. Y.
EMERY, JOHN J.....5 East 68th Street
EMMET, MISS L. F.....New Rochelle, N. Y.
EMMET, ROBERT TEMPLE.....New Rochelle, N. Y.
ENDEMANN, WILLIAM.....1263 Franklin Avenue
ENDICOTT, ROBERT.....110 East 19th Street
ENO, JOHN CHESTER.....P. O. Box 1889
ETTLINGER, LOUIS.....40 East 73d Street
EVANS, MRS. CADWALADER.....38 West 48th Street
EVANS, RICHARD.....92 William Street
EVARTS, A. W.....52 Wall Street
EVARTS, SHERMAN.....52 Wall Street
FABBRI, ALLESANDRO.....Scarborough, N. Y.
FABBRI, ERNESTO G.....Scarborough, N. Y.
FAHNESTOCK, HARRIS C.....457 Madison Avenue
FALK, GUSTAV.....24 East 81st Street
FARGO, JAMES C.....56 Park Avenue
FARNHAM, PAULDING.....15 Union Square
FISHER, L. G.....42 New Street
FITZGERALD, LOUIS.....253 Lexington Avenue
FLINT, THOMPSON J. S.....Larchmont, N. Y.
*FLOWER, JOHN D.
FOSTER, EDWARD W.....504 Fifth Avenue
FOSTER, GIRAUD.....18 Wall Street
FOSTER, M. G.....876 St. Nicholas Avenue
FOSTER, PELL W.....126 Liberty Street
FOSTER, SCOTT.....395 Canal Street
FRANKFIELD, MRS. A.....328 West 56th Street
FRASER, ALEX V.....478 Greenwich Street
FULDA, CARL.....107 Kent Street, Brooklyn
FULDA, DR. CLEMENS.....107 Kent Street, Brooklyn
FULLER, CHARLES D.....25 West 9th Street
GARRETT, JOHN W.....11 South Street, Baltimore, Md.
GAY, JOSEPH E.....Union League Club
GERRISH, JOHN BROWN.....21 Thomas Street

* Deceased.

GERSTER, DR. ARPAD G.....34 East 75th Street
GIBNEY, DR. VIRGIL P.....16 Park Avenue
GILBERT, CLINTON.....20 West 10th Street
GILL, GEORGE.....164 South Fourth Avenue, Mount Vernon, N. Y.
*GILLILAN, WILLIAM H.
GILMAN, THEODORE.....311 Palisade Avenue, Yonkers
GILSEY, HENRY, JR.....10 East 36th Street
GLEESON, JOSEPH M.....45 East 59th Street
GODDARD, F. N.....273 Lexington Avenue
GODDARD, MRS. J. WARREN.....52 East 57th Street
GODKIN, EDWIN L.....36 West 10th Street
GOLDSCHMIDT, S. A.....12 East 58th Street
GOOD, MARTIN Q.....233 East 87th Street
GOODHUE, MRS. C. C.....189 Madison Avenue
GOODRIDGE, MRS. FREDERIC.....250 Fifth Avenue
GOODWIN, REV. FRANCIS.....Hartford, Conn.
GOTTHOLD, FREDERIC.....165 West 58th Street
GOULD, CHARLES A.....Rye, N. Y.
GOULD, C. W.....5 Washington Square
GOULD, EDWIN.....Dobbs Ferry, N. Y.
GOULDEN, JOSEPH A.....2433 Creston Avenue, Fordham
GRACE, WILLIAM R.....31 East 79th Street
GRANT, R. S.....Union Club
GRAVES, ANDREW B.....Calumet Club
GRAY, J. H.....317 West 77th Street
GREENE, GEN. FRANCIS V.....11 Broadway
GREENOUGH, JOHN.....31 West 35th Street
GREENWOOD, ISAAC J.....271 West End Avenue
GREER, CHARLES.....Rye, N. Y.
GRIFFITH, DANIEL J.....21 West 56th Street
GRINNELL, GEORGE BIRD.....346 Broadway
GRINNELL, WILLIAM MORTON.....873 Madison Avenue
GRISWOLD, CHESTER.....23 West 48th Street
GROSSMAN, GEORGE J.....952 Trinity Avenue
GULLIVER, W. C.....120 Broadway
GURNEE, W. S., JR.....8 East 33rd Street
HADDEN, DR. ALEXANDER.....155 East 51st Street
HALEY, I. N.....55 West 42d Street
HALSTED, MISS L. P.....110 East 37th Street
HAMMOND, MRS. JOHN HENRY.....14 East 72d Street
HANSON, H. D.....310 East 21st Street
HARD, ANSON W.....107 Wall Street
HARBECK, CHARLES T.....Islip, N. Y.
HARRIMAN, W. M.....60 West 58th Street
HART, WILLIAM W.....47 East 12th Street
HARVEY, ALEXANDER.....Union Club
HASBROUCK, PRICE W.....39 West 90th Street

* Deceased.

HASSLACHER, JACOB.....100 William Street
HASWELL, CHARLES H.....324 West 78th Street
HAVEMEYER, T. A.....117 Wall Street
HAVENS, ALBERT G.....East Orange, N. J.
HAWLEY, E.....The Rutland, Broadway and 57th Street
HAYDEN, HORACE J.....337 West 76th Street
HAYNES, WILLIAM DE FOREST.....16 East 36th Street
HECKSCHER, JOHN GERARD.....31 West 75th Street
HEINS, GEORGE L.....303 State Street, Albany
HEINSHEIMER, L. A.....27 Pine Street
HEINTZ, JOHN C.....169th Street and Third Avenue
HENDRICKS, CLIFFORD B.....512 Fifth Avenue
HENRIQUES, DR. H. A.....Morristown, N. J.
HERMANN, FERDINAND.....P. O. Box 477
HERTER, CHRISTIAN A.....819 Madison Avenue
HERUFELD, FELIX.....147 West 86th Street
HESS, SELMAR.....956 Madison Avenue
*HIGBIE, WILLIAM HOWELL.
HILL, E. B.....198 Park Avenue, Yonkers
HILYARD, GEORGE D.....144 East 49th Street
HINTON, DR. JOHN H.....41 West 32nd Street
HITCHCOCK, CENTER.....Knickerbocker Club
HOE, RICHARD M.....11 East 71st Street
HOE, MRS. RICHARD M.....11 East 71st Street
HOE, MRS. ROBERT.....11 East 36th Street
HOLBROOK, MRS. F. S.....Stamford, Conn.
HOLBROOK, MISS LILIAN.....Stamford, Conn.
HOLDEN, GEORGE A.....185 Riverside Drive
HOLT, HENRY.....711 Madison Avenue
HOPPIN, HAMILTON L.....47 West 11th Street
HORTON, G. B.....83 Gold Street
HOSKIER, H. C.....26 Exchange Place
HOTCHKISS, HORACE L.....35 Broad Street
HOWLAND, G. G.....New York Herald
HOWLAND, HENRY E.....35 Wall Street
HOYT, ALFRED M.....1 Broadway
HOYT, COLGATE.....36 Wall Street
HOYT, GEORGE S.....72 Gold Street
HOYT, JESSE.....257 West 73rd Street
HUNTINGTON, REV. W. R.....804 Broadway
HUSTED, H. B.....276 Gates Avenue, Brooklyn
HUTCHINS, AUGUSTUS SCHELL.....69 Wall Street
HYDE, B. T. BABBITT.....20 West 53rd Street
HYDE, CLARENCE M.....80 Broadway
HYDE, DR. FREDERICK E.....20 West 53d Street
INNESS, GEORGE, JR.....145 West 58th Street
ISELIN, ADRIAN, JR.....9 East 26th Street

* Deceased.

ISHAM, CHARLES H.....30 East 63rd Street
ISHAM, MISS JULIA B.....5 East 61st Street
*JACKSON, CHARLES CARROLL.
JACKSON, FREDERIC WENDELL.....Westchester, N. Y. City
JACKSON, DR. GEORGE THOMAS.....692 West End Avenue
JACKSON, SAMUEL MACAULEY.....692 West End Avenue
JACKSON, THEODORE F.....10 West 43rd Street
JACOB, LAWRENCE.....42 East 49th Street
JACOBI, DR. A.....110 West 34th Street
JACQUELIN, HERBERT T. B.....34 East 38th Street
JACQUELIN, JOHN H.....34 East 38th Street
JAMES, ARTHUR CURTISS.....92 Park Avenue
JAMES, DR. WALTER B.....17 West 54th Street
JENNINGS, F. B.....86 Park Avenue
JENNINGS, PHILANDER R.....190 Water Street
JENNINGS, WALTER.....11 East 41st Street
JESUP, CHARLES M.....124 East 36th Street
JESUP, JAMES R.....555 Fifth Avenue
JOHNSON, F. COIT.....110 Worth Street
JOLINE, ADRIAN HOFFMAN.....1 West 72nd Street
JONES, MRS. JOSEPHINE K.....Fifth Avenue Hotel
JONES, LEWIS Q.....Bay View, Newport, R. I.
KAHN, LOUIS.....172 Broadway
KAHN, MOSES.....172 Broadway
KANE, JOHN INNES.....49 West 23rd Street
KANE, S. NICHOLSON.....23 West 47th Street
KEECH, FRANK B.....14 East 65th Street
KELLER, ERNEST F.....214 West 133rd Street
KELLEY, AUSTIN P.....37 Wall Street
KELLY, EUGENE.....763 Fifth Avenue
KEMP, ARTHUR T.....615 Fifth Avenue
KENT, EDWIN C.....66 Maiden Lane
KERSTING, RUDOLF.....104 Fulton Street
KIMBALL, ALFRED R.....15 Wall Street
KING, WILLIAM F.....17 East 63rd Street
KING, WILLIAM W.....Norfolk, Va.
KNAPP, DR. HERMAN.....26 West 40th Street
KNAPP, JOHN M.....66 Broadway
*KNAUTH, PERCIVAL.
KNIGHT, CHARLES R.....American Museum of Natural History
KNOEDLER, ROLAND F.....122 West 13th Street
*KOCH, HENRY C .F.
KUHNE, PERCIVAL.....7 East 78th Street
KUNHARDT, HENRY R.....124 West 74th Street
KUTTROFF, ADOLF.....17 East 69th Street
LAGAI, DR. GEORGE.....17 Park Place
LAMBERT, DR. ALEXANDER.....125 East 36th Street

*Deceased.

LANDON, FRANCIS G.....27 William Street
LANE, EDWARD V. Z.....143 Liberty Street
LANGLOTH, J.....784 Fifth Avenue
LAPSLEY, DAVID.....44 West 33rd Street
LAUDAUER, I. N.....37 East 76th Street
LAWRENCE, JOHN BURLING.....126 East 30th Street
LAWRENCE, NEWBOLD T.....51 Liberty Street
LAWRENCE, W. V.....969 Fifth Avenue
LAYNG, J. D.....931 Fifth Avenue
LEDOUX, ALBERT R.....39 West 50th Street
LEE, AMBROSE.....Williamsbridge, N. Y.
LEE, PROFESSOR FRED. S.....437 West 59th Street
LEFFERTS, MARSHALL C.....34 East 65th Street
LE GENDRE, WILLIAM C.....59 Wall Street
LESHER, A. L.....9 East 75th Street
LETKEMANN, H. L.....1278 Fulton Avenue
LEVY, S. H.....172 Broadway
LEWIS, FREDERIC ELLIOTT.....22 West 38th Street
LEWIS, PERCY PYNE.....5 Vanderbilt Avenue
LEWISOHN, ADOLPH.....11 Broadway
LEWISOHN, LEONARD.....14 East 57th Street
LIEBENAU, ALBERT, JR.....3492 Park Avenue
LITCHFIELD, EDWARD H.....59 Wall Street
LIVINGSTON, WILLIAM S.....670 Lexington Avenue
LOBENSTINE, WILLIAM CHRISTIAN.....245 Central Park West
LOCKWOOD, WILLISTON B.....205 West 57th Street
LOGAN, WALTER S.....121 West 64th Street
LORING, J. ALDEN.....Zoological Park
LUSK, PROF. GRAHAM.....New Haven, Conn.
LUTTGEN, WALTHER.....25 Nassau Street
LYMAN, FRANK.....34 Remsen Street, Brooklyn
MCALAN, JOHN.....4 West 84th Street
MCALPIN, CHARLES W.....11 East 90th Street
MCALPIN, MRS. CHARLES W.....11 East 90th Street
MCALPIN, GEORGE L.....9 East 90th Street
MCCABE, CHARLES F.....Fordham, N. Y.
MCCALL, JOHN A.....54 West 72nd Street
MCCLURE, S. S.....141 East 25th Street
MCCURDY, RICHARD A.....32 Liberty Street
*MCGEE, JAMES.
MCKAY, THOMAS.....460 East 10th Street
MCKIM, REV. HASLETT.....9 West 48th Street
MCLEAN, JAMES.....16 West 55th Street
MCQUADE, JOSEPH E.....3177 Southern Boulevard
MCVICKAR, EDWARD.....267 Fifth Avenue
MACE, ARTHUR J.....Williamsbridge, N. Y.
MACKAY, GEORGE D.....20 West 69th Street

* Deceased.

MAGEE, JOHN.....Corning, N. Y.
MALI, PIERRE.....8 Fifth Avenue
MAPES, DANIEL, JR.....1920 West Farms Road
MAPES, ERNEST S.....1279 Woodruff Street, West Farms
MARLOR, HENRY S.....Brooklyn, Conn.
MARSHALL, LOUIS.....33 East 72nd Street
MARTIN, F. E.....29 Pine Street
MARX, GEORGE B.....340 East 118th Street
MASLEN, RICHARD R.....217 West 125th Street
MAXWELL, ROBERT.....64 Worth Street
MEAD, WALTER H.....222 West 23rd Street
MERKEL, HERMANN W.....Zoological Park
MIDDLEBROOK, FREDERICK.....Grand Central Station
MILLS, ABRAHAM G.....71 Broadway
MILLS, W. MCMASTER.....65 East 55th Street
MONSON, A. C.....14 East 63d Street
MONTANT, ALPHONSE.....326 West 22nd Street
MOORE, FRANCIS C.....80 Madison Avenue
MORGAN, MISS ANNIE T.....219 Madison Avenue
MORGAN, EDWIN D.....100 Broadway
MORGAN, GEORGE H.....6 East 40th Street
MORGAN, J. P., JR.....J. S. Morgan & Co., London, England
MORGAN, JUNIUS S.....Princeton, N. J.
MORGAN, MRS. JUNIUS S.....Princeton, N. J.
MORRIS, DAVE H.....Westchester, N. Y. City
MORRIS, FORDHAM.....16 Exchange Place
MORRIS, DR. LEWIS R.....60 West 58th Street
MOTT, JORDAN L., JR.....17 East 47th Street
MUELLER, CHARLES F.....1815 Prospect Avenue
MUNN, HENRY NORCROSS.....Orange, N. J.
MURGATROYD, JOHN.....458 Pacific Street, Brooklyn
NEILSON, DR. HOWARD S.....46 West 48th Street
NICHOLS, ACOSTA.....27 Pine Street
NICHOLS, GEORGE L.....66 East 56th Street
NILES, MISS FLORILLA.....Bedford Park
NILES, MISS ISABEL.....Bedford Park
NILES, J. BARRON.....66 Broadway
NILES, ROBERT L.....66 Broadway
*NILES, W. W.
NOBLE, H. G. S.....52 Broadway
NORTH, DR. JAMES H., JR.....2 West 43rd Street
NOTMAN, JOHN.....54 Wall Street
OAKLEY, H. CRUGER.....52 Broadway
OGDEN, M. C.....98 Chambers Street
OLSEN, CHARLES P.....2796 Pond Place
OLYPHANT, ROBERT.....21 Cortlandt Street
OLYPHANT, R. M.....21 Cortlandt Street

* Deceased.

ONATIVIA, J. VICTOR.....713 Park Avenue
O'NEILL, HUGH.....143 West 57th Street
OSBORN, MRS. HENRY F.....850 Madison Avenue
OSTRANDER, MISS MARY M.....50 West 53d Street
OUTERBRIDGE, DR. PAUL.....52 West 53d Street
OWEN, MISS JULIETTE A.....306 North 9th Street, St. Joseph, Mo.
OWEN, MRS. THOMAS JEFFERSON.....23 W. 34th Street
PALMEDO, U.....28 Exchange Place
PALMER, FRANCIS F.....742 East 12th Street
PALMER, NICHOLAS F.....922 Fifth Avenue
PALMER, S. S.....52 Wall Street
PANCOAST, RICHARD.....28 Platt Street
PARKER, FRANCIS EYRE.....160 West 59th Street
PARSONS, EDWIN.....515 Madison Avenue
PARSONS, MRS. EDWIN.....326 West 90th Street
PARSONS, JOHN E.....30 East 36th Street
PARSONS, H. DE B.....22 William Street
PARSONS, WILLIAM BARCLAY.....320 Broadway
PARSONS, WILLIAM H.....Rye, N. Y.
PATERSON, R. W.....2 West 51st Street
PATTERSON, W. H.....275 Fifth Avenue
PAUL, W. A. O.....Hotel Margaret, Brooklyn
PEABODY, A. J.....15 West 10th Street
PEABODY, ROYAL C.....11 Broadway
PECK, THEODORE G.....Haverstraw, N. Y.
PEEK, HENRY T.....1820 Monroe Avenue
PELL, ALFRED.....Highland Falls, N. Y.
PELL, STEPHEN H. P.....512 Fifth Avenue
PENDLETON, FRANCIS KEY.....7 East 86th Street
PENFOLD, WILLIAM HALL.....10 East 40th Street
PENNIMAN, GEORGE H.....1071 Fifth Avenue
PERKINS, ROBERT P.....3 West 16th Street
PETERS, CHARLES G.....13 East 76th Street
PETERS, SAMUEL T.....117 East 37th Street
PETERS, W. R.....23 W. 73rd Street
PHIFER, ROBERT F.....46 West 17th Street
PICKHARDT, CARL.....1042 Madison Avenue
PIEL, GOTTFRIED.....Liberty and Sheffield Avenues, Brooklyn
PIERSON, J. FREDERICK.....29 Broadway
PINCHOT, GIFFORD.....Department of Agriculture, Washington, D. C.
PLYMPTON, GILBERT M.....30 West 52nd Street
POLLOCK, GEORGE E.....28 West 21st Street
POND, A. EDWARD.....124 Fifth Avenue
PORTER, CLARENCE.....509 Fifth Avenue
PORTER, H. H.....120 Broadway
PORTER, WILLIAM L.....P. O. Box 573, Waterford, N. Y.
POST, ABRAM S.....81 Fulton Street
POST, EDWARD C.....350 West End Avenue

POST, GEORGE B., JR.....Mills Building
POSTLEY, CLARENCE A.....817 Fifth Avenue
POTTER, MISS BLANCHE.....20 North Washington Square
POTTER, E. C.....36 Wall Street
POTTER, FREDERICK.....71 Broadway
POTTER, MISS MARTHA.....20 North Washington Square
POTTS, WILLIAM BREVOORT.....39 East 39th Street
PRATT, DALLAS B.....24 West 48th Street
PRYER, CHARLES.....New Rochelle, N. Y.
PYLE, JAMES TOLMAN.....673 Fifth Avenue
PYNE, M. TAYLOR.....52 Wall Street
RAND, GEORGE C.....Lawrence, L. I.
RANDOLPH, L. V. F.....39 William Street
RANDOLPH, WILLIAM W.....31 Nassau Street
RAUCH, WILLIAM.....Union Club
READ, WILLIAM A.....4 East 62d Street
REDMOND, HENRY S.....114 East 19th Street
REDMOND, GOOLD H.....6 North Washington Square
REEBER, GEORGE A.....118 East 111th Street
*REYNAL, MRS. JULES.
REYNOLDS, JAMES BRONSON.....184 Eldridge Street
RHINELANDER, CHARLES E.....6 West 32d Street
RHOADES, JOHN HARSEN.....559 Madison Avenue
RICHARD, AUGUSTE.....12 East 69th Street
RICHARDS, E. O.....105 East 19th Street
RIKER, JOHN L.....19 West 57th Street
RIKER, SAMUEL.....27 East 69th Street
RIPLEY, H. DILLON.....17 West 27th Street
RIPLEY, SIDNEY DILLON.....119 East 39th Street
RIVES, GEORGE L.....32 Nassau Street
ROBBINS, CHANDLER.....64 West 47th Street
ROBBINS, S. HOWLAND.....20 East 27th Street
ROBINSON, NELSON.....23 East 55th Street
ROBISON, WILLIAM.....18 Wall Street
ROCKEFELLER, WILLIAM.....26 Broadway
ROELKER, ALFRED.....202 West 45th Street
ROGERS, E. L.....71 Broadway
ROGERS, JAMES H.....881 St. Nicholas Avenue
ROKENBAUGH, HENRY S.....504 Fifth Avenue
ROLLE, AUGUST J.....College Point, L. I.
ROOT, ELIHU.....1626 Rhode Island Avenue, Washington, D. C.
ROPES, ALBERT G.....17 State Street
*ROSENWALD, ISAAC.
ROSS, P. SANFORD.....29 Maiden Lane
ROTH, F. R. G.....5 East 14th Street
RUNDE, A. THEODORE.....3rd Avenue & 184th Street
RUNGIUS, CARL.....107 Kent Street, Brooklyn

* Deceased.

RUNYON, CHARLES.....25 Fifth Avenue
RUPPERT, JACOB.....1116 Fifth Avenue
RUSSELL, ROBERT HOWARD.....Union Club
RYNIKER, DR. HENRY J.....219 East 12th Street
SACKETT, MISS.....196 Madison Avenue
SACKETT, CLARENCE.....196 Madison Avenue
SACKETT, S. E.....196 Madison Avenue
SAGE, DEAN.....Albany, N. Y.
SALTUS, LLOYD.....Hamilton Club, Brooklyn, N. Y.
SAUTER, FREDERICK.....3 North William Street
SCHARMANN, H. B.....170 West 59th Street
SCHEFER, CARL.....40 West 37th Street
SCHIEFFELIN, WILLIAM J.....170 William Street
SCHIRMER, RUDOLPH E.....243 East 17th Street
SCHLATTER, CHAS. F.....129 West 120th Street
SCHMIDT, GEORGE.....341 West 56th Street
SCHRANK, GEORGE.....183rd Street & Jackson Avenue
SCHULTZE, JOHN S.....59 Wall Street
SCHUMACHER, C.....31 East 81st Street
SCHUYLER, MISS LOUISA LEE.....135 East 21st Street
SEARS, ROBERT B.....7 Taulmier Place, Jersey City
SEIB, H.....85 West 118th Street
SELIGMAN, ALFRED L.....Mills Building
SEYMOUR, JULIUS H.....35 Wall Street
SHAW, CHARLES HERBERT.....47 West 43d Street
SHAW, JAMES G.....130 William Street
SHAW, WALTER W.....Care of Metropolitan Trust Co., 39 Wall Street
SHELDON, GEORGE R.....24 East 38th Street
SHELDON, W. C.....95 Park Avenue
SHERMAN, GARDINER.....235 West 72nd Street
SHRADY, HENRY M.....305 West 80th Street
SHURTLEFF, R. M.....44 West 22nd Street
SIEGEL, JACOB.....169th Street and Third Avenue
SIMONS, JAMES D.....44 Broad Street
SIMPSON, JOHN BOULTON, JR.....97 Fifth Avenue
SKIDMORE, SAMUEL TREDWELL.....71 West 50th Street
SKIDMORE, WILLIAM L.....49 West 52nd Street
SMILEY, DANIEL.....Mohonk, N. Y.
SMILLIE, CHARLES F.....29 East 38th Street
SMITH, DR. EDWARD A.....105 East 18th Street
SMITH, FRANK SULLIVAN.....54 Wall Street
SMITH, GEORGE WARREN.....Metropolitan Club
SMITH, LUCIUS H.....19 East 34th Street
SMITH, PHILIP S.....46 Johnson Park, Buffalo, N. Y.
SMITH, WILLIAM ALEXANDER.....412 Madison Avenue
SMITHERS, CHARLES.....507 Madison Avenue
SMITHERS, F. S.....180 West 59th Street
SMYTH, PHILIP A.....57 East 127th Street

SOPER, A. W.....150 West 59th Street
SOTSCHECK, CARL.....1773 Clay Avenue
SOUTHACK, FREDERICK.....48 West 53d Street
SOUTHARD, GEORGE H.....85 Remsen Street, Brooklyn
SPENCER, SAMUEL.....80 Broadway
SPITZNER, GEORGE W.....12 East 74th Street
SPRING, MISS ANNA RIKER.....434 Madison Avenue
SQUIBB, DR. E. H.....148 Columbia Heights, Brooklyn
STAFFORD, MRS. ROBERT.....Hotel Imperial
STANTON, JOHN.....13 William Street
STARR, LOUIS MORRIS.....3 West 53d Street
STEBBINS, JAMES H.....80 Madison Avenue
STEEVES, JOHN F.....138th Street and Fourth Avenue
STEPHENS, OLIN J.....146th Street and Gerard Avenue
STERLING, THEODORE WELD.....18 East 40th Street
STERN, ISAAC.....858 Fifth Avenue
STEVENS, FREDERIC W.....33 West 35th Street
STEWART, WILLIAM R.....31 Nassau Street
STIMSON, DR. DANIEL M.....11 West 17th Street
STOKES, H. B.....New Rochelle, N. Y.
STOKES, J. G. PHELPS.....229 Madison Avenue
STONE, MASON A.....244 Central Park West
STONEBRIDGE, CHARLES H.....2656 Third Avenue
STONEBRIDGE, G. E.....1845 Vanderbilt Avenue
STOW, GEORGE G.....Oyster Bay, L. I.
STRATFORD, PROF. WILLIAM.....263 West 52nd Street
STREAT, JAMES.....62 Leonard Street
STUART, INGLIS.....69 Wall Street
STURGES, HENRY C.....56 East 34th Street
STURGIS, F. K.....30 Broad Street
STUYVESANT, RUTHERFURD.....18 Exchange Place
SULLIVAN, MRS. JAMES.....36 Park Avenue
SULLIVAN MARK S.....1 Brewers Block, Cambridge, Mass.
SUTPHEN, JOHN S., JR.....9 Desbrosses Street
SWAYNE, FRANCIS B.....Riverside Avenue and 90th Street
SYMS, DR. PARKER.....50 West 47th Street
TABER, MISS MARY.....9 East 10th Street
TAFT, HENRY W.....40 Wall Street
TAIT, A. F.....82 Waring Place, Yonkers, N. Y.
TALCOTT, JAMES.....7 West 57th Street
TATHAM, CHARLES.....302 Lexington Avenue
TAYLOR, MISS ALEXANDRINA.....48 West 59th Street
TAYLOR, DWIGHT W.....500 Madison Avenue
TAYLOR, GEORGE.....8 West 126th Street
TAYLOR, HERBERT C.....52 Broadway
TAYLOR, MOSES.....6 East 72d Street
TEFFT, F. GRISWOLD.....Manhattan Club
TEFFT, WILLIAM C.....22 East 64th Street

TENNY, C. H.....8 Washington Place
TERRY, JNO. T.....Tarrytown, N. Y.
TERRY, REV. RODERICK.....169 Madison Avenue
TESLA, NIKOLA.....46 East Houston Street
THACHER, MRS. GEORGE W.....Park Avenue Hotel
THACHER, THOMAS.....10 Wall Street
THAYER, HARRY BATES.....57 Bethune Street
THOMAS, DR. ALLEN M.....45 West 54th Street
THOMAS, SAMUEL.....17 West 57th Street
THOMAS, SETH E.....8 West 20th Street
THOMPSON, ROBERT MEANS.....99 John Street
THOMPSON, PROF. W. GILMAN.....34 East 31st Street
THOMSON, DAVID.....14 East 73rd Street
THOMSON, GIRAUD F.....141 Broadway
THORNE, NEWBERRY D.....New Rochelle, N. Y.
THORNE, W. V. S.....Metropolitan Club
TIFFANY, LOUIS C.....7 East 72nd Street
TILFORD, HENRY M.....3 West 46th Street
TILLINGHAST, WILLIAM H.....26 East 64th Street
TILT, ALBERT.....5 East 67th Street
TILTON, JOSEPH W.....31 East 30th Street
TOD, J. KENNEDY.....45 Wall Street
TOEL, WILLIAM.....20 East 67th Street
TONNELE, WALTER.....12 East 15th Street
TOOTHE, WILLIAM.....Madison, N. J.
TOSTEVIN, WILLIAM P.....Darien, Conn.
TOWNSEND, ISAAC.....Union Club
TOWNSHEND, JOHN.....302 West 73rd Street
TOWS, COE DOWNING.....34 West 52d Street
TRASK, SPENCER.....27 Pine Street
TROWBRIDGE, EDWIN D.....123 East 39th Street
TROWBRIDGE, FREDERICK K.....115 East 37th Street
TUCKERMAN, ALFRED.....1123 Broadway
TURNBULL, ROBERT J.....6 West 47th Street
TURNURE, GEO. E.....115 E. 36th Street
TYTUS, ROBERT DE PEYSTER.....10 East 77th Street
UNDERWOOD, WILLIAM LYMAN.....Belmont, Mass.
UPP, THOMAS M.....Perry Avenue and Holt Place
VALENTINE, DR. WILLIAM A.....45 West 35th Street
VALLANDINGHAM, EDWARD NOBLE.....Wakefield, N. Y. City
VAN BRUNT, C. H.....10 East 46th Street
VAN CORTLANDT, AUGUSTUS.....Tuxedo Park, N. Y.
VANDERPOEL, MRS. JOHN A.....224 Madison Avenue
VAN EMBURGH, D. B.....30 East 38th Street
VAN NEST, MRS. ALEXANDER T.....31 West 37th Street
VAN NEST, G. WILLETT.....345 Fifth Avenue
VAN NORDEN, WARNER.....29 West 57th Street
VAN PELT, GILBERT S.....123 East 69th Street

VAN WINKLE, EDGAR B.....115 East 70th Street
VAN WINCKLE, GEORGE S.....1 Broadway
VICKER, H. MONTAGUE .....7 Wall Street
VIELE, HERMAN K.....146 East 35th Street
VIVANTI, FERRUCCIO ANSELMO.....995 Madison Avenue
VON DUERING, DR. ADOLPH.....552 East 155th Street
VOGEL, HERMAN.....106 East 37th Street
VORCE, A. D.....353 Fifth Avenue
WADSWORTH, CLARENCE S.....177 Commonwealth Avenue, Boston
WADSWORTH, W. P.....25 East 30th Street
WAGSTAFF, C. DU BOIS.....Babylon, L. I.
WALTON, WILLIAM.....360 West 22d Street
WANNINGER, CHARLES.....1143 Park Avenue
WARD, CHAS. H.....159 West 73rd Street
WARD, HENRY C.....431 Fifth Avenue
WARD, J. Q. A.....119 West 52d Street
WARDWELL, WILLIAM T.....21 West 58th Street
WATERBURY, JOHN I.....20 Wall Street
WATSON, CHARLES F.....South Orange, N. J.
WEATHERBEE, EDWIN H.....240 Madison Avenue
WEBB, G. CREIGHTON.....47 E. 44th Street
WEBB, DR. W. SEWARD.....Shelbourne, Vt.
WEBER, LOUIS.....9 East 93rd Street
WELLINGS, JOSEPH G.....628 West 147th Street
WELLS, OLIVER J.....Waldorf Hotel
WENDELL, MRS. JACOB.....8 East 38th Street
WERTHEIM, H. P.....27 William Street
WESTERGREN, M. F.....380 Mott Avenue
WHITAKER, H. P.....Hotel Netherlands
WHITE, JOHN JAY.....103 East 57th Street
WHITE, LEONARD D.....39 East 74th Street
WHITE, STANFORD.....160 Fifth Avenue
WHITE, S. V.....7 Wall Street
WHITE, WILLIAM W.....49 Broad Street
WHITEHOUSE, J. HENRY.....Irvington-on-Hudson
WHITIN, LOUIS F.....9 West 56th Street
WHITING, GILES.....898 Broadway
WHITMAN, CLARENCE.....5 East 76th Street
WHITNEY, CASPAR.....44 East 64th Street
WHITNEY, HARRY PAYNE.....2 West 57th Street
WHITRIDGE, F. W.....59 Wall Street
WICKERSHAM, GEORGE W.....40 Wall Street
WIGGIN, FREDERICK HOLME.....55 West 36th Street
WILLARD, E. A.....132 Front Street
WILLETS, ROBERT R.....303 Pearl Street
WILLIAMS, G. G.....34 West 58th Street
WILLS, CHARLES T.....156 Fifth Avenue
WILMERDING, GUSTAV L.....135 Madison Avenue

WINTHROP, EGERTON L.....23 East 33rd Street
WINTHROP, R. DUDLEY.....Knickerbocker Club
WITHERBEE, FRANK S.....40 Wall Street
WOLFF, EMIL.....115 West 70th Street
WOOD, ARNOLD.....40 East 35th Street
WOOD, GILBERT CONGDON.....7 West 49th Street
WOOD, J. WALTER.....South Orange, N. J.
WOOD, J. WALTER, JR.....Short Hills, N. J.
WOOD, WILLIAM C.....51 Fifth Avenue
WOOD, WILLIAM H. S.....45 East 10th Street
WOODHOUSE, J. S.....341 West 87th Street
WOODWARD, F. F.....Hotel San Remo
WOOLF, JAMES A.....1821 Trane Place, City
WOOSTER, NOYES C.....38 West 35th Street
WORTHINGTON, CHARLES C.....214 Broadway
WORTMAN, DR. J. L.....Peabody Museum, New Haven, Conn.
WRIGHT, J. DUNBAR.....346 Lexington Avenue
WRIGHT, J. HOWARD.....346 Lexington Avenue
WRIGHT, MRS. MABEL OSGOOD.....118 West 11th Street
YOUMANS, EPHRAIM M.....2020 Broadway
YOUNG, FREDERICK STAFFORD.....11 West 19th Street
YOUNG, JOHN ALVIN.....39 William Street
YOUNG, RICHARD N.....11 West 19th Street
YERKES, CHARLES T.....54 Wall Street
ZABRISKIE, ANDREW C.....2 West 56th Street

Corresponding Members.

BROWN, HERBERT.....Yuma, Arizona
BROWN, WILLIAM HARVEY.....Salisbury, Rhodesia, South Africa
CORNISH, C. J.....Oxford House, Chiswick Hall, London, W., England
EATON, HOWARD.....Medora, North Dakota
ELROD, M. J.....Missoula, Montana
GRAHAM, W. H. H.....Winnipeg, Manitoba
GRIFFITH, WILLIAM A.....Quebec, Canada
HUFFMAN, L. A.....Miles City, Montana
MCCARTY, JOHN.....Phœnix, Arizona
MARE, R. L.....St. Johns, Newfoundland
PHILLIPS, MICHAEL.....Seattle, Washington
SELOUS, PERCY.....Greenville, Michigan
STONE, ANDREW J.....New York City
WILSON, T. E.....Banff, Alberta
WILTSEE, E. A.....Crocker Building, San Francisco, Cal.

Summary of Membership.

To April 1, 1901.

Total number of	Founders	25
" "	Associate Founders	11
" "	Patrons	47
" "	Life Members	126
" "	Annual Members	852
Total of all classes		1061
Members deceased, 1900–1901		25

FORM OF BEQUEST

I do hereby give and bequeath to the "New York Zoological Society," *of the City of New York,*.....

.....

.....

THE REPTILE HOUSE.

REPORT OF THE EXECUTIVE COMMITTEE OF THE BOARD OF MANAGERS OF THE NEW YORK ZOOLOGICAL SOCIETY FOR THE YEAR 1900.

The work of the Executive Committee during the year 1900 has been largely in the nature of completing the various installations and buildings which were actually started during the preceding year, so while the apparent results of new work are less striking than during 1899, the work and study devoted to the development of the Park by the various members of the Executive Committee, and the Director and his staff at the Park, has not diminished.

The Society has made a very substantial advance in its financial status, the City having increased its maintenance fund from $40,000 to $65,000, and by reason of efforts of the members of the Executive Committee, a further sum of $300,000 has been secured from the City by virtue of Chapter 432 of the Laws of 1900 for the improvement of the Park. This, taken with the large increase in membership, and in the amount subscribed to the Park Improvement Fund, places the Society in a sound financial condition.

To sum up, the Society is free from debt. On January 1st it owed only about $3,300, and had as assets $12,000 due from the City, and $4,250 of subscriptions payable. In order to complete the fund of $250,000, which we are obliged to raise under our original agreement with the City, we still need $35,500.12, which must be subscribed during the next few months.

During the past year nineteen meetings of the Committee have been held. To our regret, Mr. Charles E. Whitehead, who has served on the Committee for five years, felt obliged to resign. Mr. Charles T. Barney, was elected to fill his place. We also regret to record the resignation of Mr. L. V. F. Randolph as Treasurer. The Society is extremely indebted to Mr. Randolph

for the accuracy and fidelity with which he has administered its accounts. Mr. Barney was elected Treasurer to fill the vacancy.

A large amount of business has been transacted in the General Office of the Society under the direction of the Secretary.

Finances and Construction.

An increase of annual membership to 3,000 necessary.

A strong effort has been made to increase the membership, and several thousand invitations to join the Society have been sent out, resulting in the addition of nine life and one hundred and thirty-four annual members during the past year. The membership on January 1, 1901, was nine hundred and sixty-nine of all classes. There have been only seventeen resignations. The total increase during the year 1900 was as follows:

Patrons	4
Life Members	18
Annual Members	218

The income from annual members is now about $8,000 in addition to Life Membership fees. From the General Fund $7,000 was transferred to the Park Improvement Fund during 1900, for construction, purchase of animals and deficiency in maintenance.

It is very desirable to increase the number of annual members to 3,000, and thereby increase our income to $30,000. This will enable us to supply the Park very handsomely with animals, and make constant additions to our buildings. The City Maintenance Fund will rise gradually, but we shall need at least $30,000 a year above this, and the citizens of New York can readily subscribe it. The London Society receives about $36,000 a year from its members.

When the two tropical buildings, the Lion House and Monkey House, now beginning construction, are completed, we shall need at least $30,000 a year to add smaller installations and to keep the Park fully supplied with animals from all parts of the world. The initial cost of supplying the Monkey House will be not less than $6,000.

It is necessary, moreover, to begin scientific and popular publications, and to get in closer touch with the educational system of the city.

THE ANIMAL FUND.

By agreement with the City, the receipts from all privileges, and the net profits of all sales in the Park, go toward the purchase of animals, and are set aside as the "Animal Fund."

The Society is receiving a steadily increasing income from the entrance fees, sale of guide books, restaurant privileges, and various other franchises within the Park. In the year 1900 the total of these amounts was $3,774.83, which was immediately applied to the purchase of animals, and to cover the expenses of the western trip of the Director, which was undertaken for the sole purpose of securing a continuous supply of Western types.

THE SOCIETY SUBSCRIPTION FUND.

Our subscription fund from members, known on our books as the Park Improvement Fund, on January 1, 1901, amounted to $210,249.88, being an increase of $48,443.34 during the year 1900, including unpaid subscriptions. This fund is devoted to construction, purchase of animals, and, during the past two years, to making up deficiencies in maintenance.

Additional subscriptions from former subscribers, are as follows:

	Additional Subscriptions.	Total.
ANDREW CARNEGIE	$6,500	$11,500
LEVI P. MORTON	1,500	6,500
JACOB H. SCHIFF	1,500	6,500
WILLIAM K. VANDERBILT	1,000	6,000
WILLIAM C. WHITNEY	1,000	6,000
PERCY R. PYNE	1,000	6,000
JOHN L. CADWALADER	2,500	5,200
JOHN S. BARNES	2,500	5,000
F. AUGUSTUS SCHERMERHORN	2,500	5,000
CHARLES T. BARNEY	3,000	4,000
HUGH J. CHISHOLM	2,550	3,550
JAMES C. CARTER	1,500	2,500
SAMUEL D. BABCOCK	1,500	2,500
GEORGE CROCKER	1,500	2,500
HENRY F. OSBORN	1,000	2,000
WILLIAM C. SCHERMERHORN	1,000	2,000
WILLIAM C. OSBORN	500	1,500
JOSEPH STICKNEY	500	1,500

New subscribers are as follows:

Thomas F. Ryan	$1,500
Mrs. Percy R. Pyne	1,000
George C. Clark	1,000
Mrs. George Lewis	1,000
John S. Kennedy	1,000
Miss A. B. Jennings	1,000
D. Willis James	1,000
Adrian Iselin	1,000
H. C. von Post	1,000
Cleveland H. Dodge	1,000
Charles E. Whitehead	500
Frederick Sturges	500

EXPENDITURES FROM SUBSCRIPTION FUND, IN CONSTRUCTION.

The year 1900 has seen the practical completion by the Society of many of the buildings and installations which were in process of erection at the opening of the Park, including the Flying Cage, which has been a most unqualified success from every point of view.

During the past year, the chief expenditures by the Society on installations were as follows:

Flying Cage	$5,495 05
Polar Bear Den	3,735 47
Bear, Wolf, and Fox Dens	3,816 91
Reptile House	2,736 45
Bird House	1,770 68
Small Mammal House	719 91
Burrowing Rodents	537 00

CITY MAINTENANCE FUND.

For two years there has been a deficiency in maintenance, owing to no lack of good-will on the part of the City authorities, but a failure to understand the needs of the Park. In 1899 the City contributed $30,000, and the Society contributed $7,038.61 toward the maintenance of the Park. In 1900 the Maintenance Fund of $40,000 again resulted in a serious deficiency, which has been met by the Society by a contribution of $6,189.33. This de-

ficiency would have been much larger but for the fact that much of the grading and forestry work was legitimately charged to the Ground Improvement Fund of $125,000 provided for under Chapter 510, laws of 1897.

It must be remembered that we have the care of a large Park, as well as of the buildings and animals. The Society estimated $80,000 as the fund needed for 1901, in order to meet the increased demand for food, fuel, additional keepers, etc. The amount appropriated by the City was $65,000. We trust that this fund will enable the Committee, by the greatest economy, to maintain the Park on its present limited scale without a serious deficiency, but a much larger amount will be needed in 1902 to meet the necessities of the new buildings.

The expenditures on account of maintenance during 1900 were as follows:

Paid from City Fund:		
For salaries and labor	$30,846	31
For food for animals, fuel, and miscellaneous supplies	15,343	02
Total	$46,189	33
Maintenance appropriation for the year.	40,000	00
Deficiency paid by the Society	$6,189	33

In order to meet current maintenance, bills, and expenditures from the Ground Improvement Fund of the City, before the same are repaid by the City (a period of from four to eight weeks), a working capital of about $18,000 is needed. This explains the loan of $17,000 and interest mentioned in the Treasurer's Report. Similar loans must be secured from time to time to enable the Society to use its Park Improvement Fund for construction, and the purchase of animals.

APPROPRIATIONS AND EXPENDITURES BY THE CITY FOR PERMANENT IMPROVEMENTS.

An appropriation of $300,000 was secured for the Society by the passage of the bill in the Legislature of New York, now known as Chapter 432, Laws of 1900, which became a law on April 13, 1900, a copy of which is attached to this report. Under

the terms of this act, the Board of Estimate and Apportionment appropriated $160,000 on July 24, 1900, which was added to the unexpended balance of the appropriation of $125,000, made available under Chapter 510, Laws of 1897. The balance of $140,000 was applied for on January 22, 1901. With the funds supplied by these appropriations, the principal items of the following work have been contracted for, and of the remainder the plans are practically ready: Work-shops, Monkey House, extension of service road, sewers, grading, and planting.

The plans for the Lion House are nearly complete, and they will be placed in the hands of the Park Department at an early date.

IMPORTANT ITEMS OF CONSTRUCTION BY THE CITY IN 1900.

Restaurant and Shelter Pavilion.

Nine thousand seven hundred and fifty lineal feet of gravel walks resurfaced.

One thousand five hundred lineal feet of service road resurfaced.

Banks of Cope Lake graded, surfaced, and seeded.

About 1,000 feet of new walks constructed.

About 900 shade and ornamental trees planted in the grounds.

About 1,200 forest trees were overhauled and pruned.

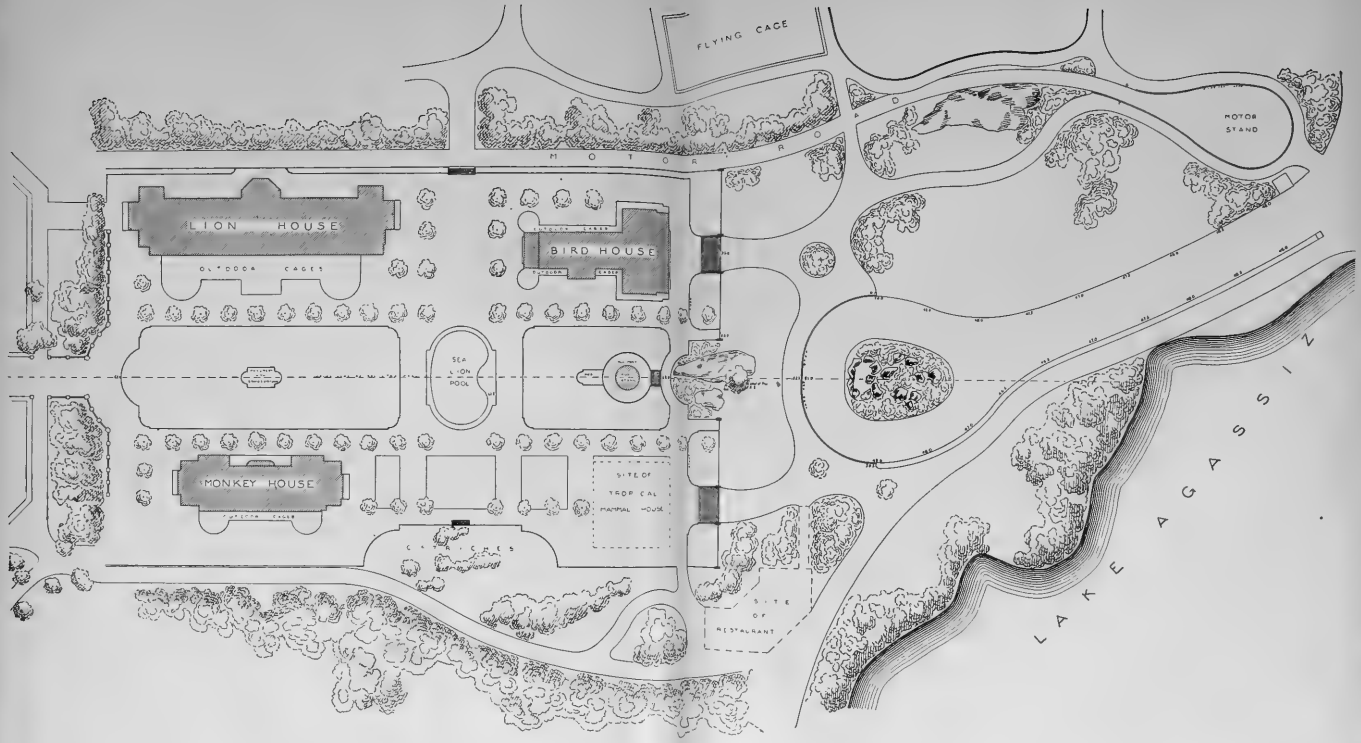
PLANS FOR THE BUILDINGS, BAIRD COURT AND CONCOURSE.

After years of careful study and consideration, the main plans of the Park, especially of Baird Court, have been finally completed.

In this important work the Committee, on the recommendation of the Chairman, Professor Osborn, determined upon the following features as an essential basis for its development:

1. The establishment of a north and south axis to coincide not only with the axis of the glade, but with the axis of the Park as a whole. This axis runs south from the Elephant House, directly past the Wolf and Fox Dens and three important aviaries, giving a noble vista of the Elephant House from the south.

2. The establishment of the Court on a single level—especially necessary for the accommodation of very large crowds of people



PLAN OF BAIRD COURT AND THE CONCOURSE.

Designed by H. A. Caparn, Landscape Architect, under the direction of the Executive Committee.

Scale, 1 inch = 120 feet.

upon the surface of the Court, and to give abundant access and approaches to the buildings on all sides.

3. The provision of space for a road for motor carriages along the west side, under the boundary line of large trees. This makes practicable a complete motor carriage circuit of the Park, whenever it becomes necessary.

4. The provision of a raised or "terrace walk and service road" to the west of the Lion House and Bird House, so that the administration of these buildings can be carried on from the rear.

5. The widening of the Court, and provision of greater space between the main buildings.

6. The planting of avenues of trees to afford shade, both for visitors, and for animals in the open-air cages. The provision of space for a music stand, also the second floor balcony of the main restaurant to be on the level of the Court.

Upon the recommendation of Mr. De Wolf the plan was committed for detailed study and execution to Mr. H. A. Caparn, landscape architect.

The Committee has devoted a very large amount of time and study to the whole matter of Baird Court and its approaches, with the satisfactory result that conclusions have at last been reached resulting in a final plan, approved in every quarter.

In June, 1900, while considering this subject, the Committee determined to secure the best expert advice obtainable, and appointed a Board of Experts, consisting of Charles F. McKim, Esq., Charles Platt, Esq., and John De Wolf, Esq., Landscape Architect of the Park Department, who were requested to consider the scheme and plans for the development of Baird Court, and to whom all plans were to be submitted and full explanation made.

Mr. Platt was unable to act from illness, but Mr. McKim kindly placed himself at the service of the Committee, and considered the whole subject in conjunction with the Landscape Architect of the Park Department, and made suggestions of value in the development of the plan.

The plan as finally reached, containing the features above enumerated, was unanimously approved by the Executive Committee, November 30, 1900, and thereafter received the official approval of the Park Department.

The work on Baird Court is now in progress under this plan,

and the construction of the Monkey House is now proceeding under the direction of the Park Department, and the Society's Architects, Messrs. Heins and La Farge, have nearly completed the plans of the Lion House, both which buildings the Committee is satisfied will receive well-earned approval, both for arrangement and taste.

Careful study is still given to the sculptural and artistic treatment of the buildings.

Mr. A. P. Proctor, the well-known animal sculptor, has executed the sculpture upon the Bird House and Reptile House, in consultation with the Architects, and has been engaged for similar work on the Monkey House. Mr. Eli Harvey, upon our invitation, has come from Paris to prepare designs for "sentinel lions," heads, a frieze and panels upon the Lion House. These will be submitted to the members of the Municipal Art Commission before their adoption.

General Administration.

ATTENDANCE.

The attendance at the Park, in spite of the difficulties of access, has been so large as at times to seriously crowd the building and paths, and the Society will have to devise means to provide for the increasing attendance in the near future, as the knowledge of the Park becomes wider. When the Rapid Transit system is completed to West Farms in about two years, the walks and paths, to say nothing of the buildings, will be taxed to the utmost to accommodate the crowds.

Attendance, total for 1900.....	525,928
Month of greatest attendance, May.....	94,965
Day of greatest attendance, May 30th....	20,134

ELEVATED RAILROAD.

The Elevated Railroad is about to extend its system to Fordham, and an elaborate scheme of boulevard development around the southern, eastern, and western boundaries of the Park is under contemplation by the Park Department.

PUBLICATIONS.

The publications of the Society during the year 1900 consisted of the Fourth Annual Report, and Bulletin No. 4, which were published early in the spring and sent to all members of the Society. Of the latter, an extra edition of 5,000 copies was printed and widely distributed in order to increase the general public interest in the Zoological Park.

A change in the form of the Bulletin is contemplated which will give it a more permanent character, and gradually make it an appropriate medium of publication of more or less scientific communications. An official bulletin describing the methods of the Zoological Park work, and improved treatment of animals, new modes of installation, observations upon the habits of animals in captivity, would render great service to the cause of zoological parks in this country. Already we find cities of the United States turning to us for advice. The Chairman has recently received a communication from Japan requesting the transmission of all the publications of the Society, to aid in the establishment of a Zoological Park in Kioto, and the ground plans of our Lion House have been furnished the Zoological Society of Dublin, by its request.

In addition to the Fourth Annual Report, which was widely distributed, the Guide Book prepared by Director Hornaday has proved very successful, and has had an extensive sale in the Park. Three thousand copies of the first edition were printed. A second edition of 3,000 was also disposed of, and a third edition of 5,000 copies, revised and improved by the addition of many new plates, has just been printed. Copies of this will forthwith be supplied to all members.

The Chairman proposes the preparation of a popular book upon the Zoological Park, richly illustrated by photographs, with anecdotes, with a popular description of the animals, for sale in the New York book-stores, as a means of spreading the general knowledge of the Zoological Park.

PHOTOGRAPHY.

Considerable progress has been made with photography, and some very artistic and valuable photographs have been secured, chiefly the work of Mr. Ernest F. Keller. Altogether the collec-

tion of negatives now numbers one hundred and thirty-six. Of certain types of animals, these negatives are unique.

THE WORK OF THE COMING YEAR.

The programme for the year 1901 includes the following important items:

The construction of the storehouse and workshop building, the Monkey House, the Lion House, the development of the south half of Baird Court, the extension of the Motor Road from Pelham Avenue to the Boston Road, the building of additional walks and paths, and the location of enclosures for certain types of animals not yet provided for.

A very important improvement is under consideration for that portion of the Park lying east of the Bronx River, in which it is hoped to secure the co-operation of the City in the development of the various approaches to the Park on the south, east, and west.

Among the scientific duties of the coming year will be the extension of our records of the lives of animals in captivity, their treatment in disease, and a series of careful experiments in the acclimatization of types of deer and prong-horns from the Rocky Mountain region.

In conclusion, the Executive Committee desires to acknowledge the cordial and intelligent co-operation of the following City officers: Commissioner Moebus, of the Borough of the Bronx, and his staff; Landscape Architect De Wolf, the Mayor, the Comptroller, the Corporation Counsel, and, in fact, of all the City officials who are in a position to aid in promoting the success of the Zoological Park.

We also desire to commend most warmly the efficient management of the Park by the Director and his staff of assistants, in all departments of the Park service.

Respectfully submitted,

HENRY FAIRFIELD OSBORN, *Chairman.*

JOHN L. CADWALADER, MADISON GRANT,
JOHN S. BARNES, PHILIP SCHUYLER,
WILLIAM WHITE NILES, CHARLES T. BARNEY.

LEVI P. MORTON, *Ex-officio.*

New York, January 1, 1901.

LION HOUSE OF THE NEW YORK ZOOLOGICAL PARK.

Heins & La Farge, Architects. To be erected 1901-2.

REPORT OF THE DIRECTOR OF THE NEW YORK ZOOLOGICAL PARK.

The first year of the actual existence of a Zoological Park, or Garden, is necessarily its year of severest trial. The actual test of new and previously untried accommodations for animals is, to those who plan and erect them, inevitably a source of great anxiety. There is always to be dreaded the discovery of new and unexpected physical conditions which will nullify the most anxious forethought, and thwart the most lavish expenditure.

The first year's work of the curators and keepers of animals was a continuous effort on their part to adjust themselves to their positions, and their animals to their strange environment. Of the animals themselves, the great majority have been recent captures, bearing visible marks of traps and forcible subjugation. It is well understood among animal dealers that of all newly captured or newly imported animals, a heavy percentage die during their first year. The term "acclimated" is now in general use to distinguish those individuals which have settled down in captivity, and seem willing to act rationally in the very important matters of eating, drinking, and exercising.

Next in the catalogue of the initial year's anxieties stands the adjustment of the Zoological Park to the needs of the public. The members of the Society were fully aware of the fact that the Park was opened to the public long before the comfort of visitors was adequately provided for. But the public desired to enter and observe the progress of improvements, regardless of the lack of restaurants, shelter pavilions, and other provisions for comfort, and, therefore, the gates were opened. Although the Society and the Park Department did everything possible to promote the comfort of visitors, the things undone were a constant cause of regret.

But the public has accepted the situation with a degree of

patience and loyalty to the undertaking, which has been a constant surprise and gratification. As quickly as the materials could be procured, the imperfect walks of last winter were wholly resurfaced, seats were provided, a temporary lunch-room was hastily fitted up by the Society in the east end of the Reptile House and opened to visitors, a soda fountain was established, ice water provided, and a large shelter pavilion erected. Visitors have been permitted to open their boxes of luncheon in every portion of the grounds. While this has involved quite an amount of extra labor, the privilege has been so greatly enjoyed by visitors, that their pleasure in it has afforded compensation for the extra labor.

RELATIONS WITH THE PUBLIC.

So far as the Director is aware, the relations between the public and the employees of the Park have been generally satisfactory. Offences against the posted rules have been very few in number, and the great majority of such offences have been directed against the proper protection of the grounds. There are a few persons who are provokingly slow in recognizing the fact that trees in the Park are not to be climbed and broken, that shrubbery must not be destroyed, and that wild flowers must not be dug up and carried away wholesale.

Since the formal opening of the Park, there have been no serious cases of annoyance or cruelty to animals in the collections. On the contrary, the extent to which visitors not only refrain from annoying or injuring the animals, but actually cooperate in their protection, has been to the Society a source of profound satisfaction.

Of complaints by the public against Park employees for rude treatment, only one case has been brought to the attention of the Director. This was quickly investigated and settled on a basis satisfactory to the aggrieved party. It is the belief of the undersigned that all the permanent employees of the Park, from the highest to the lowest, are faithfully striving to carry out the wishes of the Society, that all visitors to the Park who conduct themselves properly should be accorded the most polite and helpful consideration.

The rules and regulations adopted at the opening of the Park have proven to be well adapted, both to the regulation of the

public and the general administration of the Park. In fact, during the entire year, it has not been found necessary to make any changes in either set of regulations.

WORKING FORCE.

There have been but few changes in the permanent force, beyond the promotion of four helpers in the animal departments to keepers' positions. The work of caring for and exhibiting the living animals has been as well systematized as the imperfect facilities available would permit. The lack of the service building has been a most serious drawback in caring for the property of the Park and food supplies, in the preparation of food, etc. However, that much-needed building is now under construction, and its completion about June 1st will be of great advantage to the entire administration.

COLLECTIONS.

During the past year, many new species of living creatures were added to the collections. The Director's desire to have the collections of mammals and birds represent as many as possible of the most important species, led him into what he now regards as an error, in accepting species for which no proper accommodations had been prepared. In more senses than one, it was a mistake to acquire animals properly belonging in the Lion House, Antelope and Monkey Houses, when none of those buildings were in existence. Our attempts to keep carnivorous animals in temporary quarters have resulted in too many losses by death. The temporary Small Mammal House has admirably preserved its living contents, but in cold weather it is filled to overflowing, which necessitates the placing elsewhere of numerous animals that require constant warmth. The Florida otters, which could not have survived a Northern winter in the Otters' Pool, have usurped the marine turtles' tank in the Reptile House, where all their wants are well provided for, but where they themselves are quite out of place.

The Buffalo House has been fitted up with stalls and stoves, and is now occupied by the tropical deer, peccaries, and other animals requiring artificial heat. About one-half of the wall cages of the Bird House are occupied by a miscellaneous gather-

ing of land birds, which have displaced an equal number of water birds belonging there. These, being duplicate specimens, have been provided with a heated shelter-house that was hurriedly erected in the animal yard.

To accept specimens for which there are no satisfactory quarters, is to invite difficulty; and it would seem to be wise to return to our former policy of resolute refusal of all animals for which suitable homes have not yet been provided.

DEPARTMENT OF MAMMALS.—*J. Alden Loring, Assistant Curator, in Charge.*

The collections of quadrupeds were increased during the year by 113 gifts and 315 purchases. The special efforts put forth for the increase of these collections were almost wholly directed to the securing of important and representative American forms; and it was found that some of the most desirable species were the most difficult to obtain. Of mammals from the eastern half of the United States, a very good selection was brought together, but the Rocky Mountain region, and westward thereof, proved to be a field very difficult to exploit by correspondence. Accordingly, in October, the Society instructed the Director to make an official tour to and through the West and Northwest, to purchase desirable animals, and establish relations with resident collectors which will yield permanent supplies of desirable species. Already that effort has produced a gratifying number of mule deer, antelope, Columbian black-tailed deer, moose, and many smaller animals, with a reasonable certainty of future supplies.

Regarding two important species, the Society has had annoying experiences. It was believed that a reasonable amount of effort would secure, either by gift or purchase, a sufficient number of beavers to stock the Beaver Pond, and several otters for the Otter Pools. Both those installations were completed several months ago, and although the efforts to secure animals for them have been persistent and unremitting, and standing orders have been placed in the hands of at least twenty men who have asserted their ability to fill them, during 1900 not one beaver was received, and until last November no otters were secured.

Once, indeed, in Maine, two fine beavers actually in hand were offered to the Society at a satisfactory price, accepted forthwith, and two cages were made in which to ship them. At the last

moment, the State Game Commissioners refused to grant a permit for the exportation of the animals. The Governor of Maine was appealed to, but quite in vain. The Zoological Society has paid for the construction of the useless shipping cages, and lost the beavers. This action of the Game Commissioners was very unexpected. The authorities of Minnesota, Colorado, Texas, Montana, and British Columbia and Newfoundland have willingly and promptly granted to the Society permits to receive and export protected animals.

At last we are in receipt of information that one of our resident collectors has secured ten beavers for the Zoological Park, that the animals are feeding properly, and very soon will be shipped to New York.* In November two fine otters were purchased, and it is hoped that the Society's vexations on account of these two species of animals are about at an end.

During the year, the herd of buffaloes was increased by the addition of two fine adult male animals, received by gift from Hon. William C. Whitney, two calves born, and three adult cows received on deposit for two years from David J. Gardiner, these additions bringing the total number of individuals in the herd up to fourteen. Mr. Charles T. Barney presented two fine moose, from Manitoba, and Mr. Austin Corbin, for the Blue Mountain Forest Association, presented a herd of eight Virginia deer, and a wild boar. Mr. William Rockefeller presented four fine specimens of typical fallow deer, and a pair of European red deer, and the Duke of Bedford donated a large specimen of the equine deer of the East Indies, and two sambar deer.

The month of August produced a discouraging degree of mortality amongst the large ruminant animals from the plains and mountains of the West. The difficulties involved in acclimatizing moose, antelope, caribou, mule deer and Columbian black-tailed deer anywhere on the Atlantic coast, or in the Mississippi Valley has from the first been fully recognized. The great majority of the efforts that have been made to rear these species to maturity, and induce them to breed anywhere east of the great plains, have resulted in failure and disappointment. Notwithstanding this, the Zoological Society long ago determined to

* Two of these specimens have been forwarded. They arrived at the Park in good condition, and in April were liberated in the Beaver Pond, where they immediately made themselves at home.

experiment and persevere with these species until at least the majority of them have been successfully established here. For this reason, special efforts have been bestowed upon procuring specimens, and their care has been the Director's special charge.

Our work thus far has established several important facts, the most interesting and valuable of which is that the prong-horned antelope cannot live on Eastern grass, and its existence here requires that it be kept on land so sterile that rich, soft grass will not grow upon it, or else in yards wherein it can be limited to dry food. The experiment was therefore tried of bringing hay and alfalfa from the plains region of the West, thus far with excellent results.

At present the Park ranges contain ten prong-horned antelope, four moose, one caribou, seven mule deer, and seven Columbian black-tailed deer, besides other herds that have thriven continuously, and require no special mention here. By the authority of the Executive Committee, a skilled veterinary surgeon has been engaged for a short daily attendance at the Park, to assist and advise us. It is hoped that in time results of permanent value to the promoters of zoological parks and gardens may be reached, and if so, they will be published by the Society.

During the past year the Burrowing Rodents' Quarters have been completed, and filled with rodents and small carnivores of about twenty species, several of which were collected in California for the Society, and are new to the public of this locality.

It is a pleasure to be able to report that the first year's use of the Bear Dens has proven them to be admirably adapted to their purpose. They are all that it was hoped they would be, and the animals inhabiting them have been both healthy and happy to a degree rarely seen in captive bears. All the young bears have developed rapidly and well. This is particularly true of the Kadiak bears, the grizzly and cinnamons. The abundance of floor space has led all the younger animals to spend their waking hours in wrestling, boxing, climbing, and chasing each other, and also in frequent bathing in the pools. It is doubtful whether wild bears of the same age would have had more exercise in the same time than has been indulged in by these specimens. This healthful exercise has promoted both good health and good temper, and by preventing all annoyance or teasing of these animals, and feeding them in such a manner that there is no excuse for quarrelling,

there has never, save once, been any real fighting, and the bears are perfectly friendly with their keepers.

The only serious disagreement in the Bear Dens was caused by the introduction of a very bad-tempered and pugnacious black bear cub, which tyrannized over all its cage mates, and made itself so generally obnoxious that finally it was deliberately sought out for punishment by the large cinnamon bear, who bit it so savagely and persistently, in spite of the severe punishment instantly inflicted upon him by the keeper in charge, that eventually it died from its injuries.

For several months the two large polar bears were confined, temporarily, in one of the dens rightfully belonging to the grizzlies, in consequence of which they suffered in a peculiar way. Being very playful, their antics in the pool, which was too small for them, rubbed the hair off their backs, and produced eventually a condition which resembled a skin disease. Finding that the animals could not be prevented from injuring their backs in their temporary den, the construction of their own den, at the north end of Rocking Stone Hill, was hurriedly begun, and hastened by every means. It was completed and occupied by the polar bears on October 6th. From that day the backs of the animals began to heal, the hair began to grow, and to-day there is no visible sign of their former condition. The Polar Bears' Den is by far the most spacious and the finest of the series, and its situation is very picturesque.

On January 1, 1901, the mammal collections of the Park contained the following representatives:

	Species.	Specimens.
Primates	14	17
Insectivora	1	2
Carnivora	41	66
Ungulata	18	74
Rodentia	24	226
Edentata	2	3
Marsupialia	4	17
Seven Orders	106	405

Received by gift	113	specimens.
Purchased	315	"
Born	28	"
Net gain during year, 62 species,	254	"

DEPARTMENT OF BIRDS.—*C. William Beebe, Assistant Curator, in Charge.*

In this department, the most noteworthy event of the year was the satisfactory completion of the great Flying Cage, and its occupancy by about twenty-five species of water birds, numbering nearly 100 individuals. The evident happiness of the birds, and their freedom of action, combined with the abundance of tree and plant life, and of running water, rendered the Flying Cage one of the chief attractions of the Park. A series of pictorial identification labels, painted by Charles B. Hudson, adds very greatly to the scientific value of the collection.

In the Department of Birds, important increases have been made in the collection of geese and ducks, which now contains 186 specimens, representing twenty-eight species. As heretofore in winter, a representative series of these birds is now installed in the Bird House. Noteworthy additions to the bird collection were four fine cassowaries and two crown pigeons, imported direct from the Malay Archipelago, which have thriven satisfactorily. During the warm weather, the cassowaries were exhibited in the corral of the Caribou Range, directly south of the Bird House, where they attracted universal attention. Mr. A. Edward Pond presented to the Society a flock of five wild turkeys, which finely represent that important species, the largest and finest of all game birds.

On November 7, 1900, the wild geese on the Aquatic Mammals' Pond received a very noteworthy increase. A flock of nine wild geese migrating southward flew over the Park, observed the pond and the wild geese upon it, and immediately alighted and joined the captive birds. Finding that the Park offers abundant food, freedom and security, the wild flock elected to remain. With Page gates, a huge coop, with guiding wings, was set up on the eastern bank of the pond, and food employed as a bait. The first day's efforts to entrap the wild birds proved unavailing. At last, however, the task of driving the wild birds into the trap was finally accomplished. Their primaries were clipped, and the nine Canada geese which voluntarily adopted the Zoological Park as their home were duly entered in the list of "gifts." To all those who believe in omens, this strange accession will seem full of significance.

Late in the year the Zoological Park received from the heirs of the late Samuel B. Schieffelin a valuable gift, consisting of a collection of forty-seven pheasants of four species—golden, silver, Reeves, and Amherst—together with six shelter-houses, and an extensive series of runways. All these buildings and materials have been transported to the Park, and a series of temporary runways and shelters has been erected for the accommodation of the pheasants.

The need of permanent aviaries for the eagles and vultures, pheasants, cranes, and upland game birds is very great, and it is hoped that they may be erected during the present year.

On January 1, 1901, the Bird Department contained the following birds:

Order.	Species.	Specimens.
Struthiones	1	4
Longipennes	5	23
Steganopodes	4	14
Anseres	28	186
Odontoglossæ	2	5
Herodiones	15	41
Paludicolæ	2	6
Gallinæ	7	58
Columbæ	4	8
Raptores	19	50
Psittaci	10	16
Coccyges	1	2
Passeres	6	12
Thirteen Orders	104	425

Received by gift	106	specimens.
Purchased	310	"
Hatched	49	"
Net gain during year, 61 species,	240	"

DEPARTMENT OF REPTILES.—*Raymond L. Ditmars, Assistant Curator, in Charge.*

The Reptile House is permanently fixed in the minds of visitors as a centre of attraction. Both in the preservation and exhibition of its living contents, it has successfully endured the test of fifteen

months' actual use. Since the opening of the Park, not one death of first-class importance has occurred in this department. The largest specimen lost was a rock python nine feet in length, all others having been small and unimportant. Excepting that specimen, all the large pythons, anacondas, and boas are in fine condition.

All things considered, the Alligator Pool is perhaps the most satisfactory single feature in the Reptile House. All the alligators have grown with astonishing rapidity, and are in perfect health. The largest specimen measured in September, 1899, twelve feet one inch. In January, 1901, it measured twelve feet eleven and one-half inches, a gain of nearly a foot. Two large abscesses which it developed on its front feet from rubbing them against the sides of the pool were operated upon, and in a short time were permanently cured.

During the past year, Assistant Curator Ditmars developed a system of compulsory feeding of large serpents, which has produced very valuable results. Heretofore, though not in our collection, it has frequently occurred that large pythons and boas which were unwilling to take food voluntarily have been permitted to die by slow starvation. Mr. Ditmars prepares a string of dead rabbits, pigeons, or other food animals, and with the aid of several keepers, and the exercise of much skill and judgment, forces the whole collection down the serpent's throat. If the food is persistently disgorged, it is immediately re-introduced. Strange to say, food thus thrust by force into a serpent is properly digested, and assimilation appears to be as perfect as when it is brought about by more natural processes.

Notwithstanding the number of poisonous serpents in the collection, and the frequency with which their cages are opened, thus far none of the members of the working force of the Reptile Department have been bitten.

The needs of the public required the temporary use of the Tortoise House as a lunch-room, but for which that feature would long ere this have been fully developed. At present, the tortoises are much scattered, and the group is devoid of character.

The most important additions to the collections of the Reptile Department consisted of two very large regal pythons, twenty-seven feet four inches and twenty-five feet long respectively, and two fine specimens of the king cobra, all imported direct from

Singapore, and an anaconda sixteen feet in length, from Demerara. During the summer of 1900, Curator Ditmars and Keeper Charles Snyder spent their vacation in the swamps of South Carolina, as guests of the Pinelands Club, where they made an exceptionally fine collection of the showy water-snakes which there abound. A selection from this series, with the addition of two diamond-back rattlesnakes, was sent to the London Zoological Society in exchange for African puff adders.

On January 1, 1901, the Reptile House contained the following specimens:

Order.	Species.	Specimens.
Crocodilia	2	30
Chelonia	30	38
Lacertilia	15	57
Ophidia	45	340
	92	465
Batrachia	18	98
	110	663

Received by gift ..... 261 specimens.
Purchased ..... 103 "
Collected ..... 422 "
Born ..... 89 "
Net gain during year, 18 species, 218 specimens.

SUMMARY OF LIVE ANIMALS ON HAND ON JANUARY 1, 1901:

	Species.	Specimens.
Mammals	106	405
Birds	104	425
Reptiles	110	663
Total	320	1493

Received by gift during the year, 480 specimens.
" " purchase ..... 728 "
Born in the Park..... 166 "

DEPARTMENT OF ADMINISTRATION.—*H. R. Mitchell, Chief Clerk.*

During the past year, this department has transacted a great amount of business in a very satisfactory manner. The semi-

monthly pay-rolls have been heavy, the bills payable have been numerous, and owing to the necessity for triplicate copies of all these, they have involved a serious amount of labor and attention. The Society and Park accounts have involved the keeping of four sets of books, and the production of numerous statements and balance-sheets, including the itemized annual statements of the Treasurer.

In addition to the above, the Chief Clerk, assisted by Mr. Elwin R. Sanborn, has purchased all supplies, conducted all business in connection with the entrance gates, watch service, Park privileges, tenants, sales of guide-books and photographs, and also established and maintained the lunch-room in the eastern end of the Reptile House. Through the energetic efforts of Mr. Mitchell, the total income accruing during the year to the credit of the Animal Fund has amounted to the very acceptable sum of $3,965.29, all of which was expended in the purchase of animals.

During the absence of the Director in the Northwest, the Chief Clerk filled very acceptably the position of Acting Director, and the business of the Park went forward quite as usual.

The monthly attendance of visitors during the year 1900 was as follows:

January	20,480
February	21,208
March	42,652
April	62,140
May	94,965
June	70,115
July	56,311
August	39,446
September	45,545
October	25,990
November	29,710
December	17,366
Total attendance during the year	525,928
Greatest attendance in one day, May 30	20,134

DEPARTMENT OF FORESTRY AND GARDENING.—*Hermann W. Merkel, Chief Forester.*

To this department, also, great credit is due for the amount of intelligent and effective work accomplished by it during the past year. Its organization is admirable, and its usefulness covers a wide field. The following is an exhibit of the most important items of work accomplished during the year 1900:

Regraded, top-soiled, and seeded the banks of Cope Lake and the Elk Pond; also built overflows for both.

Excavated and brought to a finish the pool near Bird House, and the brook running through Birds' Valley.

Excavated and lined with stone two bathing pools, in the Caribou and Moose corrals.

Planned and carried out the planting of about 900 shade and evergreen trees in border plantations, in Birds' Valley, Elk Range, and along exposed walks in other portions of the Park.

Thoroughly inspected and pruned about 1,200 forest trees, and cut out about 90 dead or dangerous trees.

Cut, stored, and distributed 52 tons of ice, and distributed 102 tons additional.

Built walks at doors of Mammal House, west of Fox Dens, and to toilet buildings; also scraped service road, and all walks in the Park preparatory to their being top-dressed.

Built 21 walk-drains with iron gratings and brick catch-basins.

Built dam, and laid 650 feet of 6-inch pipe to conduct brook into head of Beaver Pond.

Erected nearly 1,200 feet of wire guards along walk borders.

Graded, top-soiled, seeded, and decorated interior of Flying Cage.

Graded, top-soiled, and seeded about 7 acres of ground in various portions of the Park.

Distributed and placed in position 200 Park settees.

Cut and stacked 12 tons of hay.

Collected and transported a carload of trees from Garrison, New York, to the nursery, and set them in the nursery.

Demolished and removed an old barn in Bronxdale.

Maintained and cleaned daily all walks and roads; mowed lawns and meadows; removed garbage and ashes; distributed some food, and assisted in the cleaning and maintaining of buildings and aviaries.

Built at the nursery a large root cellar, and excavated the cellar for the new greenhouse.

Raised and distributed, or stored, the following food for animals: About 11 tons of root crops, 2,500 heads of cabbage, 4,500 roots of celery, 4,279 heads of lettuce, 2,500 ears of sweet corn, 100 bundles of corn-stalks, 354 pumpkins, squash and melons, 2 tons of clover hay, and other vegetables in smaller quantities.

DEPARTMENT OF CONSTRUCTION AND REPAIR.—*Samuel P. Senior, Chief Constructor.*

During the past year, the only important change in the Zoological Park staff was the resignation of Mr. W. H. Puffer, as Chief Constructor.* Mr. Samuel P. Senior was immediately appointed to fill the vacancy thus caused. Mr. Senior is a graduate of the Engineering Department of the Lehigh University (1897), since which his experience in engineering, architectural construction, road-making, etc., has admirably fitted him for the wide range of his duties as Chief Constructor, and the Society is fortunate in having secured his services in that position.

The most important item of work in this department was the construction of the Polar Bears' Den, against the precipitous northern face of Rocking Stone Hill. Of all the dens for carnivorous animals ever constructed thus far, this is believed to be the most spacious and imposing. Its rear wall is a perpendicular cliff of pink and gray granite about twenty-five feet in height, so smooth and precipitous that the bears cannot climb it. This is without bars or overhang at the top. A very spacious, brick-lined sleeping den, resembling a cave, has been constructed in the southeastern face of the cliff. The floor of the enclosure consists chiefly of the natural ledge of rock which was uncovered for the purpose. The deep and very roomy swimming pool which was blasted out of the solid rock, has proven of incalculable benefit to the inmates of the den. The coping which carries the steel cage work has been built wholly of weathered granite, and is far more pleasing to the eye than the best concrete. Mr. Puffer, and the masons working under his direction, are entitled to great credit for the skill and judgment displayed in the large amount of rock construction involved in this improvement. The steel cage work was constructed and erected in a manner highly satisfactory to the

* Mr. Puffer's resignation went into effect on Oct. 15, 1900.

Society by the Page Woven Wire Fence Company. The total cost of this fine improvement was about $3,500.

The remainder of the work of the Construction Department consisted of a great number of miscellaneous tasks, such as the following examples:

The erection of the Soda Fountain Pavilion.

Erection of twelve iron folding gates, and improvement of sixteen exit turnstiles at the entrance pavilions.

Construction of new walks around Polar Bears' Den, Restaurant, and in front of first Bear Dens.

Construction of temporary lunch-room and kitchen.

Construction of shelter-house for pelicans and cassowaries.

Construction of winter stalls and doors in Buffalo Barn, for tropical deer.

Erection of permanent metal guard-rails around Polar Bears' Den, areas at Bird House, and near Northwest Entrance.

Erection of four flagstaffs on entrances.

Laying of water lines to lower Buffalo Range, Polar Bears' Den, and Soda Water Pavilion.

Barrier erected at waterfall, to protect Park.

Stone coping laid under about two miles of fences.

Sewer constructed at Polar Bears' Den.

Fences erected at two entrances, for Wild Turkeys' Enclosure, at Fallow Deer Corral, and in Ducks' Aviary.

Gutters of brick and cement constructed near Bear Dens.

All cage work in the Park repainted, also all shelter-houses in animal ranges.

CIVIL ENGINEERING DEPARTMENT.—*George M. Beerbower, Engineer.*

The amount of work to be done by the Park Engineer continues undiminished, and the demands upon Mr. Beerbower have been so numerous that thus far it has been an impossibility for him to complete the large map designed to show all completed improvements. During the year Mr. Beerbower prepared the plans and specifications for the Polar Bears' Den and Soda Water Pavilion, surveyed and platted the extensions of the Motor Road, about 4,500 feet of new walks, the entire sewer system between Baird Court and West Farms, the Elephant Enclosures, and the site of the Service Building. For about six weeks his time was devoted

to the surveying, platting, and profiling of various trial lines for the eastern extension of the Motor Road, a section of which seems to present unusual difficulties in connection with other features of the Park.

IMPROVEMENTS AND EXPENDITURES BY THE PARK DEPARTMENT.

As heretofore, the Park Department for the Borough of The Bronx, under Commissioner August Moebus, has pushed forward with all possible despatch the improvement work which has devolved upon it. Not even one day has been lost unnecessarily by this department, and the development of the Park has been hastened in every possible way. The settlement of accounts between the Society and the Park Department has been prompt, and all plans laid before the Commissioner have been acted upon with gratifying despatch. Chief Engineer Martin Schenck has taken a lively personal interest in the Park and the Society's work therein, and the interests of both the public and the Zoological Society have been greatly advanced and promoted by him.

One of the most important items of the general work of the past year was the surfacing with trap-rock screenings and crushed gneiss top-dressing of all the walks in the Park, and the Service Road to the Reptile House. This gave a perfectly smooth surface, which is also dry everywhere, save in a few spots where special side drainage is necessary, and soon will be provided.

On August 9th, a new contract for the erection of the Rocking Stone Restaurant (known officially as "Public Comfort Building No. 1") was let to Messrs. Ryan & McFerran, at $17,300, who immediately began work upon the building, and expect to complete it in a satisfactory manner on or before March 15, 1901.

Messrs. Wm. H. Wright & Son erected a spacious Shelter Pavilion in front of the Wolf and Fox Dens in a very acceptable manner, for the sum of $3,800. On December 27, a contract was awarded to Wilbur T. Wright for the erection of the Service Building, at a cost of $12,900.

On January 24, 1901, a contract for the erection of the Primates House, commonly known as the "Monkey House," was awarded to Thomas Cockerell & Son, at $59,700, and there is every reason to believe that the contract is in good hands. Active work on this building began on February 10, 1901, and it will undoubtedly be completed during the present year.

THE ROCKING STONE RESTAURANT.

From the Rocking Stone.

Plans for the extension of the sewer system, for the northern extension of the Motor Road, and for about 2,000 feet of new walks have been filed with the Park Department, inspected and approved, and contracts will be advertised very shortly.

The following statement of funds appropriated by the Board of Estimate for ground improvements in the Zoological Park, and expenditures therefrom, has been kindly prepared by Mr. G. K. Ackerman, Chief Clerk of the Park Department, Borough of The Bronx:

RECEIPTS FROM APPROPRIATIONS.

July 27, 1898.—First part of first appropriation	$62,000 00
March 17, 1899.—Second part of first appropriation	63,000 00
November 27, 1900.—Instalment of second appropriation	100,000 00
Premium on bonds	11,163 50
Balance of bonds authorized, and to be issued	60,000 00
Total	$296,163 50

EXPENDITURES.

1898–1899.—	Contract, Bart. Dunn, "for Constructing and Improving grounds for Zoological Gardens"	$30,970 48
1898.—	Sundry bills for lumber, cement, etc., September 9 to December 31, 1898	434 09
	Sundry bills, L. V. F. Randolph, Treasurer, expenses, etc	799 45
	Engineers, Inspectors, etc., to December 31, 1898	870 82
	Labor pay-rolls to December 31, 1898	6,200 66
1899.—	Contract, T. W. Timpson & Co., "for furnishing all labor and all material for constructing four toilet buildings"	1,400 00
	Contract, Page Woven Wire Fence Co., "for erecting complete all wire fences, etc."	10,571 84
	Contract, V. L. Dunne, "for furnishing 200 settees"	1,200 00
	Contract, J. Frank Quinn, "for furnishing trap-rock screenings"	1,677 90
	Contract, John C. Rodgers, Jr., "for constructing walls, pools, etc."	21,816 73
	Contract, John R. Sheehan, "four entrances"	8,600 00
	Engineers, Inspectors, etc., from January 1 to December 31, 1899	4,001 41
	Labor pay-rolls, January 1 to December 31, 1899	1,860 51
1900.—	Contract, William H. Wright & Son, "for constructing shelter pavilion"	3,800 00
	Contract, N. W. Ryan, for constructing Public Comfort Building, on account	5,999 00
	L. V. F. Randolph, Treasurer, monthly bills for preparing grounds	25,251 26
	Engineers, Inspectors, etc., from January 1 to December 31, 1900	5,775 99
	Labor pay-rolls, January 1 to December 31, 1900	6,914 80
	Balance, December 31, 1900	158,018 56
	Total	$296,163 50

WORK DURING THE YEAR 1901.

The current year will be for the Zoological Park a year of great activity and advancement. It will witness the completion of the Rocking Stone Restaurant, the erection of the Service Building ($12,900), the Primates' House ($59,700), the Lion House (about $110,000), the completion of the sewer and water systems, and the Motor Road, the construction of about 3,000 feet of new walks, the extension of the Antelope Corral, construction of a Moose Pond, and the erection of about two miles of fencing. In addition to the above, the following new installations for birds and quadrupeds will be constructed by the Society: The Pheasants' Aviary, Eagles' and Vultures' Aviary, Cranes' Aviary, Mountain Sheep, Mountain Goat, Squirrel and Raccoon Enclosures.

The need for the Antelope House is more serious than ever before. Many tropical hoofed animals have been presented to the Society, for the care and display of which there is no provision whatever. Until this very important building is provided, it is impossible to keep elephants, rhinoceroses, tapirs, or large tropical hoofed animals of any kind. The plans are complete and on file with the Park Department, and the need for the building is distressingly great.

In addition to the future work enumerated above, there remains a long list of miscellaneous items. One very important item will be the enclosing of Baird Court and its northern approach with a wire fence and suitable gates, and the construction of the roadbed of the northern approach, or concourse, in order that the immense inward traffic of contractors' teams with building materials may be entirely segregated from the remainder of the Park grounds. This is a measure demanded in the joint interests of the grounds, the public and the contractors, and it will be carried out early in the spring.

Respectfully submitted,

WILLIAM T. HORNADAY,
Director.

January 1, 1901.

TREASURER'S STATEMENT

For the Year Ending December 31, 1900.

PARK IMPROVEMENT FUND: RECEIPTS.

Balance, January 1, 1900, cash in treasury		$5,337 43
Received from City, account cash advanced for Maintenance and Ground Improvements in 1899	$10,260 10	
	799 45	
	40 56—	11,100 11
Subscriptions:		
Andrew Carnegie (additional)	6,500 00	
F. A. Schermerhorn (additional)	2,500 00	
John L. Cadwalader (additional)	2,500 00	
John S. Barnes (additional)	2,500 00	
James C. Carter	1,500 00	
Thomas F. Ryan	1,500 00	
Jacob H. Schiff (additional)	1,500 00	
Levi P. Morton (additional)	1,500 00	
George Crocker (additional)	1,500 00	
Samuel D. Babcock (additional)	1,500 00	
Hugh J. Chisholm (additional)	1,050 00	
Mrs. Percy R. Pyne	1,000 00	
Adrian Iselin	1,000 00	
H. C. von Post	1,000 00	
John S. Kennedy	1,000 00	
Cleveland H. Dodge	1,000 00	
William K. Vanderbilt (additional)	1,000 00	
Mrs. George Lewis	1,000 00	
William C. Schermerhorn (additional)	1,000 00	
Miss A. B. Jennings	1,000 00	
William C. Whitney (additional)	1,000 00	
D. Willis James	1,000 00	
Charles T. Barney (additional)	750 00	
George C. Clarke	550 00	
Fred Sturges	500 00	
Lloyd Phoenix	500 00	
William C. Osborn (additional)	500 00	
Charles E. Whitehead	500 00	
E. S. Harkness	500 00	
Joseph Stickney (additional)	500 00	
D. Crawford Clarke	250 00	
George S. Bowdoin	200 00	
Rev. E. A. Hoffman	100 00	
Winthrop Chanler	50 00	
F. D. Alexander	50 00	
Catharine Ann Sullivan	25 00	
Miss Anna R. Spring	10 00	
George Gill	10 00—	40,045 00
Transferred from General Fund:		
August 10, 1900	2,000 00	
August 16, 1900	5,000 00—	7,000 00
Advanced by Charles T. Barney and Knickerbocker Trust Co.		7,739 56
Miscellaneous receipts at Park, Guide Books, etc.		1,585 40
Interest on daily balances:		
Fifth Avenue Trust Co.	$2 27	
Atlantic Trust Co.	101 82—	104 09
		$72,911 59

PARK IMPROVEMENT FUND: EXPENDITURES.

On Buildings, Animal Installations, and other accounts during 1900:			
Flying Cage	$5,495 05		
Reptile House	2,736 45		
Bear, Wolf, and Fox Dens	3,816 91		
Polar Bears' Den	3,735 47		
Bird House	1,770 68		
Burrowing Rodents' Quarters	537 00		
Small Mammal House	719 91		
Moose Shelter	233 38		
Caribou Shelter	319 37		
Antelope Shelter	324 87		
Fallow Deer Shelter	245 37		
Red Deer Shelter	23 55		
Beaver Pond	192 15		
Ducks' Aviary	61 55		
Crocodile Pool	83 50		
Engineering Expenses	1,399 57		
Architects' Commissions	3,851 63		
Landscape Architecture	525 00		
Express, Telephone, and Telegraph	1,188 63		
General Construction	4,568 80		
Miscellaneous and General Expenses	897 80		
Guide Books	836 45		
Photographs	36 53		
Live Animals	1,744 75		$35,344 37
Return of cash advanced by Executive Committee in 1899			17,000 00
Return of cash advanced by Charles T. Barney			3,000 00
Interest on above amounts			1,027 22
Maintenance shortage for 1899, paid in 1900			1,993 05
Due from City:			
Maintenance (October and part of November)	$3,907 93		
Ground Improvements:			
Bill rendered	$4,143 21		
To be rendered	1,567 36	5,710 57	9,618 50
Maintenance cash shortage for 1900, on January 1, 1901*			4,272 31
Cash balance in treasury December 31, 1900			656 14
			$72,911 59

January 8, 1901.

L. V. F. RANDOLPH,
Treasurer.

*Add Maintenance bills for $1,917.02 unpaid on Jan. 1, 1901, making total net shortage on Maintenance for 1900, $6,189.33.

Atlantic Trust Company, 61 William Street, New York,

GENERAL FUND: RECEIPTS.

Cash balance in Treasury, December 31, 1899, as per Fourth Annual Report		$998 07
Annual dues from members		7,810 00
Life membership fees		5,200 00
Interest on daily balances		52 06
		$14,060 13

GENERAL FUND: EXPENDITURES.

General office expenses	$2,310 10	
Fourth Annual Report	479 60	
Bulletin No. 4	177 12	
Guide Books	34 68	
Stationery, printing, and office supplies	688 73	
Library	88 13	
Live Animals	506 67	
Medical attendance for employees	679 50	
Photographs and slides	740 24	
Transferred to Park Improvement Fund	7,000 00	
Miscellaneous expenses and sundries	491 81	$13,196 58
Cash balance in Treasury December 31, 1900		863 55
		$14,060 13

January 8, 1901. L. V. F. RANDOLPH, *Treasurer.*

ANIMAL FUND: RECEIPTS.

Cash in Treasury, January 1, 1900		$230 75
Receipts at Park:		
December, 1899, remitted in January	$162 65	
January	60 95	
February	24 35	
March	352 95	
April	271 85	
May	302 70	
June	390 17	
July	562 68	
August	451 21	
September	416 67	
October	271 80	
November	202 90	3,470 88
Miscellaneous:		
From William C. Whitney, for buffalo	298 16	
From Mrs. E. C. Bodman	25	298 41
Interest on daily balances		5 54
		$4,005 58

ANIMAL FUND: EXPENDITURES.

Expended for live animals during the year 1900	$4,004 18
Cash balance in Treasury December 31, 1900	1 40
	$4,005 58

January 8, 1901. L. V. F. RANDOLPH, *Treasurer.*

MAINTENANCE: RECEIPTS.

Received from City on account of Maintenance appropriation of $40,000 for 1900	$36,092 07	
Balance due from City, account of Maintenance	3,907 93	$40,000 00
Shortage for the year		6,189 33
		$46,189 33

MAINTENANCE: EXPENDITURES.

Salaries and labor	$30,846 31
Tools and hardware	1,727 28
Nursery supplies, stock and seeds	202 10
Paints and oils	297 25
Office furniture and fixtures	177 38
Office supplies and printing	375 58
Uniforms and badges	810 83
Sanitation	157 85
Insurance	355 62
Horses and vehicles	89 82
Repairs	201 00
Drainage and water supply	188 60
Kitchen utensils	47 90
Telephone service and tolls	93 76
Postage, telegraph, and express	299 91
Food for animals	7,260 66
Ice	221 78
Fuel	1,217 18
Signs and labels	146 70
Medical attendance (for animals)	56 50
Medical attendance (for employees)	147 50
Engineering supplies	89 89
Drugs and medicines	159 64
Lumber	451 85
Cement	142 10
Sundries and miscellaneous supplies	424 34
	$46,189 33

L. V. F. RANDOLPH,
Treasurer.

Atlantic Trust Company, 61 William Street, New York,
January 8, 1901.

LIST OF GIFTS TO THE ZOOLOGICAL SOCIETY

(Revised to April 15, 1901.)

ABEEL, JOHN H., New York City:
Monkey.

ADRIANCE, WILLIAM A., Poughkeepsie, N. Y.:
Black Bear Cub.

ANGELL, HERBERT E., Scarsdale, N. Y.:
Muhlenberg's Turtle, Snapping Turtle, Hog-Nosed Snake (3 specimens), Black Snake (5 specimens), Garter Snake (4 specimens), Ribbon Snake, Milk Snake (3 specimens).

ARANGO, DON JOSE AUGUSTINE, Panama, Colombia, S. A.:
Albino Capuchin Monkey.

ATKIN, MRS. R., New York City:
Six-Lined Lizard (3 specimens).

BAKER, EDWARD, Perth Amboy, N. J.:
Mink.

BAKER, JAMES J., New York City:
Mole, Screech Owl.

BARBOUR, MRS. S. E., Eau Gallie, Fla.:
Diamond-Back Rattlesnake (2 specimens), King Snake, Black Snake, Pine Snake (3 specimens).

BARBOUR, THOMAS, New York City:
Rabbit (2 specimens), King Snake, Tessellated Water Snake, Coach-Whip Snake, Pine Snake, Corn Snake, Puff Adder, Muhlenberg's Turtle (2 specimens), Spotted Turtle (2 specimens), Pond Turtle, Painted Turtle (2 specimens), Musk Turtle (3 specimens), Soft-Shelled Turtle, Mud Puppy, Chameleon (42 specimens), Blue-Tailed Lizard (3 specimens), Red-Headed Lizard, Sand Lizard (2 specimens), Striped Lizard, Green Lizard, Wood Tortoise, Gopher Tortoise (3 specimens), Hermit Crab, European Hedgehog (4 specimens), Yellow-Bellied Terrapin, Diamond-Back Terrapin, Coral Snake, Oak Toad, Hawksbill Turtle, Screech Owl, Common Toad (26 specimens), Small Terrarium.

BEEBE, CHARLES, New York City:
Canvasback Duck.

BEHLEN, HERMANN, & BROTHER, New York City:
Green Heron.

BILZ, REINHOLD, New York City:
Opossum.

Blackman, Lewis, Brewster, N. Y.:
Opossum.

Blue Mountain Forest Association, New York City (*through Austin Corbin, President*):
Virginia Deer (3 specimens).

Blume, Mrs. H. P., Jersey City, N. J.:
Red-Tailed Hawk.

Boyles, A. K., Salina, Kan.:
Cooper's Hawk (2 specimens).

Boone and Crockett Club, New York City:
"Hunting in Many Lands," "Trail and Camp Fire," "American Big Game Hunting."

Braun, H. L., & Co., Missoula, Mon.:
Cast of Grizzly Bear's Head.

Britton, Henry, Peekskill, N. Y.:
Barred Owl (2 specimens).

Brown, Herbert, Yuma, Ariz.:
Wood Rat (6 specimens), Family of White-Footed Mice.

Brooks, Mrs. W. S., New York City:
Macaque Monkey.

Burlington, Walter, Brooklyn, N. Y.:
Red Squirrel.

Christensen, Mrs. R. M., New York City:
Mourning Dove.

Clark, W. E., Westhampton Beach, L. I.:
Hog-Nosed Snake.

Cohen, W. H., & Co., New York City:
Night Heron (2 specimens, juv.).

Colburn, A. E., Washington, D. C.:
Opossum.

Cross & Baker, Glenwood Springs, Col.:
Interlocked Antlers of Mule Deer.

Cutting, Mrs. R. Fulton, Tuxedo Park, N. Y.:
Albino Raccoon.

Dawson, Dr. George M., Director Canadian Geological Survey, Ottawa, Canada:
Catalogue of Canadian Plants, Parts I. to VI., Catalogue of Canadian Birds, Part I., Annual Reports of the Geological Survey of Canada, Vols. VII., VIII., IX., and X., Maps to Accompany Annual Reports of Geological Survey, Vols. VII. and VIII.

Dorn, George, New York City:
Green Lizard (3 specimens).

Douglas, Miss, Spuyten Duyvil, N. Y.:
Alligator.

Dove, Adam, New York City:
Reptiles (161 specimens).

Dowe, Mrs. Frank Le Counte, Bedford Park, New York City:
Green Monkey.

Drosser, Hubert, New York City:
White-Throated Capuchin Monkey.
Dunham, Carroll, Jr., Irvington, N. Y.:
Red-Tailed Hawk, Porcupine.
Dunne & Co., New York City:
300 Cedar Trees.
Duvall, Mrs. E. G., Bedford Park, N. Y.:
Two Rubber Trees.
Eaton & Wilbur, Canandaigua, N. Y.:
Marsh Hawk.
Eckels, James, Forsyth, Mon.:
Canada Goose.
Emelin, Michael J., New York City:
Milk Snake.
Entemann, Paul, New York City:
Box Tortoise.
Fish, Mrs. Stuyvesant, Newport, R. I.:
Richardson's Spermophile (8 specimens).
Fite, Frank E., New York City:
Thirty-five specimens of Reptiles.
Foster, B. G., Washington, D. C.:
Opossum.
Fredenberg, John, New York City:
Robin (2 specimens).
Gaetgen, William, New York City:
Gray Squirrel.
Ganahl, Mrs. Joseph, Rye, N. Y.:
Rubber Tree.
George, David Sanford, Bedford Park, N. Y.:
Spotted Salamander.
Gilbert, Mrs. M. E., New York City:
Green Monkey.
Grod, Chester, New York City:
Rose-Breasted Grosbeak.
Hackley Hall School, Tarrytown, N. Y.:
Seaforthia elegans.
Hahn, Anton, Kingsbridge, N. Y.:
Peacock.
Hammond, Captain A. G., Puerto Principe, Cuba:
Hutia (4 specimens), American Flamingo (2 specimens).
Hebel, J., New York City:
Red Screech Owl.
Henry, J. A., New York City:
Boa Constrictor.
Henry, James, Brooklyn, N. Y.:
Alligator (2 specimens).
Herrick, A. E., Westchester, N. Y.:
Great Horned Owl.

HERZIG, GEORGE B., New York City:
Chinchilla (3 specimens).
HICKEY, DENIS, New York City:
Snapping Turtle.
HOBSON, C. N., New York City:
Box Tortoise (2 specimens).
HODENPYL, MRS. GEORGE H. G., Summit, N. J.:
Opossum, Rabbit.
HORNADAY, WILLIAM T., New York Zoological Park:
Brown Howler Monkey.
JAHN, CARL, New York City:
Fiscus elastica.
JONES, COLONEL JAMES E., New York Aquarium:
Alligator.
KAHN, MORTIMER, New York Zoological Park:
Screech Owl.
KESSLER, JOSEPH, Nyack, N. Y.:
Opossum.
KNAPP, J. M., New York City:
Red Fox (2 specimens), Alligator (3 specimens).
LAMBLY, CONRAD, Botanical Garden, New York City:
Snapping Turtle.
LANGAN, J. T., New York City:
Cockatoo.
LANGMANN, DR. GUSTAV, New York City:
King Snake, Desert Rattlesnake, Water Moccasin (4 specimens), Copperhead Snake (2 specimens), Banded Rattlesnake (2 specimens).
LETKEMANN, HERMANN V., New York City:
East India Star Tortoise, Sea Turtle (2 specimens), Pond Turtle (3 specimens), Reeves Turtle (3 specimens), Cuban Terrapin (4 specimens), Caspian Terrapin (6 specimens), Green Terrapin, Spotted Water Snake, Sand Lizard (11 specimens), Bearded Lizard (2 specimens), Spanish Ribbed Newt (3 specimens), African Skink (2 specimens), Giant Skink (4 specimens), German Toad (4 specimens), Midwifery Toad (4 specimens).
LORING, J. ALDEN, New York Zoological Park:
Green Jay.
LOUDON, CHESTER C., Mt. Vernon, N. Y.:
Horned Toad.
MACKINNON, HARRY G., Newark, N. J.:
Ring-Necked Snake.
MCGRATH, EDMUND J., New York City:
Whip-poor-will.
MAGUIRE, DR. J. H., Salem, N. Y.:
Great Horned Owl.
MALIN, MISS GRACE E., Minneapolis, Minn.:
Timber Wolf (2 specimens).
MESSERSCHMITT, G., New York City:
White-Throated Capuchin.

MEYROWITZ, E. B., New York City:
One Large and 12 Small Thermometers.
MILES, WILLIAM, New York City:
Gray Squirrel.
MILLER, C. W., New York City:
Hutia.
MITCHELL, A. J., New York City:
Hog-Nosed Snake (2 specimens).
MOROSINI, G. P., Riverdale, N. Y.:
Red and Blue Macaw.
MORROW, T. C., Mazomaine, Wis.:
Northern Rattlesnake (7 specimens), Young Northern Rattlesnake (11 specimens), Massasauga.
MULVEHILL, THOMAS, New York City:
Green Parrot.
MUNSON, DAVID, New York City:
Screech Owl.
NAEF, MRS., Highbridge, N. Y.:
Chameleon (2 specimens).
NEW YORK BOTANICAL GARDENS, New York City:
Large Collection of Greenhouse Plants.
OHLENSLAGER, MISS GEORGETTE, New York City:
Newt.
OSBORN, PROFESSOR HENRY F., New York City:
Collection of Greenhouse Plants and a Carload of Trees.
PADGETT, WILLIAM, Pike County, Pa.:
Banded Rattlesnake.
PAINE, RICHARD G., Charleston, S. C.:
Boa Constrictor (4 specimens).
PARMELEE, C. W., Brooklyn, N. Y.:
Anaconda (juv.), Water Snake.
PEARSALL, MORRIS, New York City:
Reptiles (161 specimens).
PERRY, MRS. ALEXANDER I., Princeton, N. J.:
Latania borbonica.
PETERSEN, F. W., Morris Heights, N. Y.:
Macque Monkey.
PISTONI, MICHAEL, Bedford Park, N. Y.:
Snapping Turtle.
POTTER, R. B., South Nyack, N. Y.:
Opossum.
PRENTISS, MRS. K. L., South Norwalk, Conn.:
Peacock.
PRICE, CHARLES P., Melrose, Mass.:
Texas Rattlesnake, Bull Snake.
QUIRK, JAMES, New York City:
Gray Screech Owl.
REILLY, SERGEANT, New York City:
Parakeet.

RINCKOLDT, ARTHUR C., New Haven, Conn.:
Hog-Nosed Snake (2 specimens), Garter Snake (2 specimens), Black Snake.
RIPPE, H. L., New York City:
Hare (4 specimens).
ROCKEFELLER, H. Q., Cobleskill, N. Y.:
Porcupine.
ROSS, DR. EDWARD C., New Haven, Conn.:
Java Monkey.
ROOSEVELT, HON. THEODORE, Oyster Bay, L. I.:
Black Bear.
ROWLEY, JOHN, New York City:
Skunk.
RUNGIUS, CARL, Brooklyn, N. Y.:
Two Pairs of Elk Antlers.
SAUTER, FRED., JR., New York City:
Acadian Owl, Barred Owl, Crow.
SCHIEFFELIN, HEIRS OF SAMUEL B., New York City:
Five Pheasant Shelter Houses, fully equipped; a Collection of 47 Pheasants, 57 Bantams, and a Collection of Large Plants.
SCHLESINGER, H. L., Yonkers, N. Y.:
Box Turtle.
SCHILLING, ROBERT, New York City:
Austrian Newt (6 specimens).
SCHWARTZ, B. G., New York City:
Box Tortoise.
SCOTT, JOHN D., New York City:
Screech Owl.
SEARLES, L. M., Port Chester, N. Y.:
Red-Shouldered Hawk, Bittern, Long-Eared Owl.
SETLEY, M. FREDERICK, New York City:
Sparrow Hawk.
SHAW, MRS. JOHN, Peabody, Mass.:
Cockatoo.
SHAW, R. D., Brooklyn, N. Y.:
Burro (2 specimens).
SHEIBNER, E. W., Brooklyn, N. Y.:
Gray Parrot.
SHIELDS, GEORGE O., New York City:
Twenty-one Animal Drawings.
SILSBEE, GEORGE G., New York City:
Hog-Nosed Snake.
SMALL, J. H., & SON, New York City:
Palm (2 specimens).
SMITH, A. ROY, Syracuse, N. Y.:
Black Duck (2 specimens).
SMITH, MRS. M. E., Chappaqua, N. Y.:
Terrapin.

STERN, MRS. E., Tannersville, N. Y.:
Porcupine.
STONEBRIDGE, A. J., Garrison, N. Y.:
Screech Owl.
STUART, J., New York City:
Snapping Turtle.
THAYER, GERALD H., Berkshire, Mass.:
Porcupine.
TUCKAHOE HOSE CO., Tuckahoe, N. Y. (*through W. E. Brown*):
Red-Shouldered Hawk (2 specimens).
TURNBULL, ROBERT J., New York City:
Gray Squirrel.
TOD, J. KENNEDY, New York City:
Bornean Sun Bear.
UPPERCU, MISS, New York City:
Alligator.
VICK, EDWARD C., New York City:
Golden Eagle.
VOSE, RALPH AND HARRY, West Orange, N. J.:
Salamander (24 specimens), Red Newt, Red, Clouded, Slimy, and Two-Lined Salamander (one specimen each).
WARNER, CAPTAIN G. E., British S. S. *Glencartny:*
Common European Heron, captured aboard vessel at sea, in the Indian Ocean.
WHEELER, F. M., Montclair, N. J.:
Desert Sparrow Hawk (3 specimens).
WILDFOERSTER, ERNEST, Brooklyn, N. Y.:
Storer's Snake (3 specimens), Ribbon Snake, Green Snake, Milk Snake.
WILLICK, W. H., Rahway, N. J.:
Wood Duck.
WILLIS, JAMES, New York City:
Fox Squirrel (2 specimens).
WILSON, F. S., Elk Rapids, Mich.:
Black Duck.
WOOD, E. G., Peekskill, N. Y.:
Black Woodchuck.
WOOLSEY, JOHN W., New York City:
Newt (10 specimens).
YOUNG, MISS MARGARET TENNY, New York City:
Prevost's Squirrel (6 specimens).

RECREATION SERIES.

Gifts from the readers of Recreation Magazine, through G. O. Shields, Editor and Manager.

BROWN, C. D., Rutherford, N. J.:
Black Snake, Long-Eared Owl, Black-Crowned Night Heron (7 specimens), Green Heron (5 specimens).

BROWN, E. S., JR., Rutherford, N. J.:
Long-Eared Owl.

CORLIS & LORD, DRS., New York City:
Red-Shouldered Hawk (2 specimens).

COTTRELL, O. S., JR., Keyport, N. J.:
Ruddy Duck, Pied-Billed Grebe.

DART, SAMUEL, Toledo, O.:
Opossum.

DENNER, E. T., Chippewa Bay, N. Y.:
Raccoon.

DEVALL, M. A., The Corners, N. Y.:
Barred Owl, Red-Shouldered Hawk (2 specimens).

DOANE, A. SIDNEY, Waterlily, N. C.:
Screech Owl, Opossum, Snow Goose, Rainbow Snake, Diamond-back Terrapin.

DOANE, MISS, Waterlily, N. C.:
Black Duck.

DONALD BROTHERS, Hammond, N. Y.:
Raccoon.

LATHAM, R. A., Orient Point, L. I.:
Snapping Turtle.

MACKEOWN, FRED W., Rutherford, N. J.:
Barn Owl.

PAYNE, CHARLES, Wichita, Kan.:
Dusky Horned Owl.

PRESCOTT, ROSCOE E., Tilton, N. H.:
Woodchuck.

RAUH, FRANCIS J., New York City:
Opossum (2 specimens).

SMALL, FRED T., Chatham, N. J.:
Barred Owl.

COLLECTING REPTILES IN SOUTH CAROLINA.

By RAYMOND L. DITMARS,

Assistant Curator, in Charge of Reptiles.

To the zoologist, collecting is generally a pleasing diversion; hence the trip to South Carolina, planned by the writer for the vacation period of 1900. Accompanied by Keeper Snyder, of the reptile department, the writer left New York by the Savannah Line steamer on August 3d, returning on the 18th of the same month. The material collected comprised ninety-two reptiles, representing fourteen species, of which nine species were new to the Park collection. Many of the ophidians were large and brilliantly colored, proving highly desirable specimens for exhibition.

Through the courtesy of Mr. J. M. Knapp, of New York, a member of the Pinelands Club, every facility was given the writer and his associate to make the trip successful. Without the assistance of the employees of the Club, our work in the forests and swamps would have been exceedingly difficult.

On the morning after our arrival at the village of Robertsville, Hampton County, S. C., on the outskirts of which the Pinelands Club is situated, we started for the "causeway," in a light wagon carrying the collecting apparatus. Frank Davis, game constable for the Pinelands Club, acted as our guide, carrying a Winchester repeating shotgun across his saddle, and emptied its twelve-gauge charges into several hawks. The wagon road led through the swamps, and into water deep enough to almost float the vehicle. We frequently alighted in the mud, to pursue water snakes, and several specimens of the Common Water Snake (*Natrix fasciata*) were unceremoniously seized by the tail before they had an opportunity to glide into the pools of coffee-colored water.

Once on the "causeway" we found ourselves in excellent collecting ground. Extending along each side of the road was a series of ditches, from which we noosed a number of serpents.

The Black-banded Water Snake (*Natrix taxispilota*), the Copper-bellied Water Snake (*Natrix fasciata erythrogaster*), and the Red-banded Water Snake (*Natrix fasciata*) were among the captures. Most interesting of these species was the *Natrix taxispilota*. In collecting this snake, we were surprised to note the similarity in movement and aspect to the peculiar oriental water snakes (*Homalopsinæ*) which frequent the rivers of the East Indies. The long head, widening suddenly at the base; the small, protruding eyes, situated in close proximity to the snout, and the habit of floating in a perpendicular position or resting in shallow water with the tail twisted about some aquatic plant, strongly suggest the characteristics of the aquatic opisthoglyphs.

All through this district the fallen trees were frequented by several species of lizards. Brilliant examples of the Blue-tailed Lizards (*Eumeces fasciatus*), associated with the peculiar variety known scientifically as *erythrocephalus*, were seen on all sides, but in every instance eluded capture. Numerous devices were employed with the hope of capturing the larger specimens, but they proved equally shy of noose, net, and the most delicate of baited hooks. The Swift (*Sceloporus undulatus*), although generally darting away with lightning-like rapidity when alarmed, would stop within fifteen or twenty feet and glance back wonderingly at the cause of its fright. By approaching the reptile slowly with outstretched hand, and persistently following its darts and gyrations, the collector often succeeded in bringing his hand down quickly over the creature, although in many an instance, a rapidly wriggling tail was all that remained as a reward for perspiring efforts. One of the most elusive of these creatures was the Six-lined Lizard (*Cnemidophorus sexlineatus*). These wonderfully active creatures skimmed over the sandy soil, or darted into holes with an agility simply bewildering. A number of examples were captured. In chasing an especially beautiful specimen across a cotton-field, and into an isolated growth of brush, the writer suddenly discovered, while peering through the vegetation for the reptile, that a large Rat Snake was glaring at him with hostile mien, but a few inches from his face. This handsome creature (*Coluber guttatus*), measured over five feet in length.

It was late in the afternoon when we returned from the first day's hunt. The heat was intense, and men and horses were all very tired.

The following entries from the writer's journal will serve to convey an impression of the character of our work:

"August 9th: With the light wagon and saddle horses started at eight o'clock for the sand hills, capturing a number of "Chamellons" (*Anolis principalis*) on the way. Arriving at the hills, we found burrows of the Gopher Tortoise (*Testudo polyphemus*) on every hand, but all the tortoises were below ground. Captured a number of Swifts, and, returning, we bagged six large water snakes.

"August 10th: Started out before daybreak, for the sand hills, anticipating that at dawn the tortoises would be above ground. Arriving at our destination an hour later, we were disappointed at finding none. The only explanation is, that the intense heat had driven these animals into a state of temporary æstivation. The water in the swamps is rapidly evaporating, and large water snakes were seen wandering about in the dried areas.

"August 11th: The heat is intense—101° F. in the shade. Unable to do much work during the day. Captured a specimen of the Hog-nosed Snake (*Heterodon simus*), which reptile, true to its characteristics, alternately feigned death and came to life again, much to the consternation of the negroes, who declared we exerted a mysterious influence over the snake. In the evening we went into Black Swamp in search of rattle-snakes. Found a beautiful specimen of the Cane-break Rattle-snake that had been freshly killed. This is a southern variety of *Crotalus horridus*. The ground color is a delicate shade of pink, traversed by wide bands of black; along the back is a narrow stripe of rusty red.

"August 12th: The heat continues. Went on horseback to the causeway. In the morning we discovered an Alligator's nest. It consisted of a mound of decomposing vegetable matter, about four feet in diameter and three feet high, half hidden among some bushes, and at the edge of a small pool. The nest contained thirty-seven eggs. These were two and a half inches long and one inch and a quarter in diameter. The shells were of much the consistency of a hen's egg, and when struck together, produced a metallic, almost a ringing sound. The entire nest and eggs were packed on one of our horses. On the return to the clubhouse, we captured two Chicken Snakes (*Coluber quadrivittatus*) in a deserted cabin.

"August 13th: Went through the low grounds along the Sa-

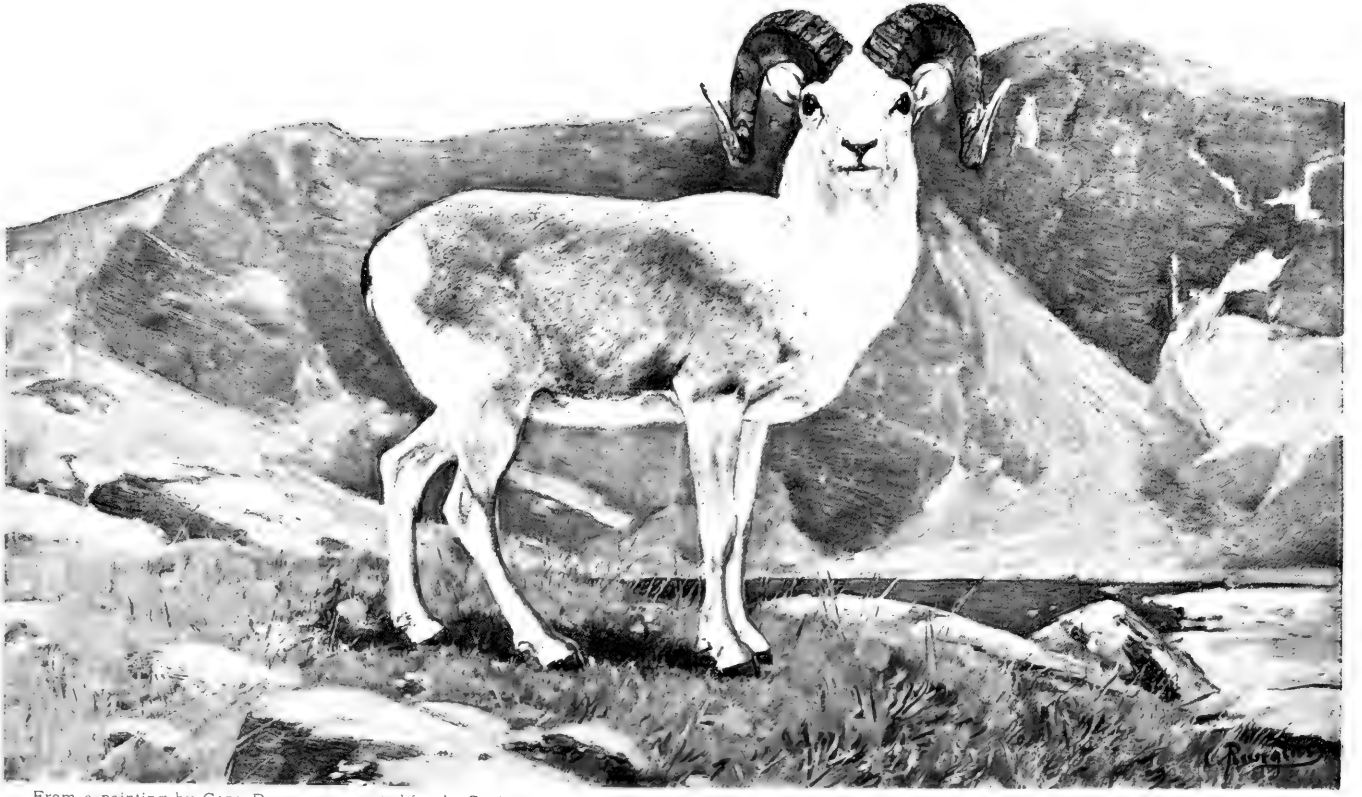
vannah River. Mr. Snyder noosed an enormous water snake, of doubtful identity. The reptile broke the noose and escaped. We estimated its length at over five feet, and its weight at least eight pounds. Three splendid specimens of the Copper-bellied Water Snake, were captured. In reaching for one of them, the bank gave way, and Mr. Snyder was precipitated into the stream.

"August 14th: Our last day at Robertsville. Took three saddle mules and started into Black Swamp. Presently the vegetation became so dense we abandoned the animals, and proceeded on foot. In a series of lagoons and partially dried-up streams, we captured eleven specimens of the Cotton-mouth Moccasin (*Ancistrodon piscivorus*), the only species of poisonous snake collected. Thousands of fish having died from the evaporation of the swamp, the moccasins were discovered to have been feeding on the harmless water snakes. A number of these were disgorged."

Besides enlarging the collection in the Reptile House of the Zoological Park, the expedition proved valuable in the discovery of several interesting varieties of snakes. Although these varieties were not of a character sufficiently distinct to merit new varietal names, they were highly interesting as examples of the variation of the species to which they belonged. Several examples of the *Natrix fasciata erythrogaster* were especially brilliant, in different shades of red. One of the most valuable specimens collected was a variety of *Thamnophis sirtalis* (the garter snake). This specimen, now thriving in the Park collection, shows a ground color of brilliant brick-red, with the skin between the scales of the same color; the body is strongly tessellated with black, and is provided with the usual longitudinal stripes, which are of a straw color. This snake was captured in a cotton-field; and near by was a specimen of the usual coloration.

Soon after the arrival of the captured specimens in New York, the venomous snakes gave birth to twenty-three young, and among the harmless snakes, forty-seven young were born.

The alligator eggs began hatching on the 14th of October; and during the next week, ten specimens emerged. The entire lot of eggs and young alligators was immediately placed on exhibition, and attracted much attention.



From a painting by CARL RUNGIUS, executed for the Society.

Engraved by C. L. WRIGHT & Co.

FANNIN'S MOUNTAIN SHEEP.

OVIS FANNINI, S. M.

NOTES ON THE MOUNTAIN SHEEP OF NORTH AMERICA, WITH A DESCRIPTION OF A NEW SPECIES.*

By WILLIAM T. HORNADAY.

To many American sportsmen and naturalists there is no other wild animal on this continent which challenges admiration equal to that bestowed upon the Mountain Sheep. Unfortunately, it is only those who have made the acquaintance of this animal in life, and upon its own ground, who have a fair conception of its character. Neither from the best mounted museum specimens, nor from the best living examples that have been shown in zoological gardens, can the observer learn the true character of this hardy mountaineer, in whose anatomy strength is combined with agility to an extent which is nothing short of marvellous. Its home is the loftiest rim-rock of the high mountain plateaus, or the most rugged and forbidding bad-lands of the middle altitudes. In summer its favorite pastures are the treeless slopes above timber-line, and in winter it paws through the snows of the mountain meadows to reach the tallest spears of grass. When the raging storms and deep snows of winter drive the elk and deer down into the valleys for food and shelter, the Mountain Sheep makes no perceptible change of locality. All the year round this animal is both well fed and well clad, and its savory flesh invites constant pursuit and attack from the mountain lion, and hunters both white and red. Unlike its dull-witted neighbor, the mountain goat, the Mountain Sheep is wide-eyed and wary, and difficult to approach.

The best-known species of Mountain Sheep of North America is the familiar Big-Horn of the Rocky Mountains (*Ovis montana*), which has been known for more than a century.

In 1884 the pure white Mountain Sheep of Alaska and north-

* The description of *Fannin's Mountain Sheep*, reprinted herewith, was read before the New York Zoological Society at its annual meeting on January 8, 1901, and published on that date as an appendix to the Society's Fifth Annual Report. The preparation of the accompanying Notes has been prompted by the fact that the literature of the subject was so meagre and so widely scattered that to the average student a comprehensive view of this very interesting group of animals was unobtainable, except by great effort. Another reason for this publication is the hope that it may stimulate, and also promote, more precise and general inquiry into the life histories and distribution of the six species of American mountain sheep.

In order to bring the subject more sharply before the student, no attempt has been made to trace the early history of the Big Horn, and the distribution of the various species is given only as it is believed to be to-day.

western Canada was described by E. W. Nelson, and christened *Ovis dalli,* in honor of Professor William H. Dall, of Washington, D. C. Next in order of discovery came Nelson's Mountain Sheep *(Ovis nelsoni),* of southern California, described by Dr. C. Hart Merriam in 1897. In 1896, while on an exploring expedition in the Cassiar Mountains, of northern British Columbia, Mr. A. J. Stone discovered the very interesting dark-colored species of Mountain Sheep described by Dr. J. A. Allen in 1897, and christened *Ovis stonei,* in honor of its discoverer.

The discovery of gold on the Klondike River, Northwest Territory, has led to the discovery of still another species of Mountain Sheep, which may justly be regarded as the handsomest and the most striking in color markings of all known species of the Genus *Ovis.*

While in Victoria, British Columbia, last November, the attention of the writer was called by Mr. John Fannin to the skin and skull of a Mountain Sheep which had been sent down from Dawson City by Mr. Henry W. Brown, as a specimen of *Ovis stonei,* and presented by him to the Provincial Museum. An examination of the skin, which is not only from an adult male animal, but is also in perfect pelage and preservation, revealed the startling fact that it represents a species absolutely new to science, and so strikingly differentiated as to render its title to independent specific rank beyond question. It is hereby described and named in honor of Mr. John Fannin, Curator of the Provincial Museum of British Columbia, in recognition of his work as a naturalist specially interested in the animal life of the Northwest.

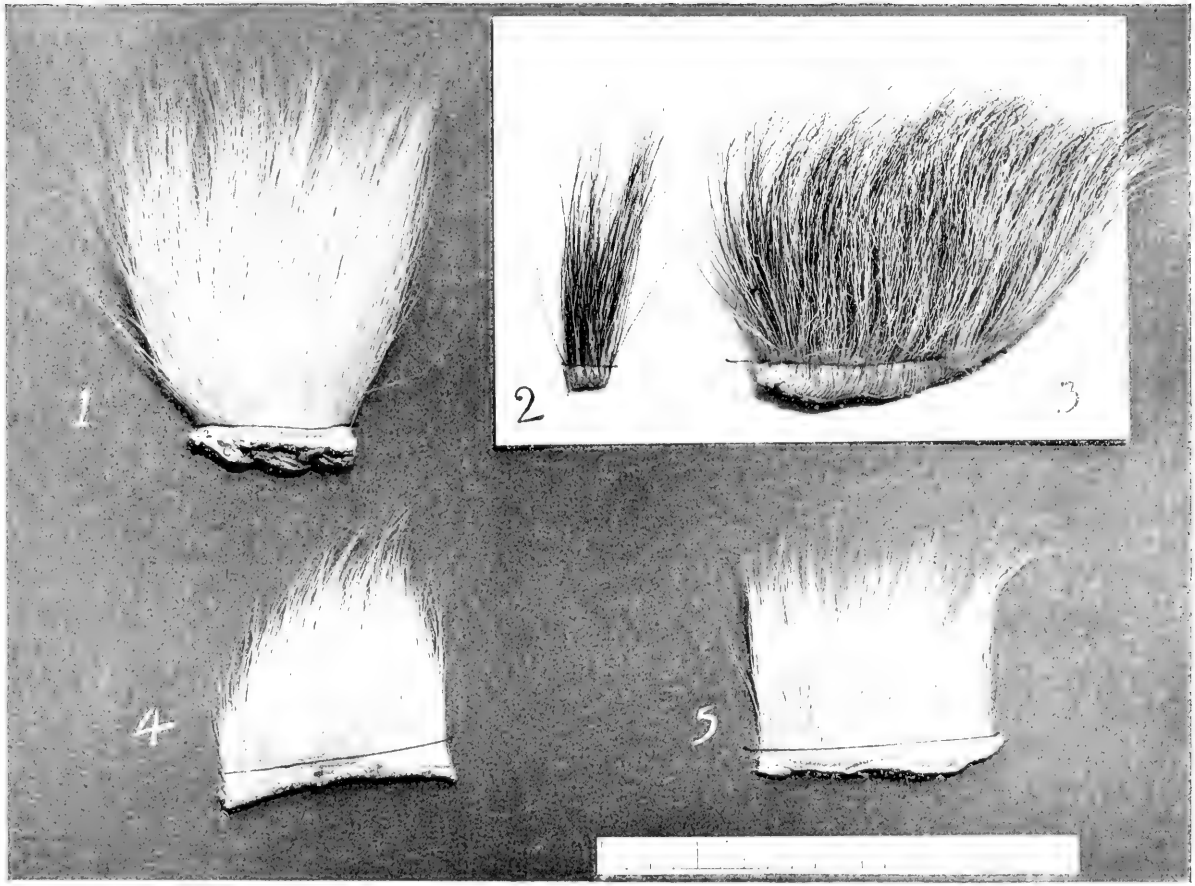
OVIS FANNINI, SP. NOV.

FANNIN'S MOUNTAIN SHEEP: ALSO, "SADDLE-BACKED" SHEEP, OR "PIE-BALD" SHEEP.

Type Collected by Mr. Henry W. Brown at Dawson City, N. W. T., February, 1900, and presented to the Provincial Museum, Victoria, B. C.

Description of an adult male, nine years old, killed in midwinter.

Colors.—Entire head and neck, breast, abdomen, inside of forelegs, and rump patch for four inches above insertion of tail, snow white. Entire body, except as above, brownish gray, giving the appearance of a white animal covered by a gray blanket. This color is produced by a nearly even mixture of pure white and blackish-brown hairs. The gray color covers the shoulders from the insertion of the neck downward to the knee, where it fades out. On the outside of the thigh, the gray color grows paler as it descends, until at the hock joint it



HAIR FROM FANNIN'S MOUNTAIN SHEEP.

No. 1. From the top of the neck.
No. 2. From the tail.
No. 3. From the middle of the side.
No. 4. From the abdomen.
No. 5. From inner surface of thigh.

fades out entirely. The posterior edge of the thigh is white. The lower portion of the inner surface of the thigh partakes of the gray body color, but is somewhat paler.

On the front edge of the thigh, and extending down to the hoof, is a conspicuous band of dark brown, 1½ inch wide, which, below the hock joint, joins rather abruptly the pure white hair which covers the sides and rear edge of the leg. A similar brown band extends down the front of the foreleg, from knee to hoof, similarly backed up posteriorly with white.

The tail is similar in color to the body, but much darker, and a thin line of dark brown hair connects it with the gray mass of the body. The white rump patch is similar in form to that of *Ovis montana*, but covers a smaller area.

Pelage.—Thick and long; finer and softer than on *Ovis montana.* On the neck and abdomen it inclines to shagginess, like that of the mountain goat. The stiff, brittle quality is noticeably absent from all white parts of the animal. Everywhere the pelage is abundant and thick, as befits an Arctic animal. Because of this, the animal appears to be shorter in the legs and more stockily built than all other American species, save *Ovis dalli.*

Length of hair on top of neck, 4½ to 5 inches; basal half, stiff, crimped; terminal half, fine, straight, rather soft. One inch of thin, fine wool next to skin.

Length of hair on throat and lower neck, 3½ inches.

Length of hair on middle of side, 2½ to 3 inches; fully crimped, stiff; trace of fine wool at base.

Length of hair on inner surface of thigh, 3 inches; straight, fine, rather soft.

Length of hair on abdomen, 2½ inches; rather fine and straight.

Length of hair on tail, upper surface, 3 inches; straight, coarse, stiff.

Horns.—In color, clear, transparent, even amber-like, similar to the horns of *Ovis dalli* when clean. Annulations numerous and well defined. A slight groove under the superior angle, not so deep as that of *Ovis stonei.* In the type specimen the horns do not spread as in *Ovis stonei* and *dalli;* but this character is of little scientific value, because of the wide variations between individuals of the same species.

Measurements of Horns.

	Inches.	cent.
Circumference of right horn at base	13½	34.4
Length on outer curve	40½	103
Greatest spread (at rear)	21½	54.6
Distance between points	20	50.9
Distance between lowest angles, across forehead	4½	11.5

General Measurements.—The following measurements were derived from the soft skin, by taxidermic methods of long usage:

	Inches.	cent.
Height at the shoulders	34	86.5
Length of head and body	60	152.5
Girth behind foreleg	38	96.5
Head, from angle of nostril to inner angle of eye	6½	16.6
Head, from end of nose to base of ear	13	33
Width between orbits	5	12.65
Height of ear	3½	9
Front hoof, 2¾ in. long by 2½ in. wide.		
Rear hoof, 2½ in. long by 2 in. wide.		
Tail, length to end of vertebræ	4	10.2
Tail, length to end of hair	6½	16.6

Distribution.—The points of difference between *Ovis fannini* and all other species of American *Ovidæ* are conspicuous, and it is remarkable that an animal so large and handsome, and so strangely marked that its separate identity must be recognizable at a considerable distance, should remain in North America undiscovered, and even unheard-of, until the closing year of the nineteenth century. It is strange, indeed, that for so many years it has escaped the vigilant eyes of the Hudson Bay Fur Company and its grand army of hunters and trappers.

Concerning the precise range and abundance of this animal, Mr. Brown has written me, under date of December 20, 1900, as follows:

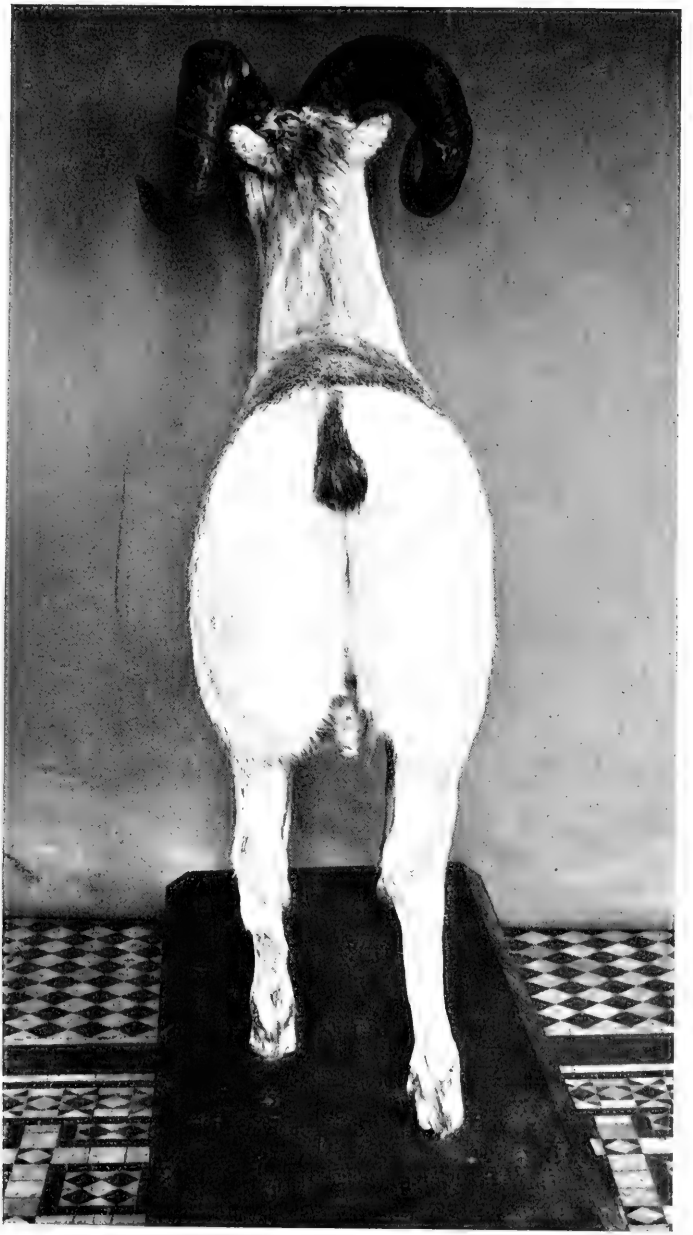
"From the summits of the low mountains about Dawson, on the east side of the Yukon, can be distinctly seen, about fifty to seventy-five miles to the eastward, a beautiful, long, rugged, snow-capped mountain range, extending in a northerly and southerly direction away beyond the view, known as the Rocky Mountains. The two main branches of the Klondike River head in those snowy mountains, in a southeasterly direction from Dawson, and I understand it is there the mountain sheep are found by the hunters. As to how numerous they are I do not know, but presume they are quite plentiful, as I have seen several sled loads of the frozen carcass brought in by hunters to sell to the Dawson markets.

"There are two species, one being all white, the other, such as the specimen you saw, is white with gray saddle-back. The white species, so far as I saw, are a little the smallest."

Mr. Warburton Pike, the Arctic explorer, informed me that on his journey down the Yukon, a short distance below Dawson, he heard of a "piebald" mountain sheep, but was unable to procure a specimen. It is highly probable that *Ovis fannini* will be found distributed throughout a considerable extent of the rugged mountain ranges which quite surround Dawson City north of the Yukon.

Inquiries that have been made of Alaskan and Northwest Territory travellers and authorities have elicited several interesting statements bearing on the existence of *Ovis fannini.* The most direct and positive is that of Mr. C. J. Jones, the well-known breeder of buffaloes, who in 1897–98 made a trip to the Barren Grounds after musk ox, and returned by way of the Porcupine-Yukon route. In a letter dated January 26, 1901, he says:

"There were two small bands [of Mountain Sheep] on the Big Black River. The members of one band were white, while the others were partly



FANNIN'S MOUNTAIN SHEEP (TYPE).

white, and a part of them were brown on the backs. I also saw the skin of a part white and part brown specimen at Yukon City."

The following statement by Mr. R. G. McConnell, of the Canadian Geological Survey, in a letter dated January 25, 1901, is equally important:

"The Saddle-Backed Sheep described by you as *Ovis fannini* occurs in the ranges west of the Yukon, between Selkirk and Forty-Mile River, but it is not known how far it ranges beyond those limits."

An inquiry addressed to Mr. A. J. Stone elicited (January 28, 1901) the following very pertinent information in reference to *O. fannini:*

"I have passed completely around its home, and heard of it a good many times, but without getting possession of any specimens. Fearing that I might be criticised as an over-zealous advocate of new species, and fearing that the reports of 'gray sheep' were groundless, I left the matter for further developments, and I am indeed glad that the real thing has been unearthed by you."

On March 29th, at Fort Wrangel, Mr. Harry Pidgeon stated to Mr. J. Alden Loring that he saw a bunch of twenty Fannin's Sheep on the cliffs of Lake La Barge. At a distance they appeared to be white, but on approaching within thirty yards he saw the gray color on their backs. Inasmuch as Mr. Pidgeon is an experienced mountain sheep hunter, and is known to be familiar with both Stone's Sheep and Dall's Sheep, his observation may fairly be regarded as conclusive respecting the existence of *Ovis fannini* at Lat. 61°, and Lon. 135°.

Mr. Loring advises me, from Juneau, on April 10th, that he has met several persons who have seen this species in the meat markets at Dawson.

OVIS DALLI, NELSON.

WHITE SHEEP: DALL'S MOUNTAIN SHEEP.

Type Specimens in the United States National Museum. Described by E. W. Nelson, in the Proceedings of the National Museum, VII., 1884, *page* 12, *as Ovis montana dalli.*

Type locality.—Tanana Hills, Alaska, 100 miles southwest of Fort Yukon, Alaska.

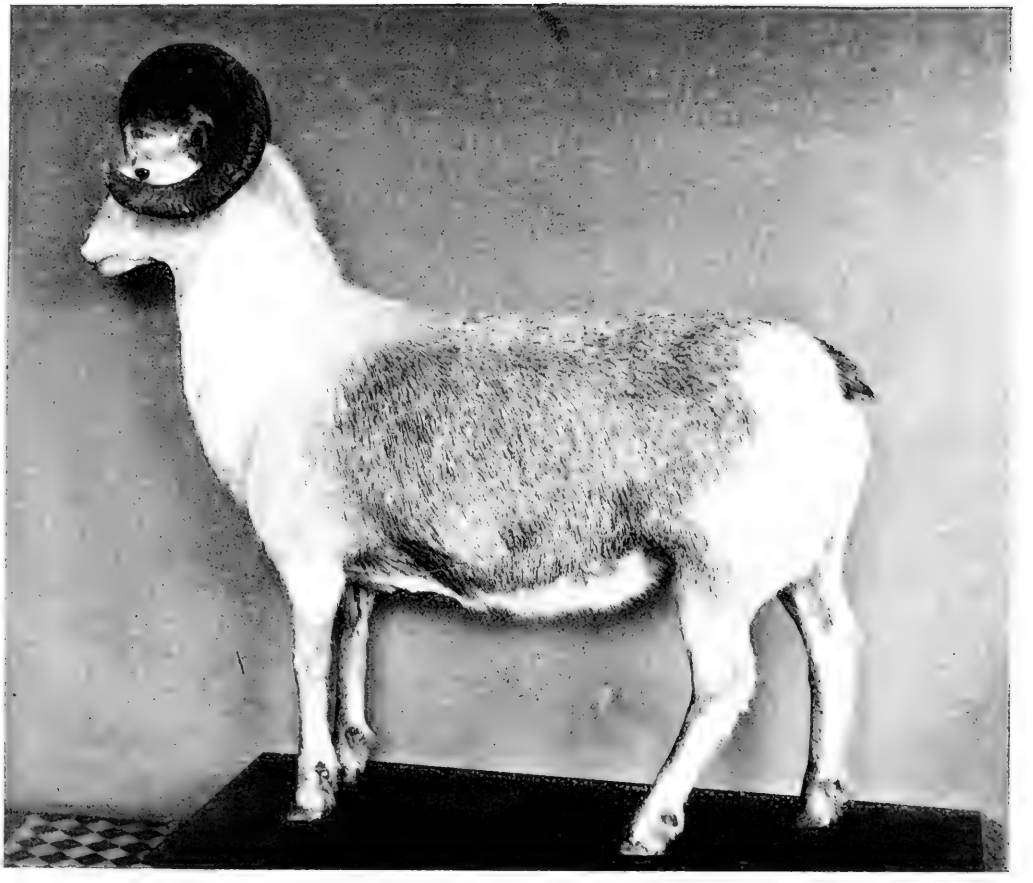
Color and Pelage.—In both sexes the pelage of *Ovis dalli,* when clean, is everywhere milk-white, both in winter and in summer, and from birth to old age.

Through a strange combination of circumstances the type specimens collected in the Tanana Hills, far in the interior of Alaska, were of such a peculiar appearance that Mr. Nelson could not possibly do otherwise than describe them as being "nearly uniform dirty-white. The dinginess of the white over the entire body and limbs appears to be almost entirely due to the ends of the hair being commonly tipped with a dull rusty speck. On close examination this tipping of the hair makes the fur look as though it had been slightly singed." *

In his report on his "Natural History Collections in Alaska" (p. 284), Mr. Nelson makes the following record: "All of the skins of this animal seen by me among the Eskimo from the Kuskoquim River to the Arctic coast were of the uniform dingy whitish color characteristic of the race."

Unfortunately, the coat of Dall's Sheep is sometimes influenced by its surroundings in a manner which tends to convey a very erroneous impression of its real character. During the spring and summer months the hair is frequently stained and discolored by contact with wet soil when the animal lies down. Each hair is a thin, white tube, filled solidly with a spongy, white pith, which readily takes up any liquid coloring matter by capillary attraction. When the end of a hair becomes filled with rusty-yellow clay water, or water discolored by dark gray earth, the coloring matter is held there for an indefinite period. This it is

*Proceedings of the National Museum, 1884, p. 12.



FANNIN'S MOUNTAIN SHEEP (*OVIS FANNINI*).

Mounted by John Fannin, Provincial Museum, Victoria, B. C.

FANNIN'S SHEEP (TYPE).

OVIS DALLI (MALE AND FEMALE).
Mounted by W. R. McFadden & Son, Denver, Colo.

which sometimes imparts to the hair of this animal the appearance of being tipped with "a dull rusty speck." It is strikingly shown in some skins in the American Museum of Natural History, collected in the month of May, and which have been examined through the courtesy of Dr. J. A. Allen. On one of these the entire pelage had been so discolored by what was probably a ferruginous clay as to turn the outer surface of the pelage, and in some places the whole depth of it, the color of iron-rust. The under surfaces of the skin were most heavily stained, and the abdomen showed large patches of this dull-reddish clay color.

Regarding the color of *Ovis dalli,* the statements of two scien-

tific collectors, Professor Lewis Lindsay Dyche and Mr. Andrew J. Stone, will be quoted in full in these notes.

For fifteen years the strangely discolored type specimens of *Ovis dalli* have conveyed to zoologists a totally erroneous impression of the true color of this beautiful animal; and for nearly that length of time they have remained unique in their peculiar appearance. At last, two other singed-looking specimens have been noted. On his journey down the Yukon, in 1896, Mr. Warburton Pike saw some Mountain Sheep skins at the mouth of Forty-Mile Creek (forty miles below Dawson City), which he describes as being "very white, with the tips of the hair looking as if they had been singed by fire."

I have examined perhaps forty skins and heads of this animal, and, excepting the type specimens, have never seen even one that was otherwise than clear milk-white, save a few which had become stained or dirty through contact with earth or dust. There is now before me a mounted head, taken in summer, the hair on which is only an inch in length, but it is perfectly white and immaculate. To show the very striking effect of this animal as seen alive in its own haunts, Messrs. W. R. McFadden & Son, of Denver, very kindly took the trouble to transport three specimens, owned and recently mounted by them, to a rocky situation near Denver, and there had them photographed for reproduction in these notes.

The hair on all these specimens is pure white, and there is no trace of any coloring matter at the ends of the hair.

Let anyone who doubts the purity of color of *Ovis dalli* examine two surpassingly fine unmounted skins in the collection of the United States Biological Survey, at Washington, Dr. C. Hart Merriam, Chief, which were collected on the Porcupine River, Alaska, eighty miles northwest of Rampart House, on January 25, 1894, by General Frederick Funston. For luxuriance of pelage I have never seen their equals. The hair of the male measures as follows:

	Inches.	Cent.
Length on top of neck	6	15.3
Length on shoulders	5	12.8
Length on side	3	7.7
Length on thigh	3½	9

The long hair on the top of the neck is finely pointed, not crimped throughout its terminal half, and is so luxuriant that it

forms a semi-erect mane, like that of the mountain goat, which extends quite over the shoulders. The tip of the tail of each of these animals bears a very small bunch of dark-brown hair, and about twoscore of long, brown-tipped hairs are scattered through the coat of the ram, on the hindquarters.

The full winter coat of *Ovis dalli* is long and thick, and softer than on *Ovis montana*. On the neck, shoulders, and abdomen it is so abundant it may properly be called shaggy. Because of the greater abundance and length of its pelage this animal seems very stockily built, but this is not the case. In midsummer it is as clean-limbed and shapely as an antelope. A noticeable peculiarity of the midwinter pelage is the length and fineness of the hair on the neck, which is quite unlike that on the Big Horn.

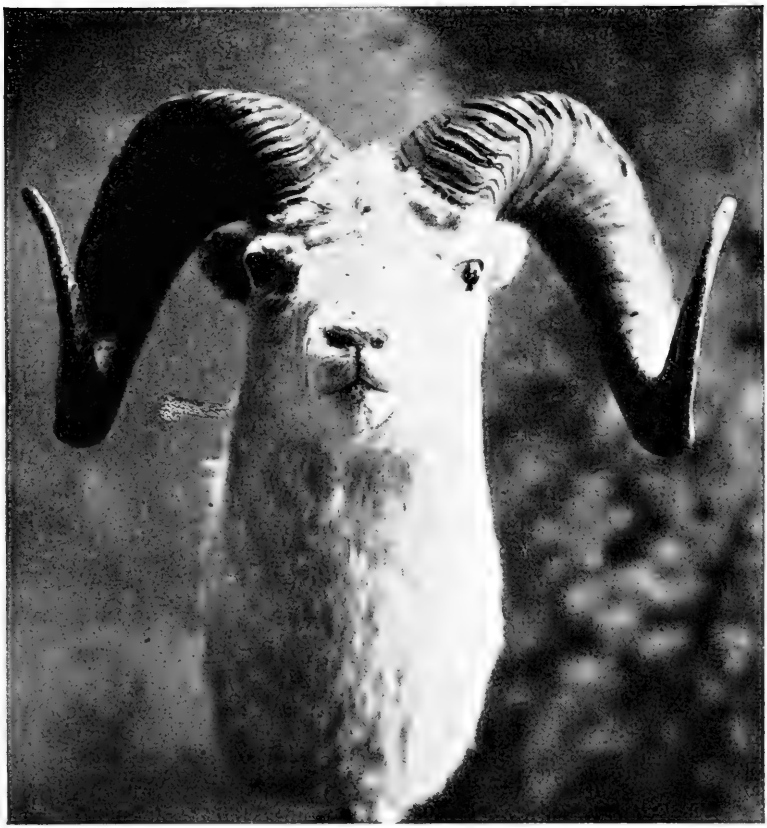
The old hair begins to fall off in May, and by the end of June has almost entirely disappeared. The transformation is as great as the shearing of a domestic sheep. Owing to the extreme shortness of the new hair, it seems to be more stiff and coarse than afterward, when it attains its full length. In comparison with other species, the pelage of *Ovis dalli* resembles that of *fannini*, while the coat of Stone's Sheep is more like that of the Big Horn.

Fortunately for all these animals, their hair is so brittle and so easily broken, their skins possess little value to mankind, although they are often put to use by the natives as clothing and robes. Had Nature seen fit to clothe the wild sheep like the best of the fur-bearing animals it is extremely probable that very few specimens would now be alive on this continent.

Horns.—The most strongly characteristic features of the horns of *Ovis dalli* are two in number—(1) the front and rear side grooves, caused by the overhang of the upper surface of the horn, and (2) their light color.

In fresh specimens the horns have a pale yellow, semi-transparent appearance, strongly suggestive of amber. From specimens that have been kept for a considerable period, and from which the natural oil of the horn has dried up, this amber-like appearance disappears, and thereafter the color is much the same as in the horns of *Ovis montana*.

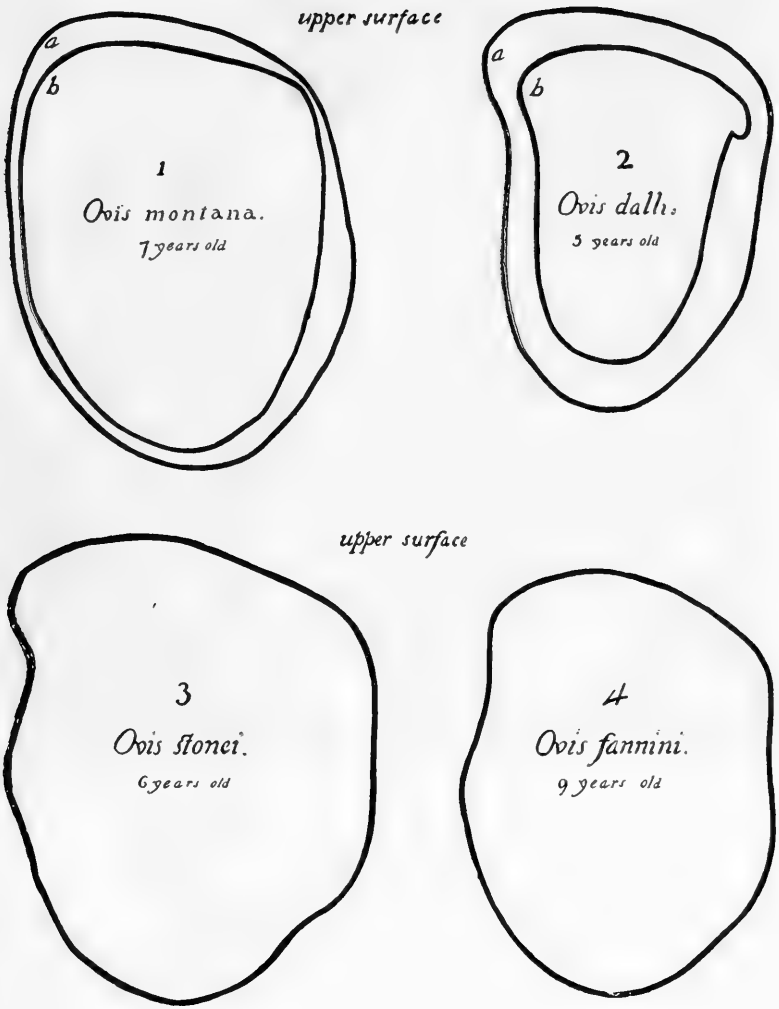
The horns do not spread widely, as in *Ovis stonei*, but they possess a peculiarity which is not found in any other American *Ovis*. The top of the horn is wider than its central transverse diameter; and, midway between the two ends, the upper surface



HEAD OF *OVIS DALLI.*
Mounted by W. R. McFadden & Son, Denver, Colo.

overhangs both sides in two pronounced ridges. The ridge on the rear, or inferior, angle overhangs most strongly, as will be seen in the cross sectional diagram, and gives the horn the appearance of being strongly grooved on both sides. The rear groove, however, disappears entirely about six inches from the skull. The largest horns of this species do not possess more than about one-half the bulk of the largest horns of *Ovis montana,* but they are much more handsomely modelled, and are rarely broken or "broomed" at the tip. I have never seen a notably imperfect pair.

The horns of the white sheep are frequently made into large, long-handled spoons or soup ladles, which find their way all over Alaska to Point Barrow.



CROSS SECTIONS OF MOUNTAIN SHEEP HORNS.

Cross section of male right horn, three inches from base, of four species of American Mountain Sheep, the left side of each being the front. The smaller cross sections of *Ovis montana* and *dalli* (*b b*) were taken midway between base and tip.

General Measurements.—The following measurements of *Ovis dalli* have been kindly furnished by Mr. Andrew J. Stone:

Large Adult Male.	Inches.	Cent.
Height at shoulders	39	99.3
Total length	58.5	148.8
Height at elbow	22	56
Depth of body	18	45.9
Femur to humerus	36	91.5
Tarsus	16.5	41.4
Tail	4	10.2
Across chest	10.5	26.3

Large Adult Female.	Inches.	Cent.
Height at shoulders	33.5	85.2
Total length	54	137.3
Height at elbow	20.5	52.1
Depth of body	15.5	39.5
Femur to humerus	33	84
Tarsus	15	38.2
Tail	3.5	9
Across chest	9.25	23.5

General Distribution.—Ovis dalli is found throughout the main range of the Rocky Mountains from Lat. 60° northward, practically without a break, to its terminus on the Arctic coast, forty miles west of the Mackenzie delta; then westward to the Romanzoff Mountains, and beyond to the Arctic coast at Cape Beaufort, a distance of 1,400 miles. From this northern boundary line the species extends eastward toward the Yukon throughout probably all the mountain ranges which are high enough to afford the animals good homes and feeding-grounds above timber line. It reaches the Yukon about at the mouth of Porcupine River, crosses to the Tanana Hills, and ranges southwestward to and through the Alaskan Mountains to the 60th parallel. It is abundant in the mountains of the Kenai Peninsula, and from the head of Cook's Inlet its western limit parallels the coast line almost as far down as Cape Fairweather. It is reported in the St. Elias Range, and doubtless inhabits many other mountainous regions that have not yet been explored and reported upon by observing travellers and naturalists.

ALASKA.—"Bluffs and high mountains of the Yukon River above Fort Yukon; headwaters of the Tanana and Kuskowim rivers; Romanzoff Mountains westward to Kaviak Peninsula; Kowak and 'Nunatog' [Noatak] rivers, northerly to Arctic coast near Cape Lisburn. In August, 1881, two specimens were seen five or six miles inland from Cape Beaufort, about 600 feet above sea level. While cruising along the coast from Kotzebue Point to Point Barrow, hundreds of skins were seen among the Eskimo. These came from the head of Nunatog River." Alaskan Mountains nearly to the head of Bristol Bay. 1887.—*E. W. Nelson.*

Mountains east of Cape Nome. 1900.—*Arthur Gardner.*

Tordrillo Mountains, head of Kuskowim River, Lat. 62°, Lon. 153°. No sheep observed between this region and the mouth of the Kuskowim, and very little animal life of any kind. 1898.—*J. E. Spurr.*

Alaska Mountains, formerly known as Chigmit Mountains, extending along western shore of Cook's Inlet. Specimens taken "near Bristol Bay" for United States National Museum. 1883.—*Charles L. McKay.*

Head of Turnagain Arm, Cook's Inlet; Matanuska River, middle reaches and headwaters; Kenai Peninsula. 1898–1900.—*T. C. Mendenhall.*

Head of Cook's Inlet, mountains between Matenuska River and Copper River. All high mountains with slopes bearing grass were inhabited by White Sheep. 1894.—*Professor Lewis Lindsay Dyche.*

Kenai Peninsula, mountains near Sheep River, which flows into Kachemarach Bay. 1898.—*Harry E. Lee.*

Kenai Peninsula, mountains around Sillokh Lake.—*Dall De Weese.*

Chittystone and Chittyna rivers (southern tributaries of the Copper River), Lat. 61° 30′, Lon. 143° 30′; also the divide between Copper and Tanana rivers, about Lat. 63°, Lon. 144°. The white sheep is called by the natives the "tebay." 1885.—*Lieut. H. T. Allen, U. S. Army.*

Copper River, lower reaches, about Lat. 61°; also at Lat. 62°; Mt. Wrangell. A pair of female horns collected in the Wrangell country, where sheep were seen in bands of fifty individuals. 1900.—*Arthur C. Spencer.*

St. Elias Mountains—reported. 1899.—*J. B. Burnham.*

Mountains west of Skaguway. 1900.—*J. K. Mankowski.*

Tanana Hills, about 100 miles southwest of old Fort Yukon—type locality. 1884.—*E. W. Nelson.*

Porcupine River, Lon. 138°; Big Black River, fifty miles north of Circle City. 1898.—*C. J. Jones.*

Eighty miles northwest of Rampart House. 1894.—*General Fred. Funston.*

Romanzoff Mountains. 1898.—*Andrew J. Stone.*

Koyukuk River, Lat. 67° 30′, Lon. 148° 30′. "Plentiful." 1900.—*H. B. Baker.*

British Columbia and Yukon Territory.—Mountains west of Lake Bennett and White Pass. 1900.—*Wilfred H. Osgood.*

High plateau between Dease Lake and Lake Teslin, immediately south of Cassiar Mountains, Lat. 59° 30′ and Lon. 130° 30′. 1898.—*George B. Richardson.*

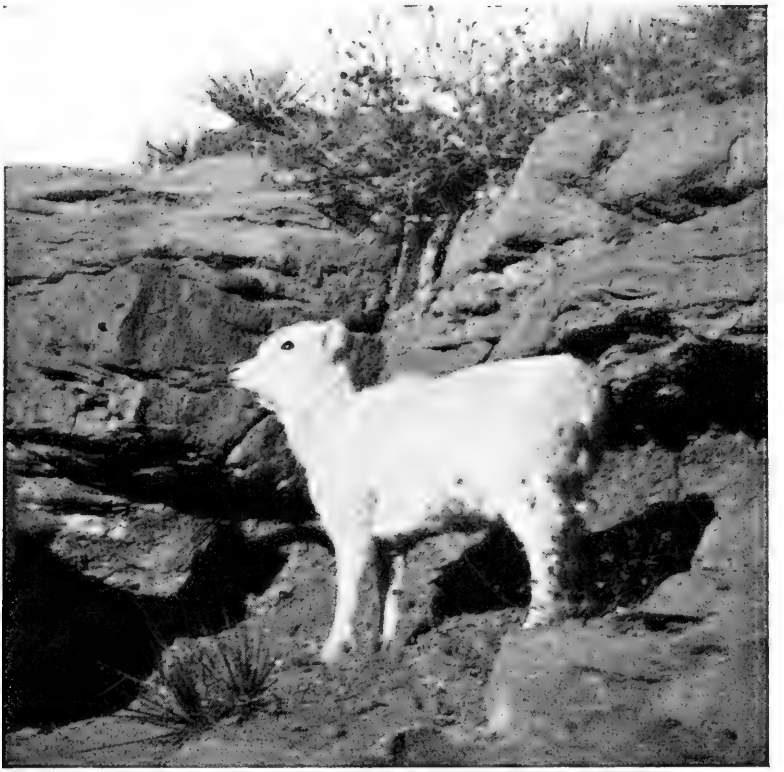
Rocky Mountains, their entire length, from Lat. 60° north to the Arctic coast, immediately west of the Mackenzie delta, ranging thence westward to the headwaters of the Noatak and Kowak rivers; Nahanna Mountains, a spur of the Rockies in Lat. 60°; and main chain of Rockies at 69°, but "very much scarcer than formerly." 1900.—*Andrew J. Stone.*

Yukon River, mouth of Forty-Mile Creek. 1896.—*Warburton Pike.*

Klondike River. 1901.—*Henry W. Brown.*

Mountains west of the mouth of Peel River; reported to range almost as far south and west as Dawson. 1901.—*R. G. McConnell, Geological Survey of Canada.*

General Notes.—The fact that for a hundred years prior to 1884, both Russians and Americans had explored the coast of Alaska without discovering the presence of this snow-white mountain sheep is its own commentary on the perceptive faculties of mankind generally in the Northwest. Had the animal inhabited



OVIS DALLI LAMB.

Mounted by W. R. McFadden & Son, Denver, Colo.

only the mountain fastnesses of the remote and difficult interior, its immunity from discovery would be easily explained; but in many localities it inhabited ranges washed by tide-water, and lived almost within sight of the traders along the coast.

It was not until 1884 that the White Sheep was discovered and described in print by Mr. E. W. Nelson, a trained naturalist, in the service of the United States Government. Strangely, and unfortunately, his type specimens were so dingy and off-color from pure white that he was compelled to describe the species as being "nearly uniform dirty-white," which was ascribed to "the ends of the hairs being commonly tipped with a dull, rusty speck." Whatever may have been the cause of this peculiar condition of

the pelage of the skins on which *Ovis dalli* was based, their color certainly was peculiar to them.

A very convincing explanation of the condition of some skins of White Mountain Sheep, which might be described as "dirty white," is found in the following interesting statement furnished me on this point by Professor Lewis Lindsay Dyche, of the University of Kansas, based on extensive personal observations in the Alaskan Mountains:

"The White Mountain Sheep are a 'dingy or dirty-white' during the summer season only. This is particularly true during the months of July and August. By the first of July the animals have shed their long, thick coats of winter hair. At this time they are almost naked, so to speak, the hair being not more than from ¼ to ½ inch in length. The animals frequent the sunny sides of the mountain ranges, and make their beds in masses of shale rock, or on slopes where there is more or less dirt. They frequently paw the rocks and earth away so as to make a form large enough to sleep in. These places become more or less covered with droppings. Light snows and rains come, the earth is damp, and the animals get their hair stained until they become a 'dingy or dirty-white.' By the first of September the snows are falling, and the animals have a fair coat of hair. They make their beds in the snow, and gradually become white. I saw skins that were white. The ones I got early in September were nearly white, but not beautiful and snow-white like those taken late in the fall and early winter. Pure white skins in the hands of the Indians soon become soiled, and dingy with smoke."

In the course of his very extensive Arctic and sub-Arctic explorations, Mr. Andrew J. Stone has enjoyed exceptional advantages for observing the White Sheep in its haunts. The following statement from him regarding the color of this animal is therefore of decided interest and value:

"I have taken specimens of *Ovis dalli* in the Nahanna Mountains, a spur of the Rockies about 60° north, and in the main range of the Rockies at 66° 30′ north. I have seen specimens at the mouth of Arctic Red River, and at Fort McPherson, on the Peel River, from near the head-waters of these streams. I have also seen numerous specimens from the Rockies where they form the divide between the lower Peel and the Mackenzie delta on the east and the waters of the Porcupine on the west, and also from the Rockies that extend farther west along the Arctic coast.

"In the fall and winter of 1900 I saw a considerable number of specimens on the Kenai Peninsula.

"The only colored hairs I ever observed on any of the specimens of *dalli* I have seen were on a specimen I took in the Nahanna Mountains. On the end of the tail were about a dozen brown hairs. The appearance of the pelage of specimens from different sections, taken at the same time

of the year, was very much alike. The summer coat acquires a rusty hue, which in all probability is due to coloring matter in the soil and beds of decomposed shale, where the sheep so frequently lie down. Winter specimens appear to be quite free from this stain, exhibiting, so far as I have ever observed, a clear white coat."

The White Mountain Sheep is noticeably smaller than the Big Horn, and its more ample pelage has the effect of making it seem short in the legs and heavy in the body. The face averages between one and two inches shorter than that of the Big Horn, of the same age. The horns are much more slender and more delicately modelled than those of *Ovis montana,* and by them alone this species can readily be distinguished from all others. Their closest resemblance is to the horns of *Ovis nivicola,* of Kamschatka.

During the last five years, explorations in Alaska and the Northwest Territory have greatly extended the known range of this species. Indeed, it would not be surprising if the complete exploration of the Northwest reveals the fact that the White Sheep inhabits every important mountain range north of the 60th parallel and west of the Mackenzie River. Whether it has ever crossed the Mackenzie delta, and spread through the mountains that extend eastward along the coast, remains to be determined; but it is entirely probable that it has done so. The gap (if one there be) between the low mountains immediately eastward of the delta and the high range extending southeastward from Cape Bathurst can be no greater than the eastward wanderings of the Big Horn from the Rocky Mountains, along both the Yellowstone and the Missouri rivers.

The localities of the White Sheep which are most accessible to American sportsmen and naturalists are the mountains of the Kenai Peninsula and the Alaskan range surrounding Cook's Inlet.

One of the best published accounts of hunting this animal in its home, and its habits when pursued, is from the pen of Mr. A. J. Stone,* and refers to the mountains about fifty miles west of the Mackenzie delta, the Arctic terminus, in fact, of the Rocky Mountain system. The following is from Mr. Stone's report:

"I found these animals everywhere above the timber line, and almost always occupying the most rugged parts of the mountains, the males particularly favoring the most rugged and rocky ridges.

*Bulletin of the American Museum of Natural History, XIII., p. 43.

"Five out of twenty-two specimens shot by me tumbled over precipitous walls into inaccessible places and were lost. One of the lost five was found in a bunch of three resting on a ledge, seemingly not over a foot wide, on the face of a cliff fully 2,000 feet high from base to summit. They were not over 150 feet from the crest of the summit, over which I leaned and watched them, unobserved, for some time. How they reached the place or left it I could not tell.

"As this animal has been but little observed by naturalists or hunters, I will relate one other adventure as illustrating its wonderful vitality, agility, and endurance. One of my Indians came in one night and reported having crippled a large ram, which he failed to get. The next morning I decided we would hunt in that direction, in the hope of securing the cripple, as I have the utmost horror of leaving a crippled animal of any kind to die a lingering death. Reaching the level top of a high ridge, we skirted it for a short distance, and then separated into two parties. I took with me the Indian who claimed to have crippled the ram the day before; in reality, however, I did not believe his report. After following the edge of a deep cañon for about a mile, he proposed that I should watch from above while he descended to look for the cripple. He had been gone for some time, and was out of sight, when I heard him halloo. On running along the crest for some distance I finally discovered him making his way up the bottom of the cañon, calling every few steps. I could not at first make out what he was up to, but soon a sheep made its appearance from behind a jutting point, and a little later it was plainly to be seen, creeping along over the rocks ahead of the Indian, up the rugged cañon, seemingly with difficulty. I concluded the Indian could easily get in range and kill the poor beast, and I could not at first understand why he did not do so, but I soon came to the conclusion that he had discovered that the easiest way of getting the skin and bones to the top of the long, hard climb was to drive the animal ahead of him, knowing that I was at the top and would be on the lookout.

"As I proceeded to the head of the cañon, in order to be ready to dispatch the beast on its arrival, I could see that one hind leg was broken; and as I watched the poor thing jump from one crag to another as it mounted that long, steep climb, I felt disgusted with such proceedings, and would have gladly carried up the skin rather than see the animal suffer, had I been in a position to do so. While I was thinking what this animal must have suffered during the preceding twelve hours, of how exhausted it must be from such a climb on three legs, and wondering if it would really get to the top, to my surprise it suddenly stood on the crest of the cañon wall, seventy-five or a hundred yards distant, fully fifteen minutes sooner than I thought possible.

"As it turned toward me, and caught sight of me, I raised my rifle and fired. It fell, turning completely over; then it jumped up, and was away across the ridge like a shot, its broken leg swinging like a pendulum at every jump. As soon as I recovered from my surprise, I followed as fast as I could run, only to see it disappear over the side of the next cañon. It circled the side of the cañon wall, and took a stand on a jutting

TWO VIEWS OF A WHITE MOUNTAIN SHEEP.

Living *Ovis dalli* (young male), photographed on the Kenai Peninsula by Harry E. Lee. At the click of the shutter for the first picture the animal sprang to its feet, and the second picture was obtained as it ran away.

ledge of rock, upon which, if I shot it, it would topple off down on to the rocks, several hundred feet below, and be ruined as a specimen; so I sat down to await its possible change of position. After a short while my white man and natives arrived, and two of them decided to go around and chase him down. As they approached him, down he went, apparently as lively as ever, and another chase took place, lasting until the white man was played out.

"From the edge of the cañon I could watch every move. Twice the native tried his smooth-bore, without effect, and I began to think the ram would get away from him. It climbed a deep cut between two high turrets in the side of the cañon wall nearest me, and found its way into a deep cavity in the side of one of the great natural abutments, and lay down. The Indian could not get to the place, but threw stones at the poor beast until it ran out. As it left this big cavity it either had to leap directly down fifteen or twenty feet or pass out by the Indian; and here is just where it displayed its wonderful capabilities in a most daring manner. As it emerged from the cavity it crept along the wall, which to all appearances was almost perpendicular, and continued straight on for twenty-five or thirty feet. It then turned around and came back to the edge of the cavity, and leaped down, falling as it struck the rock below; but it was immediately up and away, seemingly as game as ever. The Indian, who was within a few feet of the animal at the time, said that he could not see anything in the shape of a projection on the face of the rock for the animal to walk on, nor could any of us do so at a distance of perhaps two hundred yards with the aid of powerful field-glasses.

"I stood, carefully watching every movement of the animal, and how it was possible for it not only to walk the side of such a wall, crippled as it was, but actually to turn around and walk back, is beyond my conception, for I am sure there was no place on the face of the wall to which I could have clung for even a moment.

"The Indian again went in pursuit, finishing the animal soon after with a lucky shot. I went down to measure and skin the animal, but found the greater part of its coat so thoroughly filled with blood, much of which had dried and set fast, that I only saved the head.

"The shot the Indian first gave it had completely smashed the left thigh. My shot had entered the left side just back of the shoulders and a little above the heart, ranging backward and upward, and passing out at the right flank, tearing a fearful gash, through which I could thrust my fist. It had bled much, internally and externally; had lived nearly twenty-four hours after its thigh was smashed, and for four hours after the wound I gave it, suffering from loss of blood, making wonderful climbs on three legs, and performing feats hardly to be believed, even by those who witnessed them. The animal was a four-year-old ram, and a magnificent specimen."

Up to this date it cannot be learned that a specimen of *Ovis dalli* ever has been captured alive and kept in captivity. Certainly none have ever reached any of the zoological gardens of either

America or Europe. However, the acquisition of living specimens is only a question of effort and expense. Whether the species can be induced to live outside of Alaska remains to be seen, but in any event its acclimatization is likely to be a matter of considerable difficulty. There is reason to hope, however, that specimens taken from a comparatively low altitude on the coast of Alaska may live in the climate of New York longer than Big Horn from the high, dry, and rarefied atmosphere of our Rocky Mountains.

So far as I am aware, the honor of being the first person to photograph living wild specimens of White Sheep in their mountain homes belongs to Mr. Harry E. Lee, of Chicago. As a contribution to these notes, Mr. Lee has generously extended to the Society the privilege of reproducing two of his pictures, hitherto unpublished, of living sheep, and also two pictures of dead specimens, all of which are valuable representations both of the species and its home. The difficulties that have been surmounted in securing these plates surely will be appreciated by every hunter and collecting naturalist.

In response to my request for information concerning his observations on *Ovis dalli,* Mr. Lee has written me the following very interesting letter, dated at Chicago, April 8, 1901:

"It is with much pleasure that I reply to your inquiry in reference to my observations on the Alaskan White Sheep (*Ovis dalli*).

"In the summer of 1898 I visited the sheep mountains of Alaska for the purpose of studying this noble animal and to procure for my own private museum a few specimens. I was very successful in both my undertakings, and the knowledge and trophies secured amply repaid for all the hardships I had to endure. I was very anxious to procure a few photographs of the live animals on their native heath, which I could have done a number of times had not my camera failed me when I needed it most. I then determined to revisit these mountains another season, and be thoroughly fortified against accident by having more than one camera.

"In 1899 I made my second trip, and reached the Kenai Mountains, generally known as the 'Alaskan Alps,' on June 7th. These mountains are inland about forty miles, and overlook Cook's Inlet, Kachemak Bay, and Kenai Peninsula, to the south and southwest. Mount Ilimana (Volcanic Mountain) rises to the westward, while grand old Mount McKinley looms up in the northwest, far above all the surrounding country.

"The highest peaks on the Kenai range are about 12,000 feet. The surface is broken by immense glaciers and deep ravines. The table-lands are covered with a dark granite rock and patches of short, thick grass. This range of mountains, although in full view from the coast, seems to be very little known, and it is my opinion that when it is fully known it

MALE AND FEMALE WHITE MOUNTAIN SHEEP.

Photographed in the Kenai Peninsula by Harry E. Lee.

will be found to contain some of the richest mineral deposits in Alaska. We discovered a number of very promising quartz ledges, and with my own hands I dug, almost from the surface, several pieces of ore in which the shining metal was plainly visible.

" The valleys to the south of these mountains are covered with a dense growth of timber, principally pine, spruce, and birch, dotted occasionally with lakes and areas of rich grass. This grass, which is quite abundant, is of the red-top variety, and grows to a height of six feet. I have seen patches of five, ten, and twenty acres of it.

" The principal animal which inhabits these mountains is the far-famed White Sheep (*Ovis dalli*). This animal is not only the most graceful in appearance, but the most agile and wary in its native haunts of any animal that I know of. It is also one of the most courageous, and even fierce, when met by an enemy on its own rocky cliffs.

" It is very seldom that wolves or bears, even when in their most dire want of food, will venture on the ledges where these apparently helpless and harmless animals station themselves while they calmly await the enemy's approach. In attacking, the graceful yet strong neck of the sheep is slightly arched, the shapely head with its massive horns is lowered, the hoofs seem to be glued to the rocks, until with one lightning bound it meets its antagonist.

" The most erroneous idea that I have ever heard advanced, but which I was once led to believe, until I watched for weeks the movements of these animals, was that these sheep alight on their heads when jumping down perpendicular walls of rock. This is absolutely untrue. I have watched carefully their movements, under every condition, and in every instance they came down on all fours, with the feet slightly drawn together under the body. I have seen them make some remarkable leaps, and which would seem incredible except to those who have made a careful study of the animal in its native haunts.

" During the severe winter months these sheep hibernate to a certain extent, because it is impossible for them to procure food of any kind while the deep snows cover the mountains. They find protection from the storms in the crevices of the ledges.

" In the spring time, when they first come from their winter quarters, they are so poor that they are hardly able to walk. It is then that the bears and wolves make their feasts on them, and numbers of White Sheep are destroyed.

" The lambing season is from May 1st until August 1st, and I have even found some very small lambs in September. The males and females are hardly ever found together during the summer months. The males generally inhabit the roughest and highest peaks, while the ewes and lambs keep along the high plateaus.

" During the morning and evening, while the ewes are feeding, the lambs are always kept well in front of them. The old ewes take turns in watching and guarding, and often remain about fifty yards in the rear. They nearly always feed to windward, and if the slightest foreign scent is detected they immediately wheel about and make for the cliffs.

" I have tried for days to get a photograph of the lambs and their

mothers feeding, but the watchful eyes of the sentinel on guard always kept me at a safe distance, and the nearest approach I could make was two hundred yards.

"The horns of a full-grown male White Sheep will measure fifteen inches in circumference at the base and thirty-eight inches in length. The average weight of the full-grown male during September or October is 300 pounds; the female about fifty pounds less. The horns of the female, which are almost straight, will average three-quarters of an inch in diameter at the base, tapering to the point, and about five inches in length. Very often these female sheep are taken for goats, on account of the similarity of horns.

"Two lambs are the usual number at a birth. I have seen a few instances where three lambs were with one mother, but it is only rarely that this happens.

"The pelage of the sheep is of snowy whiteness, and is a mixture of hair and a little very fine wool. Every spring the old hair falls off when the new hair is about one-half of an inch in length. The coat grows very rapidly, and by fall a heavy covering of three inches is formed, which it is almost impossible for cold or rain to penetrate.

"The flesh of the sheep is, without any exception, the most palatable and nutritious of any meat I have ever tasted. One of the most peculiar features about it is, that one can make a complete meal of it three times each day for weeks, and relish it more and more at every meal. The flesh is of a light reddish color, with a rich, aromatic taste, and very juicy. The great demand for this meat by miners and prospectors in Alaska during the past few years is beginning to show its effect on these noble animals. On my first hunting trip, in 1898, I counted hundreds of sheep on a certain range of mountains, but when I returned to the same range in 1899 there was hardly a sign of sheep to be found.

"The brown or 'grizzly' bears which inhabit these mountains have a very cunning mode of procuring a feast on the flesh of the White Sheep. The bears are of a grayish brown color, almost the exact color of the rocks. In migrating from one mountain to another the White Sheep have well-worn paths, in which they travel in single file. A hungry bear secretes himself among the rocks, within arm's-reach of the path, and awaits his opportunity. The unsuspecting sheep walks proudly along, until, with the agility of a cat, the powerful paw of the bear strikes forth, and the helpless sheep is at his mercy. Hundreds are killed every season in this way.

"The wolves have a different method, and are not generally so successful as bears. Their plan is to move stealthily along the ledges when the sheep are feeding, approach their prey closely, and cut off its retreat from the steep cliffs. When attacked by a wolf the sheep huddle up in a bunch and form a complete circle, with their heads always facing the foe. The wolf keeps running around, snapping and snarling, endeavoring to get the flock scattered, but this is seldom accomplished, as the sheep know only too well what this means. If possible, they keep steadily on their guard until the wolf becomes tired and is driven off.

"It is a burning shame that there have not yet been enacted adequate laws for the protection of the White Sheep, and also for the moose and caribou of Alaska."

STONE'S MOUNTAIN SHEEP (*OVIS STONEI*, ALLEN).

Field Columbian Museum, Chicago. Mounted by C. E. Akeley.

OVIS STONEI, ALLEN.

STONE'S MOUNTAIN SHEEP: "BLACK SHEEP."

Type Specimens in the American Museum of Natural History, New York City. Collected by Andrew J. Stone, 1896.

Type locality.—Northern British Columbia, Cheonnee Mountains, headwaters of the Stickine and Nass rivers. Lat. 57° to 58°.

Description.—This animal is smaller and more lightly built than *Ovis montana.* Its pelage is compact, and not so abundant as in *Ovis dalli* and *fannini,* and lightest in color when immature. After the third year it is readily distinguished by its dark colors, gray and dark brown, by a nearly black dorsal stripe extending from the back of the head to the tip of the tail, and the wide spread of its horns.

Lamb.—Variable in color. Sometimes quite similar to the lamb of *Ovis montana* of the same age, and again much lighter. A lamb in the American Museum of Natural History, twenty-five inches high at the shoulders, is light gray. On the head, neck, and shoulders, to the region behind the elbow, the color is almost as light as the rump patch and inside of thighs. The breast and region of the shoulder joint and humerus are a shade darker, as also are the loins, iliac region, and thighs outside. The dorsal stripe is conspicuous and sharply defined. The horns are only one inch in length.

A lamb of the same age in the Field Columbian Museum is everywhere very much darker, save its rump patch, and, taken alone, might easily be mistaken for a young specimen of *Ovis montana.*

Male and female, up to third year.—From the first year the color gradually grows stronger and darker until full maturity is reached.

Male, fourth year.—Decidedly darker in all its dark colors, and the rump patch is lighter.* The head has remained unchanged, as to lightness of its color, from the first year. The body color of old males is Vandyke brown, with a slight mixture of gray hairs; but at a little distance the animal appears to be dark brown, or blackish brown. The body color is darkest low down on the sides, where it meets the white area of the abdomen, and is nearly black.

The face is distinctly lighter in color than the body, the end of the muzzle being of a dirty, or dusky, white. The top of the muzzle is a warm, brownish gray, and the forehead is the same. Below the eyes is a large patch of a lighter color. Behind the horns, on the occiput, is a conspicuous dark patch from which an almost black band, 1½ inches wide, extends back to the shoulders. Between this and the lower half of the neck the hair has, in some specimens, a rusty yellow wash, which

* Between the type specimens in the American Museum at New York, and those composing the very fine group in the Field Columbian Museum at Chicago, there is a marked difference in intensity of color. The former are all much lighter than the very brown and sombre Chicago specimens. Mr. Stone is of the opinion that the New York specimens more nearly represent the average color of this species. The difference is no greater, however, than is sometimes observed in *Ovis montana,* but the cause of it remains a mystery.

consists of many yellow-tipped white hairs slightly mixed with brown. The lower surface of the neck is colored like the back and sides, but is darker where it joins the body. This color is continued over the breast to a point about six inches back of the forelegs, where it is sharply divided by the apex of a broad triangular rear area of white. This white tract covers the abdomen up to the flanks, the space between the thighs, and extends on upward until it terminates high up on the hind-quarters in a rump patch similar to that of *Ovis montana*. In this light-colored rump patch the tail appears as a diamond-shaped patch of blackish-brown hair. The darkest portions of this animal are behind the forelegs, on the outside of the forearm, and on the outside of the thigh from the hock joint upward. The front edges of the legs are dark colored, while the rear edges are light, and a light-colored band extends centrally up the inside of the thigh.

Pelage.—On summer specimens the pelage is short and compact, and the animal has a very trim and neat appearance. Of the specimens that have been collected up to this date, sixteen have been examined by the writer, and upon all the pelage is stiff and coarse. The long, fine, and abundant hair of the neck and abdomen of *Ovis fannini* is conspicuously absent, a fact which is only partly accounted for by the season in which the specimens were collected.

Horns.—The wide-spreading, deeply grooved horns of *Ovis stonei* are one of the most prominent characters of this species. The horns are light in color, slender, and deeply annulated near the head. Their most prominent mark is a deep groove under the superior edge, a quarter of an inch deep for the first seven inches out from the base, but usually disappearing entirely about eleven inches out. The back of the horn, at the middle, is almost flat.

Measurements.—Of actual measurements of *Ovis stonei* in the flesh, none are available for adult males, those taken by Mr. Stone having, unfortunately, been mislaid beyond recovery. Regarding the size of this animal, however, Mr. Stone has furnished me with the following statement: "The sizes of *Ovis stonei* and *O. dalli* are identical; there is no perceptible variation between the sizes of the two species. I know this from actual measurements." Regarding specimens of other ages, Mr. Stone has kindly supplied the following records of measurements made by him:

General measurements of adult female Ovis stonei.

	Inches.	Cent.
Height at shoulders	32	81.4
Total length	52	132.4
Height at elbow	20¼	51.5
Depth of body	13¾	35
Femur to humerus	32½	82.6
Tarsus	15	38.2
Tail	3	7.7
Across the chest	8	20.4

Two-year-old male Ovis stonei.

	Inches.	Cent.
Height at shoulders	29¾	75.7
Total length	49	127.7
Height at elbow	18	45.9
Depth of body	13	33.1
Femur to humerus	28½	72.5
Tarsus	14	35.7
Tail	2¾	
Across the chest	7	

STONE'S SHEEP (*OVIS STONEI*, ALLEN).

Male specimen, 7 years old, in the Field Columbian Museum, Chicago. Mounted by C. E. Akeley.

Measurements of the head of a six-year-old ram mounted by Lindley & Foster, Victoria, B. C.

	Inches.	Cent.
Circumference of horn at base	14.25	36.3
Length on outer curve	32.50	82.6
Extreme width, between points	28.75	73.1
Inner corner of eye to nostril	6	15.4
Width between lower angle of horn ridges	5.50	14
Length, base of horn to end of nose	8.50	21.6
Circumference of muzzle	8.50	21.6

The strongly marked species of Mountain Sheep which now bears the name of *Ovis stonei* was discovered in the Cheonnee Mountains of northern British Columbia, at the head-waters of the Stickine and Nass rivers, in the summer of 1896, by Mr. Andrew J. Stone, in whose honor the species was named. It inhabited an elevation of 6,500 feet, which is about 4,000 feet above timber line. Three of the specimens collected were mounted in Missoula, Mont., and exhibited at the New York Sportsmen's Show in the winter of 1897, where they were at once recognized as representing a species up to that time unknown. The specimens were purchased by the American Museum of Natural History, and described by Dr. J. A. Allen in the Bulletin of that institution, Vol. IX., pp. 111–114, pl. 2, on April 8, 1897.

Thus far nothing positive is known of the geographic range of the Black Sheep save the facts that have been furnished by Mr. Stone himself. On this point he makes the following statement:*

"The range of *Ovis stonei* extends throughout the Cassiar Mountains, and in the Rocky Mountains, east of the Cassiar, north to where Beaver River, a tributary of Liard River from the north and west, breaks through the Rockies near latitude 60°. I believe that the Rocky Mountain divide, between the head-waters of the Peace River and those of the Fraser River, forms the dividing line between its range and that of the southern *Ovis cervina*. Its western limit very nearly conforms to the Cassiar Mountains and their numerous spurs."

In 1896, Mr. Warburton Pike, while journeying down the Yukon River, saw at Hoole Cañon, on the Pelly River, near Pelly Mountains, two skins and heads of mountain sheep, which he has described as follows:†

"The horns were exactly like those of the Big Horn of more southern latitudes, and the skin gave no signs of the gradation of color known to exist between the true *Ovis montana* and the *Ovis dalli* of the northern mountains."

* Bulletin A. M. N. H., xiii., p. 42, 1900.

† "Through the Sub-Arctic Forest," 1896, p. 199.

This interesting observation is capable of but two interpretations: (1) the specimens seen were *Ovis montana,* which thereby makes a long leap northward, from Lat. 55° to 61° 45′, about 650 miles; or, (2) they were *Ovis stonei,* either weathered or slightly immature specimens, which in either case would very closely resemble the dark British Columbia phase of *Ovis montana.* Mr. Stone himself is authority for the range of his Black Sheep up to Lat. 60°, within ninety miles of Hoole Cañon. It is my belief that the specimens seen by Mr. Pike were really immature *Ovis stonei,* and mark the most northerly limit yet recorded for that species.

In this connection it is worth while to note that, up to this date, there has been no record of the presence of both the Black Sheep and White Sheep in the same locality, nor of any mixing of either of these with the Big Horn.

HEAD OF STONE'S SHEEP.

Mounted by Lindley & Foster, Victoria, B. C.

OVIS MONTANA, CUVIER.

BIG HORN: ROCKY MOUNTAIN SHEEP.

Type locality.—Eastern slope of the Rocky Mountains, between the Missouri and Saskatchewan rivers.

Nomenclature.—This animal was first made known to the world, in 1803, by E. Geoffroy (Ann. du Mus. d'Hist. Nat., II., 360–363, pl. 60), as "Belier de Montagne." In 1803 or 1804, one or both, it received two technical names, *O. cervina* from Desmarest, and *O. canadensis* from Shaw, and the question of priority is yet unsettled. In 1817, Cuvier adopted as the name of this species the Latin equivalent of the name under which it was first made known to the world, thus: "Belier de Montagne" (Mountain Ram) = *Ovis montana.* For some reason, nearly all writers from 1818 to 1895 chose to accept the name accepted by Cuvier as the one bestowed by the first describer of the species. During the past eighty years *Ovis montana* has been recognized and used by Richardson, Prince Maximilian, Blyth, Gray, Audubon and Bachmann, Baird, and a host of other writers. In view of these facts, and of the confusion which would certainly follow any change, it seems best to retain the name that long usage has made familiar, and which is also most appropriate.

General description and measurements of an adult male specimen, seven years old, collected by W. T. Hornaday, in the Shoshone Mountains, Fremont County, Wyoming, November 16, 1889.

Colors.—Body (except rump patch), neck, head (except end of muzzle), ears outside, legs to hoofs, and tail, uniform gray-brown, but varying considerably in intensity, even between members of the same herd. Sometimes the body color has a bluish tone. On the hind legs, especially the front edge, the color is much darker, like Vandyke brown, but the posterior edges of the legs are lighter than the body. The hind quarters terminate in a conspicuous white or cream-yellow rump patch, which extends downward between the thighs and over the abdomen, until it terminates in a point a few inches in front of the flanks. The breast and abdomen, except as above, are covered with very dark hair, which is slightly intermixed with white hairs, and sometimes contains a light-colored patch. This dark-colored abdomen seems to have been specially designed by nature to render this mountain animal less conspicuous from below than if furnished underneath with white hair, like most animals of the plains. In fact, the peculiar colors of the Mountain Sheep are about the best that could have been selected to match the grayish-brown rocks of the Rocky Mountains generally where this creature makes its home.

The end of the nose, the lips, and chin are much lighter than the remainder of the head and the body; in some specimens, almost white. The hoofs are black, with the exception of a white lower edge.

The general color scheme of *Ovis montana* varies considerably, according to locality and time of year. The hair of freshly killed specimens, taken in November, in prime condition, sometimes has a rich

bluish-purple tone, which gradually disappears from the dry skin. Pale specimens are common in all localities.

The female is of the same general color as the male, but the lamb in its first year is darker than the adult.

Pelage.—Everywhere the hair of *Ovis montana* is coarse and harsh. That of the neck, shoulders, body, abdomen, and hind quarters is crimped throughout its length, brittle, and colored quite down to the roots. On the head, ears, lower limbs, tail, inner flanks, and on the chest behind the forelegs, it is straight, stiff, and harsh. There is no fine, straight hair on the neck and abdomen, as on *Ovis dalli* and *fannini.*

Measurements of hair of the specimen described.

	Inches.	Cent.
On back of neck	3	7.7
Middle of the side	2	5.1
On front of neck	2	5.1
On abdomen	2	5.1
On tail	1	2.3

Horns.—The horns of the male Big Horn are very massive, and thick in proportion to their length. As a rule they are not strongly annulated, and are rather smooth on their upper surface. They are well rounded on the superior edge, and there is no groove under either edge, as in *Ovis dalli* and other species. The ends of the horns are often stubbed, or "broomed," by fighting, and occasionally the ends are squarely broken off, like the breaking of half-decayed wood. The horns are not so clear, or semi-transparent, as those of *Ovis dalli,* and sometimes they have a weathered appearance. Each year's growth of the horn is distinctly visible by the annual rings, until eight or nine years, when they disappear among the ordinary annulations.

Horn measurements.

	Inches.	Cent.
Circumference at base	14	35.7
Circumference at middle	13	33.1
Greatest spread (at rear)	19.75	50.2
Distance between points	16.50	42
Width of tip	2	5.1

The largest horns of *Ovis montana* ever figured and recorded, up to this date, were taken in the Selkirk Mountains, B. C.* Their measurements were as follows:

	Inches.	Cent.
Circumference of horn at base	18.50	47.1
Length on outer curve	52.50	133.6

The horns of the female Mountain Sheep are small and goat-like, extend upward and backward with a slight curve, and spread outward. For their small size they are strongly annulated, and rather flat. Neither as ornaments nor weapons are they fitted for so fine an animal as that which is called upon to bear them.

* *Recreation* Magazine, New York, 1897, vii., p. 11.

HEAD OF BIG HORN (*OVIS MONTANA*, CUVIER).

Mounted by Lindley & Foster, Victoria, B. C.

General measurements of specimen from the Shoshone Mountains:

	Inches.	Cent.
Height at shoulders	40	101.8
Height at middle of back	38.25	97.4
Height at highest point of hind quarters	39	99.2
Height to top of horns, head erect	56	142.5
Depth of chest from centre of abdomen to the ground	22.75	57.9
From centre of abdomen to the ground	22.75	57.9
Circumference of chest	44	112
Length, end of nose to insertion of tail	58	147.6
Elbow to top of shoulders	21	53.5
Head: from end of nose to base of ear	10.50	26.7
From end of nose to angle of jaw	10	25.5
From angle of nostril to eye opening	6.50	16.6
From base of horn, through centre of eye to lower line of the jaw	8	20.4
Greatest breadth of jaw	5.50	14
Circumference of muzzle	12	30.6
Depth of muzzle, at corner of mouth	4.50	11.5
Width between orbits	5.50	14
Width between front angle of horns at base	4	10.2
Length of the ear	4.50	11.5
Tail: length to end of vertebræ	3	7.7
length to end of hair	4	10.2
Body: greatest width of hind quarters	14.50	36.9
greatest width of thorax	14.50	36.9
greatest width of shoulders	12.50	31.9

Distribution.

British Columbia.—So far as definitely traced, the Smoky River (54° 20′), Alberta, N. W. T., eastern slope of the Rocky Mountains, is the northern limit of this species. It is found at the head of Grand Cache Creek; also at Jasper House. No *Ovis stonei* in these localities, but reported "farther north." 1887.—*J. Alden Loring.*

"The mountains of the mainland except the Coast Range, from Kootenay to Cassiar; Similkameen, Bridge River and Chilcotin." 1900.—*John Fannin.*

Cariboo Mountains; Bridge River; Lilloet. 1900.—*Charles A. Bramble.*

Westward "from the main range of the Rocky Mountains . . . to a line drawn a certain distance back from the sea-coast, approximately along the middle of the Coast Ranges," which "limits the sheep on the west. Within the above area, however, are many ranges and groups in which sheep do not occur." 1901.—*Dr. George M. Dawson, Director Geological Survey of Canada.*

"I believe that the Rocky Mountain divide, between the head-waters of the Pease River and those of the Fraser (Lat. 55°), forms the dividing line between its range (*O. dalli*) and that of the southern *Ovis cervina.*" [*O. montana.*] 1900.—*Andrew J. Stone.*

East Kootenai. 1900.—*W. J. Moore.*

Southern part of Similkeen Mountains, and Okanagon Valley, Yale County. 1901.—*James Campbell.*

Washington.—Main range of the Cascade Mountains, on both sides of international boundary. Saw about 500 head in 1889.—*Lewis Lindsay Dyche.*

Mt. Chopaca. 1887.—*G. O. Shields.*

Winthrop, Okanogan County. 1894.—*Guy Waring.*

Oregon.—Wallowa County. 1895.—*J. R. Fowle.*

Montana.—Fridley, Park County, and Magdalen, Madison County. 1897.—*W. A. Hague.*

Miles City, and Hell Creek, Dawson County. 1900.—*James McNaney.*

St. Mary's Lakes. 1889.—*George Bird Grinnell.*

East of Flathead Lake, thirty miles; St. Mary's Lakes. 1896.—*R. H. Chapman.*

Ten miles from northeast corner of Yellowstone Park. 1899.—*Henry Gannett.*

Divide between Madison and Gallatin rivers. 1896.—*M. P. Dunham.*

Idaho.—"Common along Salmon River, Pohsimeroi Mountains, and Saw-Tooth Mountains; and said to be common in north Idaho." 1891.—*C. Hart Merriam.*

Henry's Lake. 1896.—*R. W. Rock.*

Salmon River, middle fork, sixty miles from main Salmon River. In 1897 trappers reported 2,000 to 2,500 head.—*W. W. Miner.*

Oregon.—Southeastern. 1887.—*C. H. Townsend.*

North Dakota.—Medora. 1900.—*Howard Eaton.*

Wyoming.—Yellowstone Park. 1898.—*Ernest Seton-Thompson* and *Captain George S. Anderson.*

Shoshone Mountains, northern Fremont County. 1900.—*W. T. Hornaday.*

Head of Green River. 1900.—*Carl Rungius.*

Teton Range; Big Horn Mountains. 1898.—*Henry Gannett.*

Black Hills. 1895.—*W. W. Granger.*

Marysvale. 1895.—*Frank Petersen.*

Colorado Desert. 1895.—*Ira Dodge.*

Dubois. 1895.—*Nelson Yarnell.*

Ten Sleep. 1895.—*James Fullerton.*

Ishawood. 1897.—*N. E. Brown.*

Laramie (twenty-five miles west). 1891.—*Captain S. A. Lawson.*

Colorado.—Mr. T. H. Johnson, Game Commissioner of the State of Colorado, reports, under date of February 5, 1901, that mountain sheep are found in the mountains of the following counties of Colorado, and all counties westward thereof: Larimer, Boulder, Gilpin, Clear Creek, Park, Fremont, Custer, Huerfano, and Las Animas. This area comprises practically the whole of the mountainous western half of the State. Regarding the abundance of mountain sheep in Colorado, Mr. Johnson makes the following statement:

"Owing to the law prohibiting their killing or capture, mountain sheep are reported to be holding their own in most of the counties named. This law has been in effect during the past four years, and from all reports which we have been able to gather there is reason to believe that there has been a notable increase in a number of localities. Of course, as compared with ten years ago, they are fewer, but there is no instance of record where they have disappeared entirely from localities where they were known to have been ten years ago."

Elk Mountains, Gunnison County. 1893.—*Henry Gannett.*
Routt County. 1900.—*Henry F. Osborn.*
Estes Park. 1900.—*L. L. Dyche.*
Pagosa Springs, Archuleta County. 1898.—*James W. Melrose.*
Deep Creek, near Dotsero. 1897.—*L. D. Gilmore.*

Utah.—Willard, Wasatch Mountains. 1896.—*D. Arrowsmith.*
Uintah Range. 1899.—*William Greene.*
Little Pinto. 1899.—*G. C. Goddard.*

The Big Horn, or original Rocky Mountain Sheep, justly bears the popular and highly appropriate title by which it has been known for nearly a century. In height, weight, and size of horns it surpasses all other American species, and is itself surpassed only by the *Ovis ammon* of the Himalayas, and its rival, the *Ovis poli* of Thibet. *Ovis nivicola,* of northeastern Siberia, is closely allied in form and size to the White Sheep of Alaska.

For a quarter of a century the Big Horn has been constantly persecuted. Its flesh is very savory, although in animals under three years of age it so closely resembles the flesh of mule deer of the same age that sometimes it is impossible to detect any difference.* In old rams, the so-called "woolly taste" of mutton is detectable, but in young or immature animals it is scarcely so.

The head of the male Big Horn is a trophy which appeals to all sorts and conditions of hunters, except Indians. In the grandest head the noble red man sees nothing more than a pair of horn spoons for his soup-kettle. Thousands of *Ovis montana* have been hunted down and killed for their heads alone, and thousands more have met their death before the rifles of sportsmen because they are grand game. Their wariness, their strength and agility in climbing, and the rugged mountains which they inhabit

* In Wyoming, in 1889, at the request of the writer, a test was made. Two plates of steaks, of deer and Mountain Sheep, were cooked in the same way and at the same time. In attempting to identify them by taste alone four experienced hunters, ambitious to be correct, all tasted and deliberately pronounced the deer steaks to be those of the Mountain Sheep.

combine to render them difficult to find and difficult to kill, and therefore all the more tempting to the genuine sportsman.

Although constantly persecuted, the Big Horn has held its own throughout many portions of its original range with surprising persistence. Although in many localities it has been exterminated, it still lives in situations which seem utterly untenable for an animal so large and so highly prized by the hunter and epicure. Only two years ago three Mountain Sheep were found on the bluffs of the Yellowstone River, almost opposite Miles City, Mont., fully 150 miles from the nearest mountains. In 1900, two large rams were seen in the bad lands of the Little Missouri, on the Custer Trail Ranch, four miles south of Medora, N. D.

Stranger, however, than any of the pioneering known of Mountain Sheep in the northern latitudes is the daring energy of this animal in crossing wide tracts of waterless desert in order to reach fresh fields and pastures new. Mr. Willard D. Johnson found Mountain Sheep (probably *Ovis nelsoni*) on the Seri Mountains, in northwestern Mexico, a range which is separated by seventy-five miles of waterless desert from the nearest ranges of the Sierra Madres.

The ancestors of the Mountain Sheep found by Dr. Merriam on San Francisco Mountain, Arizona, must have traversed forty miles of arid country to reach their present home from their probable point of departure, the Grand Cañon of the Colorado.

Habits.—The ideal haunts of Mountain Sheep of all species, from the Arctic coast to Colorado, are the slopes of high mountains, above timber line, near the edge of the snow fields that are perpetual. Contrary to the general belief that these regions are usually barren of vegetation, both in the north and in our own country, the belt immediately above timber line is usually rich in herbage. On the continental divide in Wyoming it is no rare sight to find southern slopes covered with rich grass a foot or more in height. In many portions of Alaska such regions are abundantly provided with plant-life acceptable to the White Mountain Sheep as food. Mr. J. K. Mankowski informs me that on the mountains north of Skagaway the treeless slopes above timber line are really rich pastures, covered with grass resembling red-top and other vegetation, on which the White Mountain Sheep and Mountain Goats feed luxuriously. In some localities the treeless belt between timber line and the edge of perpetual snow bears

UNUSUAL HORN DEVELOPMENT OF THE BIG HORN (*OVIS MONTANA*), Figure adapted from *Recreation* Magazine. Owned by W. F. Sheard. Circumference of horn at base, 13⅜ inches; length, 52½ inches.

gray moss, much resembling reindeer moss, and on which the White Sheep feed.

But let it not be supposed for a moment that the flocks of Mountain Sheep are in the least confined to the treeless slopes or the timber at the upper edge of timber line. In fact, those may well be called their summer pastures. At the approach of winter they seek lower altitudes, and are much given to frequenting mountain ranges that are covered with pine timber opening into numerous glades, known as "mountain parks." It is essential, however, that one side of the Mountain Sheep's home ranch should fall away abruptly, in ragged lines of perpendicular rim-rock, with acres of slide-rock below, in order that the sheep may have the means of escape from their numerous enemies, particularly hunters. The rocky citadel of defence is quite as necessary as the grassy glades.

I once had an illustration of the Mountain Sheep's tactics on a mountain-top where the flock seemed poorly provided for means of escape. Two old rams were feeding at the edge of a mountain park, at an elevation of about 9,000 feet. The snow was fourteen inches in depth, with a slight crust upon it. When first seen they were in a fifteen-acre open meadow, near the edge of the rim-rock, bravely pawing through the snow to reach the longest of the dry, brown stems of bunch-grass that thrust their heads half way up through it. A few hours later, when one of these animals fell to my shot, he was found to be as fat and well filled with nature's choicest hay as if he had been feeding at a generous manger instead of winning his food from under a foot of snow.

On finding themselves objects of a hunter's special notice the two rams quietly dropped over the sharp edge of the plateau, ploughed down a narrow cleft filled with slide-rock, and disappeared. Pursuit on their trail led down to the foot of the 200-foot wall of rim-rock, and close along its base for a long distance. At last the trail went farther down, and dropped over the next lower wall of rim-rock, in a manner that seemed deliberately calculated to make pursuit more laborious. As a change of tactics, the hunt was kept up along the top of the rim-rock, but the quarry hugged the wall so closely that not even once was it sighted. It became evident that only by hours of patient work could those animals be encountered again, if at all. For the time being they made good their escape, and we hunted along the edge

of the plateau for two miles farther. At last the rams reascended to their feeding-grounds, were found on my return hunt, taken completely by surprise, and the largest became a natural history specimen.

It is well known that during the summer and autumn the rams and ewes form separate flocks, feed in separate pastures, and do not mingle again until late in the fall.

Although it was then the middle of November the rams were flocking by themselves, and the ewes and lambs formed a separate bunch; but we found the two quite near each other. In the open glades near the friendly rim-rock the frosted-silver surface of the snow field was trodden into a perfect network of trails, and at frequent intervals it was broken up in patches, from six to ten feet square, where the sheep had pawed through the snow to reach the grass. The animals sought for the high points in the ground on which the snow lay less deep than on the levels. For nearly an hour we lay behind a large rock pile, and watched a flock of about twenty ewes and lambs literally grazing in the snow. The lambs usually fed close beside the oldest ewes, to take advantage of their efforts with the snow, and it was surprising to note the sturdy strength of limb displayed by the adult members of the flock in breaking up the snow and throwing it back from a given spot. During the whole time that this flock was under observation it fed on a hillside, quite as busily as grizzly bears digging roots, and did not shift its position.

As noted elsewhere, Mountain Sheep are very migratory in their habits, often taking very hazardous risks for the sake of seeking new haunts. In times past, nearly every large tract of rugged bad-lands in Montana and Wyoming contained at least a few sheep, and once they were common along the bluffs of the Missouri River, as far down as the mouth of the Cannon-Ball River. The most remarkable instance, of recent date, of the venturesome character of this animal is contained in a letter from Mr. Daniel Coolidge, a Pacific coast naturalist, who writes as follows:

"The only place [in Southern California] where I know of Mountain Sheep, definitely, is on Chihuahua Mountain, near Warner's Ranch, on the western edge of the Colorado Desert. For several years the cowboys tried to rope some of them, for Woodward's Gardens, as they ran across Coyote Valley from Torres Mountain to Chihuahua Mountain."

Usually, Mountain Sheep lambs (of *Ovis montana*) are born between May 15th and June 15th, sometimes on the snow-fields, sometimes in rock-clefts, near the edge of timber. Like domestic sheep, one lamb at a birth is the usual number, but twins are also frequent. Against human foes the mother is timid and makes no stand, but it is fairly certain that she successfully defends her helpless offspring against the attacks of eagles, for otherwise no lambs would survive. In the Rocky Mountains—as we found to our loss—a dead sheep that lies unprotected for twenty-four hours is almost certain to be badly torn by an eagle during that time.

Mountain Sheep in Captivity.—Numerous attempts have been made to keep Mountain Sheep in captivity and to acclimatize them in the Eastern United States and in Europe. In the home country of the animal it has been kept in confinement with a very fair degree of success, and has even bred. So far as disposition and temperament are concerned, it takes kindly to domestication. When taken young and reared in captivity, the lambs become as gentle and affectionate as domestic sheep. Those which have been caught in an adult state, by hunters on snowshoes chasing them into deep snowdrifts, have accepted close confinement with a degree of resignation and philosophy rather unusual in caged wild animals.

In 1893 Mr. W. B. Benham, of Bozeman, Mont., captured a fine three-year-old Big Horn ram, which he kept confined in a very small, tightly boarded pen near his store. For a week after capture the animal was wild and savage, and fought against captivity, but he soon realized the futility of resistance and became tractable. Mr. Benham also owned another fine ram and two or three females. Of the ram, known as "Billy," an excellent photograph has been published in *Forest and Stream* (December 1, 1894). This animal was caught literally "by hand," by a hunter who ran it down on snowshoes in deep snow, seized it, threw it down, tied its legs together, and finally dragged it out of the mountains as it lay on a hide.

Between fifteen and twenty head of Mountain Sheep have been taken to the Mississippi Valley and the Atlantic coast for exhibition in zoological gardens, but none of them have lived longer than about one or two years, and none have bred. The combined drawbacks of a complete change in altitude, humidity of atmos-

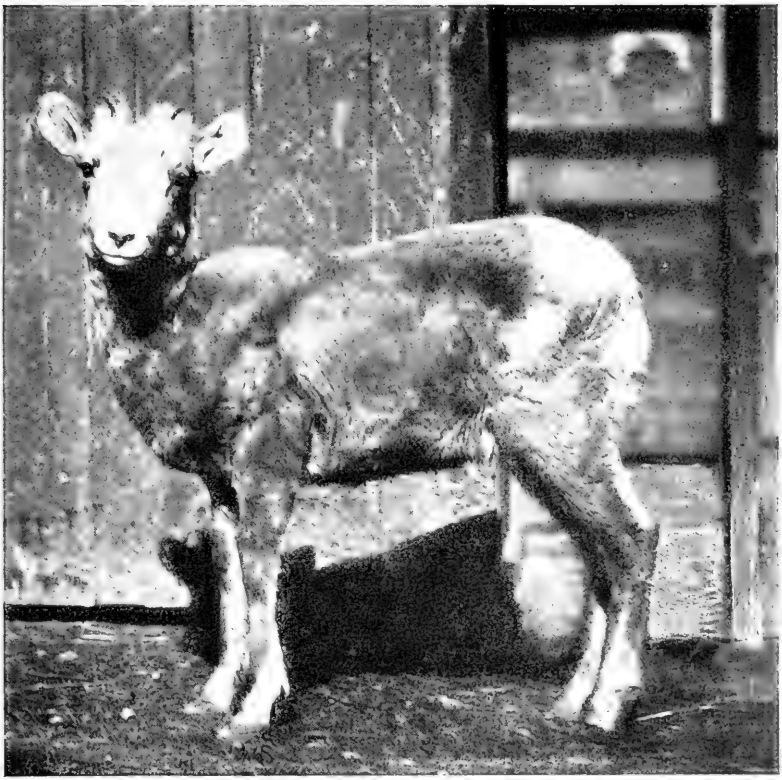
phere, and food have been greater than this mountain animal could overcome. It is to be hoped that methods will yet be devised by which this noble animal can be enabled to survive and breed and become thoroughly acclimated in the Eastern United States, and the New York Zoological Society intends to do its utmost toward the accomplishment of this result. It is the opinion of the writer, however, that with *Ovis montana* success is possible with young animals only by having them retained in their home country until their development has reached a point well along toward maturity, say an age of two years, when the animal will have a fund of constitutional strength to draw upon in resisting the ill-effects of the very radical change in environment that is necessary.

At the present moment the Zoological Society is making an organized effort for the capture of specimens of *Ovis dalli* for acclimatization in the New York Zoological Park. It is believed that it will prove easier to achieve success with Mountain Sheep from the humid climate and low altitude of the Alaskan coast than with specimens of *Ovis montana* from the high and dry atmosphere of the Rocky Mountain region.

In 1888 Dr. George Bird Grinnell secured, in northwestern Montana, of a Piegan Indian, a female Mountain Sheep lamb, which he forwarded to the Smithsonian Institution for the nucleus collection of the National Zoological Park, and which came into my care. In *Forest and Stream,* of June 6, 1889, Dr. Grinnell published the following very interesting account of how this animal was found and captured:

"It was in the month when they plant potatoes (May) that John and two other men drove their wagons up to the mountains to cut timber for fence-posts and poles. The prairie was bright and green, and the young leaves of willows and aspens were growing, but upon the range the far-reaching fields of snow seemed scarcely to have begun to grow smaller, and the nights were still cold. The men worked hard, chopping and hauling; but one day John, thinking that flesh meat was needed, left his axe in camp, and, taking his gun instead, started out to hunt.

"It was still early in the day when he reached the foot of the great buttress-like shoulder that juts out from the range on the south side of the stream. As yet he had seen no game, and no very fresh sign, but here he suddenly came on the tracks of two mountain sheep which had passed along late the day before, after the surface of the snow, softened at mid-day by the rays of the sun, had, as night drew on, begun to freeze again. He followed these tracks for some little distance, and at length, as he



OVIS MONTANA LAMB.

Living; female, 8 months old.

looked over a low ridge, saw far ahead of him, on the upper edge of an extensive snow field, two sheep, and at their feet two tiny dark objects, which he knew must be two young ones. They were too far off to shoot at with any reasonable prospect of hitting them, and over the smooth white snow there was no possible means of approaching nearer without their taking the alarm. More in order to see what they would do than with any idea of hitting them, he guessed at the distance and fired a shot.

"The two old ones ran off, and were soon high up on the rocky ledges, looking back anxiously now and then, but always going higher and higher, but the very young ones remained where they had first been seen. Then it occurred to the hunter to see if he could catch one of them. He toiled along the snow and was soon close to the little lambs. One of them was lying down, but the other was on its feet, and seemed to regard the strange object that was approaching with some fear. John had no difficulty in placing his hands on the one that was lying down, but all his endeavors to get hold of the other were futile. It did not seem greatly alarmed, but was too shy to be touched. After tying the feet of the captive with his neckcloth, John made up his mind to attempt to run down the little tottering creature, hardly larger than a rat, which insisted on keeping just out of his grasp; but, run as fast as he might, the lamb avoided him, and presently, when it got among the rocks, it showed such activity that John, in despair, gave up the pursuit, and returning to his starting-point, took up the captive lamb and started for camp.

"John was sufficiently interested in the matter to go back over the tracks of the sheep, and he satisfied himself that these lambs had been born either that morning or the preceding night. On both the little ones the umbilical cord was soft and dragging. The tracks that he had been following, and which had been made the night before, were those of the two mother sheep, whose little ones had not then been born.

"The little sheep was reared on cow's milk diluted with water, and was weaned about September 1st. In nature the lambs suck up to November 1st, but not much after that. John told me that the sheep ate "anything," but on questioning him more closely I learned that after she was weaned her main dependence was the dry prairie grass, although she was fed with more or less regularity at the house on bread, crackers, oats, the peelings of boiled potatoes, and the uncooked scrapings of dough from the pan in which the bread was mixed."

The animal referred to above, and shown herewith, was as docile and affectionate as any domestic lamb, except that she greatly disliked dogs. She sometimes became tired of the confinement of her paddock, and on several occasions was mysteriously found on the outside of her wire fence. For some time we were puzzled to know how she so easily scaled an eight-foot fence. We presently discovered that she escaped by leaping up to the edge of a cross bar, *two inches* wide and four feet from the ground, from which, as a ledge, she easily sprang to the

top rail, and from thence to the ground. When once outside she manifested not the slightest desire to run away, but quietly began to graze on the lawn. When six months old the size of this animal was as follows: Height at shoulders, 22½ inches; length, nose to tail, 42 inches; weight, 51 pounds.

When eleven months old its height was 30¾ inches; length, 55 inches; and weight, 90 pounds.

When about sixteen months old it died of apoplexy.

The Zoological Society of Philadelphia has exhibited in its Gardens several specimens of the Big Horn, and in response to my inquiries regarding their history in confinement, Mr. Arthur Erwin Brown, Superintendent of the Gardens, has favored me with the following very interesting statement:

"In the matter of the Mountain Sheep, long ago I used the following language in the 'Guide' to our Gardens: 'It is a significant fact, illustrating the great principle of inheritance in animals, that the only species of ungulates from the western part of the American continent which have yet been successfully domesticated east of the region of the Great Plains are the elk and the buffalo, and in each of these cases their progenitors, but a few generations back, ranged nearly if not quite to the Atlantic coast.' I have, for many years, been of the opinion that the ungulates of the Rocky Mountains will not stand domestication in the East. The difficulty seems to me to lie chiefly in the increase of humidity in the atmosphere and the deficiency of the mineral salts to which they have been accustomed in their native food, which in my experience it has not been possible to supply artificially with success.

"The Zoological Society of Philadelphia has had four specimens of Mountain Sheep, all from Idaho. Three were females, one to two years old. The duration of their life in the Gardens was, respectively, four, seven, and eight months. In each case a condition of starvation, resulting from malnutrition, became obvious within a couple of months, gradually progressing, ultimately ending in diarrhœa and death. No especial lesions shown on autopsy.

"The other specimen promised better. It was a fine male, apparently about four years old, and in fine condition. He reached the Gardens on December 10, 1895, and continued in good health, with good assimilation of food, until the summer of 1897, which was both hot and exceedingly damp. In July there were several weeks of unusual humidity, and he suddenly developed obstinate diarrhœa, which would not yield to treatment, and he died on July 18, 1897, a little more than nineteen months after his arrival.

"I have seen so many cases of animals from dry climates, whose ailments here bore more or less exact proportion to the amount of humidity, that I have been led to regard it as a factor of prime importance.

"I do not think we will ever have much success with sheep, still less

probably with the white goat, and very little with the antelope and the mule deer. We have rather a peculiar case of the last species now in a very large buck, which has been in the Gardens since March 22, 1894, and had previously lived for two or three years some miles out of Philadelphia. All that we have ever had previously have soon run down in condition, and none have lived more than two or three years, but all have bred freely. This fellow has remained in fine shape, and is still in good health, but he will not breed either with his own species or with the common deer, which cross I have easily made with other males of *macrotis*."

Several specimens of *Ovis montana* have been exhibited in the Zoological Garden of Lincoln Park, Chicago, but none of them have long survived. Of these, two died of tuberculosis. In 1884 W. F. Cody's Wild West Show exhibited a three-year-old ram, which on July 1st had fully shed its winter pelage, and stood forth in a close-fitting, chocolate-brown coat of hair not exceeding half an inch in length.

Scab among Wild Sheep.—In a few localities in the Rocky Mountain region Mountain Sheep are now threatened with a new terror. The ubiquitous sheep-herder of the West sometimes pastures his flocks in the home of the Big Horn. In 1885 scab killed many wild sheep in the Wind River Mountains and the Shoshone Mountains, and in that year Vic Smith counted forty-three dead bodies on one hillside adjacent to the spot where Red Lodge, Mont., now stands. In 1895 James Fullerton found a herd of scab-affected sheep in a cañon of the Big Horn Mountains, and in the year following, N. E. Brown found in the Shoshone Mountains, near Ishawood, fifteen dead sheep lying near together.

Crossing with Domestic Sheep.—Wild Mountain Sheep are said by reliable men to have frequently crossed with domestic sheep in their mountain homes, and have thereby caused much annoyance. The hybrid animal partakes strongly of the wild stock, and bears no wool.

In 1885, Mr. Rudolf Borcherdt, of Denver, shipped three Big Horn sheep to Halle, Germany, where they were successfully crossed with the mouflon, and also domestic sheep. Regarding this effort, Mr. Borcherdt has kindly furnished, under date of April 29, 1901, the following valuable statement:

"In the fall of 1884 a Dr. Hyer, of Halle-on-the-Saale, Germany, came to me stating that he wished to procure a few *Ovis montana*, one male and two females, for the purpose of inter-breeding them with other wild and

domestic sheep. The proposed experiment interested me very much, and I at once took steps to procure the animals.

"A few advertisements in our mountain weeklies brought various responses. In Ouray, Col., I. procured for $150 one male, three years old, which had been raised in captivity. The specimen proved to be quite tame, and easy to handle, and in all a splendid acquisition for such an experiment as that proposed.

"Next on the program, I heard that near Red Cliff, Col., five *Ovis montana* had been captured in a snow-drift, but three of them had died during capture. The other two, both females, one three years old, the other about two years old, had successfully been landed in Leadville, and were for sale at $150 for the pair. I went to Leadville at once, secured the sheep, brought them to Denver, and lodged them in a large cage, 12 x 15 feet, in which, previously, I had nailed some drygoods boxes for their exercise and amusement.

"So far, so good. But now my trials began. The sheep had been in captivity only a week, and scarcely had touched food of any kind. I began to feed them the best of timothy and clover hay, also carrots and oats. The hay did not seem to suit them, but they would eat sparingly of oats and carrots. When I saw that timothy would not do, I tried alfalfa hay. This they seemed to like better, eating principally the leaves. But dire consequences soon set in, that made me feel rather uncomfortable, considering the $300 I had paid for the sheep. Dysentery set in, which almost became chronic. The sheep lost flesh, and altogether looked a sickly pair.

"Finally, I came to the conclusion that hay cut in our mountains might suit them better. I procured a bale of the best South Park hay, and this alone undoubtedly saved the sheep. This hay they ate with great relish, and soon laid on flesh and became hearty and strong. Up to this time, the ram had not been put with the ewes, and I now put them together in the cage. At first they had a lively time; the old fellow would knock down the ewes at the slightest provocation. I was constantly afraid he would hurt them, but after a week or two he became docile, and after that they got along nicely. When at liberty, the ram used to feed on anything—bread, kitchen refuse, in fact, anything but old tin cans.

"At last Dr. Hyer returned from California, where he had been in the interest of the Halle Institution. We at last got the sheep ready for shipment. I put each in a separate crate, and sent along a dozen bales of South Park hay, carrots, oats, and cress. In fact, we did not change the diet in the least.

"The sheep left this country in the best of health and condition. On their arrival in Germany, Dr. Hyer wrote me that they stood the trip splendidly. The ram was sea-sick for three days, but the ewes were well throughout the trip. About a year after I again heard from Dr. Hyer that the sheep had been successfully crossed with *Ovis musimon* (mouflon), the ram with mouflon ewes, and *Ovis montana* ewes with mouflon rams. Still later I heard from the doctor that the crosses had been successful, on both sides. I here wish to state, from my own knowledge, that *Ovis musimon* crosses readily with domestic sheep, and that such crosses again breed

successfully. Through other sources I learned afterward, that the young of the wild crosses had been successfully crossed with domestic sheep."

Legal Protection of Mountain Sheep.—Owing to the fact that the surviving Mountain Sheep inhabit only the most remote and inaccessible regions, the difficulty in affording them legal protection against slaughter is very great. States with a sparse population can ill afford the expense that would be involved in covering vast areas of rugged mountains with paid game wardens. As a rule, the utmost that any mountain State can accomplish is to prevent the sale and shipment of her most valuable wild animals, and punish known violations of the laws protecting them. Fortunately for our wild animals, public sentiment in favor of their preservation from extinction is rapidly spreading, and the lines of protection are each year being more tightly drawn.

Of the thirteen States inhabited by Mountain Sheep, California and Nevada alone have failed to enact laws for their protection. Five States have enacted for this species a perpetual close season—Arizona, Colorado, Montana, North Dakota, and Utah. Their good example should be followed by each of the other eight. In other States and British provinces the close seasons for Mountain Sheep are as follows:

Oregon	November 1 to July 15
Idaho	January 1 to September 1
New Mexico	January 1 to October 1
South Dakota	January 1 to October 15
Washington	November 1 to September 1
Wyoming	December 1 to September 1
British Columbia	Ewes protected at all times
	Rams from December 15 to September 1
North West Territories	December 15 to October 1
Alaska	*No protection*

The penalties for the unlawful killing, or transportation, or sale of Mountain Sheep are as follows:

Arizona	$50 to $100 fine
Colorado	$10 to $500 fine
Idaho	$25 to $75 fine and costs
New Mexico	$25 to $100 fine
North Dakota	$100 fine
Oregon	$100 to $500 fine
South Dakota	$25 to $200 fine
Utah	Not less than $10 fine
Washington	$10 to $100 fine and costs
Wyoming	$100 to $500 fine

At present Alaska is a vast slaughter-pen for large game. Except the fur seal, nothing is protected. As usual in America, a great wealth of animal life is being ruthlessly swept away without the slightest attempt to check the slaughter. As far as possible every mining town is supplied with wild meat. Caribou and Mountain Sheep carcasses are brought into Dawson *by the ton,* and the old days of buffalo slaughter are being enacted over again.

It is high time that the United States Government should enact laws for the regulation of big-game hunting in Alaska, and the first step should be the absolute prevention of the sale of game. There is also work for the Canadian Government to do in the Klondike region.

OVIS NELSONI, MERRIAM.

NELSON'S MOUNTAIN SHEEP.

Type specimens in the United States National Museum, Biological Survey Collection. Ten specimens collected by E. W. Nelson, June 4, 1891. Described by C. Hart Merriam, in the Proceedings of the Biological Society of Washington, Vol. XI., page 217, July 15, 1897.

Type locality.—Grape Vine Mountains, on State boundary between California and Nevada, about Lat. 37°.

The following is Dr. Merriam's description and measurements:

"*General characters.*—Apparently similar to *Ovis stonei* Allen in pattern of coloration, but much paler; rump patch small and completely divided on median line; tail short and slender; molar teeth very small.

"*Color.*—Upper parts, except rump patch, pale dingy brown; under parts and legs much darker, contrasting sharply with the white areas; inguinal region, hinder part of belly (narrowing to a point anteriorly some distance behind forelegs), inner aspect of thighs, and posterior aspect of fore and hind legs, white.

"*Measurements* (taken in flesh by collector).—Total length, 1,280; tail vertebræ, 100; hind foot, 360; height at shoulder, 830. In the dry skin the rump patch measures about 190 in breadth by 150 in length (from apparent base of tail)."

Probable Distribution.

California.—Mountains east of Yosemite Valley; Mt. Waterman, of San Bernardino Range. 1900.—*Walter K. Fisher.*

San Diego County, along the desert side of the mountains. 1897.—*A. W. Anthony.*

Chihuahua Mountains, fifty miles northeast of San Diego. 1901.—*Daniel Coolidge.*

Lower California Peninsula.—Santa Catalina Mountains.—*W. W. Price,* Bull. A. M. N. H., VII., p. 258, 1895 (as *Ovis cervina*).

"Gulf of Cortez"—head of the Gulf of California. 1898.—*George H. Gould.*

Mountains of San Pedro Martie (Lat. 30° 30′), fifty miles north and south by twenty miles wide, "sometimes mapped as Santa Catalina, but not called so by the natives." From this range sheep are common all along the Gulf to near Mulege (Lat. 27°), and especially about Ubi Mountain. Found on the Pacific side at Lat. 29° 30′. 1901.—*A. W. Anthony.*

Owing to a lack of material, no one can say at present where *Ovis montana* reaches its southern boundary, or where *Ovis*

nelsoni is delimited on the north. No specimens are available from San Francisco Mountain, the Grand Cañon, or from western Nevada, other than the Grapevine Mountains, nor have we any from Lower California or the Seri Mountains.

Through the courtesy of Dr. C. Hart Merriam, and with the valued assistance of Mr. W. H. Osgood, I have been enabled to make an examination of the series of ten specimens of *Ovis nelsoni* which have been collected for the Biological Survey in the type locality. These specimens were brought into direct comparison with specimens of *Ovis montana,* and also with a fine series of eight skins and skulls, four males and four females, recently collected for the Survey at Lake Santa Maria, in northern Mexico.

Between the two groups of southern specimens and skins of *Ovis montana* from farther north the color differences are strongly marked. It is equal to the difference between a brown bear and a black one. The following are the points of divergence between *nelsoni* and *montana* which immediately appeal to the eye, in the order named:

1. The southern specimens are small, and the pelage of all is short, stiff, and harsh.

2. The general color is totally different from that of *Ovis montana,* and difficult to describe. It is a pale salmon gray, the pelage having the appearance of being suffused with a warm, pinkish, sunset glow. This applies to skins collected in July, but which even then retained what appeared to be their winter pelage. The weathered and dingy-looking rump patch is blended so closely with the color of the body and hindquarters as to be but slightly noticeable.

3. The tail is so thinly haired, so long (three inches), and so small that it strikingly resembles the almost naked tail of a pig-tailed macaque monkey. If this character proves to be constant, it is of itself sufficient for the identification of the southern species.

4. The forehead of *Ovis nelsoni* (and also that of the specimens from Lake Santa Maria) is by no means so deeply concave as that of *Ovis montana.*

5. The shortness of the (molar) tooth-row in *nelsoni,* and the small size of the molars generally, clearly distinguish this species.

It seems safe to assume that the sheep isolated on the penin-

sula of Lower California, save as they wander northward along the western edge of the Colorado Desert, are of the same species as those in the Grapevine Mountains, bordering Death Valley, and they will be so set down on the map of distribution. The status of the Mexican specimens has been determined by Dr. Merriam, and they represent an entirely new form.

It is very desirable that good skins of adult Mountain Sheep, in winter pelage, should be obtained from San Francisco Mountain, the cañon of the Colorado, Arizona, from the Organ Mountains, New Mexico, the Seri Mountains and southern California, the Sierras of eastern California, and in fact all points south of Lat. 37°. Hunters in these localities can easily promote the further investigation of this subject by taking the trouble to preserve skins in complete form, with their respective skulls intact. Mexican naturalists, especially, should take pains to ascertain the range of the Mountain Sheep in their country.

OVIS MEXICANUS, MERRIAM.

MEXICAN MOUNTAIN SHEEP.

Type specimen, ♂ ad. No. 99,342, in the United States National Museum, Biological Survey Collection. Eight specimens, collected by E. W. Nelson and E. A. Goldman, September, 1899. Described by Dr. C. Hart Merriam, Proc. Biol. Soc. of Washington, April 5, 1901.

Type locality.—Mountains near Lake Santa Maria, State of Chihuahua, Northern Mexico, Lat. 31° 25′.

Dr. Merriam's description is as follows:

"*Characters.*—Size large; color dark, much darker than *nelsoni,* but less dark than *canadensis;* horns large; massive, dark, not strongly outcurved; hoofs and molars larger than in *O. canadensis;* ears long and large, nearly double the size of those of *canadensis,* measuring from occiput, in dry skin, 110-116 mm.; tail long and slender, measuring about 130 mm. Color pattern similar to that of *canadensis.*

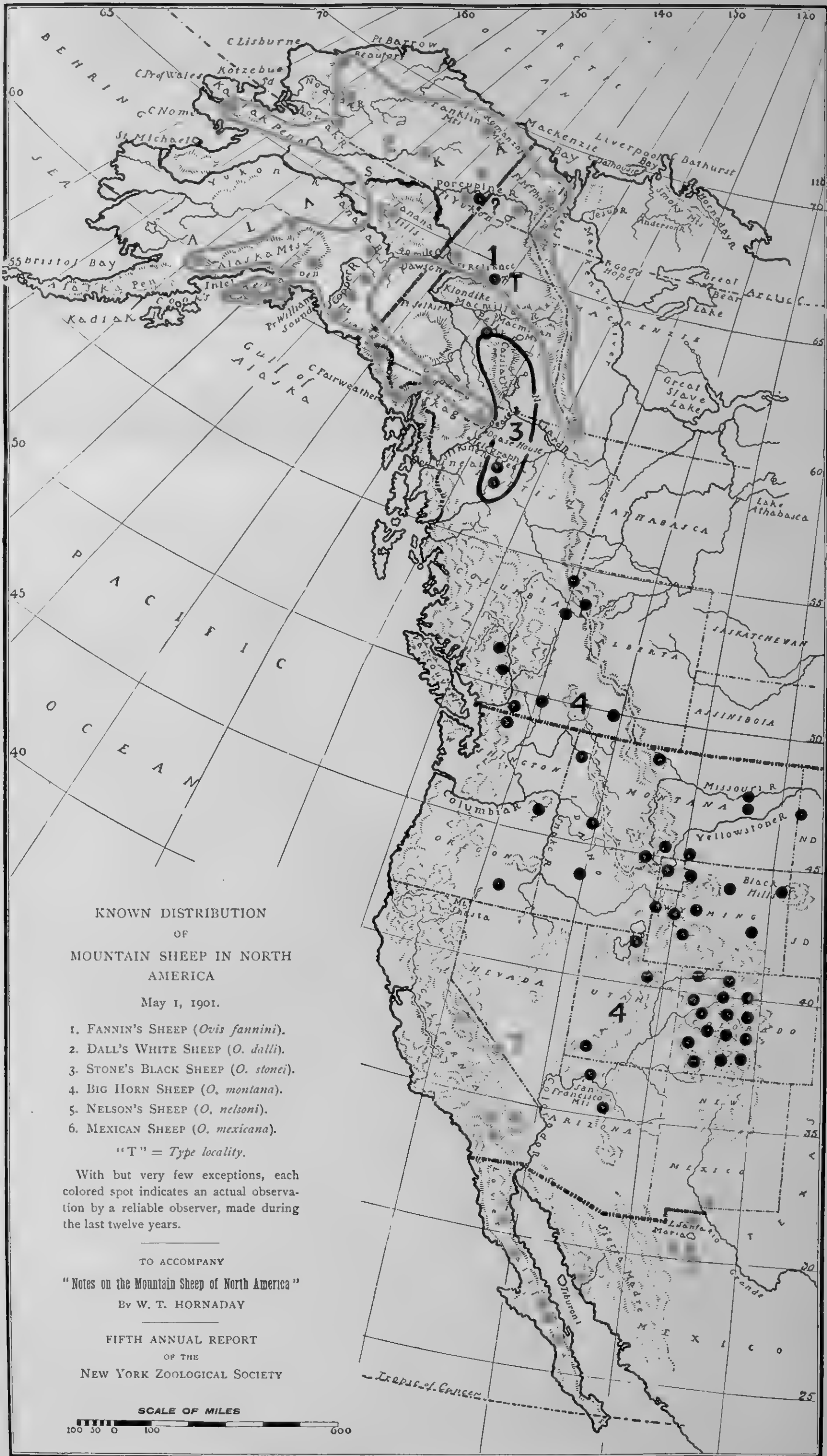
"*Color.*—Body color above and below drab brown, darkest on throat, legs, and tail; no trace of dorsal stripe; muzzle decidedly paler than rest of face; rump patch broader and more squarely truncate anteriorly than in *canadensis;* dark color on hind leg covering much more of inner side of thigh than in *canadensis;* but much less of lower leg, the white spreading broadly over the posterior and inner aspects, and on the inner side ending abruptly just above the calcaneal joint; whitish part of chin broader and less sharply defined.

"*Cranial characters.*—Skull as a whole large and massive. Compared with *canadensis,* orbits less prominent; frontals flatter (less "dished" in forehead); basioccipital narrow, its sides nearly parallel, its muscular facets small and median sulcus broad; occiput (viewed from behind) much narrower; depth of face (above molars) less; premaxillæ longer, more slender, and reaching much farther back; jugal relatively small and less expanded anteriorly; lachrymal long, reaching well out toward premaxilla; paroccipital narrower and more slender; *lips of posterior nares* (behind hamulars) *thin* and somewhat everted [in *canadensis* thickened and *much swollen*]; angle of mandible obsolete; coronoid process lower and less expanded. Molar teeth larger. Horn cores longer, with longer curve and less flaring base.

"*Horns.*—Large and heavy, but longer and less massive than those of *canadensis;* upper (flat) side narrower; base less flaring; orbital corner shortly rounded off (not produced).

"*Measurements.*—Type specimen, ♂ ad.: Total length, 1,530; tail vertebræ, 130; hind foot, 425; height at shoulder, 900. An ad. ♀ from type locality: Total length, 1,490; tail vertebræ, 130; hind foot, 405; height at shoulder, 880."

Probable distribution.—In addition to the eight specimens collected by Mr. E. W. Nelson, three other specimens were taken by Mr. D. M. Payne and party, of El Paso, Texas, at Lake Santa Maria, Mexico, in



KNOWN DISTRIBUTION

OF

MOUNTAIN SHEEP IN NORTH AMERICA

May 1, 1901.

1. Fannin's Sheep (*Ovis fannini*).
2. Dall's White Sheep (*O. dalli*).
3. Stone's Black Sheep (*O. stonei*).
4. Big Horn Sheep (*O. montana*).
5. Nelson's Sheep (*O. nelsoni*).
6. Mexican Sheep (*O. mexicana*).

"T" = *Type locality.*

With but very few exceptions, each colored spot indicates an actual observation by a reliable observer, made during the last twelve years.

TO ACCOMPANY

"Notes on the Mountain Sheep of North America"

By W. T. Hornaday

FIFTH ANNUAL REPORT

OF THE

New York Zoological Society

SCALE OF MILES

100 50 0 100 600

December, 1900. Mr. Payne describes the animal as being "smaller than the Big Horn, color a sort of slate, with white belly and inside of legs, also white rump; tail, the same color as the back, and connected with it by a stripe about an inch in width."

It is probable that the Mountain Sheep inhabiting the following localities are referable to the newly discovered species, *Ovis mexicana.*

Texas.—Guadaloupe Mountains. 1900.—*D. M. Payne.*

New Mexico.—Organ Mountains, southeast of Las Cruces. 1901.—*C. J. Jones.*

International Boundary and *Mexico,* forty miles southeast of Deming, New Mexico. From this locality specimens in the flesh were, in 1900, brought to Deming, and sold in a meat market. 1900.—*C. J. Jones.*

Seri Mountains, on the mainland opposite Tiburon Island. "As observed at a distance of 150 yards, the adult male bore no visible marks of difference from *Ovis montana* as seen [by the same observer] in Nevada." 1898.—*Willard D. Johnson, U. S. Geol. Survey.*

I have had the privilege of examining all these specimens and comparing them with Dr. Merriam's collection of *Ovis nelsoni.* The two species are strongly alike in color, and show that the pelage of both these offshoots from *Ovis montana* have been similarly affected by the aridity and heat of the country they inhabit. Both these species lack the deeply concave forehead of the Big Horn, but the large molars and large ears of *Ovis mexicanus* render it impossible to do otherwise than to recognize it as a distinct species.

Of course it will be understood that in assigning to this, and the preceding species, certain contiguous localities in which Mountain Sheep are known to occur, but from which no specimens have been secured for identification, the author is only attempting to suggest what seems to him reasonable probabilities.

Under the name of *Ovis canadensis auduboni,* Dr. Merriam also describes (Proc. Biol. Soc. of Washington, p. 31, April 5, 1901) a new sub-species of the Big Horn, based upon a single skull, and with no skins available. The full description is as follows:

Type from "Upper Missouri."—No. $\frac{15200}{22610}$ ♂ yg.-ad. U. S. National Museum. Believed to have been collected in the Badlands of South Dakota in 1855 by Dr. F. V. Hayden, on the Warren Expedition.*

*The U. S. National Museum register contains entries of several Mountain Sheep collected by Dr. F. V. Hayden on Lieut. G. K. Warren's Expedition to the Upper Missouri in 1855. In Lieut. Warren's report on his "Explorations in the

Characters.—Size large; skull and horns broad and massive; molar teeth much larger than in any known American sheep, the upper tooth-row in adult males measuring 96 mm. or more, and the three upper molars 63–65 mm. Under-jaw (in type specimen) massive, heavy posteriorly, deeply bellied (depth under last molar 52 mm.); angle broadly rounded. In *canadensis* the jaw is light throughout, and the angle, while small, is marked. Horns narrower and as a rule longer than in *canadensis*.

The animal is named in honor of Audubon, who, in 1843, obtained from the Badlands specimens which he supposed the same as the Rocky Mountain species.†

Dacota Country in the year 1855" (published in 1856), Dr. Hayden states that the bighorn was abundant in the region known as the badlands, and the narrative shows that the particular badlands meant are those between the Cheyenne and White Rivers in South Dakota.

† Quadrupeds of North America, Vol. II., pp. 163–172. 1851.

CHARTER

OF THE

New York Zoological Society.

CHAPTER 435.

AN ACT to incorporate the New York Zoological Society and to provide for the establishment of a zoological garden in the city of New York.

Accepted by the city. Became a law April 26th, 1895, with the approval of the Governor. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Charles A. Dana, Oswald Ottendorfer, Andrew H. Green, William H. Webb, Henry H. Cook, Samuel D. Babcock, Charles R. Miller, George G. Haven, J. Hampden Robb, Frederic W. De Voe, J. Seaver Page, Rush C. Hawkins, David James King, Wager Swayne, Charles A. Peabody, Jr., Charles E. Whitehead, Charles R. Flint, Samuel Parsons, Jr., Mornay Williams, Henry E. Gregory, Isaac W. Maclay, Isaac Rosenwald, Hugh N. Camp, Andrew D. Parker, Cornelius Van Cott, William F. Havemeyer, Frederick Shonnard, William W. Thompson, Alexander Hadden, Edward L. Owen, John H. Starin, Rush S. Huidekoper, William W. Goodrich, Albert H. Gallatin, Frederick S. Church, Edward C. Spitzka, Robert L. Niles, Madison Grant, C. Grant La Farge, William Van Valkenburg, and such other persons as may, under the provisions of its by-laws, become members of the corporation hereby created, are hereby created a body corporate and politic, by and under the name of the New York Zoological Society.

SEC. 2. Said corporation shall have power to establish and maintain in said city a zoological garden for the purpose of encouraging and advancing the study of zoology, original researches in the same and kindred subjects, and of furnishing instruction and recreation to the people, and may purchase and hold animals, plants and specimens appropriate to the objects for which said corporation is created.

SEC. 3. The managers of said corporation shall have power to make and adopt by-laws for the management and government of its affairs and business, for the admission, suspension and expulsion of its members, and for the terms and conditions of membership; to prescribe the number and mode of election of its officers; to define their duties; to provide for the safe-keeping of its property, and from time to time to alter and modify its by-laws.

SEC. 4. The affairs and business of said corporation shall be managed and controlled by a board of managers, the number of whom shall be prescribed by the by-laws. The first board of managers shall be divided by lot into three classes, equal in number, one of which classes shall hold office for one year, another for two years, and the other for three years; and all persons elected to be managers at any subsequent election shall hold office for three years, and until others are elected in their stead. There shall be a president, two vice-presidents, treasurer and secretary, to be elected by the board of managers annually, who shall hold office until others are elected in their stead. The first meeting under this act may be held at any time upon a notice of five days, signed by any five of the incorporators named in the first section of this act, fixing a time and place for such meeting, a copy whereof shall be mailed to each of said incorporators at his usual post-office address, and twelve of such incorporators shall be a quorum for the purpose of organization, adoption of by-laws and election of officers. No manager of said corporation shall receive any compensation for his services, nor be interested, directly or indirectly, in any contract concerning its property or affairs.

SEC. 5. Said corporation may raise money by the issue of its bonds, secured by a mortgage on any or all of its property not acquired from said city or state.

SEC. 6. Said corporation may take, purchase and hold real and personal estate necessary for the purpose of its incorporation, the net annual income of which shall not exceed fifty thousand dollars, and shall possess the general powers and be subject to the restrictions and liabilities prescribed in the third title of the eighteenth chapter of the first part of the revised statutes.

SEC. 7. The commissioners of the sinking fund of the said city are authorized in their discretion to allot, set apart and appropriate for the use of said corporation, any of the lands belonging to said city north of One Hundred and Fifty-fifth street, but not in the Central Park, and such appropriation may be revoked if, after the expiration of five years from the passage of the act, a zoological garden is not established thereon; said grounds thus set apart and appropriated shall be used for no purpose whatsoever except those aforesaid. As soon as any lands are set apart the Mayor of the said city of New York, and the President of the Department of Parks of said city, shall become and be ex-officio members of the board of managers of said corporation. If at any time the animals now composing the menagerie at Central Park shall be removed therefrom by the authorities having charge thereof, said authorities may make an arrangement with the incorporators named in this act or the corporation formed by them for leasing or sale of such animals to such incorporators or corporation, and said incorporators or corporation shall have a preference over any other person or corporation in respect thereto upon the same terms which said authorities could make with any such other person or corporation, or upon such other terms as to such authorities may seem proper, but nothing herein provided shall be construed as giving the

commissioners of the Department of Public Parks authority to sell, lease, transfer, or in any otherwise dispose of said animals or other property connected with or belonging to said menagerie.

SEC. 8. Admission to the said garden shall be free to the public for at least four days, one of which shall be Sunday, in each week, subject to such rules and regulations as shall be prescribed by said corporation.

SEC. 9. This act shall take effect immediately.

STATE OF NEW YORK,
OFFICE OF THE SECRETARY OF STATE, } *ss:*

I have compared the preceding with the original law on file in this office, and do hereby certify that the same is a correct transcript therefrom, and of the whole of said original law.

{ L. S. }

Given under my hand and the seal of office of the Secretary of State, at the city of Albany, this third day of May, in the year one thousand eight hundred and ninety-five.

ANDREW DAVIDSON,
Deputy Secretary of State.

BY-LAWS

OF THE

New York Zoological Society.

ARTICLE I.

MEETINGS OF THE SOCIETY.

SECTION 1. The office and place of business of the New York Zoological Society shall be in the City of New York, unless otherwise ordered.

SEC. 2. The Society shall hold its annual meeting for the election of Managers, and other business, on the second Tuesday of January, or such day thereafter during the month of January to which said annual meeting shall adjourn.

SEC. 3. Special meetings of the Society shall be called by the Secretary, upon the request of the President or the Chairman of the Executive Committee, or at the written request of ten members.

SEC. 4. Notices of all meetings shall be mailed to each member of the Society at least three days before such meeting.

SEC. 5. At meetings of the Society twenty members shall constitute a quorum.

SEC. 6. The order of business shall be as follows:

1. Roll call.
2. Reading of minutes not previously read.
3. Report of Executive Committee.
4. Report of Secretary.
5. Report of Treasurer.
6. Report of Director.
7. Election of Managers.
8. Communications.
9. Miscellaneous business.
10. Reports and resolutions.

ARTICLE II.

BOARD OF MANAGERS.

SEC. 1. The Board of Managers shall consist of thirty-six members, together with the Mayor of New York and President of the Park Board, or Commissioner for the Bronx, who shall be members *ex-officio* of the board.

SEC. 2. Nineteen managers shall constitute a quorum, but ten managers may transact current business, and adjourn, subject to the subsequent approval of a meeting at which a quorum shall be present.

SEC. 3. The Board of Managers shall hold an annual meeting on the third Tuesday of January, or on such day thereafter to which said annual meeting shall adjourn. Regular meetings of the Board may also be called by the Secretary on the third Tuesdays of October and April, upon the request of the President or Chairman of the Executive Committee. Special meetings of the Board shall be called at any time by the Secretary, upon the request of the President or the Chairman of the Executive Committee, or at the written request of five Managers.

SEC. 4. Notices of meetings of the Board shall be mailed to each Manager at least three days before such meetings.

SEC. 5. The successors to the outgoing class of Managers shall be elected by the Society at its annual meeting, but vacancies in the Board may be filled for the unexpired term by the Board of Managers, or by the Executive Committee.

SEC. 6. A Nominating Committee shall be annually appointed by the Executive Committee, and shall consist of three members of the Society at large, who shall nominate and post ten days before the annual election the names of twelve persons to succeed the outgoing class of Managers in a conspicuous place in the office of the Society.

SEC. 7. No person shall be eligible for election to the Board of Managers, except to fill vacancies, unless his name shall have been posted as a candidate by such Committee, or by not less than ten members, in writing, in a conspicuous place in the office of the Society ten days before the annual election.

SEC. 8. Any Manager who shall fail to attend three consecutive meetings of the Board, unless excused by vote of the Board, shall cease to be a Manager.

SEC. 9. The Board of Managers shall at its annual meeting elect a President, two Vice-Presidents, a Secretary and a Treasurer, who shall hold office for one year, or until their successors are elected. The President, Vice-Presidents and Treasurer shall be members of the Board.

SEC. 10. The Director of the Zoological Park, and all other persons employed by the Society, shall be appointed by the Board or by the Executive Committee, and shall hold office during the pleasure of the Board.

SEC. 11. The Board shall, at its annual meeting, elect an Executive Committee and Auditing Committee, which shall hold office for one year, or until their successors are elected. The Board of Managers and the Executive Committee shall also have authority to appoint such other Committees or Officers as they may at any time deem desirable, and to delegate to them such powers as may be necessary.

SEC. 12. The order of business of the meetings of the Board shall be as follows :

1. Roll call.
2. Reading of minutes not previously read.
3. Report of Executive Committee.
4. Report of Secretary.
5. Report of Treasurer.

6. Report of Auditing Committee.
7. Report of Director.
8. Election of Officers.
9. Election of Committees.
10. Election of new members.
11. Communications.
12. Miscellaneous business.

SEC. 13. All reports and resolutions shall be in writing, and the ayes and nays may be called on any resolution at the request of one Manager.

SEC. 14. Whenever the funds of the Society shall permit, the Board of Managers or the Executive Committee may award medals or other prizes for meritorious work connected with the objects of the Society.

ARTICLE III.

OFFICERS.

SEC. 1. The officers of the Society shall consist of a President, two Vice-Presidents, a Treasurer, a Secretary and a Director of the Zoological Park. These officers, with the exception of the Director, shall be elected at the annual meeting of the Board of Managers, but any vacancy may be filled for an unexpired term by the Board of Managers, or by the Executive Committee, until the next annual election.

SEC. 2. The President shall preside at all meetings of the Board and of the Society, and shall be *ex-officio* a member of the Executive and Auditing Committees.

SEC. 3. The Vice-Presidents shall, in the absence of the President, perform his duties and possess his powers, acting in the order of their election.

SEC. 4. The Treasurer shall receive, collect and hold, subject to the order of the Board of Managers, or the Executive Committee, all dues, subscriptions, fees and securities. He shall pay all bills as ordered by the Board of Managers or the Executive Committee, and shall report to the Society at its annual meeting, and to the Board of Managers at all regular meetings and to the Executive Committee at each meeting. He shall keep all moneys and securities in some bank or trust company to be approved by the Board of Managers or Executive Committee. The books of the Society shall at all times be open to the inspection of the Managers.

SEC. 5. The Secretary shall be a salaried officer of the Society. He shall be present, unless otherwise relieved by the Board or Executive Committee, at all meetings of the Society, of the Board and of the Standing Committees. He shall keep a careful record of all proceedings, shall have the custody of the seal, archives and books, other than books of account, and shall conduct the correspondence of the Society. He shall issue all notices and tickets and shall perform such other duties as the Board may direct. He shall be a member *ex-officio* of the Executive and Auditing Committees and of the Scientific Council.

SEC. 6. The Director of the Zoological Park shall be elected annually by the Executive Committee at a salary to be determined by said Commit-

tee, and paid monthly from funds of the Society.* He shall be the responsible administrative officer of the Park, and shall recommend to the Executive Committee candidates for the various positions in the Park. He shall also perform all such other duties in connection with the business, scientific and literary administration of the Society as may be assigned to him by the Executive Committee.

ARTICLE IV.

COMMITTEES.

SEC. 1. There shall be two standing committees, the Executive Committee and the Auditing Committee, which shall hold office for one year or until their successors are elected.

SEC. 2. The Executive Committee shall consist of seven Managers, together with the President and Secretary of the Society *ex-officio*. Four members shall constitute a quorum, and all meetings shall be called by the Chairman. The Executive Committee shall fill all vacancies in its own number and shall have the full powers of the Board of Managers, except so far as such delegation of power may be contrary to law.

SEC. 3. The Executive Committee shall have the control and regulation of the collections, library and all other property of the Society, and shall have power to purchase, sell and exchange specimens and books, to employ and control all officials and employees of the Society and Park, and generally to carry out in detail the directions of the Board of Managers and the terms of any contract between the City, or Park Board, and the Society.

SEC. 4. All the rules and regulations for the examination of applicants for the various positions in the Park shall be made or approved by the Executive Commttiee.

SEC. 5. The Executive Committee may regulate the auditing and payment for all current accounts.

SEC. 6. The Executive Committee shall annually appoint a Nominating Committee, whose duties and powers are set forth in Sections 6 and 7, Article II. of these By-Laws.

SEC. 7. It shall also appoint a Scientific Council whose powers and duties are set forth in Section 2 of Article V. of the By-Laws.

SEC. 8. The Committee shall make a written report at each regular meeting of the Board of Managers.

SEC. 9. The Auditing Committee shall consist of three regular members of the Society, in addition to the President and Secretary, members *ex-officio*, and vacancies shall be filled by the Executive Committee. It shall be the duty of the Auditing Committee to audit, annually, the accounts of the Treasurer and of the Director, and any other accounts of the Society, and shall report to the Board of Managers at its annual meeting.

*Until such time as he enters fully upon his public administrative duties.

ARTICLE V.

SCIENTIFIC COUNCIL.

SEC. 1. The Executive Committee shall annually appoint a Scientific Council of not more than ten members, and shall fill all vacancies. Members of the Council shall hold office until their successors are appointed.

SEC. 2. The duties of the Council shall be to act as an advisory board in all matters pertaining to the scientific administration of the Society, and especially as to the scientific features of the Park, the promotion of zoology by publications and otherwise, and the preservation of the native fauna of America.

SEC. 3. Four members, including the Chairman, shall constitute a quorum. The Chairman shall be elected annually by the Council. The Secretary of the Society shall be a member and Secretary *ex-officio* of the Council.

ARTICLE VI.

MEMBERS.

SEC. 1. The present members and such others as shall become associated with them, under the conditions prescribed by the By-Laws, shall be members of this Society as long as they shall comply with the By-Laws.

SEC. 2. Members failing to comply with these By-Laws, or for other good and sufficient cause, may be expelled from the Society by the Executive committee.

SEC. 3. Candidates for membership shall be proposed and seconded by members of the Society. The name, occupation and place of residence of every member so proposed shall be submitted for election to the Board of Managers or the Executive Committee, and such person, when elected, shall become a member upon payment of the annual dues, or of the fees as prescribed below.

SEC. 4. The annual dues shall be ten dollars, payable in advance, on the first day of May of each year, but the Executive Committee may remit the dues for the current year in the case of members elected between January 1st and May 1st of each year. The classes of membership shall be as follows:

SEC. 5. The payment of $200 at one time shall constitute any member a Life Member.

SEC. 6. The payment of $1,000 at one time, or in the case of a Life Member, of $800, shall constitute any member a Patron.

SEC. 7. The payment of $2,500 at one time, or in the case of a Patron of $1,500, or of a Life Member of $2,300, shall constitute any member an Associate Founder.

SEC. 8. Any member who shall donate to the Society $5,000, or property of equal value, or any Associate Founder who shall donate $2,500, or any Patron who shall donate $4,000, may be elected by the Board of Managers or Executive Committee a Founder.

SEC. 9. Any member who shall donate to the Society $25,000, or any Founder who shall donate $20,000, may be elected by the Board of Managers or Executive Committee a Benefactor.

SEC. 10. Persons who have rendered marked service in the science of zoology or natural history may be elected Honorary Members, but not more than three such Honorary Members shall be elected in any one calendar year.

SEC. 11. Residents who have rendered scientific services to the Society, or marked services in zoology or natural history, may be elected as Permanent Fellows.

SEC. 12. Non-residents who communicate valuable information to the Society, or who have rendered marked service in the science of zoology or natural history may be elected Corresponding Members.

SEC. 13. Benefactors, Founders, Associate Founders, Patrons, Life Members, Honorary Members, Permanent Fellows and Corresponding Members shall be exempt from annual dues.

ARTICLE VII.

PRIVILEGES OF MEMBERS.

SEC. 1. A member's ticket admits the member and his immediate family to the Park on reserve days, and to all lectures and special exhibitions, and may be used by the member's immediate family, and shall be good for the current year.

SEC. 2. Admission tickets, each admitting two persons on reserve days, are issued to members for distribution, and are good for the current year.

SEC. 3. Each member of the Society is entitled annually to a member's ticket and to ten admission tickets.

SEC. 4. Each member shall also receive one copy of the catalogue or handbook, the report and official publications of the Society, and shall have all the privileges of the Library and Members' Building.

SEC. 5. No member shall be entitled to the privileges enumerated in this Article unless his annual dues shall have been paid.

SEC. 6. The Life Members shall have all the privileges of Members and ten additional admission tickets.

SEC. 7. Benefactors, Founders, Associate Founders and Patrons shall have all the privileges of Life Members, and shall in addition receive copies of all scientific works published by the Society.

SEC. 8. Any member who shall fail to pay his annual dues within three months after the same shall have become due, and after notice of thirty days, by mail, shall cease to be a member of the Society; subject, however, to reinstatement by the Board of Managers or Executive Committee for good cause shown.

SEC. 9. Any person elected to membership who shall fail to qualify within three months after notice of his election shall be considered to have declined his election; but such term may be extended by the Board of Managers or Executive Committee.

ARTICLE VIII.

FINANCES.

SEC. 1. The fiscal year of the corporation shall be the calendar year commencing January 1st and ending December 31st.

SEC. 2. Neither the Society nor any of its Managers or Officers shall contract any debt which, with existing debts, shall exceed in amount the funds then in the Treasury.

ARTICLE IX.

AMENDMENTS.

SEC. 1. Amendments to these By-Laws may be proposed, in writing, at any meeting of the Board of Managers, and adopted by unanimous consent of the Managers present, or if such proposed amendment shall fail to receive unanimous consent, the Secretary shall, with the notices of the next meeting, send a copy of it to each Manager and state that it will be brought up for action at such meeting, when it may be passed by a majority vote.

GRANT OF SOUTH BRONX PARK

TO THE

New York Zoological Society.

At a special meeting of the Commissioners of the Sinking Fund, City of New York, held on March 24, 1897, a resolution was passed allotting South Bronx Park for the use of the New York Zoological Society upon conditions entirely satisfactory to the Society.

The full text of the resolution is as follows:

WHEREAS, by chapter 435 of the Laws of 1895, entitled "An act to incorporate the New York Zoological Society and to provide for the establishment of a Zoological Garden in the City of New York," it is provided that the Commissioners of the Sinking fund of the City of New York are authorized in their discretion to allot, set apart and appropriate, for the use of said corporation, any of the lands belonging to said city north of 155th Street, but not in Central Park,

RESOLVED, that the said Commissioners of the Sinking Fund do hereby allot, set apart and appropriate for the use of said corporation, a tract of land in the southern portion of Bronx Park, embracing an area of about 261 acres, and consisting of so much of said park as lies south of Pelham Avenue, upon the following terms and conditions, to wit:

First. That said grounds thus set apart and appropriated, shall be used for no other purpose whatsoever except for the purposes of said Zoological Garden as the same are specified in the act aforesaid, and that said appropriation of said lands hereby made shall be revoked if, after the expiration of three years from the date of the commencement of the work by the Park Department for the necessary improvement of the grounds as referred to and described in the sixth paragraph of this Resolution, a Zoological Garden is not established upon said tract of land.

Second. That the original equipment of buildings and animals for said Zoological Garden shall be paid for from funds contributed by the New York Zoological Society, and that said Society shall, before it enters into occupation of the allotted land and within one year from the date of this Resolution, raise one hundred thousand dollars by subscription, and within three years from the date of the commencement of the work by the Park Department for the necessary improvement of the grounds as referred to and described in the sixth paragraph of this Resolution, the further sum of at least one hundred and fifty thousand dollars. If the said Society shall fail or neglect to raise said funds within the periods respectively fixed therefor,

it shall, on demand of the Commissioners of the Sinking Fund, surrender to the City of New York the land allotted to it as a site for said Garden, and all improvements made thereon. The said Society shall not mortgage its buildings or animals, or any of its property within said Garden, which is directly or indirectly maintained by the City of New York.

Third. The said Zoological Society shall have the power to establish an endowment fund from the donations and bequests, which fund shall be used solely, unless otherwise specified by the donors thereof, for the general uses and purposes of said Society. The funds of said Society, other than the sums contributed to said endowment fund, shall be expended upon buildings and other enclosures for animals, for the collections of animals, and for the general purposes of the Society. Among the funds thus to be expended shall be the subscriptions of members, life members and patrons, and all cash donations to said Society, other than those made for the purposes of the endowment fund, and all moneys derived from the sale of animals; and the net proceeds of the privileges that may be developed in said Garden, such as refreshments, boating, riding animals, the sale of photographs, etc., shall be used for, and expended in the increase of the collections; and payments from the funds of such Society, including the endowment fund, shall be made directly from the treasury of the Society.

Fourth. The library, pictures, maps, office furniture, and other movable property purchased and owned by the Society shall remain the property of the Society, and excepting living animals, may be removable at will, and every piece of such property shall bear a distinguishing mark. But no buildings, aviaries or cages may be sold or removed by said Society without the written consent of the Board of Parks. All property paid for from the maintenance fund, hereinafter referred to, shall belong to the City.

Fifth. So long as the said Society is entrusted with the control and management of the said Zoological Garden, and the city provides for the proper maintenance and care of the animals and collections therein, the said Society shall not remove any of its animals or collections for exhibition elsewhere without the consent of the Board of Parks, but if the City shall ever cease to provide for the proper maintenance and care of the said animals and collections, the said Zoological Society shall have the right, upon giving three months' notice in writing to the Board of Parks, to remove the said animals and collections owned by it. The said Society shall have the right to improve its collections by the exchange of animals, and also by the sale of animals not needed for exhibition; but all moneys derived from such sale or exchange of animals shall be used only for the purpose of increasing said collections.

Sixth. The City of New York shall annually provide the necessary funds for the maintenance and care of the Zoological Garden, its buildings, inclosures and other improvements made from time to time therein, and the animals and collections of said Society; but the appropriation for the for the first year is not to exceed Sixty thousand dollars ($60,000). It shall be the duty of the City to provide from such sums or appropriations, as may be applicable thereto, the cost of the necessary improvement of the ground

prior to the erection of buildings and inclosures, including such roads, walks, fences, grading, water supply, drainage and heating as may be or become necessary for the proper development of said Zoological Garden, all of which work of preparation and construction shall be performed in conformity with the plans therefor to be agreed upon between the Park Department and the Zoological Society. The said City shall also furnish the necessary supply of water, and adequate police patrol and protection, and the salaries of all persons employed directly in the service and development of the Zoological Garden shall be paid from the maintenance fund, and from such other funds as may be available for and applicable to the purpose. Payments from the maintenance fund shall be made upon vouchers filed with the Comptroller and drawn in such form as he may direct; and said Society shall annually render to the Mayor of the City of New York, a report showing all expenditures during the year then past, made on account of the said Zoological Garden, all revenues and resources thereof, a statement of the number of the members of said Society, of the donations received and of the number of animals in the Garden, the chief items of improvement made during the year, and all other information that the said Mayor may require.

Seventh. The Park Department shall at all times have access to the grounds, buildings and other inclosures of the said Zoological Society for general police visitation and supervision, and for all other lawful purposes. Prior to the commencement of any work on said Garden the general plan therefor shall be submitted to and approved by the Park Board, and all subsequent plans for buildings, roadways and paths shall also be so submitted and approved. No living tree shall be cut down or removed, except by the express authority of said Park Department, but the said Zoological Society shall have the right to remove dead trees and such bushes as it may be necessary to remove in the preparation of inclosures for animals, or in making other improvements. The said Department of Parks shall plant such and so many shade trees, aquatic plants, shrubs and flowers as may be necessary to enhance and secure the seclusion, beauty and usefulness of the park, and shall do and perform all the work of gardening necessary to carry out the general plan of improvement and the subsequent plans as may be agreed upon between the said Zoological Society and the said Department of Parks.

Eighth. The said Zoological Garden and its collections shall be free to the public without the payment of any admission fee or gratuity whatsoever for not less than seven hours a day on at least five days of the week, one or which shall be Sunday, and also on all legal holidays and half holidays, subject to such reasonable regulations as may be made by said Society, but the said Society may close the area devoted to the collections of animals on not more than two days in each week, and on such days may charge an admission fee which shall be fixed by said Society, and all moneys derived from such admission fees shall be expended by said Society in the increase of the collections or in the improvement of said Garden or its buildings; but the portion of the grounds situate east of Boston Road, and all the Bronx River below the Boston Road bridge shall be open to the public

at all times as pleasure grounds, subject to such reasonable regulations as may be adopted by said Society with the approval of the Park Department, and the occupancy of that portion of the park by herds of animals or by collections, shall be subject to the consent of the Park Department.

Ninth. The said Zoological Society shall have the right and power to appoint, direct, control and remove all persons and officers employed by them in and about the Zoological Garden, and to fix the salaries of such persons and officers and to make promotions, but all regular employees shall be chosen, and their salaries fixed and promotions made, by reason of special fitness and ability.

Tenth. Subject to the conditions hereinbefore contained, the said Zoological Society shall exercise entire control and management over all the affairs of the said Zoological Garden.

ACT PROVIDING FOR GROUND IMPROVEMENTS IN THE ZOOLOGICAL PARK.

CHAPTER 432.

AN ACT to provide for the improvement of that portion of Bronx Park in the City of New York allotted to and set apart for the New York Zoological Society.

Accepted by the City. Became a law April 13, 1900, with the approval of the Governor. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Department of Parks for the Borough of the Bronx in the city of New York, when the New York Zoological Society shall have raised or expended the sum of two hundred thousand dollars for the development of that portion of Bronx Park allotted to it by the city of New York by agreement dated March twenty-fourth, eighteen hundred and ninety-seven, and when the Board of Estimate and Apportionment in the exercise of its discretion shall have consented and concurred, is hereby authorized to make such improvements upon the portion of Bronx Park allotted to the said New York Zoological Society as shall be necessary to fully provide for and complete sewerage and surface drainage, additional service roads, water supply, asphalt or other surface for existing and other walks, stone steps, terraces and coping and balustrades, the resurfacing and extending of roads and paths, and additional roads and paths, bridges, guard rails, fences, gates, wire netting, and barbed-wire overhang to boundary fence, wire flood-gate at Pelham Avenue bridge, the improvement of the waterfall in the Bronx River, regulating, grading, filling and fertilizing grounds, and stocking and planting with trees, shrubs, and plants, and the necessary materials and other substances required in carrying out the same, entrances and shelter pavilions, carriage sheds, public restaurants, drinking fountains, boat houses, work shops, a green house for propagating and storage purposes, the construction and equipment of a building for carnivorous animals, and the construction and equipment of a building for primates, together with such other buildings, structures, and improvements as may be deemed necessary by the board of managers of the said New York Zoological Society, and be approved by said Commissioner of Parks for the Borough of the Bronx.

SEC. 2. Prior to the expenditure of any amount hereunder, plans and specifications for the several improvements, buildings, structures, and other items of expenditure herein contemplated, shall be prepared by said New York Zoological Society, and approved by the Commissioner of Parks for the Borough of the Bronx, and all work herein specified shall be under the supervision of said Commissioner. The construction and equipment of the buildings hereinabove provided for, when undertaken, shall be prosecuted under the supervision of the architects chosen by the board of

managers of the said New York Zoological Society, and the compensation of such architects, and the cost to the New York Zoological Society of preparing the plans and specifications of the improvements provided by this act shall be paid out of the fund provided by this act. All payments to be made on account of work under the supervision of said architects shall be made upon the certificate of said architects that said work has been done in a satisfactory and workmanlike manner and in accordance with the plans and specifications; and all payments under the provisions of this act shall finally be approved by the Commissioner of Parks for the Borough of the Bronx, upon the certificate of the engineer-in-chief of said department.

SEC. 3. For the purpose of providing means for carrying into effect the provisions of this act, it shall be the duty of the Comptroller of the city of New York, upon being thereunto authorized by the Board of Estimate and Apportionment of the city of New York, to issue and sell corporate stock of the city of New York in the manner now provided by law to an amount not exceeding in the aggregate the sum of three hundred thousand dollars.

SEC. 4. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

SEC. 5. This act shall take effect immediately.