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A. J. Ramsey

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TWELFTH ANNUAL REPORT
OF THE
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ZOOLOGICAL SOCIETY

CHARTERED IN 1895

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

1907



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 CHICHESTER, CHARLES DARWIN,
 CHILDS, EVERSLEY,
 CHILDS, WILLIAM H.,
 CHISOLM, B. OGDEN,
 CHOATE, JOSEPH K.,
 CHUBB, PERCY,
 CHURCH, CHARLES T.,
 CHURCH, E. D., JR.,
 CHURCH, FREDERIC E.,
 CHURCH, F. S.,
 CHURCH, THEODORE W.,
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 CLARK, D. CRAWFORD,
 CLARK, J. MITCHELL,
 CLARK, L. C.,
 CLARK, W. A.,
 CLARK, WILLIAM N.,
 CLARKE, E. A. S.,
 CLARKE, THOMAS SHIELDS,
 CLAUSEN, GEORGE C.,
 CLEARY, JOHN,
 CLEVELAND, CHARLES D.,
 CLYDE, WILLIAM P.,
 COCHRANE, JOHN W.,
 COCKEROT, MISS E. V.,
 COCKRAN, HON. W. BOURKE,
 COFFIN, DANIEL M.,
 COFFIN, WILLIAM EDWARD,
 * COHEN, SAMUEL M.,
 COLBRON, PAUL TOWNSEND,
 * COLBURN, N. A.,
 COLBY, HOWARD A.,
 COLE, EDWARD F.,
 COLLIER, PETER F.,
 COLLIER, PRICE,
 COLLIER, MRS. R. J.,
 COLLINS, CLARENCE LYMAN,
 COLLINS, DR. STACEY BUDD,
 COLLINS, MRS. ELLEN,
 COLLINS, MISS GERTRUDE,
 COLLORD, GEORGE W.,
 COMSTOCK, MRS. H. G.,
 CONDON, THOMAS GERALD,
 CONKLING, PAUL,
 CONTENT, HARRY,
 COOMBE, T. GORTON,
 COOPER, THEODORE,
 CORBIN, AUSTIN,
 CORBIN, MRS. AUSTIN,
 CORNING, C. R.,
 CORWINE, WILLIAM R.,
 COSTAIN, EUGENE H.,
 COSTER, CHARLES,
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 COWLES, DAVID S.,
 COX, CHARLES F.,
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- COX, MARK T.,
 CRAIGIE, ARCHIBALD WALPOLE,
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 CRANE, ALBERT,
 CRAVATH, MRS. PAUL D.,
 * CRAWFORD, DR. W. H.,
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 CRICKMORE, H. G.,
 CROMWELL, FREDERIC,
 CROMWELL, JAMES W.,
 CROMWELL, LINCOLN,
 CROEMEYER, ROBERT,
 CROSS, GEORGE D.,
 CROSS, MRS. C. VANDERBILT,
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 DANA, PAUL,
 DANA, WILLIAM B.,
 DARDS, CHARLES A.,
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 DAVENPORT, MRS. IRA,
 DAVIDGE, WILLIAM H.,
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 DAVIES, J. CLARENCE,
 DAVIES, JULIEN TAPPAN,
 DAVIES, WILLIAM GILBERT,
 DAVIS, DANIEL A.,
 DAVIS, GHERARDI,
 DAVIS, HOWLAND,
 DAVIS, JOSEPH P.,
 DAVIS, M. B.,
 DAVIS, MORGAN,
 DAVISON, CHARLES STEWART,
 DAVISON, GEORGE HOWARD,
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 DAY, MRS. HENRY MILLS,
 DEAN, PROF. BASHFORD,
 DE COPPET, HENRY,
 DEEVES, RICHARD,
 DE FOREST, ROBERT W.,
 DEGENER, J. F.,
 DEGOICOURIA, A. V.,
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 DELAFIELD, FREDERICK P.,
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 DELANOY, WILLIAM C.,
 DELESKER, CHARLES,
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 DEMING, L. C.,
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 DE RHAM, H. CASIMIR,
 DESPARD, WALTER D.,
 DEVEREUX, WALTER B.,
 DE VINNE, THEODORE LOW,
 DEWAR, CHARLES B.,
 DE WITT, WALTER G.,
 DE WITT, WILLIAM G.,
 DEXTER, STANLEY W.,
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 DEYO, ROBERT E.,
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 DICKERSON, E. N.,
 DIEHL, GEORGE H.,
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 DRAYTON, J. COLEMAN,
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 DUNN, GANO S.,
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 GROSS, FRANK,
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 HAMILTON, MISS ELIZABETH STEWART,
 HAMILTON, WILLIAM PIERSON,
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 HATFIELD, THOMAS F.,
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 HAVEMEYER, II. O., JR.,
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 HAVEMEYER, T. A.,
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 HAVEN, J. WOODWARD,
 HAVENS, ALBERT G.,
 HAWE, MATTHEW,
 HAYNES, WILLIAM DE FOREST,
 HECKER, ANTON J.,
 HECKSCHER, JOHN GERARD,
 HEDGES, JOB E.,
 HEIMAN, ABRAHAM,
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 HEINTZ, JOHN C.,
 HEITEMEYER, CLEMENS,
 HELD, DR. R. JOHNSON,
 HENCKEN, HANCKE,
 HENDRICKS, FRANCIS,
 HENKEL, JOHN,
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 HESS, SELMAR,
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 HEWITT, HERBERT H.,
 HEYNE, F. W.,
 HILL, E. B.,
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 HILLS, MRS. ALFRED K.,
 HILYARD, GEORGE D.,
 HINCHMAN, WALTER,
 HIRSCH, CHARLES S.,
 HISS, PHILIP,
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 HODENPYL, ANTON G.,
 HOE, RICHARD M.,
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 * HOLDEN, EDWIN B.,
 HOLDEN, EDWIN R.,
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 HOPPIN, HAMILTON L.,
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 HOPPIN, WILLIAM W., JR.,
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 HOWE, WIRT,
 HOWLAND, HENRY E.,
 HOWLAND, MRS. HENRY E.,
 HOYT, COLGATE,
 HOYT, WALTER S.,
 HOYT, GERALD L.,
 HOYT, GOOLD,
 HOYT, MRS. JESSE,
 HUGHES, CHARLES E.,
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 HUSSEY, WILLIAM H.,
 HUSTED, MISS M. KATHARINE,
 HUSTED, SEYMOUR L., JR.,
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 HUTCHINSON, CARY T.,
 HUTTER, KARL,
 HUYLER, JOHN C.,
 HYDE, AUGUSTUS L.,
 HYDE, B. T. BABBITT,
 HYDE, CLARENCE M.,
 HYDE, DR. FREDERICK E.,
 INCHEE, GEORGE B.,
 IJAMS, J. T.,
 INNESS, GEORGE, JR.,
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 IRVIN, MRS. RICHARD,
 ISELIN, ADRIAN, JR.,
 ISELIN, C. OLIVER,
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 ISELIN, MISS GEORGINE,
 ISELIN, JOHN H.,
 ISHAM, CHARLES H.,
 ISHAM, SAMUEL,
 IVORY, L. C.,
 JACKSON, FREDERIC WENDELL,
 JACKSON, DR. GEORGE THOMAS,
 JACKSON, R. G.,
 JACKSON, SAMUEL MACAULEY,
 JACOB, LAWRENCE,
 JACOBI, DR. A.,
 JACOBUS, JOHN S.,
 JACQUELIN, HERBERT T. B.,
 JACQUELIN, JOHN H.,
 JAMES, ARTHUR CURTISS,
 JAMES, DR. ROBERT C.,
 JAMES, DR. WALTER B.,
 JANEWAY, DR. EDWARD G.,
 JENKINS, WILLIAM B.,
 JENNINGS, FREDERICK B.,
 JENNINGS, PHILANDER R.,
 JENNINGS, WALTER,
 JESTER, CLAUDE W.,
 JOHNSON, MRS. F. COIT,
 JOHNSON, GUY B.,
 JOHNSTON, J. HERBERT,
 JOHNSTON, SAMUEL D.,
 JOHNSTON, WILLIAM J.,
 JOLINE, ADRIAN HOFFMAN,
 JONES, H. BOLTON,
 JONES, DWIGHT A.,
 JONES, LEWIS Q.,
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 KAHN, LOUIS,
 KAHN, OTTO H.,
 KALLMAN, CHARLES,
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 KANE, JOHN INNES,
 KANE, MISS LOUISA LANGDON,
 * KANE, S. NICHOLSON,
 KEECH, FRANK B.,
 KELLEY, AUSTIN P.,
 KELLOGG, MRS. CHARLES,
 KELLY, EUGENE,
 KEMP, ARTHUR T.,
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 KENT, EDWIN C.,
 KEPPEL, FREDERICK,
 KEUFFEL, WILHELM,
 KIDDER, JAMES HATHAWAY,
 KILIAN, HENRY,
 KIMBALL, ALFRED R.,
 KING, EDWARD,
 KING, JAMES GORE,
 KING, MRS. LEROY,
 KING, N. K.,
 KING, WILLIAM F.,
 KINNEY, MORRIS,
 KITCHING, FRANK W.,
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 KLAW, MARC,
 KLEE, BENJAMIN,
 KLEIN, ALFRED J.,
 KNAPP, DR. HERMAN,
 KNAPP, JOHN M.,
 KNOEDLER, ROLAND F.,
 KOENIG, JOHN J.,
 KOHLMAN, CHARLES,
 KOGGE, A. H.,
 KOLB, GUSTAVE F.,
 KUHNE, PERCIVAL,
 KUNHARDT, HENRY R.,
 KUTTROFF, ADOLF,
 LACOMBE, HON. E. HENRY,
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 LANE, EDWARD V. Z.,
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 LANGE, HARRY W.,
 LANGE, J. D.,
 LANGELOTH, J.,
 LANGDON, WOODBURY G., JR.,
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 LATHROP, FRANCIS,
 LATTING, CHARLES P.,
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 LAWRENCE, JOHN BURLING,
 LAWRENCE, NEWBOLD T.,
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 LAWRENCE, WALTER BOWEN,
 LAWRENCE, W. V.,
 LAYNG, J. D.,
 LEDOUX, DR. ALBERT R.,
 LEE, MRS. FREDERIC S.,
 LEE, PROF. FREDERIC S.,
 LEE, J. BOWERS,
 LEE, WILLIAM H. L.,
 LEFFERTS, MARSHALL C.,
 LEITNER, JACOB,
 LESHER, A. L.,
 LETKEMANN, H. V.,
 LEVY, EMANUEL,
 LEWIS, FREDERIC ELLIOTT,
 LEWIS, PERCY PYNE,
 LEWIS, WADSWORTH RUSSELL,
 LEWIS, DR. WILLIAM J.,
 LEWISOHN, ADOLPH,
 LIBBEY, O. B.,
 LIEBENAU, ALBERT,
 LIEBERTZ, JOSEPH,
 LINCOLN, LOWELL,
 LITCHFIELD, EDWARD H.,
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 LIVINGSTON, WILLIAM S.,
 LOBENSTINE, WM. C.,
 LOCKWOOD, WILLISTON B.,
 * LOGAN, WALTER S.,
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 LOWELL, MISS CARLOTTA RUSSELL,
 LOWELL, JAMES B.,
 LOW, ETHELBERT IDE,
 LUCKSINGER, JACQUES,
 LUEDER, A.,
 LUSK, PROF. GRAHAM,
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 LYMAN, FRANK,
 LYNDE, FRANCIS E. P.,
 * LYNDE, ROLLIN H.,
 * McALAN, JOHN,
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 McINTYRE, THOMAS A.,
 McKIM, REV. HASLETT,
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 McLEAN, JAMES,
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 MACK, JACOB W.,
 MACHEL, ADOLPH,
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 MAGEE, JOHN,
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 MAIRS, GEORGE H.,
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 MAPES, DANIEL, JR.,
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 MARSHALL, CHARLES H.,
 MARSTON, EDWIN S.,
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 MATHEWS, THOMAS,
 MATTHIESSEN, MISS MARIE,
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 MEHLTRETTER, CHARLES F.,
 MEISSNER, CARL A.,
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 deMILHAU, LOUIS JOHN,
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 PARSONS, WILLIAM BARCLAY,
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 PLATT, FRANK H.,
 PLATT, MISS MARION ERSKINE,
 PLYMPTON, GILBERT M.,
 POGGENBURG, H. F.,
 POLESIE, MAX,
 POLLOCK, GEORGE E.,
 POOR, HENRY V.,
 PORTER, CLARENCE,
 PORTER, WILLIAM L.,
 POST, ABRAM S.,
 POST, EDWARD C.,
 POST, GEORGE B., JR.,
 POST, MRS. H. A. V.,
 POST, WILLIAM H.,
 POSTLEY, CLARENCE A.,
 POTTER, MISS BLANCHE,
 POTTER, EDWARD CLARKSON,
 POTTER, FREDERICK,
 POTTER, MISS MARTHA,
 POTTS, WILLIAM BREVOORT,

* Deceased.

PRATT, GEORGE D.,
 PRENTICE, JOHN HILL,
 PRENTISS, GEORGE LEWIS,
 PRIME, MISS CORNELIA,
 PRINCE, EDWARD S.,
 PRINCE, PROF. J. DYNELEY,
 PRYER, CHARLES,
 PUTNAM, WILLIAM A.,
 PYLE, JAMES TOLMAN,
 PYNE, MRS. M. TAYLOR,
 QUINTARD, DR. EDWARD,
 *RAND, GEORGE C.,
 RANDALL, FRANK E.,
 RANDOLPH, EDMUND D.,
 RANDOLPH, WILLIAM W.,
 RANFT, RICHARD,
 RAPALLO, EDWARD S.,
 RATHBORNE, RICHARD C.,
 RAUCH, WILLIAM,
 RAWLINS, J. ARMSTRONG,
 READ, WILLIAM A.,
 REDMOND, MISS E.,
 REDMOND, HENRY S.,
 REED, CHARLES,
 REESE, T. T.,
 REIMER, OTTO E.,
 REINCKE, E. A.,
 REINHARDT, GEORGE N.,
 REYNOLDS, E. B.,
 REYNOLDS, JAMES BRONSON,
 RHINELANDER, CHARLES E.,
 RHINELANDER, FREDERIC W.,
 RHINELANDER, MISS SERENA,
 RICHARD, AUGUSTE,
 RICHARD, EDWIN A.,
 RICHARDS, E. O.,
 RIKER, JOHN L.,
 RIKER, SAMUEL,
 RIPLEY, H. DILLON,
 RIPLEY, JULIAN A.,
 RIPLEY, LOUIS A.,
 RIVES, GEORGE L.,
 ROBBINS, CHANDLER,
 ROBERTSON, MRS. FANNY P.,
 ROBERTSON, R. H.,
 ROBINSON, EDWARD,
 ROBINSON, ELI K.,
 ROBINSON, G. H.,
 ROBINSON, G. N.,
 ROBINSON, HENRY A.,
 ROBISON, WILLIAM,
 ROCKWOOD, WILLIAM H.,
 ROE, CHARLES F.,
 ROE, FRANK O.,
 ROE, IRVING L.,
 ROELKER, ALFRED,
 ROGERS, E. L.,
 ROGERS, JAMES H.,
 ROKENBAUGH, HENRY S.,
 ROMAINE, W. TYSON,
 ROOSEVELT, W. EMLEN,
 ROOT, ELIHU,
 ROSE, JOHN J.,
 ROSSITER, ARTHUR W.,
 ROSSITER, E. V. W.,
 ROTH, FREDERICK G. R.,
 ROTHWELL, JAMES E.,
 ROWELL, GEORGE P.,
 ROWLAND, THOMAS,
 RUNGUIS, CARL,
 RUNYON, CARMAN R.,
 RUPPERT, JACOB,
 RUPPERT, MRS. JACOB,
 RUPERTI, JUSTUS,
 RUSSELL, ARCHIBALD D.,
 RYAN, J. D.,
 RYLE, ARTHUR,
 ST. JOHN, F. L.,
 SACKETT, CLARENCE,
 SACKETT, MISS GERTRUDE T.,
 SACKETT, MRS. S. E.,
 *SAGE, DEAN,
 SAGE, JOHN H.,
 SAGE, MRS. RUSSELL,
 SAMPSON, CHARLES E.,
 SAUTER, FREDERICK,
 SCHAEFER, HENRY,
 SCHANCK, GEORGE E.,
 SCHANG, FREDERICK,
 SCHAU, C. F.,
 SCHEFER, CARL,
 SCHIEFFELIN, MRS. H. M.,
 SCHIEFFELIN, WILLIAM JAY,
 SCHILLING, ROBERT H.,
 SCHIRMER, GUSTAV,
 SCHIRMER, RUDOLPH E.,
 SCHMIDT, F. LEOPOLD,
 SCHNEIDER, G. E.,
 SCHNIEWIND, F.,
 SCHOLLE, A. H.,
 SCHULTZE, JOHN S.,
 SCHUYLER, MISS LOUISA LEE,
 SCHWARZ, HENRY F.,
 SCOTT, HON. FRANCIS M.,
 SCOTT, WILLIAM,
 SCRIBNER, ARTHUR H.,
 SCRYMSE, JAMES A.,
 SEARS, ROBERT B.,
 SEDGWICK, ROBERT,
 SEE, A. B.,
 SEITZ, ARTHUR,
 SELIGMAN, ALFRED L.,
 SELIGMAN, JEFFERSON,
 SETON, ALFRED, JR.,

* Deceased

- SEWALL, FRED. W.,
 SEXTON, LAWRENCE E.,
 SEYBEL, DANIEL E.,
 SHAPIRO, D.,
 SHAW, CHARLES HERBERT,
 SHAW, JAMES G.,
 SHAW, WALTER W.,
 SHEETS, DR. E. A.,
 SHEFFIELD, JAMES R.,
 SHELDON, GEORGE R.,
 SHELDON, WILLIAM C.,
 SHIPWAY, JOHN H.,
 SHOEMAKER, HENRY W.,
 SHURTLEFF, ROSWELL MORSE,
 SIEGEL, JACOB,
 SILLECK, HENRY G., JR.,
 SILLECK, MRS. HENRY G., JR.,
 SILLIMAN, HARPER,
 SIMMONS, JOSEPH F.,
 SIMPSON, JOHN W.,
 SIMPSON, WILLIAM,
 SINCLAIR, JOHN,
 SKEEL, FRANK D.,
 SKIDMORE, WILLIAM L.,
 SLADE, FRANCIS LOUIS,
 SMILEY, DANIEL,
 SMILLIE, CHARLES F.,
 SMILLIE, JAMES D.,
 SMITH, DR. A. ALEXANDER,
 SMITH, AUGUSTINE J.,
 SMITH, ARTHUR,
 SMITH, F. M.,
 SMITH, H. SANBORN,
 SMITH, JAMES,
 * SMITH, J. HENRY,
 SMITH, LUCIUS H.,
 SMITH, NATHANIEL S.,
 SMITH, PHILIP S.,
 SMITH, ROBERT W.,
 SMITH, DR. SAMUEL,
 SMITH, WILLIAM ALEXANDER,
 SMITHERS, CHARLES,
 SMITHERS, F. S.,
 * SMYTH, PHILIP A.,
 SNOW, C. G.,
 SOLTSMANN, E. G.,
 SORCHON, MRS. VICTOR,
 SOUTHACK, FREDERICK,
 SPEAR, JAMES, JR.,
 SPEDDEN, FREDERIC O.,
 * SPEIR, MRS. CECILIA M.,
 SPENCER, LORILLARD,
 SPIEGELBERG, F.,
 SPITZNER, GEORGE W.,
 SPOFFORD, MRS. J. L.,
 SPRING, MISS ANNA RIKER,
 SPURR, E. W.,
 SQUIBB, CHARLES F.,
 SQUIBB, DR. EDWARD H.,
 STAFFORD, WILLIAM FREDERICK,
 STANDISH, MYLES,
 * STANTON, JOHN,
 STANTON, JOHN R.,
 STARR, LOUIS MORRIS,
 STEBBINS, JAMES H.,
 STECHER, HENRY BALFOUR,
 STECKER, ADAM A.,
 STEERS, HENRY,
 STEEVES, JOHN F.,
 STEIL, GEORGE H.,
 STEINBECK, EDWARD,
 STEPHENS, OLIN J.,
 STERN, ISAAC,
 STERN, VESTY J.,
 STEVENS, ALEXANDER H.,
 STEVENS, FREDERIC W.,
 STEVENSON, PAUL EVE,
 STEWART, WILLIAM R.,
 STILLMAN, MISS CHARLOTTE R.,
 STILLMAN, JAMES A.,
 STILLMAN, THOMAS B.,
 * STILLMAN, T. E.,
 STIMSON, DR. DANIEL M.,
 STOKES, H. B.,
 STOKES, MISS OLIVIA E. PHELPS,
 STONE, MASON A.,
 STONE, WALTER KING,
 STOUT, ANDREW V.,
 STOUT, JOSEPH S.,
 STOW, GEORGE G.,
 STRANGE, A. B.,
 * STRATFORD, PROF. WILLIAM C.,
 STRAUSS, FREDERICK,
 STREAT, JAMES,
 STREETER, D. D., JR.,
 STRONG, THERON G.,
 STURGES, HENRY C.,
 STUYVESANT, RUTHERFURD,
 SULLIVAN, MRS. JAMES,
 SUTTON, WOODRUFF,
 SWAN, ALDEN S.,
 SWAYNE, FRANCIS B.,
 SWENSON, S. J.,
 TABER, MISS MARY,
 TAFT, HENRY W.,
 TALCOTT, JAMES,
 TATHAM, CHARLES,
 TATUM, A. H.,
 TAYLOR, DWIGHT W.,
 TAYLOR, GEORGE,
 TAYLOR, MRS. HENRY OSBORN,
 TAYLOR, HENRY R.,
 TAYLOR, HERBERT C.,
 TAYLOR, JAMES B.,

* Deceased.

TAYLOR, KNOX,
 TAYLOR, LLOYD,
 TAYLOR, MOSES,
 TAYLOR, STEVENSON,
 TENNEY, C. H.,
 TERRY, JOHN T.,
 TERRY, REV. RODERICK,
 THACHER, MRS. GEORGE W.,
 THACHER, THOMAS,
 THAYER, HARRY BATES,
 THOMAS, DR. ALLEN M.,
 THOMAS, SETH E.,
 THORNDIKE, DR. TOWNSEND W.,
 THORNE, JONATHAN,
 THORNE, NEWBERRY D.,
 THORNE, W. V. S.,
 TIFFANY, LOUIS C.,
 TILFORD, HENRY M.,
 TILT, BENJAMIN B.,
 TILTON, JOSEPH W.,
 TIMKEN, J. HENRY,
 TIMMERMANN, HENRY G.,
 TOD, J. KENNEDY,
 FODD, H. H.,
 TOUSEY, WILLIAM,
 TOWNSEND, EDWIN S.,
 TOWNSEND, ISAAC,
 TOWNSEND, J. HENRY,
 TOWNSHEND, JOHN,
 TOWS, COE DOWNING,
 TRASK, SPENCER,
 TROSTEL, FERDINAND,
 TROWBRIDGE, FREDERICK K.,
 TRUAX, HON. CHARLES H.,
 TRUSLOW, T. BROOKS,
 TUCKERMAN, ALFRED,
 TUCKERMANN, PAUL,
 TURNURE, MRS. ARTHUR,
 TURNURE, GEO. E.,
 TWEDDELL, WILLIAM H.,
 UNDERWOOD, WILLIAM LYMAN,
 UPMANN, CARL,
 VALENTINE, DR. WILLIAM A.,
 VAN BEUREN, FREDERICK T., JR.,
 VAN CORTLANDT, AUGUSTUS,
 VANDERBILT, ALFRED G.,
 VANDERPOEL, MRS. JOHN A.,
 VAN DER SMISSEN, DR. G. J.,
 VAN EMBURGH, D. B.,
 VAN NEST, MRS. ALEXANDER T.,
 VAN NEST, G. WILLETT,
 VAN NORDEN, THEODORE LANGDON,
 VAN NORDEN, WARNER M.,
 * VAN PELT, GILBERT S.,
 VAN WINKLE, EDGAR B.,
 VAN WYCK, WILLIAM,
 * VARNUM, JAMES M.,
 VERDI, MISS MARY,
 VIELE, HERMAN K.,
 VICTOR, A.,
 VOGEL, HERMAN,
 WADDINGTON, GEORGE,
 WADSWORTH, CLARENCE S.,
 WADSWORTH, W. P.,
 WAGNER, OTTO,
 WAGNER, H. WM. C.,
 WAGSTAFF, C. DU BOIS,
 WAINWRIGHT, J. HOWARD,
 WALCOTT, FREDERIC C.,
 WALKER, GEORGE L.,
 WALKER, GEORGE W.,
 WALLER, ROBERT, JR.,
 WALSH, SAMUEL A.,
 WANNINGER, CHARLES,
 WARBURG, PAUL M.,
 WARD, ARTEMAS,
 WARD, MRS. GEORGE CABOT,
 WARD, HENRY C.,
 WARD, J. Q. A.,
 WARDNER, HENRY STEELE,
 WARDWELL, WILLIAM T.,
 WARREN, JOHN HOBART,
 WARREN, LLOYD,
 WATERBURY, JOHN I.,
 WATSON, CHARLES F.,
 WATSON, REV. J. HENRY,
 WEATHERBEE, EDWIN H.,
 WEAVER, R. H.,
 WEBB, F. EGERTON,
 WEBB, DR. W. SEWARD,
 WEBER, CHARLES,
 WEEKS, JAMES,
 WELLS, OLIVER J.,
 WENDELL, EVERT JANSEN,
 WENDELL, GORDON,
 WENDELL, MRS. JACOB,
 WERTHEIM, H. P.,
 WESTOVER, M. F.,
 WETMORE, EDMUND,
 WHEELER, EVERETT P.,
 WHEELOCK, DR. GEORGE G.,
 WHITE, ALAIN C.,
 WHITE, HORACE,
 WHITE, JOHN JAY,
 WHITE, LEONARD D.,
 WHITE, S. V.,
 WHITE, WILLIAM W.,
 WHITEHOUSE, J. HENRY,
 WHITEHOUSE, WILLIAM F.,
 WHITING, DR. CHARLES A.,
 WHITING, MISS GERTRUDE,
 WHITING, GILES,
 WHITMAN, CLARENCE,
 WHITMAN, WILLIAM, JR.,

* Deceased.

WHITNEY, MISS E. C.,	WITHERBEE, FRANK S.,
WHITRIDGE, F. W.,	WITTHAUS, DR. RÜDOLPH A.,
WICKERSHAM, GEORGE W.,	WOLFF, EMIL,
WIENER, FELIX F.,	WOOD, ARNOLD,
WILKINS, F. H.,	WOOD, GILBERT CONGDON,
WILLETS, JOHN T.,	WOOD, J. WALTER,
WILLIAMS, MRS. G. G.,	WOOD, WILLIAM CONGDON,
WILLIAMS, RICHARD H., JR.,	WOOD, WILLIAM H. S.,
WILLIAMS, MRS. PERCY H.,	WOODCOCK, EDWIN,
WILLIAMS, MRS. R. H., JR.,	WOODHOUSE, J. S.,
WILLIAMS, THOMAS,	WOODWARD, JAMES T.,
WILLIAMS, WALDRON,	WORCESTER, WILFRED J.,
WILLOUGHBY, MISS MARY CAREW,	WRIGHT, J. DUNBAR,
WILLS, CHARLES T.,	WRIGHT, MRS. J. HOOD,
WILSON, DR. EDMUND B.,	WRIGHT, JOHN HOWARD,
WILSON, GEORGE T.,	WRIGHT, MRS. MABEL OSGOOD,
WILSON, HENRY R.,	YOUNG, A. MURRAY,
WILTSEE, ERNEST,	YOUNG, FREDERICK STAFFORD,
WINANT, FREDERICK,	YOUNG, GEORGE W.,
WINCKELBACH, L. O.,	YOUNG, JOHN ALVIN,
WINTHROP, EGERTON L.,	YOUNG, JOHN W.,
WINTHROP, EGERTON L., JR.,	YOUNG, RICHARD N.,
WINTHROP, ROBERT DUDLEY,	ZARRISKIE, ANDREW C.,
WISNER, CHARLES,	ZINSSER, AUGUST,

Corresponding Members.

BARBOUR, MRS. S. E.,	GOLDING, CAPT. THOS.,
BROWN, HERBERT,	GRIFFITH, WILLIAM A.,
BROWN, WILLIAM HARVEY,	STONE, ANDREW J.,
CORNISH, C. J.,	WILSON, T. E.
ELROD, M. J.,	

Summary of Membership.

Benefactors	4
Founders	21
Associate Founders	12
Patrons	41
Life Members	193
Annual Members	1,335
Corresponding and Honorary Members.....	18
Total Membership	1,624

Qualifications for Regular Membership.

Annual Members	\$ 10	Associate Founders	\$ 2,500
Life Members	200	Founders	5,000
Patrons	1,000	Benefactors	25,000

Form of Bequest.

I do hereby give and bequeath to the "NEW YORK ZOOLOGICAL SOCIETY," of the City of New York,.....

.....

.....



PORTION OF BAIRD COURT.

Showing the new Bird House for perching birds and the Sea-Lion Pool.

REPORT OF THE EXECUTIVE COMMITTEE

TO THE BOARD OF MANAGERS.

THE Executive Committee of the Board of Managers of the New York Zoological Society has the satisfaction of reporting another year of continuous and substantial progress, especially along the lines of scientific work.

The Zoological Park and the Aquarium have continued to enjoy an extraordinary measure of public approval, as is best evidenced by the fact, that during the year 1907, 1,276,041 people visited the Zoological Park, and 2,131,393 visited the Aquarium, making the striking total of visitors to the two institutions of 3,407,434. The cost to the City for providing amusement, recreation and scientific instruction to this great crowd was about five and one-half cents per visitor.

During the past year the most important permanent improvements comprised the partial construction of the Elephant House; the completion of the northern retaining walls, steps and balustrades of Baird Court; the construction of the western approach to Baird Court; the construction of the Plaza at the Boston Road Entrance; the construction of the West Farms Block; the completion of the West Farms Entrance to the Park; the remodeling of the Elk Corrals, Mountain Goat Corrals, and other enclosures for North American Deer; and the construction of important new walks. The construction of the Entrance Pavilions, Concourse Approach and Concourse at the north end of the Park is nearly finished.

The membership of the Society on January 1, 1908, was as follows:

Benefactors	4
Founders	21
Associate Founders	12
Patrons	41
Life Members	193
Annual Members	1,335
Corresponding and Honorary Members....	18
<hr/>	
Total membership	1,624

FINANCES.

<i>Animal Fund.</i> —During the year 1907 special subscriptions have been received toward the Animal Fund amounting to		\$3,907.00
Received from sale of animals		2,335.50
Received from Park privileges		12,582.35
Balance from the year 1906		1,355.16
		<hr/>
Total receipts		\$20,180.01
During the year there was expended for animals the sum of		18,854.68
		<hr/>
Balance January 1, 1908		\$1,325.33

Income Account.—The Income Account has been heavily taxed during the year to maintain the work of the Society outside of that for which funds have been supplied by the City. It has been barely sufficient to meet the needs of the Society, and showed, at the 1st of January, 1908, a balance of \$100. The smallness of this amount emphasizes the constant need for an increased membership.

General Fund.—The General Fund shows a balance of \$1,706.80.

Ground Improvement Fund.—On January 1, 1907, there was a balance in the Ground Improvement Fund of \$313,580.32, and during the year \$100,000 in addition has been received from the City; also \$3,049.78, being the premium on the sale of bonds. During the year the sum of \$266,873.05 has been expended, leaving a balance of \$149,757.05 available for new construction at the Park.

Maintenance of the Zoological Park.—The amount provided for the maintenance of the Park for 1907, \$141,558.75, was, by very close economy during the year, found sufficient to maintain the Park. The City has appropriated for maintenance for the year 1908, the sum of \$154,627.00, which is an increase of \$13,068.25 over the year 1907. This increase in the maintenance was extremely timely, and was particularly gratifying to your Committee as proof of the confidence of the present administration in the management of the Park.

Maintenance of the Aquarium.—The amount appropriated for the maintenance of the Aquarium for 1907 was \$45,000, which

has proved sufficient to maintain that institution during the year. The same amount has been provided for 1908.

Aquarium Improvement Fund.—A small balance of \$900.67 remained in this fund on January 1, 1908, and will be scarcely sufficient to complete the improvements now going on.

Detailed statements of the above accounts are set forth in the Treasurer's report.

Upon the closing of the Knickerbocker Trust Company, in which the Society had its funds, a new account was opened with the Farmers Loan and Trust Company on the same basis as with the Knickerbocker Trust Company. The accounts with the Knickerbocker Trust Company were closed up in a satisfactory manner by the payment by the Society of a net overdraft due the Trust Company, so that none of the funds of the Society are now tied up in any way.

IMPORTANT GIFTS TO THE PARK.

The most important gifts during the year have been: A pair of Elephant Tusks, presented by Mr. Charles T. Barney; two Kodiak bears, presented by Mr. E. H. Harriman; a Yucatan deer, presented by Mr. William A. Lawrence; a donation of \$3,000, presented by Mr. Frederick G. Bourne; \$457, presented by Mr. Samuel Thorne, and \$450, presented by Mr. Jacob Schiff.

NEW BUILDINGS AND INSTALLATIONS.

The construction of the Elephant House began early in the spring of 1907, and was prosecuted throughout the year with great vigor. Thus far the work of the contractor, F. T. Nesbit & Company, has been of the most satisfactory character, and the building bids fair to become one of the best and most mechanically perfect structures in the Zoological Park. At the close of 1907 the structure was about one-third complete.

Work on the yards surrounding the Elephant House has been held up because of the financial crisis, but it is believed that the postponement is only temporary. The plans for the ironwork of the yards have long been ready to transmit to the Park Department, and as soon as conditions permit, a contract for this work will be let.

The Public Comfort Building on the Boston Road is about four-fifths complete. At the latest this building should be ready for use by the spring of the present year.

The new Soda Pavilion, immediately south of the Aquatic Bird House, is rapidly going forward, and will undoubtedly be ready for use by the beginning of the business season of 1908. This structure is about half complete.

The western approach to Baird Court was satisfactorily completed in September, and was immediately made available for use.

PLANS FOR 1908.

During 1908 the Society hopes to complete the Elephant House and its surrounding yards, but as this is an undertaking of great magnitude, the work may extend into 1909.

In the spring of 1908 the Concourse will be thrown open, and will afford ready access for automobiles and carriages to the north end of Baird Court. A large amount of planting will be necessary to carry out the design of this entrance, but it is hoped that it will be entirely completed during the year.

The plans for the Administration Building are completed and in the hands of the Park Department, and as soon as the condition of the finances of the City warrant it, this contract will be let. With this building once in use the members of the Society will have a headquarters at the Park, and the privileges connected with the use of this building will greatly enhance the value of membership in the Society.

ANIMAL COLLECTIONS.

The collection of living animals showed for the year a marked increase over the number on hand at the end of 1908. The summary is as follows:

Mammals	188	Species	607	Specimens
Birds	543	"	2,530	"
Reptiles and Amphibians	134	"	897	"
	<hr/>		<hr/>	
Total	865	"	4,034	"

The most notable addition of the year consisted of an Indian rhinoceros, secured in May, of Carl Hagenbeck at a cost of \$6,000. The specimen was then about a year and a half old. Unfortunately the sight of one eye was defective, but with this exception the animal has remained in excellent health, and has

grown satisfactorily. It bids fair to make a good representative of this important species, specimens of which are very rarely seen in captivity.

Two young African elephants were purchased from Carl Hagenbeck for \$4,000, and have proved to be vigorous and healthy.

The bison herd has been increased during the year by the birth of twelve calves, two of which, however, were born on the Wichita Forest Reserve in the new Bison Range which has been stocked by the Zoological Society. This represents a very high percentage of births for the number of adult female bison on hand on January 1, 1907. With but one exception all these young animals are living and doing well.

Comparative tables showing the relative numbers of living animals in our Park and in European Zoological Gardens appear on page 55.

FORESTRY DEPARTMENT.

During the year 1907 the most important planting operations were the initial planting of the West Farms Block and around the Boat House; the completion of the planting at the Boston Road Entrance, and the planting of the Italian Garden at the north end of Baird Court.

Of all the ornamental planting in the Park, the Italian Garden is the most important and conspicuous. It consists chiefly of ornamental evergreens banked against tall red cedars of varying height, four groups of which surround an interior of flowers and box hedges.

MEDICAL DEPARTMENT.

The Medical Department continues to reap the benefits derived from its constantly increasing knowledge of the diseases of wild animals. The death rate remains at the low mark of the past few years, and no animal of great value was lost during the past year. Aside from a mild epidemic of distemper among the small mammals, which was quickly controlled, no serious diseases have occurred. Tuberculosis among the primates still continues to be an unimportant factor in the death rate. This good record is due, in a great measure, to the careful quarantine regulations enforced. The health of the hoofed animals has been excellent, and the increased number of births among these animals during 1907 is the best indication that a healthy environment has been established.

EAST SIDE EXTENSION.

The condition of the forest territory to the east of the Zoological Park has continued unsatisfactory owing to the inability of the City to properly police it, and protect the trees standing on this newly acquired land from destruction. The Society is doing all it can to urge on the authorities the importance of protecting this area, and some change in the status of this land will probably occur in the near future.

BRONX PARKWAY COMMISSION.

The law creating the Bronx Parkway Commission was passed during the year, and signed by the Governor, who thereupon appointed as members of this Commission, Mr. Madison Grant, as President, together with Mr. William White Niles and Mr. James G. Cannon. There is every reason to believe that the plans of the Commission will be carried out as soon as funds can be supplied by the City for that purpose. These plans involve regulating the Bronx River and its protection from contamination. They also provide for an extension of Bronx Park northward for thirteen miles to the Kensico Dam, and include the entire erosion valley of the Bronx River. This will mean that the Bronx Lake and River in the Zoological Park will be preserved and protected for all time. If, by any chance, these plans should not be carried out, it will be only a question of time when the water supply in the river will either entirely disappear, or become so contaminated as to render its present use in the Park an impossibility.

NEW YORK AQUARIUM.

During the year the work of improvement at the Aquarium was continued. The work of installing a closed system of circulation by means of lead-lined pipes is practically completed, and will be put in operation early in the coming year. A feed-water heater for the boilers was installed, with a view to decreasing the consumption of coal, and a bronze salt-water heater was also installed.

The Aquarium continued its aid to the teachers in the Public Schools, which forms a valuable part of the educational system of New York City.

On May 23, 1907, occurred the centennial of the construction of the original fort known as Southwest Battery, and after the War of 1812 as Castle Clinton and Castle Garden, and as finally The Aquarium. As on this day also occurred the two hundredth anniversary of the birth of Linnæus, it was made the occasion of a double celebration in commemoration of these events.

INTERNATIONAL ZOOLOGICAL CONGRESS.

On August 19, 1907, the Seventh International Zoological Congress convened in Boston. The regular sessions in Boston were attended by several members of the New York Zoological Society, who presented various scientific papers. On August 26, the Congress arrived in New York, and in the entertainment of the Congress during that week, the members of the Zoological Society took an active part. Thursday, August 29, was devoted to the Zoological Park and Aquarium. All the members of the Congress were personally conducted through the Zoological Park and shown its collections. Luncheon was served in the Lion House. In the evening the Congress was entertained at the Aquarium with a reception.

NATIONAL COLLECTION OF HEADS AND HORNS.

During the year the National Collection of Heads and Horns has been increased by numerous valuable gifts from American sportsmen. The most important accession was the famous Reed Collection of heads and horns of Alaskan moose, caribou, walrus, bear and mountain sheep. The entire collection was purchased by Emerson McMillin, Esq., and delivered at the Zoological Park, free of all cost to the Society. It has been stored, temporarily, in one of the rooms of the Lion House, which has been temporarily assigned to the collection of heads and horns.

Mr. George L. Harrison, Jr., of Philadelphia, presented fourteen mounted heads of African antelopes and gazelles; Mr. J. R. Bradley, presented mounted heads of the Siberian argali, waterbuck, Coke's hartebeest, impala antelope and Atlantic walrus; Mr. Madison Grant presented two heads of white mountain sheep which were collected at the most northerly limit of the distribution of that species, a pair of walrus tusks which are believed to be the largest known; Mr. Caspar Whitney presented a head of wood bison, from the Peace River country, Athabasca; Mr. Thomas D. Leonard presented a mounted head of an American elk and numerous other gifts were received.



PART OF THE BISON HERD IN THE ZOOLOGICAL PARK.
A number of them now form the herd in the Wichita Preserve.

The number of gifts that have been received during the past year indicate a keen interest on the part of the American sportsmen in the upbuilding of the National Collection of Heads and Horns, and it is now reasonably certain that the plan for two complete series of heads and horns of the ungulates of the world will be consummated within a comparatively short time.

The collection will be installed in the Administration Building as soon as that building is ready to receive it, and at that time a special effort will be made to add largely to the collection. Meantime the Society will be grateful to receive large specimens of heads, horns or antlers of game, all of which will be properly protected in a fireproof building.

NATIONAL BISON HERD.

On October 10, 1907, in accordance with the offer of the Society to the Government, fifteen bison were selected from our herd and shipped to the new range that has been made by the National Government on the Wichita Reserve. The shipment was accompanied by Mr. H. R. Mitchell and Mr. E. R. Sanborn, and the animals arrived in excellent condition. The Wells Fargo Express Company, the American Express Company, the New York Central and Hudson River R. R. Co., and the St. Louis and San Francisco R. R. Co., furnished free transportation for the two carloads of bison and their attendants, from New York to Cache. The Forestry Bureau of the National Government erected corrals, sheds, etc., in accordance with plans furnished by the Zoological Society, and every effort is being put forth to care for the bison in a scientific manner.

The following letter has been received from the Hon. James Wilson, Secretary of Agriculture:

DEPARTMENT OF AGRICULTURE, OFFICE OF THE SECRETARY.

WASHINGTON, D. C., February 4, 1908.

MR. MADISON GRANT, Secretary

New York Zoological Society, New York City.

DEAR SIR: I wish to extend to you my sincere appreciation of the bison herd your society presented to the Forest Service. The buffaloes arrived in excellent condition at their destination in Oklahoma, and have thrived since being placed in the enclosure built for them. They were sprayed with crude petroleum and other methods taken to prevent their becoming infected with fever ticks. The animals are now being fed on alfalfa hay and are supplied with pure, fresh water from a well built for the purpose.

I wish to assure you that your magnificent gift is keenly appreciated, and that you have my sympathy and admiration for the great work your society is doing.

Very truly,

JAMES WILSON, *Secretary.*

PUBLICATIONS.

During the year the Annual Report and three Bulletins have been published and sent to all the members of this Society, together with a special August edition of the Bulletin, which was issued for the visit of the Seventh International Zoological Congress to New York. This issue of the Bulletin took the place of the regular October number. A pamphlet on the National Collection of Heads and Horns was also prepared and sent out to all members during the year. A new Guide Book has been prepared and has been sent to all members.

GAME PROTECTION.

The establishment of the Wichita herd of Bison has been the most dramatic event in the year in the direction of game protection. During the summer the Secretary of the Society visited Alaska and traversed the entire interior of the country, giving special attention to the conditions of game. Mr. Grant's notes on this subject and on the animal life in Alaska are published in this annual report.

During the first four months of 1907, Mr. G. O. Shields was employed as the Society's Special Agent for Game Protection. During that period Mr. Shields worked diligently with the legislatures of thirty-five States, which then were in session, to secure certain amendments to their game laws which were deemed necessary, and also to secure the passage of certain new laws. Mr. Shield's campaign to prevent the use of the automatic gun was continued, and it was chiefly through his efforts that the Pennsylvania Legislature finally enacted a law prohibiting the use of that weapon. The same bill was introduced in the legislatures of several other States; but the opposition to its passage was so strong, and so well organized, that success was attained in Pennsylvania only. Mr. Shields inaugurated a movement for the protection of the gray squirrel for five years, and succeeded in securing the passage of bills to that end in the legislatures of New York, New Hampshire, Indiana and Nebraska. Unfortunately, the bill which passed the Legislature of the State of New York was vetoed by Governor Hughes; but in the other States mentioned, the legislative action became a law.

The Society's agent contributed materially to the enactment, by the Connecticut Legislature, of a law prohibiting the spring shooting of migratory wild fowl.

Owing to an unfortunate shortage of funds for game protection measures, it was impossible to continue Mr. Shield's services as the Society's agent after May 1, 1907.

OBITUARY.

The death of Mr. Charles T. Barney, long Chairman of this Committee, was a great loss to the Society and to the individual members of this Committee. The Committee took immediate action in the matter, and the obituary notice passed by them at the time of Mr. Barney's death is set forth in full below. To honor Mr. Barney still further, his son, Mr. James W. Barney, was elected to take his place on the Board of Managers.

During the year the Society lost two of its patrons, Mr. Henry O. Havemeyer and Mr. D. Willis James, and also lost, through death, the services of one of its architects, Mr. George L. Heins, to whose skill the architecture in the Zoological Park is much indebted, and to whose interest in the Society this Committee desires to make public record.

ACKNOWLEDGMENTS.

The Committee desires to express its appreciation of the continued devotion to the interests of the Society of the Director of the Zoological Park, and of the Director of the Aquarium. The staffs of both the Park and the Aquarium have been loyal and devoted to their work, and the Committee desires to take this opportunity to express its sense of appreciation. The Committee desires also to acknowledge the courtesy and interest shown by the Mayor, Hon. George B. McClellan, and by the Comptroller, Hon. Herman A. Metz, and to the President of the Park Board. The members of the Park Department for the Borough of the Bronx have been uniformly helpful and friendly toward the work at the Park, and special acknowledgement is here made to Commissioner Joseph I. Berry, to Mr. Martin Schenck, Chief Engineer; Mr. William P. Hennessy, Assistant Engineer, and Mr. G. K. Ackermann, Chief Clerk, and this Society, desires to record its appreciation of their co-operation.

Respectfully submitted,

HENRY FAIRFIELD OSBORN, *Chairman*,

MADISON GRANT,
JOHN S. BARNES,
PERCY R. PYNE,

WILLIAM WHITE NILES,
SAMUEL THORNE,
LEVI P. MORTON, *ex officio*.

January 1, 1908.

Resolution

of the

Executive Committee of the Board of Managers
of the New York Zoological Society
passed November 21, 1907

Charles Tracy Barney

who died at the City of New York, November 14, 1907, became a member of the original Board of Managers of the New York Zoological Society in 1895. In 1900 he was elected a member of the Executive Committee, and in 1904 was elected Chairman of the Executive Committee, an office which he filled with great enthusiasm and a generous expenditure both of time and of money until he was suddenly taken away from us.

He was always most liberal minded, most hospitable to new ideas, and kept before him at all times a large conception of the Park as an ideal civic institution for the pleasure and education of the entire public. Such a conception of the duties of citizenship commands our lasting gratitude and justly entitles him to a lasting appreciation on the part of the citizens of New York.

His fellow members on the Executive Committee desire to record their deep sense of personal loss, and their warm appreciation of his services to the Zoological Park and to the Zoological Society.

Treasurer's Reports.

FOR THE YEAR ENDING DECEMBER 31, 1907.

The annual expenditures of the various funds are shown in the appended statements.

General Fund.

Cash in Treasury, January 1, 1907..... \$6,039.32

RECEIPTS.

Sale of Aquarium Publications..... 38.20

\$6,077.52

EXPENDITURES.

Architects' Commissions \$370.72

Income Account (Transfer) 4,000.00

Cash Balance, December 31, 1907..... 1,706.80

\$6,077.52

H. R. MITCHELL,
Chief Clerk.

PERCY R. PYNE,
Treasurer.

January 1, 1908.

Income Account.

Cash in Treasury, January 1, 1907..... \$406.81

RECEIPTS.

Life membership	\$800.00	
Annual dues	12,250.00	
Stokes' bird fund	135.00	
Aquarium publications	58.64	
General fund (transfer)	4,000.00	
		17,243.64

\$17,650.45

EXPENDITURES.

Interest	\$1,702.35	
Stationery and office supplies.....	520.56	
Annual Report	1,929.86	
General office expenses	1,782.31	
Library	178.55	
Mailing circulars	274.24	
Miscellaneous expenses	530.33	
Photographs and slides	1,005.27	
Treasurer's office expenses	507.50	
Bulletin	1,345.78	
Salary of Secretary	4,000.00	
Game protection	100.00	
Munzie damage suit	670.36	
Aquarium	50.00	
Heads and horns	892.71	
Scientific research	226.54	
Employers' insurance	459.35	
Audit of accounts	150.00	
Expense of lectures	159.25	
Linnaean celebration	220.98	
Salary and expenses of Librarian	465.50	
Publication of "Zoologica"	365.00	
		17,536.44

Cash balance, December 31, 1907..... 114.01

\$17,650.45

H. R. MITCHELL,
Chief Clerk.

PERCY R. PYNE,
Treasurer.

January 1, 1908.

Animal Fund.

Cash in Treasury, January 1, 1907..... \$1,355.16

RECEIPTS.

Special Subscription:

Frederick G. Bourne	\$3,000.00		
Samuel Thorne	457.00		
Jacob H. Schiff	450.00	\$3,907.00	

Receipts at Park:

Rocking Stone Restaurant.....	500.00		
Privilege account	3,000.00		
Admissions	8,248.65		
Checking	25.15		
Rents	648.27		
Miscellaneous	160.28		
Sale of animals	2,335.50	\$14,917.85	\$18,824.85
			\$20,180.01

EXPENDITURES.

Purchase of Animals:

Mammals	\$13,982.55		
Birds	2,382.75		
Reptiles	655.55	\$17,020.85	

Traveling and other expenses	800.11		
Express and other charges	1,033.72	\$18,854.68	
Cash balance, December 31, 1907		1,325.33	
			\$20,180.01

H. R. MITCHELL,
Chief Clerk.

PERCY R. PYNE,
Treasurer.

January 1, 1908.

Maintenance Fund.

RECEIPTS.

Received from the City on account of maintenance appropriation of \$141,558.75 for the year	\$116,744.84	
Balance due from the City on account of maintenance	24,813.91	\$141,558.75

EXPENDITURES.

General administration	\$14,593.41	
Maintenance of buildings and care of collections	41,658.06	
Maintenance and care of grounds	37,083.68	
Tools and hardware	1,456.91	
Paints and oils	1,555.52	
Office supplies and printing	618.79	
Repairs	781.89	
Telephone service and tolls	515.70	
Postage, telegraph and express	1,183.11	
Food for animals	29,917.55	
Fuel	5,800.00	
Drugs and medicines	201.77	
Lumber	1,475.70	
Miscellaneous supplies	630.29	
Plumbing supplies	239.85	
Electric lighting	485.61	
Fencing and netting	581.35	
Janitors' supplies	435.02	
Glass and glaziers' supplies	145.20	
Sanitation	582.29	
Horses and vehicles	77.15	
Surgical instruments and appliances	12.18	
Nursery stock and seeds	74.10	
Medical attendance, animals	360.00	
Engineering supplies	49.29	
Sand	233.50	
Office furniture and fixtures	48.05	
Rubber hose	142.05	
Nursery supplies	65.97	
Uniforms and badges	180.25	
Medical attendance, employees	43.00	
Ice	215.48	
Signs and labels	24.00	
Telephone and electrical supplies	63.53	
Cement	28.50	\$141,558.75

H. R. MITCHELL,
Chief Clerk

PERCY R. PYNE,
Treasurer.

January 15, 1908.

Ground Improvement Fund.

SHOWING STATUS OF APPROPRIATION NO. 4.

RECEIPTS.

Unexpended balance of Appropriation No. 3, brought forward		\$4,106.42
Appropriation by Board of Estimate and Apportionment:		
Available, July, 1904.....	\$275,000.00	
Available, May, 1905.....	275,000.00	
Available, May, 1906.....	250,000.00	
Available, May, 1907.....	100,000.00	\$900,000.00
Premium on bonds to December 31, 1907.....		13,233.48
		<hr/>
		\$917,339.90

EXPENDITURES.

Through Park Department:

Contract, Conrad Hewitt, Pheasants' Aviary	\$19,546.00	
Contract, Geo. L. Walker Co., Glass Court, Bird House	24,199.00	
Contract, J. V. Schaefer, Jr., Co., Baird Court	67,000.00	
Contract, Guidone & Galardi, two Toilet Buildings	8,385.00	
Contract, Peter Kiernan, Camel House	2,800.00	
Contract, Wright & Son, Feed Barn.....	15,316.00	
Contract, J. J. Buckley, Public Comfort Building	5,600.00	
Contract, Guidone & Galardi, Small-Deer House	41,543.00	
Contract, W. Horne & Co., West Farms Entrance Pavilion	5,008.00	
Contract, Granite Steps, near Bear Dens....	1,569.00	
Contract, J. P. Kane Co., Cement	993.75	
Contract, Brown & Fleming, Broken Stone..	7,437.50	
Contract, August Bans, Sewer Pipe	333.72	
Contract, D. E. Kennedy, Installing Electric Conduit	1,999.00	
Contract, Leslie McHarg & Co., Terrace Wall and Plaza Steps	4,770.00	
Contract, Guidone & Galardi, Boat House....	34,235.00	
Contract, J. V. Schaefer, Jr., Co., Concourse Entrance	22,108.00	
Contract, J. V. Schaefer, Jr., Co., Concourse and West Approach to Baird Court....	36,271.50	
Contract, Wm. Whistens Co., Public Comfort Building	16,999.00	
Contract, John H. Devlin, Part of Judgment on Contract dated September 4, '02, for Improving Existing Roads	710.00	
Contract, F. T. Nesbit & Co., Elephant House	147,599.00	
Contract, Kelly & Kelly, Inc., Soda Pavilion	7,679.00	
Miscellaneous Expenditures through Park Department	7,068.88	\$479,170.35
	<hr/>	<hr/>
Carried forward		\$479,170.35

Brought forward		\$479,170.35
<i>By the Zoological Society:</i>		
Mountain Goat Enclosure	\$1,377.49	
Pheasants' Aviary	2,113.42	
Reconstruction of Walks	17,398.81	
Forestry and Planting	55,670.72	
Guard Rails	7,014.24	
Ostrich and Mammal House Walks and Yards	1,757.30	
Miscellaneous Ground Improvement Items..	23,074.72	
Electric Conduit	1,523.08	
Baird Court Boundary and Concourse.....	6,996.51	
Small-Deer House Walks and Yards.....	16,898.44	
North End of Baird Court	9,913.74	
Improvements North of Lake Agassiz.....	6,276.99	
New Walks	19,284.46	
Southern Boundary Fence	5,060.12	
Lion House Roof	1,400.00	
Public Comfort Station East of Bronx River	2,033.56	
Bird House	3,943.45	
Sea Lion Pool	2,655.64	
Buffalo Range Grading and Seeding.....	2,363.14	
Improvements East of Bronx River	1,481.04	
Excavating Lake Agassiz	2,615.60	
Grading Elk Range and Filling Pond.....	2,573.93	
Tortoise Yards	1,461.08	
Beaver Pond Pipe Line	2,316.73	
Maral Deer Shelter	294.23	
Moving Buffalo House and Corrals	5,918.56	
New Shops	1,053.12	
Western Range Fences	6,811.30	
Subway Entrance Plaza	11,749.66	
Restaurant Steps	1,204.11	
Landscape Architecture	7,788.18	
Boston Road Public Comfort Station.....	935.49	
Feed Barn Yard and Wall	9,114.47	
Camel House Yards and Fences	1,630.53	
Small-Deer House	3,791.50	
Boat House	4,903.12	
Flood Gates	1,055.04	
Service Road Extension	2,760.08	
West Farms Block	10,249.69	
Water Line to Bear Dens	1,163.33	
Antelope Shelter	1,617.44	
Concourse Entrance	718.24	
Elephant House Walks and Yards.....	4,754.39	
Elephant House	7,159.25	
Subway Entrance	535.00	
Elk Yards	3,419.99	
Zebra and Wild Horse Installation	1,424.01	
Reconstruction of Crematory	1,067.56	\$288,412.50
<hr/>		
Balance Available for Expenditure December 31, 1907		149,757.05
		<u>\$917,339.90</u>
H. R. MITCHELL, <i>Chief Clerk.</i>	PERCY R. PYNE, <i>Treasurer.</i>	
January 1, 1908.		

Aquarium Improvement Fund.

RECEIPTS.

Balance of \$40,000 Appropriation as per Report of 1906.....	\$1,156.04
Premiums account sale of bonds	13.50
	\$1,169.54

EXPENDITURES.

Through Park Department:	
Barney & Chapman, Commissions.....	\$125.52
J. E. O'Connor, Removing Suction Line....	135.00
Pay-roll, Chief Engineer and Labor.....	133.87
Balance available for Expenditure	394.39
	775.15
January 1, 1908.	\$1,169.54

J. J. ODELL,

Chief Bookkeeper, Dept. of Parks.

Aquarium Fund.

RECEIPTS.

Received from New York City on account of Aquarium Appropriation for 1907.....	\$45,000.00
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EXPENDITURES.

Pay-rolls	\$30,117.21	
Coal	5,743.40	
Telephone	161.08	
Alterations and Repairs	2,978.53	
General Supplies	1,368.33	
Fish Food	1,765.85	
Live Specimens	831.40	
Incidental Expenses	200.00	
Electric Light	415.93	
Ice	38.85	
Stationery and Books	159.90	
Uniforms	13.00	
Furniture	49.00	
Cartage (fishes and cans)	197.39	
Cartage (debris)	144.00	\$44,183.87
Balance unexpended		816.13
		\$45,000.00

E. R. SAMPSON,

Disb. Clerk.

January 1, 1908.

NOTE.—Unexpended balance reserved for payment of 1907 gas bill, the rate being undecided.

The Audit Company of New York,

43 Cedar Street.

We certify that the foregoing statements showing the condition of the various funds of the New York Zoological Society on December 31, 1907, are true exhibits of the accounts.

The items comprising the expenditures of \$479,170.35 on the Ground Improvement Fund, Number 4, were disbursed by the Park Department. As this money did not pass through the books of the Society, the items have not been verified by us.

THE AUDIT COMPANY OF NEW YORK,

(Signed) E. F. PERINE, *President*.

(Signed) F. C. RICHARDSON, *Secretary*.

New York, February 27, 1908.

NEW YORK, N. Y., April 10, 1908.

To the President and Board of Managers of the New York Zoological Society:

The undersigned who were appointed the auditing committee of the New York Zoological Society for the year ending December 31, 1908, hereby report that they have examined the special audit of the books and accounts of the New York Zoological Society for the year ending December 31, 1907, made by the Audit Company of New York, and find that the report sets forth clearly the expenditures and receipts of the various accounts, and that all the accounts of the Society have been verified, except expenditures shown on Exhibit E of the Audit Company's report, covering the Ground Improvement Fund, which expenditures were made through the Park Department, the moneys not passing through the hands of the Society. These expenditures, we understand, are checked by the Comptroller, and are not verified by this audit.

In its report of February 14, 1907, the Audit Company of New York called attention to the fact that the records of the Aquarium Fund were inadequate and unsatisfactory, the items in many instances being entered in lead pencil only, and recommended that a suitable cash book and ledger be obtained at once, and all entries made with ink. We have inquired as to whether this recommendation has been complied with and would report that it has.

Respectfully submitted,

W. W. NILES, *Chairman*,

C. LEDYARD BLAIR,

HUGH D. AUCHINCLOSS,

Auditing Committee.





ROCKY MOUNTAIN GOATS IN THEIR RANGE.



HEAD OF YOUNG MALE ROCKY MOUNTAIN GOAT.

REPORT OF THE DIRECTOR
OF THE
NEW YORK ZOOLOGICAL PARK.

THE progress made during the year 1907 brought the Zoological Park to a state which may fairly be estimated as seven-eighths complete. Both the southwestern and southeastern corners of the establishment were finished, and the remaining unfinished sections were greatly advanced. It was impossible to make an ending of the extensive operations in progress immediately north of Baird Court, but they were carried to such a point that if planting operations can go on unrestricted every-

thing connected with the Pelham Avenue Entrance, the Concourse and its Approach, except the tree-planting, will be finished in 1908.

THE ZOOLOGICAL CONGRESS.

The most notable scientific event of the year was the visit of the Seventh International Zoological Congress, on August 29, 1907. The foreign delegates, to the number of one hundred and ten, representing fourteen countries, extending from Australia to Russia, and including Japan, together with a large number of American delegates, spent the entire day at the Zoological Park. The building, collections and grounds were critically examined; and it may be added that the institution, as a whole, never was in better condition to stand a searching inspection than on that day. The published results of this inspection by experts will naturally be regarded by the Society with interest.

In this connection a letter from three of the German delegates to the Congress, which appeared over their signatures in a New York newspaper on September 3, will be of interest:

TO THE EDITOR OF THE NEW YORK STAATS-ZEITUNG:

As a supplement to your article headed "In the Lion House," which appeared in No. 208 of the New York "Staats-Zeitung," we take the liberty to send you, in a few words, the views of the German zoologists on your zoological garden. The article mentioned is incomplete, for the reason that it does not do justice to the many superior features.

Among all existing zoological parks, there is none in which the animals are found in such absolutely natural conditions as here in New York. The extent of the ranges for deer, bison, etc., and the imposing flying cage, had the undivided admiration of all the scientists present. Added to this is the great number of interesting forms of animals, especially of the American fauna, and last, but not least, is the surprisingly large number of individuals.

The past attainments give a guarantee that the New York Zoological Garden, upon completion, is sure to take a specially pre-eminent position among institutions of its kind.

(Signed) PROFESSORS BRAUN, HEYMONS and BORGERT.

LECTURES TO SCHOOLS.

Early in the year the Director of the Zoological Park received from the Bronx Borough Teachers' Association, through Prof. Hugo Newman, an urgent request that courses of lectures be given in the Park, for the special benefit of the school children of Bronx Borough, in Grade 5A, as a part of their regular

course work. It was desired that the lectures should be based upon pictures of living animals which afterward might be found in the collections.

The need for these lectures seemed to be so imperative it was decided that, despite the lack of anything even remotely resembling a lecture hall, an effort must be made by the Park officers to meet the demand. Forthwith, the large rustic Shelter Pavilion, near the Wolf Dens, was converted into a practicable lecture hall. By surrounding the interior with heavy black curtains, erecting a platform and purchasing the necessary apparatus, illustrated lectures were made possible, and the courses began on April 23.

Three courses were delivered, to a total of about 3,500 pupils of Grade 5A, coming from thirty-eight schools of Bronx Borough. About 7,000 pupils of that grade applied for permission to attend the lectures, but it was impossible to accommodate more than one-half that number. Inasmuch as these lectures occupied regular school time, and were equivalent to so much classroom work, it was impossible to increase the number of lectures without interfering with other regular studies.

The first course of lectures was delivered by the Director of the Zoological Park, under the title of "An Introduction to the Study of Animals." These lectures related wholly to mammals. Mr. C. William Beebe, Curator of Birds, followed with a course entitled "An Introduction to the Study of Birds," and Curator Ditmars gave as the final course "An Introduction to the Study of Reptiles."

Each lecture was followed by a "demonstration." This means that the three hundred and fifty to four hundred pupils in attendance were by their teachers divided into groups of from forty to fifty, and with a guide to point out the route, each group was taken separately over a course that had been laid out by the lecturer. On reaching each group of living examples, a teacher, who had been specially instructed and stationed there, pointed out the living animals referred to in the lecture and stated certain facts regarding them.

All this involved a great deal of work on the part of the teachers. Each lecture required the presence and active co-operation of about twenty teachers, one-half of them to bring pupils to the Park and conduct them afterward, the others to demonstrate. Necessarily the demonstrators required to be instructed in advance by the lecturers. To aid them the Teachers' Association printed a pamphlet which contained a full syllabus of each lecture.

The experiment, as a whole, proved intensely interesting. The zeal and industry of the teachers were inspiring, and the interest of the pupils was everything that could be desired. The most perfect discipline was maintained throughout. The members of the Bronx Borough Teachers' Association, and especially Professor Newman, deserve great credit for their tireless energy in behalf of those lecture courses, and thereby giving their pupils the benefit of a study of living animals in their regular school work.

The Zoological Society has received from the Board of Education of this city an urgent request that steps be taken to provide, at the expense of the city, a permanent and commodious lecture hall in the Zoological Park, capable of seating at least 1,200 pupils, in order that the school pupils of Manhattan Borough may be enabled to share the advantages now enjoyed by the schools of the Bronx.

It is hoped that at no distant day this request may be met. The disadvantages in the use of the Shelter Pavilion as a lecture hall are serious.

ATTENDANCE OF VISITORS.

During the year 1907 the monthly attendance of visitors, as recorded by the entrance turnstiles, was as follows:

January	39,469
February	27,580
March	67,258
April	90,551
May	161,486
June	168,034
July	187,875
August	190,653
September	126,520
October	90,713
November	65,179
December	60,723

Total for the year 1,276,041

Largest daily attendance, June 16, (Sunday), 36,052.

ANIMAL COLLECTIONS.

During the year the total number of animals living in the Zoological Park and on public exhibition passed the 4,000 mark.

In the history of any zoological park or garden this may fairly be regarded as a very important event. The full number of living specimens on hand and in good health on January 1, 1908, was 4,034, a full statement of which will be given later on. The total number of species represented was 865.

In this connection the following table, showing the number of mammals, birds, reptiles and amphibians living in the largest zoological gardens of the world, is of special interest. For the majority of these records I am indebted to the official reports of Dr. G. Loisel, of Paris, on "Une Mission Scientifique dans les Jardins et Établissements Zoologiques, publics et privés," of Europe, 1907:

ANIMAL STATISTICS OF THE LARGEST ZOOLOGICAL GARDENS
OF THE WORLD.

All as of Jan. 1, 1907, except New York and London, which are for 1908.

I. RANKED BY NUMBER OF LIVING SPECIMENS.

Institutions.	Mammals.	Birds.	Reptiles and Amphibians.	Total.
New York Zoological Park	607	2,530	897	4,034
Berlin	946	2,176	27	3,149
London	873	1,621	478	2,972
Philadelphia	487	952	1,087	2,526
Hamburg	473	1,665	251	2,389
Schoenbrunn	593	1,351	171	2,085
Cologne	424	1,479	98	2,001
Breslau	592	1,067	184	1,843
Frankfort	644	1,002	158	1,804

II. RANKED BY NUMBER OF SPECIES.

Institutions.	Mammals.	Birds.	Reptiles and Amphibians.	Total.
Berlin	408	885	4	1,297
London	341	780	147	1,268
Hamburg	235	578	86	899
New York	188	543	134	865
Frankfort	193	446	68	707
Cologne	174	437	41	652
Breslau	177	363	44	584
Schoenbrunn	160	345	47	552



LONG-HAIRED CHIMPANZEE "AUGUST" AND BALD-HEADED CHIMPANZEE "BALDY."
From the Zoological Gardens, London.

DEPARTMENT OF MAMMALS.

William T. Hornaday, Curator; Raymond L. Ditmars, Assistant Curator.

Being in possession of the Small-Deer House, fully completed and amply filled; of a remodeled and perfect series of ranges and corrals for the Rocky Mountain goats and North American deer; with a very nearly complete outfit of thick-skinned animals in readiness to fill the new Elephant House as soon as completed; with the Wichita National Bison Herd safely on its new range, and with a very satisfactory list of births for the past year, I think we may view our collection of mammals with some satisfaction.

The completion of the Small-Deer House has been a source of very great relief, not only to the smaller hoofed animals, but also to the officers of the Park! The building and its yards seem thus far to be admirably adapted to their purposes, and these accommodations for our tropical deer already seem quite indispensable. A considerable number of valuable and zoologically important animals, such as the markhor, male barasinga, male Burmese thameng, Yucatan deer, Molucca deer, muntjac and various small African antelopes that have been temporarily crowded out of the Antelope House and each winter kept immured in storage sheds, are now kept on exhibition, under the best sanitary conditions.

The careful remodeling and extension of the mountain goat yards has more than doubled the space previously available for those interesting animals, and has also given them a bank of earth, covered with small trees, which will prove beneficial. Adjoining two sides of the goats' range there has been established an ideal small range for our herd of white-tailed deer, embracing a bit of timber and brush, a grassy hillside and a square of dry, paved yard, all surmounted by a background of coniferous planting. In this installation the deer are thriving as they never have previously.

In addition to the features mentioned above, the range space between the llama yards and the elk corrals has been converted into a series of four small ranges for mule deer and Columbian black-tailed deer, all of which are now fully stocked with those species. Thus we are enabled to exhibit our most important American deer in a series. At present we have four male mule deer, all in excellent condition.

The most important mammalian accession during the year was

a young male Indian rhinoceros, (*Rhinoceros unicornis*), which is one of the rarest—and also most wonderful—animals to be found in captivity. So far as known there are not more than six or seven of these animals in captivity, and in India the range of the species has been reduced to a small area. Our specimen was captured in Assam, by the soldiers of the Maharajah of Nepal, in the winter of 1907, and was furnished to the Society, at a cost of \$6,000, by Mr. Carl Hagenbeck.

In the autumn the Society had the good fortune to receive as a gift from Mr. Edward H. Harriman a pair of Kodiak bear cubs, (*Ursus middendorffi*), which had been captured by natives on the eastern side of Kodiak Island. These are the first bears received by us from Kodiak Island, and they are extremely interesting animals. When they arrived both were suffering severely from gastritis, but by careful treatment Dr. Blair presently brought them to a state of good health. These cubs are quite different in appearance from the other members of the group of big brown bears of Alaska which we have received from the Alaskan Peninsula, Hudson Lake and Admiralty Island. For the present they are exhibited in the "Nursery" Den.

Health of the Mammals.—Throughout the year, with but one exception, the general health of the mammals as a whole has been excellent. Only two specially important animals were lost by death during the year—a Suleiman markhor and the largest orang-utan, "Dohong." The exception to the rule of good health took the form of a mild outbreak of distemper, in the canines of the Small-Mammal House, which caused six losses before it was stamped out by Dr. Blair. In the Antelope House, which contains about \$50,000 worth of animals, the female Grant zebra died, but the other inmates of that building are all in excellent health. The health of the small-eared Congo elephant, which for a considerable period was not satisfactory, has now greatly improved, and during the past year "Congo" has gained in weight more than 400 pounds.

Births during 1907.—In a zoological garden the list of births among the mammals affords a very good index of the general condition of the animals belonging to that class. Our most important item in the birth register is that covering the American bison. From fourteen cows of breeding age in our herd on January 1, 1907, *twelve* calves were born; but of those two were born in Oklahoma, after the Society's gift bison herd had been delivered to the National Government, on the Wichita Game Preserve.

The following is a list of the most important mammalian births in the Park during 1907:

<i>Order Primates.</i>	1 Grant's Zebra.
1 Long-Armed Baboon.	2 Malay Sambar Deer.
1 Green Monkey.	2 Eld's Deer.
1 Ring-Tailed Lemur.	2 Barasingha Deer.
	5 Indian Sambar Deer.
<i>Order Carnivora.</i>	5 Elk.
2 Syrian Bears.	3 Axis Deer.
2 Russian Hairy-Eared Bears.	4 Sika Deer.
4 Black Coyotes.	4 Red Deer.
3 Lions.	6 Fallow Deer.
	2 Persian Wild Goats.
<i>Order Ungulata.</i>	1 Tahr.
2 Nylghais.	12 American Bison.

Summary.—The following is a complete statement of the number of mammals living in the Zoological Park and on exhibition on December 31, 1907:

	Species.	Specimens.
Primates	33	85
Carnivora	51	132
Pinnipedia	1	4
Insectivora	1	1
Rodentia	26	119
Ungulata	65	250
Marsupialia	8	11
Edentata	3	5
Total	188	607

DEPARTMENT OF BIRDS.

C. William Beebe, Curator; Samuel Stacey, First Keeper.

At the close of 1907 it is possible to view the bird collections of the Zoological Park with satisfaction. The collections as a whole are very large, they are admirably labeled and explained, the birds are comfortably housed and satisfactorily exhibited, the death rate has been reduced to a very low point, and the

great majority of the birds are positively happy. To doubt the assertion that they are contented and happy is to doubt the evidence furnished of the human eye. The community principle, by which many individuals are caged together in large cages, is an unqualified success.

During the past year the death rate in the bird collection as a whole has been greatly reduced. It was about *fifty per-cent.* less than during the previous year, and has reached a point below which it would seem impossible for the death rate in a collection of this magnitude ever to go. Such results can not reasonably be hoped for each year.

No new installations for birds were provided during the past year. As the death rate has been remarkably low the advantages of large community cages is further proven. While the success of the past year was partly due to favorable weather, it should in the main be accredited to three precautionary factors in the care of the birds: first, the invariable rule of quarantining every newly arrived individual for a certain length of time; second, the daily removal of the surface sand and cleansing of the cages; and, third, the constant watch for symptoms of illness, with the instant removal and treatment of cases in the isolated rooms that are used as hospitals. Food, of course, is a factor of great importance, but without the above measures the most perfect regimen would be of little avail in keeping so great a number of living birds in good health.

The most important addition of the year in the Bird Department was the arrival of over one hundred birds, many of large size, from the London Zoological Gardens, received in exchange for a shipment of American birds. Among the rarer birds in this lot was a Kolbe vulture, lammergeier, Australian wedge-tailed eagle, brush turkeys, black-footed penguins, bearded titmice, piping crows, crow-shrikes, greater spotted woodpeckers, white-crested touraceous, hyacinthine macaw and hoopoe.

Another notable feature of the year was the forming of a large collection of native American song birds, especially the wood warblers. Of this latter group twenty-three species have been placed on exhibition, including such rare and delicate birds as the Connecticut, mourning, palm and worm-eating warblers. The sight of these living migrants in their winter plumage is new even to the learned ornithologist, and to the ordinary lover of birds it is a treat to be able to follow them through their annual changes of plumage. Nowhere else, except in Mexico and Brazil, can these species be seen alive at this period of the year.

An unusually valuable lot of doves and weaver-birds were collected for the Society in Africa by Gustav Sebillé, and added to the collection.

Black-footed penguins have at last been acclimatized, and will doubtless remain long on exhibition. Their summer home is in the large flying cage, but in winter they inhabit a stone igloo in one of the cages on the eastern side of the large Bird House. These birds are so strange in form, and of such great interest, their acclimatization is a matter for congratulation.

All American birds which have been reduced almost to the point of extinction by the influence of civilization are of prime interest. In this connection a valuable addition is a second specimen of the rare whooping crane, of our Northwest. The two trumpeter swans in the Park made a nest in the Beaver Pond and laid eggs, but failed to hatch them. It is claimed by some ornithologists that but few of these birds are left alive in the world.

Of the many smaller birds of brilliant plumage and special interest which have been added to the collection during the year the most noteworthy are the green hunting-crows and wandering tree-magpies of India, the strange rollers, cayenne wood-rail, Patagonian lapwings, pine grosbeaks and black-banded aracari toucans. Prof. C. O. Whitman presented a pair of the scarce oriental turtle doves, of interest from their generalized type of plumage.

Many rare species of birds have laid eggs during the year, and the nests and young birds have been in evidence throughout the spring and summer. Eggs have been laid by sand-hill cranes, white-breasted guans, rufous tinamous, curassows, weka rails, griffon vultures, brown pelicans, double-striped stone plovers, rheas and emus.

The voluntary return of a turkey vulture to the Flying Cage after an absence of many months, and the presence of an escaped mockingbird at large in the Zoological Park throughout the entire winter, hints of a new field of work which the Curator hopes soon to enter. It suggests the idea of stocking the Park, and perhaps eventually the surrounding country, with vanished native species, such as the cardinal, bluebird and mockingbird, and, by a system of extensive berry-feeding in winter to make them more or less permanent residents. If they are reared in the Park and then set free, there is no reason why such a plan should not succeed.

Two large wall cases have been put up in the Glass Court. In one the development of a feather is shown by means of wax



BLACK-FOOTED PENGUINS IN THE ZOOLOGICAL PARK.

Spheniscus demersus.

models, while the other has been filled by the Curator with various interesting ornithological specimens illustrating the following: The various shapes of birds' wings and their uses; the relation of a feather to the scale of a fish and the tooth of a shark; the occurrence and adaptations of down in feathers, and the extracted pigment of feathers, including pure metallic copper from the wing of a tinamou. Here, also, are specimens of doves illustrating the Curator's experiments in regard to the effect of moisture.

Relief from the confusion of construction and the constant worry of new installations in the Bird Department has given opportunity for the inauguration of experimental work, and Curator Beebe has devoted all spare time possible to the investigation of a few of the many problems which ever confront the student of ornithology and general evolution. In Mr. Beebe's researches on the effects of unusual humidity, some very startling results have already been attained, and were given immediate publication. They now form Vol. I, No. 1, of the new scientific publication of the Society, entitled "*Zoologica*," and appear under the title of "Geographic Variation in Birds, with Special Reference to the Effects of Humidity."

Another important problem now under careful consideration is the cause of the seasonal change of color in such birds as the scarlet tanager. Some interesting and unexpected results have already been reached, and will soon be published. Investigations of this character enter a totally unexplored field, where the way must be slowly cleared by the elimination of negative factors before the dynamic phases of the problem can be reached and submitted to critical investigation. In this work the keepers of the Bird Department have taken a keen interest, and their cheerful co-operation has been most helpful in the accumulation of data in the new field of experimental ornithology.

SUMMARY OF BIRDS LIVING IN THE ZOOLOGICAL PARK

ON DECEMBER 31, 1907.

	Orders.	Species.	Specimens
Rheiformes,	Rheas	1	2
Struthioniformes,	Ostriches	2	3
Casuariformes,	Emeus and Cassowaries..	2	4
Tinamiformes,	Tinamous	2	4

	Orders.	Species.	Specimens.
Galliformes,	Quail and Pheasants	55	164
Columbiformes,	Pigeons and Doves	37	173
Ralliformes,	Coots and Gallinules	9	20
Sphenisciformes,	Penguins	1	3
Lariformes,	Gulls and Terns	10	29
Charadriiformes,	Plovers and Sandpipers . .	8	20
Gruiformes,	Cranes, Seriemas	9	19
Ardeiformes,	Ibises, Storks and Herons	22	62
Palamedeiformes,	Screamers	1	3
Phœnicopteriformes,	Flamingoes	2	3
Anseriformes,	Swans, Geese and Ducks .	43	355
Pelecaniformes,	Cormorants and Pelicans .	9	25
Cathartidiformes,	New World Vultures	5	11
Accipitriformes,	Hawks and Eagles; Old- World Vultures	22	37
Strigiformes,	Owls	13	30
Psittaciformes,	Parrots, Macaws and Cockatoos	48	117
Coraciiformes,	Kingfishers and Hornbills	4	5
Trogones,	Trogons	1	1
Coccyges,	Cuckoos	3	6
Scansores,	Toucans	6	19
Piciformes,	Woodpeckers	2	6
Passeriformes,	Thrushes, Sparrows and all Perching Birds	226	1,409
26 Orders		543	2,530

DEPARTMENT OF REPTILES.

Raymond L. Ditmars, Curator; Charles E. Snyder, First Keeper.

A number of interesting specimens of species new to the collection were obtained during the past year. Among these were three matamatas, representing one of the most curious species of turtles. They were collected by Mr. George K. Cherrie, of the Brooklyn Institute of Arts and Sciences, and deposited in our

collection during life. In order to exhibit these chelonians to the best advantage a special tank was constructed, provided with glass sides.

Among the additions to the collection of crocodilians were a Nile crocodile, an Amazon caiman and a spectacled caiman. The collection of lizards and serpents remains about the same in size as during past years. A thoroughly representative series of each order is on exhibition. Noteworthy among the serpents added to the collection are boas of several species, from Mexico, Central America and tropical South America. Several examples of the showy South American rattlesnake, (*Crotalus durissus*), have been obtained. An interesting addition to the serpents is a brood of tree boas, bred and born in the Reptile House.

The growth of the younger alligators has progressed at such a rate that last fall, when the saurians were brought into the Reptile House, the regular accommodations were found quite inadequate. The large male alligator in the saurian pool was partitioned off at an end of the tank, and the greater part of the pool was given over to the collection from outside. Two large alligators were sent to the Aquarium to make room for the younger contingent, some of which have attained a length of seven feet. The strange albino alligator, on exhibition for the past seven years, is now over eight feet in length, having grown fully five feet since arrival.

A notable improvement in the snake cages is the provision in each cage of a high rustic table built of red cedar poles. These tables are supported on rough cedar posts, and the reptiles have evinced a decided fondness for climbing and lying upon them, where they may be seen to better advantage than heretofore.

In line with the work begun last summer when lectures were delivered to the pupils of the public schools of this Borough, a case of anatomical models and other objects relating to the venom apparatus of poisonous snakes has been placed upon the main floor of the Reptile House. This exhibit has been of much interest to visitors. It contains skulls of a representative series of Old and New World venomous snakes, showing the long fangs of the vipers and the proportionately very short poison-conducting teeth of the venomous colubrine serpents. A skull of the South American bushmaster is shown, in which are to be seen the many auxiliary fangs ready to take the place of the main pair if the latter are lost, thus exploding the old fallacy which held that a poisonous snake can be rendered permanently harmless by extracting its fangs.

Another preparation displays a cobra with spread "hood," and on this specimen may be seen the long movable ribs that fold against the side of the serpent's body when the reptile is in a passive mood. This exhibition case contains the paraphernalia necessary in the treatment of snake bites, also several dishes containing dried snake poison, and the apparatus for the extraction of venom when the same is to be used for the manufacture of anti-venomous serum—a product which also is exhibited.

REPTILES ON HAND ON DECEMBER 31, 1907.

	Species.	Specimens.
Chelonia	36	201
Crocodylia	5	53
Lacertila	12	153
Ophidia	65	305
Amphibia	16	185
	<hr/>	<hr/>
Total	134	897

The total census of the Zoological Park collections on December 31, 1907, is as follows:

SUMMARY OF COLLECTIONS.

	Species.	Specimens.
Mammals	188	607
Birds	543	2,530
Reptiles	118	712
Amphibians	16	185
	<hr/>	<hr/>
Total	865	4,034
Increase over 1906	47	410

GROUND IMPROVEMENTS UNDER THE DIRECTION OF
ZOOLOGICAL PARK OFFICERS.

Hermann W. Merkel, Chief Constructor and Forester.

The Plaza, Boston Road Entrance.—The most extensive and important work of the Park force on ground improvements was carried out in the southeastern section of the Park. The construction of the plaza surrounding the entrance pavilion of the

new Boston Road Entrance, at West Farms, was finished in July, 1907. Owing to the great amount of filling required, and the very considerable surface area to be treated, this item of construction required an unusually large amount of labor and materials. The work was performed in a thorough manner, and on the front was brought to a proper finish with a concrete curb carried on a suitable curve from 182d Street into the Boston Road, beyond the entrance. The improvement of the plaza was finished long before the completion of the Pavilion. The Pavilion was finally accepted in November, and opened to the public immediately thereafter.

West Farms Block.—The park area of about four acres situated immediately south of the Boat House, between the Boston Road and the Bronx River, is familiarly known at present as the "West Farms Block." This once rocky and unsightly spot has been fully improved, and brought up to the standard of the surrounding portions of the Park. The northern end of this area was judiciously fitted to the Boat House and the retaining wall south of the boat platform, and finished at its highest point as an outlook up the Lake. A walk twelve feet wide and 870 feet long was constructed from the northeastern corner of Boston Road and 180th Street (at the Subway terminus) through the new grounds up to the Boat House. The street frontages were planted with shrubbery. Fortunately the Boston Road has been paved with brick by the Department of Highways from the Subway terminus up to the entrance to the Zoological Park.

Through the completion of the various improvements mentioned above the whole southeastern quarter of the Zoological Park is now in a finished state, excepting only a very small area around the incomplete Public Comfort station. From the Boston Road Entrance a walk now leads north to the bison ranges and Lydig Memorial Arch, while another leads westward to the south door of the Antelope House, and beyond.

Improvement at Buffalo Entrance.—At the Buffalo Entrance the rough wall of loose rock which formed the southern boundary of the entrance was replaced by a permanent and slightly wall and coping of concrete. On this a new fence was erected—along the corral of the European bison—and the space in front of it was carefully graded and planted. This was completed in the month of June.

Yards and Walks for Small-Deer House.—Almost equal in importance with the work done near West Farms was the building of the walks, yards, fences and grounds surrounding the Small-

Deer House. This construction involved the building of about 1,400 lineal feet of walks twelve feet wide, and thirty corrals embracing about 30,000 square feet of space. In the course of this work a great quantity of earth filling was required, but through the foresight and good management of Mr. Merkel all save a small portion of it was procured without cost. Of fences, 2,750 lineal feet were built, the whole outside fence, 850 feet in length, being erected on a stone wall with a concrete coping. These fences are of special design, and while all are as open as possible and reasonably pleasing to the eye, they are entirely safe for the animals within them. The yards on the west side of the house were finished with a tarred surface, and the others must be similarly treated at an early date.

The Italian Garden.—The most notable feature of formal planting thus far developed in the Park was the construction of an Italian Garden at the northern end of Baird Court. It has been developed as the central feature of an elaborate architectural design consisting of stone stairways and balustrades, and lies in a sloping position, extending from the lower to the upper levels of the embankment.

Preliminary to the planting of this Garden it was necessary to excavate about 300 yards of rock, after which about 500 yards of soil and fertilizers had to be supplied. The Garden was laid out in accordance with the design of Mr. James L. Greenleaf, Consulting Landscape Architect, and planted by Mr. Merkel's force of gardeners, with over 3,000 box bushes, 500 evergreens and 1,800 red geraniums. Planting was also done around the Feed Barn, on Audubon Court, around the Small-Deer House, along the Buffalo walks, in the West Farms Block, and around the Boat House and West Farms Entrance. In this planting work 2,100 conifers, 852 deciduous trees, 2,000 deciduous shrubs, 6,000 evergreen shrubs, and 6,325 perennials were used, besides many more which were taken from our border plantations.

Mountain Goat Yards.—Immediately west of the Small-Deer House a series of three large yards for mountain goats and Virginia deer were built, of which about 14,400 square feet were paved. Around these yards about 630 feet of single and double fences were erected, and the lines were made to conform to the lines of the new walk leading south.

New Elk and Deer Yards.—At the Elk Range seven corrals and yards were either built new or reconstructed. To prevent the fighting of male elk and mule deer through their partition fences, with damage both to the fences and to their antlers, an entirely

new kind of partition fence was invented and erected. It consists of two lines of steel posts set two feet apart at their bases, and sloping toward each other at the top. To these two lines of posts several heavy horizontal T-bars, of steel, are firmly bolted. On the outside of this invincible skeleton structure two lines of extra heavy Page-wire elk-fence are securely bolted. This fence is, we believe, as nearly horn-proof as any fence can be, except a solid wall. Of these double division fences, 488 lineal feet were constructed. In the corrals which they enclose 7,176 square feet of ground was paved with tar-surface macadam. The two small shelter houses for deer were placed upon permanent concrete foundations, and a shelter house eight by sixteen feet was newly erected.

Elephant-Yard Walks.—Two new walks bounding the Elephant House Yards on the east and west were built of tar-surface macadam. They are twelve feet in width and their total length is 1,850 feet. One of these walks leads from the south door of the Lion House to the end of the Elk Walk, and the other from the door of the Primates' House directly to the Small Mamma! House.

Walk to Baird Court Approach.—A walk twenty feet wide and 200 feet in length was constructed west of Baird Court, leading from the south end of the Aquatic Bird House to the steps of the new cut-stone approach.

Resurfacing Walks.—The improvement of the old walks by resurfacing them with tar was carried on diligently. The Beaver Valley Walk, leading from the Beaver Pond to the Primates' House, the Audubon Court walks, Osborn's Walk, west of the Aquatic Bird House, and the walk leading from West Farms Entrance to the south door of the Antelope House, all were thus improved.

Guard Wires.—Guard wires were erected along 9,217 feet of walks in various portions of the grounds.

Tree-Storage Shed.—A new shed was erected for the storage of our bay trees and other tall trees that can endure low temperatures. Its dimensions are twenty by thirty feet in ground plan, by twenty-five feet in height. This shed is heated by pipes connected with the boiler in the greenhouse that is situated near.

Crematory.—A crematory for the burning of garbage and the bodies of dead animals was erected at the Nursery. It consists of a double-shelled, water-cooled steel cylinder, so placed that both top and bottom can be reached by wagons for the dumping of garbage and the removal of ashes. It was erected upon a

brick foundation. It has internal diameters of four and eight feet, and has a smokestack thirty-six feet in height. We believe that this crematory solves the long-standing problem of what is best in this line for such institutions as ours.

Removal of Old Caribou Barn.—The barn formerly occupied by caribou, and situated near the southern end of the Aquatic Bird House, was removed to the new Wild-Horse Installation in what formerly was the old Moose Range. There the building was rebuilt, and while awaiting its equine occupants it is being used by a small herd of European red deer.

Kestrels' Cage.—The cage for the kestrels and owls was entirely rebuilt, and put upon a concrete foundation.

Insects Injurious to Trees.—The fight against noxious insects was continued, and shows surprisingly good results. Of tent caterpillar's nests there were found and destroyed a total of 3,220, against 11,194 in 1906, and 40,300 in 1905. Of cocoons we collected 470, most of which were allowed to remain in cages until spring, when the parasites were permitted to escape, and the imagoes were killed. *Of noxious scale insects we are now practically free.*

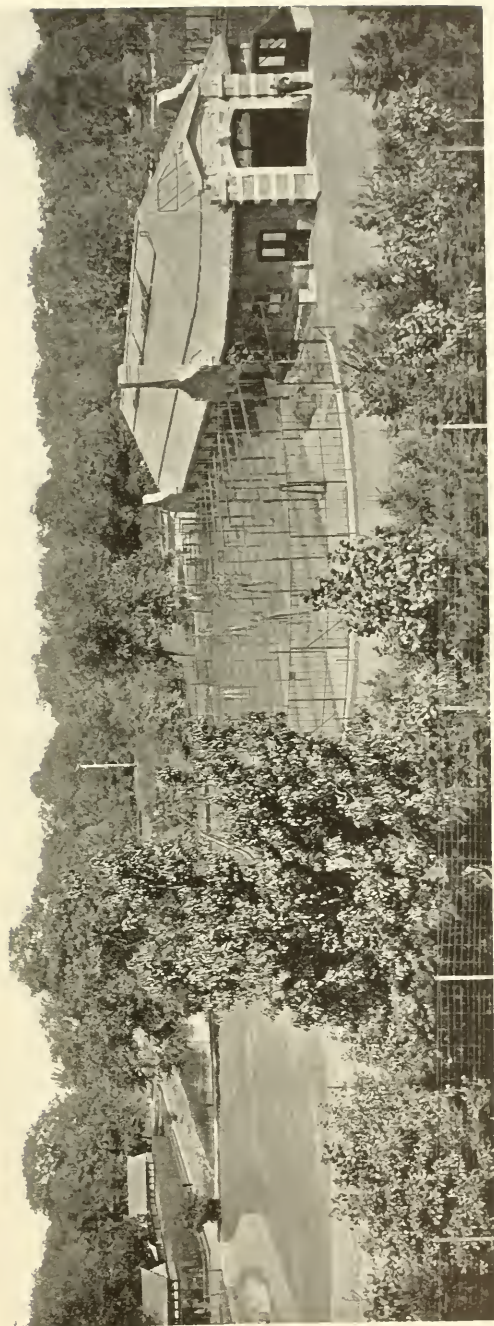
Tree Pruning.—Owing to the pressure of other work only 184 of the largest trees were pruned, but we expect to prosecute this work more vigorously during the early part of 1908.

CONTRACT WORK IN GROUND IMPROVEMENTS.

Conducted under the direction of the Park Department for the Borough of the Bronx, Martin Schenck, Chief Engineer;
W. P. Hennessy, Asst. Engineer.

The Elephant House.—Early in the year a contract for the construction of the Elephant House was awarded to Messrs. F. T. Nesbit & Company, and work began as soon as the condition of the ground would permit. Construction work was prosecuted with great diligence, and excellent progress was made until the severe weather of January, 1908, necessitated a suspension of work.

Up to date the construction of this important building—the contract price of which is \$147,599—promises to be very conscientious, diligent and satisfactory. The construction force appears to take a keen and intelligent interest in all details, and to be animated by a spirit of pride in the finished work. The cage doors and cage-work now in place seem to have been constructed



NEW SMALL-DEER HOUSE AND SURROUNDING CORRALS.
The Pheasant Aviary and a portion of the Wild-Fowl Pond are shown
in the left of the picture.

in the most careful manner, and undoubtedly will perform their functions admirably.

While it is impossible to forecast the date of the completion of this building it seems reasonable to suppose that the structure will be in our possession by October 1 of the present year. The plans and specifications for the fences to form the yards surrounding the Elephant House are in the hands of the Park Department, and it is hoped that a contract for them will be awarded at an early date. It is necessary, however, that the actual erection of those heavy fences of structural steel and wrought iron should be deferred until the walls are finished, and the space surrounding the building can be occupied by new materials and other workmen.

The Boat House.—Early in 1907 the Boat House, near West Farms, was completed by Guidone & Galardi, at a cost of \$34,235, and occupied by the Department of Privileges.

The Small-Deer House, begun in 1906 by Guidone & Galardi, (\$41,543), was completed in June, 1907, and immediately filled with animals that long had needed the new accommodations. The very extensive series of fences and yards surrounding this building were constructed wholly by the "Ground Improvement" force of the Park, and thereby all the delays and other troubles incident to contract work were entirely avoided.

Pelham Avenue Entrance, Concourse and Approach.—The contract for these improvements, entered into in October, 1906, with the John V. Schaefer, Jr., Company, (\$58,379.50), is still incomplete, although its finish is not far away. The macadam roadway, the retaining wall and open balustrade, and the two pavilions and stonework of the entrance are practically finished. The iron gates remain to be erected. While it is reasonably certain that this contract will be completed in the spring or summer of 1908, it will not be possible to open the Pelham Avenue Entrance for use by visitors until the sidewalk surrounding the roadway has been constructed. On account of the disturbed financial situation, the bids offered for the sidewalk construction have thus far been held in abeyance without action.

Western Approach to Baird Court.—This much-needed improvement was included in the contract described above, and in the months of July, August and September it was undertaken and very satisfactorily performed. It was finished in time to be used for the first time on August 29, the day of the visit of the International Zoological Congress. The fine cut-stone work adds greatly to the architectural effect of the western steps that lead up to the central area of the Court.

The Boston Road Entrance Pavilion, (William Horne & Company, \$5,008), was not completed until late in the year. Work on this small contract occupied, all told, a period of *very nearly two years*, and the progress of it was extremely dilatory and unsatisfactory. While the contract should have been completed early in 1907, and the entrance immediately opened to the public, it was not available until in October, 1907. For this reason visitors lost the use of it during the whole season of mild weather.

Public Comfort Station.—In January, 1907, a contract for the very important but unfortunately delayed building for public comfort on the Boston Road, near the new entrance, was let to William Whisten's Son, at \$16,999. Work on the building has been prosecuted since last April, and it is hoped that it will be finished in the spring of the present year. It is probable that as soon as it passes into the hands of the Society the top of the dead wall facing the Boston Road will be restudied and altered somewhat.

The New Soda Pavilion, near the Bird House, is being erected by Kelley & Kelley, at a cost of \$7,679. Work began in December, and the structure will undoubtedly be completed and ready for use by May 1, 1908. With its completion and acceptance, the old temporary soda pavilion will be removed.

DEPARTMENT OF ADMINISTRATION AND PRIVILEGES.

H. R. Mitchell, Chief Clerk and Manager; William Mitchell, Assistant.

With the growth of the Zoological Park both the volume and importance of the work of this department steadily increases. Quite aside from the regular outside business connected with the privileges, the mass of bills and accounts and the bookkeeping annually attended to in the Chief Clerk's office is really very great. The amount of business handled by the Chief Clerk's very small office force is highly creditable both to him and to his assistants. At the same time the working force of the administrative office is much in need of more room and increased facilities, both of which must be provided at no distant day. Our permanent policy of avoiding all clerical work that can be avoided has been highly beneficial to all concerned.

The disbursements through the Chief Clerk's office for 1907 on account of Ground Improvement work carried on by the Society kept pace with the same business during previous years. The slight falling off in maintenance business was more than made up by the increase in privileges.

Telephones.—During the year the very unsatisfactory state of our private telephone service became unendurable, and the question of the installation of a new system was taken up with the New York Telephone Company. The figures of that company, for the maintenance of our entire telephone system, were so satisfactory that it was decided to place the maintenance of the system in their care. As soon as several matters which are now pending in regard to underground cables have been settled, it will be possible to communicate with the office from all buildings and entrances. For various reasons, however, public service will only be extended to the Park entrances, soda stands, Rocking-Stone and Boat House Restaurants.

Privileges.—On the whole, the season of 1907 was a very successful one for the Privilege Department. This was despite the fact that weather conditions were very unfavorable. The policy of developing of the privileges by the installation of the best and most modern equipment was, without question, the means by which we were enabled to show a substantial increase of profits, notwithstanding the unfavorable season.

Soda Water.—The four new "Twentieth Century" sanitary soda fountains, mentioned in our last year's report as having been ordered, were duly installed and made ready to operate about the 15th of April. To this equipment was added two complete outfits for carbonating water, which were attached to our most important fountains, and so arranged that they worked automatically as the supply in the carbonating tanks was lowered. From a sanitary and an economic standpoint the new fountains and carbonators were an entire success. Many compliments on their neat and clean appearance were received from visitors, and we were often informed by strangers that they were the most perfect and up-to-date apparatus to be found in any park in the country. The vindication of Mr. Mitchell's judgment in installing them was found in an increase of fifty-eight per cent. in profits for the season of 1907. This increase in the volume of business can be accounted for only by the unusual attractiveness of the fountains.

The manufacture in the Park of the ice cream for the soda fountains and for the Boat House and Rocking Stone Restaurants, which was first inaugurated in a small way several years ago, has grown to such proportions that the facilities for this work in the cellar of the Service Building are now entirely inadequate. The greatest need of the Privilege Department at this time is a combination ice-house, ice manufacturing and refrigeration plant, as

mentioned last year. In view of the improbability that a building of this character can be planned, approved and contracted for during 1908, Mr. Mitchell urges that a shed be erected at a point whereon it would be permanently useful for storage purposes and used temporarily for this work.

New Soda Pavilion.—The contract for the long contemplated soda pavilion, to take the place of the temporary stand just north of the West Approach to Baird Court, was let last October, and construction work began in November. The building is situated on the site of the old caribou barn, south of the Aquatic Bird House, fronting on the walk leading to the Western Approach to Baird Court. The building will no doubt be completed in time to install the fountain and have it ready for use by May 1, 1908.

Boat House Restaurant.—When the Boat House was completed and turned over to the Society last March it was opened with a dining-room in the north half of the building, and lunch-room and soda fountain in the southern half. It was not expected that it would at once be possible to put this establishment on a paying basis. Considerable time is required to acquaint the public with a new place of this kind and establish it in their confidence. On the whole, very satisfactory progress has been made in that direction.

Boating.—The boating privilege at once proved very popular. Two carloads of Mullins' steel boats were purchased and put into use. The wooden boats purchased from the former lessee of this privilege were completely overhauled, repaired and painted. Our equipment now contains about 120 rowboats, but on busy days that number is not sufficient to handle the business. An order has been placed for another carload of the steel boats, for delivery in the spring of 1908, and also for a number of wooden boats, to replace some of the old ones that will have to be destroyed.

The electric launch "Albatross" was especially popular with ladies and children on account of its perfect reliability and freedom from all risks of the explosions and other accidents that sometimes occur on naphtha and gasoline launches. During the season for boating the boat attendants are neatly uniformed in white duck suits and white caps, and the river is patrolled by life-savers whose duties are to enforce the rules for public safety and to save life if necessary. During the year nearly 10,000 tickets for rowboats were sold, and about 7,000 tickets for the launch.

Rocking Stone Restaurant.—The business of the Rocking Stone



NEW BOAT-HOUSE ON BRONX RIVER.
A fleet of Mullins' steel boats and the electric launch "Albatross" are in active service the entire season.

Restaurant was not affected by the opening of the Boat House Restaurant. A much-needed step was taken this year in the putting up of a number of small signs directing visitors to the restaurant. The addition of music each afternoon, which was furnished by a small stringed orchestra, seemed to be acceptable. The business for the year showed a very gratifying increase. The music will be continued during the coming season.

The operation of our restaurant laundry has proven very successful, and our employees handle the linen from both our restaurants, as well as uniforms, aprons and all other work from the soda water department.

Guide Book.—On account of the delay in the preparation and printing of the revised and extended Guide Book, we were without Guides during the months of May, June and July. There was, therefore, a considerable falling off in sales and profits for the year. The 7,000 copies of the Giraffe Edition, printed in 1906, were exhausted on April 30. The new issue, called the Elephant Edition, of 30,000 copies, was by far the largest number yet printed at one time. For this issue the old Guide was completely revised and re-written, and a large amount of new matter was added in order to cover the enlarged collections, and several new buildings and installations. The Elephant Edition contains 171 pages, which is fifty more than the previous issue, and there are fifty-nine illustrations. The total number of copies of the Guide Book printed up to January 1, 1908, is 88,000.

Postal Cards and Souvenir Books.—The souvenir postal cards are as much in favor with visitors as in previous years. In fact, their popularity seems to be on the increase rather than otherwise. Our different series have been constantly increased in number of subjects until they now constitute the largest and most complete assortment of animal cards to be found in any zoological institution.

In an effort to improve the standard of our colored cards, considerable attention has been given to the merits of color reproductions generally. Revised editions of each of our souvenir books were printed early last year, and many new illustrations were added to make them more attractive. Sales were especially large, probably on account of the fact that the Guide was not on sale during the early spring. The net profits for the season increased by almost one hundred per cent. over the figures of the previous year.

Riding Animals.—The receipts from riding animals fell off nearly one hundred per cent. from last year, due to the riding

elephant "Gunda" not having been on the stand during the season. In 1906 Gunda earned, as a riding animal, \$646.50. Since he first went on the stand, including the year 1906, he has earned more than enough to cover his original cost, \$2,500. The pony equipment was maintained as heretofore, and this item showed a satisfactory increase over last year.

Gate Receipts.—The receipts from admissions at the gates on closed days (Mondays and Thursdays) have shown yearly increases since the opening of the Park. The receipts from this source for the first year that the Park was open, 1900, were \$1,869.35. These figures have gradually gone up until in 1907 they reached the sum of \$8,248.65.

DEPARTMENT OF CIVIL ENGINEERING.

George M. Beerbower, C.E.

As an illustration of both the extent and variety of the activities of our Civil Engineer during the year 1907, the following statement is of interest:

For the first work of the year lines and grades were established and batter-boards erected for the copings and fences of the westerly yards of the Small-Deer House. This was immediately followed by the engineering work necessary on the drainage of the yards, the adjacent walks, and the fences of the remodeled yards for the mountain goats and white-tailed deer.

In connection with the construction work of the Ground Improvement force, the following new walks were surveyed and staked out to show lines and elevations:

From the Boston Road and 180th Street to the Boat House.

From the Boston Road to west front of Boat House, and boat platform.

From the Boston Road entrance plaza to the new Public Comfort Building.

From the entrance plaza to the Fallow Deer Range.

From the Lion House, past the Elephant Yards, to the Wolf Dens.

From the Primate House, past the Elephant Yards, south to the Service Road.

From the Aquatic Bird House to the western steps of Baird Court.

From the Boat House northward to the Buffalo Entrance.

From the West Farms Road, northward to Bronxdale (new addition).

A very complete series of studies were made by Mr. Beerbower for a new and permanent Public Comfort Station, to be located centrally in the Zoological Park. In this connection surveys and plats were made of two available sites, and a thorough inspection was made of Public Comfort buildings in Manhattan and Brooklyn, and of dealer's fixtures generally. Records and estimates were made to determine the needs of the central portion of the Park.

Mr. Beerbower's most important task of the year was the preparation of complete working plans and specifications for the steel fences to surround the yards of the new Elephant House, all of which were filed with the Park Department in October, and duly approved. This work was followed by the preparation of plans and specifications for a series of eight overflow bear-dens, and studies of possibilities in the terminal station of the Subway in West Farms.

DEPARTMENT OF PUBLICATIONS AND PHOTOGRAPHY.

Elwin R. Sanborn, Asst. Editor and Photographer.

It is quite time that the volume and variety of the work of this department should be set forth with some particularity, in order that the public may obtain a fair conception of its value. Both branches of Mr. Sanborn's work are steadily increasing in volume and in permanent value. During the past year the work done on publications amounted to about double that of any previous year, as the following list will show:

Publications Issued in 1907.

Guide to the Zoological Park, Elephant Edition, completely rewritten and extended by the Director.

The National Collection of Heads and Horns, Part I.

Eleventh Annual Report of the Society.

Bulletin, Nos. 25, 26, 27 and 28.

Zoologica, Vol. I, Part 1.

5,000 folders and 6,600 circulars.

It is to be observed that in the publication of any book or periodical, besides the work bestowed upon the manuscript, it is necessary for Mr. Sanborn to read the proof carefully four or five times. If manuscript is not carefully prepared and closely marked for the compositors heavy charges for extra corrections



AMERICAN BISON BULL IN THE ZOOLOGICAL PARK.

are the inevitable result. As a proof of the thoroughness of our editorial work, it may be mentioned that the charge for extras on the Eleventh Annual Report amounted to only \$19.00, and on the Guide Book only \$34.00. Notwithstanding the increase in the size of the Guide Book, and the low price at which it is sold to visitors, it yields a good percentage of net profit to the Animal Fund.

New Photographic Work.

The following list of new photographs made in 1907 by Mr. Sanborn will afford an index of a year's activities in this field:

- Series of Owls, for Eleventh Annual Report.
- Series of Horns, to illustrate "Heads and Horns," Part I.
- Series of the Rhinoceroses, Tapirs and Elephants.
- Series of Bison Herd, large views.
- Series of Elk, Ostriches and Cranes.
- Series of Pathological features and operations.
- Series of New Construction Work and installations: West Farms Entrance, Boat House, Elephant House, Concourse, Launch "Albatross," Classes from Public Schools, Soda Pavilions and Fountains.
- Series of Important Plantings.
- Series of large views of Baird Court, Jungle Walk and Audubon Court.

Of these photographs important collections have been furnished to correspondents in South America, the Philippines, France, Germany, England, Hawaii, and in many portions of the United States. Many artists and taxidermists have availed themselves of the opportunity to secure pictures of animals for use in their work, and the list of publishers seeking prints for reproduction in books and periodicals is rapidly increasing. A card index of negatives and prints renders our whole stock readily available. All our half-tone plates are on file in Mr. Sanborn's office. Although the work of filing, indexing and cataloguing our negatives, prints and electrotypes is not yet complete, it is well advanced, and the system adopted is admirable.

Miscellaneous Work.—The most important item accomplished under this head was the making of twelve new index albums, which brings this important series down to date.

The following is a statement of the photographic prints made during the year 1907:

For index albums and files	3,789
For magazines and newspapers	773
For miscellaneous collections	1,066
For publications of the Society	135
	5,763

A stereopticon was purchased for the lectures to pupils of the public schools, and operated by Mr. Hedrich.

An exhibit was made at the Sportsman's Show, and operated.

A report on the transfer of the gift bison herd to Oklahoma, with illustrations, was prepared by Mr. Sanborn, and published in Bulletin No. 28.

In conclusion, it is reasonably certain that the work of Mr. Sanborn and his assistant, Mr. Hedrich, never will grow any less, but probably will steadily increase from year to year.

MAINTENANCE.

H. W. Merkel, Chief Constructor; E. H. Costain, Assistant Forester and Captain-of-the-Watch.

Through strenuous effort, the doing of extra duty by a great many men, the employment of several boys where men were needed, and finally the well-nigh complete exhaustion of all visible food and fuel supplies at the end of the year, we succeeded in maintaining the Zoological Park without the deficit that at one time was regarded as almost inevitable. Nevertheless, the great shortage in December, 1907, involved unusually heavy expenditures during January, 1908.

Thanks to the increase in our annual maintenance fund, which was granted by the Mayor and the Board of Estimate for 1908, we will be enabled to carry the Park through the present year more becomingly, and with less of a struggle, than last year. The increase granted will be wholly consumed by the new men, animal food and fuel rendered necessary by the new buildings completed last year and to be completed in 1908.

The general course of maintenance work conformed to the lines now well established. The most important new items of increase are: the Small-Deer House, (2 men), the Boston Road and Bronxdale entrances, (2 men), the Public Comfort Station on the Boston Road, (1908, 2 attendants), the Pelham Avenue "Con-

course" Entrance, (1 man and 1 boy). The opening of the Elephant House, (in 1908), will add three more men to the permanent force.

Believing that the composition of our maintenance force is a matter of general interest to members of the Society the following complete enumeration of its members is submitted:

MAINTENANCE FORCE ON JANUARY 1, 1908.

General Office Administration.

The Director.	1 Telephone Operator.
1 Chief Clerk and Manager of Privileges.	2 Messengers.
1 Assistant to Chief Clerk.	8 Gatekeepers.
1 Stenographer.	1 Janitor.
2 Clerks.	1 Matron.

Care of Animals.

2 Curators.	6 Assistant Keepers.
1 Veterinary Surgeon.	1 Label Writer.
2 Head Keepers.	4 Janitors.
13 Keepers.	

Maintenance and Repairs of Buildings and other Installations.

1 Chief Constructor and Forester.	5 Painters.
1 Capt. of Watch.	5 Carpenters.
3 Watchmen.	1 Fireman.
1 Storekeeper.	1 Plumber.
1 Blacksmith.	3 Plumber Helpers.
2 Blacksmith Helpers.	1 Foreman Wireworker.
1 Foreman Painter.	5 Wireworkers.

Care of Grounds.

1 Asst. Forester.	4 Cleaners.
2 Gardeners.	1 Foreman.
3 Gardener Helpers.	25 Cleaners and Laborers.
1 Florist.	1 Special Policeman.
9 Foresters.	1 Janitor.
1 Stable Foreman.	1 Farmer.
5 Drivers.	1 Messenger.

Total maintenance force on January 1, 1908, 141 persons.

It is also of interest to compare the force of the Zoological Park with those of the two other leading zoological gardens of the world.

The London Zoological Gardens, of 34 acres, employs 111 persons.

The Berlin Zoological Garden, of 60 acres, employs 115 persons.

The New York Zoological Park, of 264 acres, employs 141 persons.

The difference between the number of employees in the Zoological Park and those in Berlin and London is due to our far greater area of park land and improvements to be cared for, cleaned daily and kept in repair. Our heavy attendance of visitors is also an important factor, especially in view of the fact that *our visitors throw upon our walks and grounds at least twenty times more rubbish and waste paper than any attendance of visitors would dare to throw down in any European park.* This abuse will be taken up seriously in the near future, and an effort will be made to educate a certain portion of the public of New York out of the idea that a public park is a place for unlimited license and disorder. The worst offenders are the lower class aliens, who insist upon doing here what they never dared to do in their home countries.

Respectfully submitted,

WILLIAM T. HORNADAY,

Director and General Curator.

January 1, 1908.



SPOTTED MORAY IN THE NEW YORK AQUARIUM.
Lycodontis moringa.

REPORT OF THE DIRECTOR OF THE AQUARIUM TO THE BOARD OF MANAGERS.

THE year 1907 has been a notable one in the history of the Aquarium, the number of visitors exceeding that for 1906, making another record year in the matter of attendance, which was 2,131,393.

While the exhibits received no notable additions, all the available tank space was occupied. The collections consisted of forty-four tanks of fresh-water fishes, forty-seven tanks of sea fishes, both local and tropical; seven large floor pools containing good sized specimens of sturgeon, drumfish, alligator, crocodile, manatee, sea turtle, seal and sea-lion. Fresh-water turtles of twenty species were exhibited in ten large table aquaria; twenty smaller aquaria were devoted to marine invertebrates and a small collection of frogs and salamanders. The number of species of vertebrates exhibited from year to year is usually over two hundred.

Additions to the collection of tropical fishes were restricted to a single shipment from Bermuda.

At the close of the Sportsman's Exhibition in Boston, in April, a collection of over 200 specimens of fresh-water fishes, representing twenty species, was secured at a very low rate from the New England Forest, Fish and Game Association.

In July, and again in October, exchanges of local sea fishes were made with the Detroit Aquarium for fresh-water fishes from the Great Lakes.

At the close of the Exposition at Jamestown a collection of about 250 fresh-water fishes, of fifteen or more species, was turned over by the United States Bureau of Fisheries to the Forest, Fish and Game Society of America for exhibition at the Sportsman's Show held in New York in December. These, with certain fishes collected elsewhere by that Society, were later presented to the Aquarium.

The young male manatee presented by Mr. A. W. Dimock in 1906 is now passing its second winter at the Aquarium.

Fish Hatchery.—The fish-cultural exhibit is kept in operation during all the months when eggs of food fishes are in season. About 2,300,000 young fry were distributed in state waters, being delivered to the New York State Fish Commission.

Fish eggs were presented by the United States Bureau of Fisheries, the State Fish Commission, and the Tuxedo Club. Over 1,000,000 yellow perch fry, hatched from eggs collected on Long Island by employees of the Aquarium, were deposited in lakes in the Zoological Park, the Bronx River and elsewhere. The species hatched during the year were brook, rainbow, lake, steelhead and brown-trout; whitefish, yellow perch and smelt.

IMPROVEMENTS.

The electric lighting facilities were increased by additional lights over the exhibition tanks and pools, and the gas lighting system was extended to the main floor tanks. The artificial light now available is still insufficient for the proper illumination of the building on dark days, especially in the winter.

A feed-water heater for the boilers was installed with a view to decreasing the consumption of coal and a bronze salt-water heater was also installed for the warming of water containing tropical fishes.

It is five years since the Zoological Society accepted the control of the Aquarium, and a summing up of the various improvements effected during that period seems to be desirable.

The principal improvements in the building itself were made possible through the Improvement Funds granted by the City in 1903 and 1904; the minor improvements—chiefly in the equipment—were accomplished at different times from the Maintenance Fund. The following list shows the more important items under each head:

Improvement Fund.—The construction of an underground reservoir for pure sea-water; the construction of filters for sea-water; the construction of pipe-galleries under the building; the enlargement of forty-three skylights; the erection of larger boilers; the introduction of a ventilating system; alterations to correct unsightly features of the building; the artificial aeration of the tanks; the painting of the interior; the introduction of leadlined piping—this work now being completed; the erection of an iron and plate glass vestibule; the attachment of the thermostat system to the entire heating equipment.

Maintenance Fund.—The introduction of a fish hatchery; the introduction of electric light; the introduction of a large bronze pump for stored sea-water; the introduction of numerous small aquaria on the floor, and on the copings on the large pool; the replacing of the worn out iron water heater with a heater of bronze; the erection of a large feed water heater to secure economy of coal; the extension of the gas light system to the main floor tanks; the provision of uniforms for employees.

In addition to these items may be mentioned a few of the many small improvements that have served to make the Aquarium more interesting and useful to the public:

The complete labeling of the collections; the introduction of small aquaria in 300 public schools and other educational institutions of the City; the general increase of the collections; the equipment of the office, laboratory, photographic room and library with furniture, appliances and books necessary to efficient public service; the publication of circulars of information, etc., etc.

There can be no doubt that the efforts put forth by the Society to make the Aquarium attractive in every way possible have been responsible for its steadily increasing attendance, which for two years in succession has exceeded two millions of visitors.

It would be superfluous to take up in detail here the various relationships maintained by the Aquarium with visitors, teachers, school children, newspaper men, anglers, professional fishermen, fish culturists and scientists—the large correspondence carried on with all of these being an important feature of the work of the Aquarium office from day to day. Neither the building itself nor its office force are large enough for the proper fulfilment of the demands constantly being made upon them. Much of the time of the Director was taken up during the summer with work as secretary and treasurer of the local committee for the entertainment of the International Zoological Congress which visited New York in August.

ATTENDANCE.

The attendance for the year 1907 was greater than ever before, reaching the enormous figure of 2,131,393, an average of 5,839 per day.

The year's attendance is therefore equal to half the population of New York City. The greatest number of visitors for a single day was 24,544.

The following table shows the attendance at the Aquarium in 1907 by months:

ATTENDANCE AT THE NEW YORK AQUARIUM, 1907.

January ...	Number of visitors	82,232	Daily average	2,652
February ..	" "	79,123	" "	2,825
March	" "	139,908	" "	4,513
April	" "	149,615	" "	4,987
May	" "	192,668	" "	6,215
June	" "	178,402	" "	5,946
July	" "	262,327	" "	8,462
August ...	" "	278,702	" "	8,990
September .	" "	284,175	" "	9,472
October ...	" "	215,928	" "	6,965
November .	" "	151,371	" "	5,045
December .	" "	116,942	" "	3,772
Total		2,131,393	" "	5,839

The number of visitors for the eleven years of the Aquarium's history is now close to twenty millions, as shown by the following table:

1897	Visitors	1,635,252	Daily average.....	4,480
1898	"	1,689,471	" "	4,628
1899	"	1,841,330	" "	5,044
1900	"	1,585,584	" "	4,344
1901	"	1,644,856	" "	4,506
1902	"	1,700,453	" "	4,659
1903	"	1,547,873	" "	4,240
1904	"	1,625,770	" "	4,554
1905	"	1,726,170	" "	4,729
1906	"	2,106,569	" "	5,771
1907	"	2,131,393	" "	5,839
Total		19,234,721	" "	11 years 4,790

AID TO SCHOOL TEACHERS.

The work of supplying small seashore forms of life to teachers in the City schools increases from year to year. The following printed form is sent to principals or teachers making application for specimens:

"The New York Aquarium will supply small fishes and marine invertebrates for stocking aquaria in your school. It will be necessary for you to provide an aquarium jar or tank, and send here for a supply of sea-water. When everything is in readiness the specimens, with marine plants, will be delivered at the school house. It is important that you first visit the laboratory here, where instruction in caring for aquaria can be had at any time. Sea-water can be sent by express to those forwarding carboys for that purpose."

A limited amount of fresh-water life has also been supplied.

The material furnished has gone not only to public schools, but to normal and high schools, and to the colleges and universities of the City. The Aquarium has limited the free distribution of specimens to City institutions, although there have been many applications from outside Greater New York.

Classes accompanied by teachers have continued to visit the Aquarium, the total number of pupils for the year being 6,300. All parties from schools visiting the Aquarium are provided with a guide to enable them to see the collections to the best advantage.

The total number of educational institutions to which specimens have been sent for class work or aquaria since January 16, 1903, is approximately 300.

Mr. Spencer of the Aquarium staff has personally managed all work of this kind, including the adjustment of the aquaria in each school.

WORK OF THE COLLECTOR.

This has included not only the collection of hundreds of specimens of local fishes and invertebrates for exhibition, but the gathering of great quantities of salt-water minnows and shrimps used as live food. The surplus sea-shore forms obtained in abundance by the Collector, Mr. J. J. DeNyse, have as usual been given freely to school teachers for class room purposes and the stocking of school aquaria. Nothing collected for the Aquarium is wasted, even dead specimens, when in good condition, being sent to the natural history museums or used as food for seals or alligators.

THE LABORATORY.

One of the laboratory rooms was placed at the disposal of the Metropolitan Sewerage Commission, which used it throughout the year in its investigations respecting the pollution of the

harbor by sewage and factory waste. The results show that the effects of the pollution of the harbor are liable to become very serious, as the amount of sewage is increasing. There are bottom deposits of sewage in many parts of the harbor that are several feet in thickness. These have been probed and measured by the Commission. Chemical and bacteriological studies were made of the water and the deposits in many parts of New York Bay. The investigations show that the action of the Hudson River and the tides do not take refuse out to sea. Matter carried in suspension by ebbing tides can not pass or even reach the Narrows before meeting flood tides, which bring it back. The sewage of Greater New York, everywhere poured into the harbor, is augmented by that from the adjacent cities of New Jersey.

Many forms of marine life which assist in the disposal of organic matter in the harbor must decrease in numbers and disappear as the volume of sewage increases, while the shad, oyster and other fisheries are already suffering from its effect.

The keeping of marine species in the Aquarium has always been difficult on account of the fact that the salt-water pumped from the harbor into the tanks is charged with sewage.

The water is, in fact, so impure that the death rate among the sea fishes is very high. It has always been quite impossible to exhibit the more delicate marine invertebrates for the same reason.

The new system of *stored* sea-water now in course of completion for the Aquarium will, however, afford relief from this great drawback.

The laboratory was used for some time by Dr. G. G. Scott, of the College of the City of New York, in his studies respecting the regeneration of the fins of killifishes. Further studies made in the laboratory by Dr. F. B. Sumner, of the same college, on the relations between fishes and their surrounding medium were published as "A contribution from the biological laboratory of the New York Aquarium."

Other biological papers based on the work in the Aquarium laboratory, or on specimens therefrom, were published by Dr. H. D. Senior, of the Wistar Institute of Anatomy, Philadelphia, and Mr. C. V. Morrill, Jr., of New York.

Many sea fishes in the Aquarium killed by impure water were skeletonized in the laboratory by Dr. R. W. Shufeldt, of New York, who is engaged in a study of the osteology of certain tropical species.

CENTENNIAL OF THE AQUARIUM BUILDING.

On the evening of May 23 the New York Zoological Society celebrated the centenary of the Aquarium building in connection with the celebration of the two hundredth anniversary of the birth of Linnaeus by the New York Academy of Sciences.

About 450 persons were present by invitation, the guests being received by officers of the Zoological Society and the Academy of Sciences.

The Aquarium was specially decorated and illuminated for the occasion, and those present enjoyed the first view of the collections by electric light.

This was the first opening of the Aquarium at night, the second being on the evening of the 29th of August, when 250 members of the Seventh International Zoological Congress were given a special reception. Music was provided on both occasions.

Most of the foreign members of the Zoological Congress were surprised to find that the New York Aquarium contained a larger and more varied collection than any aquarium in Europe. As a matter of fact, it maintains the largest collection of living fishes ever gotten together for exhibition anywhere.

ACKNOWLEDGMENTS.

The United States Bureau of Fisheries, always the chief donor to the Aquarium, supplied, as usual, most of the fish eggs for the operation of the hatchery.

The New York Forest, Fish and Game Commission furnished eggs of smelt and rainbow-trout for the same purpose.

The late Henry Bishop, of Baltimore, presented fifteen Japanese goldfish of the large and handsome varieties so successfully bred by himself. Fancy Japanese goldfishes were also presented by E. K. Bruce, Jr., of Thornburg, Iowa. Mr. Henry W. Beman, of New Preston, Conn., sent 100 young black bass and fifty young yellow perch, raised in his ponds. Mr. A. B. Davis, of Wading River, Long Island, presented thirty handsome pickerel.

A collection of large brook trout, brown-trout and land-locked salmon was presented by the Maine Commission of Inland Fisheries, and a collection of salmon, trout and other game fishes by the New England Forest, Fish and Game Association.

Director A. G. Mayer, of the Marine Biological Station at the Tortugas, sent numerous red land-scrabs from the Bahamas, and Mr. George J. Gould, Jr., two young loggerhead turtles from the

same region. The latter, delivered in April, are already nearly four times as large as when received.

A specimen of the remarkable blind salamander, (*Typhlomolge rathbuni*), from the artesian well of the United States Fisheries Station at San Marco, Texas, was sent by Mr. J. L. Leary, Superintendent.

Master Edward Redfield, of Closter, N. J., sent several Muhlenberg and other species of fresh-water turtles. He has, in fact, supplied most of the Muhlenberg turtles received at the Aquarium for several years.

Several paradise fishes were presented by Mr. Russel P. Van Keuren, of Honesdale, Pa., and Capt. Percy Watson, of the steamship "Castle of Muncaster."

At the close of the Jamestown Exposition a fine harbor seal was presented by the United States Bureau of Fisheries.

Dr. F. B. Summer presented a loon, which was later transferred to the Zoological Park.

Contributions to the Library were received from the Smithsonian Institution, the United States Bureau of Fisheries, the New York Forest, Fish and Game Commission, the Illinois State Laboratory of Natural History, the New Jersey Fish and Game Commission, Messrs. A. S. Barnes & Co., New York; Prof. E. L. Mark, Harvard University; the New Jersey State Museum, Trenton, and C. H. Townsend, New York.

Colored plates of fishes and other aquatic animals were presented by Messrs. A. Hoen & Co., Baltimore; the J. B. Lyons Co., Albany; and the Zeese-Wilkinson Co., New York.

Messrs. Chesebro Brothers, of Fulton Market, presented an albino diamond-backed terrapin.

A complete list of gifts will be found under the head of accessions.

Record of monthly mean temperatures and specific gravities at the New York Aquarium during the years 1903, 1904, 1905, 1906 and 1907. (From daily observations made by Mr. W. I. DeNyse.)*

	1903		1904		1905		1906		1907	
	Temp. water	Spec. grav.	Temp. water	Spec. grav.	Temp. water	Spec. grav.	Temp. water	Spec. grav.	Temp. water	Spec. grav.
January .....	...	.....	34	1.014	35	1.013	39	1.014	39	1.012
February.....	37	1.010	33	1.014	33	1.016	36	1.012	35	1.014
March.....	40	1.008	36	1.013	36	1.014	38	1.011	36	1.013
April.....	46	1.009	40	1.009	43	1.011	43	1.010	42	1.010
May.....	56	1.014	52	1.010	52	1.014	52	1.013	50	1.011
June	61	1.013	61	1.010	62	1.015	62	1.013	56	1.013
July	66	1.013	70	1.013	68	1.015	69	1.013	65	1.015
August.....	68	1.013	71	1.014	71	1.016	72	1.014	70	1.016
September.....	68	1.013	68	1.014	68	1.014	71	1.015	69	1.015
October.....	62	1.011	59	1.013	62	1.014	63	1.016	62	1.012
November	52	1.014	51	1.013	51	1.015	54	1.014	51	1.010
December.....	40	1.014	59	1.015	44	1.014	43	1.014	45	1.011

*Density observations were made with samples of water brought to a temperature of 60 degrees Fahr.

Respectfully submitted,

CHARLES H. TOWNSEND,

Director.



SCHOOLMASTER.
Lutianus apodus.



SPOTTED HIND.
Epinephelus guttatus.

POLLUTION OF STREAMS—AN APPEAL TO ANGLERS.*

By C. H. TOWNSEND,
DIRECTOR OF THE NEW YORK AQUARIUM.

Formerly Chief of the Fisheries Division, United States Fish Commission.

THE pollution of public waters is our most common act and our most uncivilized practice. The casting of refuse in a stream results only in transferring it from one neighborhood to another.

The great evil with which practical fish-culture in America has to contend at the present time is the contamination of public waters by sewage and the refuse of manufacturies.

Although the propagation of fishes by artificial means has, in this country, reached a degree of efficiency unequalled in other countries, the preservation of streams in conditions desirable for the maintenance of fish life has been singularly neglected.

In a majority of those states which possess fishery resources there exist more or less effective restrictions upon fishing and the operation of fishery industries, but it is seldom that enactments against the depositing of waste matter in fishing waters are enforced.

The annual output of fish fry from hatcheries in various parts of the country, operated by the Fisheries Bureau at Washington, has now reached the enormous figure of something like three thousand millions. The fish cultural work of the different state fishery commissions, taken collectively, yields probably equal numbers of young fry. The Governmental part of the work is done from no more than thirty-five or forty hatcheries scattered over the country—a remarkable illustration of the efficiency of artificial fertilization and rearing of fry.

It would be safe to state that fish planting in America exceeds that of all other countries put together. Fish culturists from Europe and from countries as far away as Japan and New Zealand come here to study our methods.

*An address delivered to the Anglers' Club of New York, March 17, 1907.

All our fish commissioners of experience, both National and State, are agreed that the decrease in the supply of food fishes is traceable more to the pollution of waters than to any other cause, and stream pollution is going on at a rate proportionate to the increase in population and the development of manufacturing industries.

The effects of pollution are most serious in the more densely populated States. It begins almost at the sources of streams and extends to the very mouths of the largest rivers.

The conditions would probably not be so serious in their effect upon the supply of fresh-water fishes had not the flow of streams been lessened by deforestation. With the cutting away of forests and the cultivation of the land, the summer temperature of streams has become higher and the breeding grounds of game and food fishes covered by silt washed down by floods.

Happily the movement for reforestation is gaining ground. It is most important, and all anglers should be active supporters of the efforts now being made for forest preservation.

The pollution of streams not only affects fishing for sport and commercial fishing, but the all-important matter of public health.

The agencies at work are almost too varied for enumeration. In general the pollution of waters is caused by sawmills, pulp and paper mills, tanneries, starch, cheese and sugar factories, gas, wood-alcohol, chemical, glass and dye works, oil refineries, distilleries and breweries, logging, smelting and mining, and by factories of all sorts. To this catalogue might be added the item of dead animals, which in the aggregate is an important one.

There is also the depositing in the waters of cinders, garbage and trash by the vast fleet of fresh-water steamers everywhere. In addition to these sources of pollution there is practically all the city and town sewage of the country.

With such facts confronting us there is no need of inquiring why we do not get better results from our admirable National and State fish cultural work. It is not merely the class of anglers who are concerned—the people everywhere are becoming alive to the dangers of the situation.

The streams of western Pennsylvania, for instance, are already ruined by coal mining. I have recently visited some of the streams in which I fished as a boy. They are to-day little more than sulphur-yellow drains of coal mines, disfiguring the fair face of nature, in many cases throughout their entire courses and for distances sometimes as great as the width of two or three

counties. They contain no living thing—neither fish, frog, crayfish, nor any form of animal or plant life.

The coal and coke industries which have brought about these conditions may possibly be regulated at some future time. At present their vast importance and the state of public opinion do not give us any hope for stream purification in coal mining regions.

The well-known conditions of pollution extending throughout the Hudson River and its tributaries may be found in all rivers of the country where the population is great and the manufacturing industries well developed.

Boards of health throughout the country are considering the conditions, but little is accomplished except where local conditions here and there become intolerable. Officers are usually unable to enforce existing laws and juries will not convict.

The Herculean labor involved in setting things right will require the consent of the population and a liberal use of the money and effort of the present generation, while the next generation will need to be vigilant in sustaining whatever protection may be secured.

In Europe many of the problems connected with sewage disposal have been solved, and considerable help is thus available from the experience and practical efforts of other countries.

It is not the object of the present article to discuss the conditions which prevail in such rivers as our own Hudson; the large navigable rivers, flowing through densely populated sections, will have to be dealt with from the viewpoint of public health. Anglers as a class are, however, interested in the upper waters of our streams, where they go for recreation, and the protection of such waters is quite possible.

Many years of experience in the field as an officer of the United States Fisheries Bureau has led me to the belief that there is hope for the early salvation of our mountain streams where the population is not yet sufficient to cause damage by sewage. Here we have to deal chiefly with such matters as pollution by sawdust and wood pulp refuse.

Sawdust not only blackens the water, but drifts into eddies, where it becomes water-logged and settles, forming deposits which are very destructive to young fishes. It also settles into the gravel beds, and to some extent covers them, making unsafe for fish eggs many important spawning grounds.

Recent experiments by the National Fisheries Bureau have shown that sawdust promotes the growth of fungus on fish eggs

and kills both eggs and young fishes. The finer kinds of sawdust affect the larger fishes, getting into their gills, and dead fishes are found with considerable quantities of sawdust in their stomachs.

Many nuisances which we tolerate could be abated through active effort. A single instance from my personal experience will serve to illustrate the indifference of anglers.

There is a large sawmill on the east branch of the Delaware, just above the mouth of the Beaverville, which has for years deposited sawdust in the river. The heap of sawdust remaining on the bank is about the size of an ordinary two-story house, its front base resting on the edge of the stream. As the river has been cutting it away for years there is no ready means of estimating the amount of matter carried down stream.

The sloping cliff of sawdust against the high bank—large as it is—is merely a remnant. The annual waste from the mill goes over it into the water and may be seen along shore for some distance down stream. Many anglers pass this nuisance and comment on it, but I have never heard of any steps being taken to abate it.

The State Fisheries office informs me that it has "a list of over six hundred pollutions (of this kind) in the State," but that the law is defective, making prosecutions extremely difficult.

Paper and pulp mills use lime, caustic soda, sulphuric acid, etc., all of which are deadly to fish life when drained into streams.

Without further cataloguing of the injurious wastes liberated into streams from factories of all kinds, we may truthfully assert, with the support of numerous National and State fishery documents, that the maintenance of fish life is becoming impossible.

Our whole national system of disposing of wastes is an immoral one; the town and the mill can be kept clean, but the condition of the stream itself has been utterly disregarded.

In spite of the fact that there are laws in all States which prohibit the drainage of dangerous matter into public waters, there exist in factories without number secret waste pipes which are opened during the night, the outpourings of which are so deadly to fish life that the practice of operating them can only be named as dastardly.

We have lived under these conditions so long that we are used to them. It is the old case of each for himself, with no thought of the health, wealth or happiness of those farther down stream.

In many beautiful streams, where fishing is still possible, fishes have become uneatable through tainting of the water.

This is true in a greater degree of shad and other sea fishes which succeed in passing through the unspeakable waters of New York Harbor.

There are immense quantities of sawdust and other matter flowing in most of the streams of the Adirondacks. Washed down by freshets, these wastes are deposited in the beautiful lakes chiefly used for summer residence, rendering the water unfit for domestic and municipal use.

It has taken a quarter of a century to get pure food laws through Congress, and it will take longer to clean up the streams of the country, but it seems possible by concerted action of the anglers of America that our mountain streams can be cleared up, and in a very few years—soon enough for most of us to derive benefit from our labors. The results desired can only be secured by united effort.

By separating the higher waters from the general pollution problem, the angler can count on considerable support from towns using such streams for drinking water.

Important decisions have recently been made in New York respecting sawdust pollution, which affect more than 600 saw-mills in the northern part of this State, but the work of improving conditions can not be left with the courts and the State fishery officers. The latter are in some cases at least dominated by the very interests which cause the trouble.

The citizen—and best of all for this particular purpose, the organized angler-citizen—must be the active prosecutor.

Several angling associations have gotten good results in opposing stream pollution by organized effort, and have done away with small nuisances in their own neighborhoods. Cleaning up the mountain streams is undoubtedly the easiest part of the whole anti-pollution task.

If associations of anglers can get together for united action there is no reason why the work of preserving the angling waters can not rapidly be made successful. It seems better for the present to take up the struggle from the point of view of the angler and to confine the efforts to the head waters. In this way the work will be easier for boards of health in their labors for the purification of waters further down.

Anglers should be able to secure help from commercial fishermen everywhere, since market fishing, even when excessive, is not as bad as wholesale stream pollution, and they should also be able to secure the support of all communities desiring clean water for town use. As organized bodies they could exert a most

wholesome influence on the work of fishery boards in all the States.

The interests engaged in polluting our higher waters are not yet sufficiently powerful to claim everything for their side of the question. A reasonable amount of discussion ought to make it clear that the waters of our higher lakes and streams are vastly more valuable as sources of municipal water supply, for fisheries, and for summer homes, than they can possibly be to a minority of small manufacturers. It is to be expected that all industries concerned will protest vigorously, but they are still greatly in the minority, and therefore the prospects are hopeful.

Sawdust *can* be kept out of streams, and at a very moderate expense. The wastes of other mills can be kept on land, evaporated or otherwise treated. Water containing deleterious substance of all kinds can be settled, cleared, filtered, evaporated or purified by chemical processes. It is needless at the present time to argue against this point, since engineers everywhere understand methods of disposal suitable to various conditions.

Ice companies are already protesting against sewage discharge adjacent to their places of operation. Ice from sewage-polluted streams is likely to cause typhoid fever, as the germs are not destroyed by freezing.

It is not only possible to keep wastes out of the water, but it is possible to turn them into profit through valuable by-products. In many parts of Europe sewage is not only kept out of the waters but valued as fertilizer.

The struggle for the preservation of some of the inland lakes of New York against pollution has been carried on for some time and good results have been secured in several instances. The Merchants' Association of New York City has made a good beginning in its work for the preservation of the Hudson, and it is unlikely that any additional sewage systems will be permitted to pollute the river. The pollution of the Hudson begins well up stream in Washington, Warren and Saratoga counties, where the refuse from 63 mills and 121 villages is poured in. The mills alone throw in over a million pounds a day, and the death rates of towns on the Hudson are known to be dependent upon their position on the river, whether above or below extensive pollution.

Sewage trash from New York City loads the sea beaches of Long Island and the Jersey shore. Harbor pollution has gone on unregarded until the oyster beds within a wide radius of

the city have been affected and the oyster industry seriously damaged.

It is unnecessary to cite further instances of water pollution; object lessons are available in every community.

Every year enough fish fry goes into our streams and lakes to make the very best of angling within three or four years were the streams protected.

Can not angling associations at once begin the work of preserving our higher angling waters? Would it not be possible to form State organizations of anglers for this purpose?

List of Gifts
TO THE ZOOLOGICAL SOCIETY.

From January 1, 1907, to January 1, 1908.

- ABBOTT, F. H., New York City:
European Goldfinch, European Linnet, Japanese Robin, Tovi Parrakeet.
- ACED, MRS. E. A., Brooklyn, New York City:
Blue-and-Yellow Macaw.
- ANONYMOUS:
Canary.
- BEACH, MASTER LUDLOW FREY, Palatine Bridge, N. Y.:
Fox Squirrel.
- BECKER, JULIUS, New York City:
Guinea-Pig (3 specimens).
- BEEZ, MRS. J., New York City:
Bullfinch.
- BEHM, CARL, New York City:
Pilot Black-Snake.
- BENEDICT, E. C., Indian Harbor, Greenwich, Conn.:
Great Blue Heron.
- BOEHN, MATA, Briarcliffe Manor, N. Y.:
Tovi Parrakeet (2 specimens).
- BOURST, KARL, New York City:
Rhinoceros Iguana.
- BRADFORD, MRS. L. C., Brooklyn, New York City:
Blue Jay.
- BREMER, RUSSELL H., New York City:
Alligator.
- BRIDGES, CAPT., S. S. "Italia," New York City:
Duck Hawk, European Quail (5 specimens).
- BRISTOL, PROF. C. L., University Heights, New York City:
Marine Toad.
- BROTHERTON, MISS SARAH E., North Pelham, N. Y.:
White Rabbit.
- BROWN, G. J.:
Great Blue Heron.
- BROWN, GEORGE A., New York City:
Opossum.
- BULL, DAVID M., University Heights, New York City:
Broad-Winged Hawk (2 specimens).
- BURKHARDT, L. M., Newark, N. J.:
Red-Tailed Hawk.
- BURRELL, ALEXANDER M., Atlas S. S. Line, New York City:
Rail.
- BUTLER, CYRUS W., St. Petersburg, Fla.:
Hutia.
- BUTTERY, HAROLD, Norwalk, Conn.:
Red-Shouldered Hawk (2 specimens).
- CADY, MASTER PIERRE, Bloomfield, Essex County, N. J.:
48 Red-Backed Salamanders, 6 Common Frogs, 20 Green Frogs, 21
young Painted Turtles, 7 Salamanders. Total, 102 specimens.

- CHANDLER, MISS VIOLA, New York City:
American Chamoleon.
- CHERRIE, GEORGE K., Brooklyn, New York City:
2 Eggs of Hoatzin, taken from the nest on the Orinoco.
- CROPSEY, ANDREW G., Stoney Brook Farm, N. Y.:
Green Snake.
- CROSS, G. E., New York City:
Alligator.
- DADE, PETER, S. S. "Siberia," New York City:
Margay Cat.
- DAMMAM, H., New York City:
Green Heron.
- DEEKERT, RICHARD, New York City:
Bull Frog (2 specimens).
- DITMARS, RAYMOND L., New York City:
Ocelot.
- DODD, DR. EDWARD, Babylon, N. Y.:
Great Horned Owl.
- DOOLITTLE, WILLIAM, Far Rockaway, L. I.:
Alligator (2 specimens).
- DREW, J. A., Brooklyn, New York City:
Red-and-Blue Macaw.
- DUFFNER, MRS., New York City:
Box Turtle.
- ELIASON, CARL, Hollandale, Fla.:
Corn Snake, Mud Puppy.
- ELLIFFE, RICHARD E., Bedford Park, New York City:
Saw-Whet Owl.
- FLACK, H. F., Bronxwood Park, Williamsbridge, New York City:
Alligator.
- FORBES, MRS. A., Brooklyn, New York City:
Pea Dove, Albino Barbary Turtle Dove, Amazon Parrot.
- GAULTON, J. H., Brooklyn, New York City:
Least Bittern.
- GLAESSER, MISS F., New York City:
Chinese Turtle (2 specimens).
- GOEPEL, MISS MINNIE, New York City:
Yellow-Headed Amazon Parrot.
- GOETT, EDWARD, New York City:
Garter Snake (5 specimens), Green Snake, Storer's Snake.
- GORDON, MRS. GEORGE, New York City:
Amazon Parrot.
- GRIGG, MASTER J. R., New York City:
Box Tortoise.
- GRIGG, JOSEPH W., New York City:
Texas Horned Lizard.
- GRUNEWALD, MISS E., New York City:
Capuchin Monkey.
- HAMILTON, HENRY, Van Nest, New York City:
Alligator.
- HAND, MRS. CHARLES W., New York City:
White-Nosed Monkey.
- HARRIMAN, E. H., New York City:
Kodiak Bear (2 specimens).
- HAY, HENRY, New York City:
Screech Owl.
- HERTZ, VICTOR, New York City:
Guinea Fowl (4 specimens).

- HICOK, DE LOS, Fordham, New York:
Black Snake; Water Snake.
- HITZEL, AUGUST, New York City:
Russian Bullfinch.
- HOLLIS, W. STANLEY, American Consul, Lorenzo Marquez, Portuguese
East Africa:
Mozambique Grass Monkey.
- HOLZER, MRS. JOHN W., New York City:
Great Horned Owl.
- HOOD, MR., New York City:
Ring-Necked Parrakeet.
- HOOPER, A., Brooklyn, New York City:
Gray-Headed Love-Bird.
- HUBBELL, GEORGE W., New York City:
Screech Owl (3 specimens).
- HUBER, MISS H. INNIS, New York City:
Tovi Parrakeet (2 specimens).
- HULME, G., New York City:
Alligator.
- HUMMEL, EMIL O., U. S. Militia Training Ship "Granite State," New
York City:
Ring-Tailed Monkey.
- HYDEMANN, SIDNEY, New York City:
Alligator.
- ILLWITZER, THOMAS, New York City:
Alligator.
- JACKSON, MRS. ROBERT G., Yonkers, New York:
Bonneted Capuchin Monkey.
- JACOBUS, DAVID DINKEL, Jersey City, N. J.:
Alligator.
- JAKAB, MRS. J., New York City:
Florida Terrapin (2 specimens).
- JOHNSON, ELBERT L., New Rochelle, N. Y.:
Broad-Winged Hawk.
- KELLY, MRS., New York City:
Lesser Sulphur-Crested Cockatoo.
- KINLOCK, MISS M. E., Staten Island, N. Y.:
Alligator.
- KIPP, FRANK A., New York City:
Red Fox.
- KNEZEK, CHARLES, New York City.
Blue-Fronted Amazon Parrot.
- KOZIELL, T. W., New York City:
Monkey.
- KRAPOHL, HENRY, New York City:
Screech Owl.
- LAUDER, GEORGE, Greenwich, Conn.:
Woodchuck.
- LAWRENCE, WILLIAM A., New York City:
Yucatan Deer.
- LEMMON, MISS ISABEL McC., Englewood, N. J.:
White-Fronted Amazon Parrot.
- LITTEL, MRS. H. M., New York City:
Yellow-Headed Amazon Parrot.
- LUDEWIG, GEORGE O., Laguna de Terminos Camp, Mexico:
Double-Striped Thicknee (2 specimens), Globose Curassow (2
specimens).
- MCCLELLAND, THOMAS, New York City:
Alligator.

- McVICAR, FRED., Mount Vernon, N. Y.:
Black Snake, Hog-nosed Snake, Garter Snake, Ribbon Snake (13 specimens).
- MARCKRES, GEORGE M., Sharon, Conn.:
Pine Grosbeak (2 specimens).
- MEAD, B. A., Mount Kisco, N. Y.:
Hog-Nosed Snake (2 specimens).
- MERGENTHALER, C., New York City:
English Pheasant.
- MESSNER, CHRISTIAN, New York City:
Canary.
- METZGER, MRS., New York City:
Canary (13 specimens), Java Sparrow.
- MILLER, C. F., East Orange, N. J.:
38 Striped Snakes, 53 Water Snakes, 14 Brown Snakes, 19 Painted Turtles, 11 Spotted Turtles, 82 White Rats, 4 Snapping Turtles, 1 Muhlenberg's Turtle, 4 Bull Frogs, 62 Pond Frogs, 59 Garter Snakes, 10 Musk Turtles, 12 Box Turtles, 5 Wood Turtles, 10 Wood Frogs, 6 Leopard Frogs, 30 Salamanders, 14 Green Snakes, 1 Pickering's Tree Toad, 1 Common Tree Toad, 1 Ring-Necked Snake, 1 Mounted specimen of Muhlenberg's Turtle. Total, 438 specimens.
- MILLS, MISS STELLA, Kingsbridge, New York City:
Blue Jay.
- MOLFENTER, MRS. CHARLES, New York City:
Screech Owl.
- MORGAN, C. W., New York City:
Cotton-Headed Marmoset, Raccoon.
- MORI, MRS. T., Arrochar Park, Staten Island, N. Y.:
Monkey.
- MOSELEY, PROF. H. L., Sandusky, Ohio:
Water Moccasin.
- MOTT, 3d, JORDAN LAWRENCE, New York City:
Barred Owl.
- MULLER, WILLIAM H., Brooklyn, New York City:
White Rat (40 specimens).
- MUSEUM OF THE BROOKLYN INSTITUTE OF ARTS AND SCIENCES, Brooklyn, New York City:
Opossum (2 specimens).
- NIENABER, CHARLES, New York City:
Red Fox.
- O'DONNELL, MASTER EDWIN, New York City:
Angora Guinea-Pig (3 specimens).
- OLSEN, MASTER LAWRENCE, New York City:
Angora Guinea-Pig.
- PALM, GEORGE, Mount Vernon, N. Y.:
Horned Lizard.
- PEAVEY, ROBERT W., Rockaway, L. I.:
Hog-Nosed Snake (15 Specimens).
- PEDERSEN, P. G. C., Steamship "Oscar II," Hoboken, N. J.:
Curlew.
- PERILLO, V., New York City:
Ruby-Throated Hummingbird.
- PETRY, FRANK, New York City:
Alligator.
- PFUFF, JOHN, West Orange, N. J.:
Woodchuck.
- PIERCE, MRS. C. H., New York City:
Cuban Solitaire (2 specimens), Mockingbird, Cardinal, Song Thrush.

- PORTER, W. H., New York City:
Roseate Cockatoo.
- PRECHTEL, JOHN, Weehawken Heights, N. J.:
Hawkshill Turtle, Rough-Eyed Caiman.
- PRESCOTT, CAPT. C. D., Steamship "El Dorado," New York City:
American Osprey.
- RANDOLPH, EDGAR F., Morristown, N. J.:
Ferruginous Rough-Legged Hawk.
- RAYMOND, MRS. J. C., New York City:
Blue-Fronted Amazon Parrot.
- REA, MISS SUSIE, New York City:
Australian Cavy.
- REYNOLDS, THOMAS, Brooklyn, New York City:
Roseate Cockatoo.
- RICE, M. A., New York City:
Pig-Tailed Monkey (2 specimens).
- RIDER, GEORGE H., Buffalo, N. Y.:
Texas Rattlesnake (3 specimens).
- ROCK, WILLIAM R., New York City:
Golden Agouti.
- ROGERS, ARCHIBALD, Hyde Park, New York:
Copperhead Snake.
- ROLF, MRS. IDA, New York City:
Alligator.
- ROMER, MRS. P., New York City:
Roseate Cockatoo.
- ROSENTHAL, ARTHUR, Mount Vernon, N. Y.:
Alligator.
- SATTLER, GEORGE, New York City:
Sora Rail.
- SCHLANCH, W. S., New York City:
Tovi Parrakeet.
- SCHMIDT, CONRAD, New York City:
European Blackbird.
- SHAW, R. E., Esmont, Va.:
Green Snake, Brown Snake.
- SHOEMAKER, MRS. HENRY, Riverside, Conn.:
Ring-Tailed Monkey, White-Throated Sapajou.
- SIEVERS, A. H., New York City:
Coati Mundi.
- SMITH, CHARLES, New York City:
Snapping Turtle, Painted Turtle.
- SMITH, ROBERT H., Portchester, N. Y.:
Fox Squirrel.
- SNOWDEN, ALEXANDER O., Peekskill, N. Y.:
Angora Guinea-Pig (2 specimens).
- SNYDER, GEORGE W., Cumberland, Md.:
Timber Rattlesnake (2 specimens).
- STEBBINS, MRS. E., New York City:
Angora Guinea-Pig.
- STEEB, T. HAROLD, Sparkill, N. Y.:
Bat.
- SUMNER, DR. F. B., Woods Hole, Mass.:
Loon.
- TALKAY, MARIE, New York City:
Alligator.
- THOMSON, JOHN R., Hobart, N. Y.:
Great Horned Owl.

- TOWNSEND, MRS. A. D., Clifton, Staten Island, N. Y.:
Painted Turtle.
- TOWNSEND, D., Mohegan, N. Y.:
Gray Squirrel (2 specimens).
- TRENT, H. L., New York City:
Green Snake, Copperhead Snake (3 specimens).
- TURNER, R., New York City:
Alligator.
- VENTURINI, MRS. A., New York City:
Large-Spotted Genet.
- VETTERMAN, MASTER ARTHUR, New York City:
Gray Squirrel.
- VON KROCKOW, GNEOMAR, New York City:
Garter Snake (20 specimens), Water Snake, Hog-Nosed Snake,
Snapping Turtle, Box Turtle.
- WARMBOLD, WALTER, New York City:
Tovi Parrakeet.
- WEILER, MRS. H., Bedford Station, N. Y.:
Peacock.
- WESTERMANN, MASTER AUBREY, Mount Vernon, N. Y.:
Angora Rabbit.
- WHITMAN, PROF. C. O., Chicago, Ill.:
Oriental Turtle Dove (2 specimens).
- WILDFOESTER, W., New York City:
Hog-Nosed Snake.
- WILSON, HARRIS, New York City:
Great Horned Owl.
- WORTH, WILLIAM A., New Rochelle, N. Y.:
1 Blacksnake, 1 Ribbon Snake, 14 Garter Snakes, 2 Milk Snakes, 1
Water Snake, 1 De Kay's Snake. Total, 20 specimens.
- YANGER, MISS ELIZA F., Newark, N. J.:
Wilson Petrel.

Gifts of Plants.

- DENICKE, J. B., New York City:
1 *Agave Americana*.
- GALLATIN, MRS. J. N., New York City:
1 7-foot Rubber Plant.
- GRASS, H., New York City:
1 *Latania*.
- KOCH, H. C., New York City:
1 Rubber Plant.
- VAN WIE, MRS. S. A., New York City:
1 *Pittosporum tobira*.
- VICKERY, FRED., Mount Vernon, N. Y.:
2 Agaves, 1 *Opuntia* Cactus, 2 *Latantias*, 1 *Kentia*, 2 Rubber Plants,
1 *Begonia*, 1 *Fuchsia*, 1 *Oxalis*.

List of Gifts

TO THE NATIONAL COLLECTION OF HEADS AND HORNS.

(April 1, 1907, to April 1, 1908.)*

BRADLEY, J. R.:

Coke Hartebeest. Mounted head.
Impala Antelope. Mounted head.
Atlantic Walrus. Mounted head.
Siberian Argali. Mounted head.
Waterbuck. Mounted head.

BROWN, ALEXANDER, Bryn Mawr, Pa.:

Greater Kudu. Horns.

EMMONS, LIEUT. G. T., Princeton, N. J.:

Bear claw of enormous length, from Kiskka Village, Nass River,
British Columbia.

GLEASON, DEXTER M., Woodford, Vt.:

White-Tailed Deer. Spike Antlers.

GRANT, MADISON:

Pacific Walrus. Tusks, probably largest known.
White Mountain Sheep. Mounted head. Female. From fifty miles
west of mouth of the Mackenzie River, Canada.
White Mountain Sheep. Mounted head. Young male. Same locality.

HARRISON, GEORGE L., JR., Philadelphia, Pa.:

Waterbuck. Mounted head. Grant Gazelle. Mounted head.
White-Eared Cob. Mounted head. Female.
Addra Gazelle. Mounted head. Red-Fronted Gazelle. Mounted head.
Male. Thomson's Gazelle. Mounted head.
Addra Gazelle. Mounted head. Grant Gazelle. Mounted head.
Female. Coke Hartebeest. Mounted head.
Dorcas Gazelle. Mounted head.

Dorcas Gazelle. Horns.
Two Lion Skulls.
Grant Gazelle. Skull and scalp. Male.
Impala. Scalp.
Reedbuck. Skull and horns.
Tora Hartebeest. Skull and horns.
Soemmerring Gazelle. Skull, Horns and scalp.
Abyssinian Bushbuck. Skull and horns.
Abyssinian Buffalo. Scalp.

*The objects in this list of gifts to the Heads and Horns Collection will be described in Part II of the annual publication devoted to this collection, shortly to appear.

JAMRACH, WILLIAM, London, England:

Tibetan Argali. Horns and skull.
 Chiru; Tibetan Antelope. Horns.
 Wild Yak. Horns.

KAEGBEHN, FERDINAND, Hoboken, N. J.:

Arizona Elk. Antlers.
 Pamir Stag. Antlers on skull.
 Desert Mule Deer. Antlers.
 Olympic Elk. Antlers.
 American Beaver. Skull.
 Mule Deer. Antlers.
 Necklace of Buffalo Teeth.
 Collection of old copper prints of wild animals, by Johann Elias
 Ridinger. Seven large prints, twenty-five display-size and fifty
 folio-size. Subjects, principally red deer, fallow deer and roebuck.

LEONARD, THOMAS D.:

American Elk. Mounted head. Jackson's Hole, Wyoming.

MCMILLIN, EMERSON. The "Reed Collection," as follows:

1 Alaskan Moose. Mounted head.
 5 Alaskan Moose. Antlers and skulls, with head skins.
 5 Grant Caribou. Mounted heads.
 1 Osborn Caribou. Mounted head.
 3 White Mountain Sheep. Mounted heads.
 7 White Mounted Sheep. Horns, skulls and head skins.
 5 Alaskan Brown Bear. Mounted heads.
 1 Black Bear. Mounted head.
 3 Alaskan Brown Bear. Rugs, with heads mounted.
 1 Alaskan Brown Bear. Skull.
 2 Pacific Walrus. Mounted heads.
 7 Pairs Walrus Tusks.

MARTIN, JAMES S.:

White Mountain Goat. Mounted head. Female.
 White Mountain Goat. Mounted head. Young Male.

MITCHELL, MASON, American Consul, Chungking, China.

Szechuan Takin, (*Budorcas taxicolor szechuan*). Male. Skin, skull
 and horns.

NORTON, JOHN W., Cazenovia, N. Y.:

American Elk. Mounted head. Female.
 Prong-Horned Antelope. Mounted head. Female.
 Mule Deer. Mounted head. Female.
 Crawshay Waterbuck. Skull, horns and head skin.
 Common Waterbuck. Skull, horns and head skin.
 Common Waterbuck. Skull, horns and head skin.
 Grant Gazelle. Skull, horns and head skin.
 Grant Gazelle. Skull, horns and head skin.
 Eland. Skull, horns and head skin.
 Greater Kudu. Skull, horns and head skin.
 Baker Roan Antelope. Skull, horns and head skin.
 Impala. Skull, horns and head skin.
 Ward Redunca Antelope. Skull, horns and head skin.
 Ward Redunca Antelope. Horns on skull.
 Impala. Horns on skull.
 Coke Hartebeest. Horns on skull.

PIKE, RUTHVEN W.:

Wild Reindeer. Antlers.

PIKE, WARBURTON, Victoria, B. C.:

Musk-Ox. Mounted head.

RANDOLPH, EDGAR F., Morristown, N. J.:

Marsh Deer. Antlers.

Swamp Deer. Antlers.

Addax. Antlers.

SAMPSON, HENRY JR., and E. H. LITCHFIELD, JR.,:

Big-Horn Mountain Sheep. Mounted head.

SAUTER, FRED.:

Wild Reindeer. Antlers.

WHITNEY, CASPAR:

Wood Bison. Mounted head.

Gifts to the Aquarium.

ANTHONY, MASTERS BURR and STEPHEN, New York City:

Young Alligator (2 specimens).

BADCOCK, EDWARD HOWARD, JR., Brooklyn, N. Y.:

Young Alligator.

BAKER, MRS. FLORENCE, New York City:

Japanese Gold Fish (3 specimens).

BEEMAN, H. W., New Preston, Conn.:

100 Young Black Bass, 40 Yellow Perch.

BENJAMIN, MASTER GILBERT S., Ridgewood, N. J.:

Spotted Turtle.

BISHOP, HENRY, Baltimore, Md.:

Fancy Gold Fish (15 specimens).

BOUTON, MRS. KATHERINE, Glen Ridge, N. J.:

Muhlenberg Turtle (2 specimens).

BRAMSON, MR. MAX, Brooklyn, N. Y.:

Painted Turtle.

BROWNE, C. E., Highland, Ulster County, N. Y.:

Snapping Turtle.

BRUCE, E. K., JR., Thornburg, Iowa:

Japanese Gold Fish (12 specimens).

BURNS, MASTER ELAN, Silver Lake, S. I.:

2 Box Tortoise.

BURROUGHS, MRS., Brooklyn, N. Y.:

Young Alligator.

CAMPBELL, ALEXANDER, Jersey City, N. J.:

Box Tortoise.

CHESEBRO BROS., New York City:

Albino Diamond-Backed Terrapin.

- COMMISSIONERS INLAND FISHERIES AND GAME (*through Mr. L. T. Carleton*), Augusta, Maine:
 Collection of large Brook and Brown-Trouts and Landlocked Salmon.
- COOPER, G. D., 1142 Deane Street, Brooklyn, N. Y.:
 Young Alligator.
- CORONELL, HARRY, Brooklyn, N. Y.:
 Fancy Gold Fish.
- CROFTS, C. K., New York City:
 Young Alligator.
- DAVIS, A. B., Wading River, L. I.:
 Pickerel (30 specimens).
- DOTY, MISS KATE, New York City:
 6 Crabs, 1 Frog.
- DUBOIS, MASTERS CUSHING and TOM, Brooklyn, N. Y.:
 7 Painted Turtles, 4 Spotted Turtles.
- EMBERSON, HARRY, New Rochelle, N. Y.:
 Horseshoe Crabs (3 specimens).
- FIELD, WILLIAM B., Osgood, New York City:
 Diamond-Backed Terrapin (2 specimens).
- FIETZSCH, W. R., Brooklyn, N. Y.:
 Painted Turtle.
- FRIEND, CHARLES, New York City:
 Painted Turtle.
- GANONG, W. J., New York City:
 Painted Turtle.
- GARDNER, MISS M., New York City:
 Painted Turtle.
- GOULD, GEORGE, JR., New York City:
 Loggerhead Turtles (2 specimens).
- HALVORSEN, MASTER EDWARD, Brooklyn, N. Y.:
 Painted Turtle (5 specimens).
- HAMBURGER, MRS. L., New York City:
 Young Alligator.
- HAMILTON, ARTHUR A., New York City:
 Alligators (5 specimens).
- HARRIMAN, C. E., New York City:
 Mud Puppy (*Necturus*).
- HECKENMECK, MRS., Brooklyn, N. Y.:
 Tortoise (3 specimens).
- HEINRICK, ARTHUR O., Baldwin, L. I.:
 Collection of Fishes.
- HELD, C. W., New York City:
 File Fish.
- HIRSCH, ARTHUR, New York City:
 Young Alligator.
- HONGROI, MISS, New York City:
 Painted Turtle.
- JOHANN, W., Brooklyn, N. Y.:
 14 Painted Turtles, 3 Spotted Turtles, 3 Snapping Turtles.
- JOVINE, J., New York City:
 Young Alligator.
- KOCK, W. H., New York City:
 Young Alligator (2 specimens).
- KOMISKY, MISS ROSE, New York City:
 Spotted Turtle.
- LEARY, JOHN L., Supt. Bureau of Fisheries Station San Marco, Tex.:
 Blind Salamander (*Typhlomolge rathbuni*).
- LOHSE, H., New York City:
 Young Alligator (3 specimens).

- LOSEY, HARRY, Astoria, Queens, New York:
Painted Turtle, 2 Musk Turtles.
- LOYD, MR., North White Lake, New York:
Snapping Turtle (3 Specimens).
- LYNCH, GEORGE F., New York City:
Young Alligator (2 specimens).
- MACNAMARA, MISS ELIZABETH, Brooklyn, N. Y.:
Young Alligator.
- MAYER, DR. A. G., Dry Tortugas, Florida:
Collection of Red Land Crabs.
- MEISSNER, MASTERS CHARLES and LAWRENCE, Brooklyn, N. Y.:
Large Snapping Turtle.
- MILLS, MASTER ANDERSON, Brooklyn, N. Y.:
Horseshoe Crab.
- MINI, EDWIN, New York City:
Young Alligator.
- MISSING, MRS. CHARLES, Brooklyn, N. Y.:
Snapping Turtle.
- MURDEN, MASTER W., New York City:
Painted Turtle.
- NEW ENGLAND FOREST, FISH AND GAME ASSOCIATION, Boston, Mass.:
Collection of Salmon, Trout and Game Fishes.
- NEWMAN, ERNEST, Brooklyn, N. Y.:
Diamond-Backed Terrapin.
- NEW YORK FOREST, FISH AND GAME COMMISSION (*through C. H. Walters,
Cold Spring Harbor, L. I.*):
1,000,000 Smelt Eggs, 3,000 Rainbow-Trout Eggs.
- NIGHMAN, MRS. CHARLES, Bayonne, N. J.:
Young Alligator.
- OWENS, C., Hoboken, N. J.:
Gopher Tortoise.
- PHILLIPS, MASTER THOMAS, New York City:
Collection of Frogs and Tadpoles.
- PYKE, F. H., New York City:
Alligator.
- REDFIELD, MASTER EDWARD, Closter, N. J.:
35 Newts, 2 Spring Frogs, 2 Wood Turtles, 1 Muhlenberg, Turtle,
Quantity of Frog Spawn.
- REID, FRED. L., New York City:
Painted Turtle (2 specimens).
- SEALE, W. P., Delair, N. J.:
Collection of Water Plants.
- SMITH, MASTER EBURNE R., Midvale, N. J.:
Wood Turtle.
- STUART, MASTER LYMAN KNIGHT, Sodus Point, N. Y.:
Soft-Shelled Turtle (9 specimens).
- SUMNER, DR. F. B., Director Marine Biological Laboratory, Woods Hole,
Mass.:
Great Northern Loon.
- TOWNSEND, C. H., New York City:
Fresh-Water Crayfish (12 specimens).
- TRUSHEIM, ALFRED, Brooklyn, N. Y.:
Painted Turtle.
- UNITED STATES BUREAU OF FISHERIES, Washington, D. C. (*through Hon.
Geo. M. Bowers, Commissioner*):
Harbor Seal, Fish Eggs as follows: 20,000 Brook Trout, 10,000
Rainbow Trout, 10,000 Whitefish.
- VANDONBROOK, MR., New York City:
Painted Turtle.

- VAN FENGADO, A., Jersey City, N. J.:
Young Alligator.
- VAN KEUREN, RUSSELL P., Honesdale, Pa.:
4 Paradise Fish, 22 Tadpoles, 97 Newts, 4 Banded Sunfish.
- WELLS, BROOKS H., New York City:
Box Tortoise.
- WILLIAMS, C. A., New York City:
Spotted Turtle.
- WATSON, CAPT. PERCY, S. S. "Castle of Muncaster," New York:
Paradise Fishes (9 specimens).
- WEINES, JOHN, New York City:
Mantis Shrimp.
- WINANS, MISS LILLIAN and MASTERS CLARENCE and EDWARD, Arlington, N. J.:
Young Alligator.
- WOASSNER, MRS., New York City:
Young Alligator.
- WOODS, FRANK, New York City:
Collection of Star Fishes.

Gifts to Aquarium Library.

- BARNES, A. S., & Co., New York City:
How to Teach Nature Study.
Outlines for Primary and Kindergarten Classes.
Lessons in Nature Study.
The Spirit of Nature Study.
- CARNEGIE INSTITUTION OF WASHINGTON, Washington, D. C.:
Publications on aquatic and marine life.
- HOEN, MESSRS. A., & Co., Baltimore, Md.:
16 Plates Fishes of Samoa.
20 Plates Fishes of Alaska.
- ILLINOIS LABORATORY OF NATURAL HISTORY (through Director S. A. Forbes), Urbana, Ill.
Bulletins Illinois Laboratory of Natural History.
- LYON, J. B., & Co. (through C. M. Winchester, General Manager), Albany, N. Y.:
Collection of colored plates of fishes of New York.
- MARK, DR. E. L., Harvard University, Cambridge, Mass.:
Contributions from the Zoological Laboratory 186-189.
- NEW JERSEY FISH AND GAME COMMISSION (through Benj. P. Morris, President), Long Branch, N. J.:
Reports, New Jersey Fish Commission, 1903-4-5.
- NEW JERSEY STATE MUSEUM (through S. R. Morse, Curator), Trenton, N. J.:
Amphibians and Reptiles of New Jersey.—Fowler.
- NEW YORK FOREST, FISH AND GAME COMMISSION (through Hon. J. S. Whipple, Commissioner), Albany, N. Y.:
Report of New York Forest, Fish and Game Commission, 1902-03.
- TOWNSEND, C. H., New York City:
Synopsis of Fresh-water Mussels.—Simpson.
Story of Life in the Seas.—Hickson.
- SMITHSONIAN INSTITUTION OF WASHINGTON, Washington, D. C.:
Reports and other publications for 1907.
- U. S. FISHERIES BUREAU (through Hon. George M. Bowers, Commissioner), Washington, D. C.:
Reports and other publications for 1907.
- ZEESE-WILKINSON Co., New York City:
Colored plates of crawfishes.

Purchases.

STEAMER "ANGLER"—Collections from the "fishing banks" off the New Jersey Coast:

163 dogfish, 391 skates, 74 sculpins, 20 starfish, 134 mutton fish, 3 horse mussels, 10 barndoor skates, 2 codfish, 337 sea ravens, 11 anglers, 31 blackfish, 16 stone crabs, 34 bergalls, 2 specimens Neptune's ruffles, 4 hake, 95 sea robins, 6 spider crabs, 4 sea anemone, 10 sea bass, 1 channel crab, 15 fluke, 1 young green turtle, 3 porgy, 3 puffer, 2 large blue sharks, 5 specimens of coral.

JACOB SCHNOOR, Port Monmouth, N. J.:

4 large sturgeons.

EGGELING, OTTO, New York City:

3 *Siren lacertina*.

KNOLL, LOUIS, & SONS, New York City:

12 frogs, 6 turtles.

MCDONALD, MRS. JANET, Bayville, Maine:

4 harbor seals.

NEW ENGLAND FOREST, FISH AND GAME ASSOCIATION, Boston, Mass.:

16 brook trout, 21 burbot, 10 brook suckers, 1 quillback, 4 red horse, 49 yellow catfish, 15 channel catfish, 11 gold fish, 18 yellow perch, 12 sauger pike, 4 pike perch, 14 mud fish, 6 bull heads, 6 eels, 5 pumpkin seed, 4 rock bass, 7 mud puppy, 5 muscalunge, 1 pickerel.

Tropical fishes from Bermuda:

10 mud parrot fish, 3 red-finned parrot fish, 6 green parrot fish, 10 blue parrot fish, 2 yellow tails, 6 cow fish, 25 hinds, 20 Nassau groupers, 3 princess rock fish, 3 spotted morays, 48 squirrel fish, 23 surgeon fish, 2 blue tang, 12 yellow grunts, 6 blue-striped grunts, 9 angel fishes, 1 porcupine fish, 16 four-eyes, 4 trunk fish, 10 coney, 1 hog fish, 1 spiny lobster, 1 queen trigger fish, 1 spot snapper, 1 red grouper, 13 common trigger fish.

NEILSEN, ALEX., Venice, Erie County, O.:

12 turtles (3 species), 12 *Necturus*.

BOUTEN, MISS GLADWIN, Glen Ridge, N. J.:

Muhlenberg turtle.

FRENCH, DR. CECIL, Washington, D. C.:

1 harbor seal.

By Exchange.

DETROIT AQUARIUM, Detroit, Mich.:

3 lake sturgeons, 12 pike, 5 burbot, 12 pike perch, 5 stone rollers, 15 rock bass, 9 white bass, 5 common suckers, 13 crappie, 2 muscalunge, 2 spotted catfish.



MEASURING THE AFRICAN ELEPHANTS, "KARTOOM" AND "SULTANA."

REPORT OF THE VETERINARIAN.

By W. REID BLAIR, D.V.S.

THE annual death rate is greatly influenced by the condition in which the new animals are received. During the past year an unusual number of monkeys, such as sapajous and marmosets, were presented. On examination many of these were found to be in the last stages of "cage paralysis," or were so otherwise diseased and emaciated as to be unfit for exhibition in our cages. There were a number of tubercular cases among those presented. Of the animals acquired in this way seventeen died or were destroyed while under quarantine control, so that this number might fairly be excluded from figuring in our death rate for 1907.

Distemper.—For the first time in several years we have had a considerable number of distemper cases, all of which, however, were confined to the animals in the Small-Mammal collection. The disease first appeared in a South American wild dog, a recent arrival, confined in the Small-Mammal House. Within a week's time more than a dozen cases were found, affecting a hyaena dog, South American wild dogs, coati mundi, squirrels, civit cat and desert foxes.

All the infected animals were immediately isolated, and the cages thoroughly disinfected daily with steam and a creolin solution. These measures succeeded in confining the disease to the north end of the building. In practically all of the cases conjunctival congestion was one of the earliest and most constant symptoms—swollen eyelids and red mucosa, with weeping. Within twenty-four hours the watery tears became muco-purulent, matting together the lashes and eyelids.

Diarrhea set in early, and the fecal discharges, at first black and pasty, soon became mixed with mucus, and even blood. The abdomen was tense and contracted; and weakness and prostration came rapidly. Several of the cases showed marked nervous symptoms from the beginning of the attack. These were particularly pronounced in the case of the hyaena dog, as well as in both Azara dogs. The animals were very restless, frequently getting up and moving about, twitching the muscles of the face and limbs and rolling the eyes. Epileptic attacks appeared in the

early stages of the disease. These spasms would follow each other in rapid succession. Tonic spasms affected the muscles of the neck, causing the head to be turned rigidly to one side. In the nervous form, death usually took place on the second or third day after the first symptoms were noted.

In several of the cases in which the appetite was not entirely lacking, and in which we succeeded in administering medicines, recovery took place in about three weeks. A South American wild dog, two coati mundis, two opossums and a raccoon dog have entirely recovered, but have not yet been returned from the hospital cages.

The skin eruptions which are observed in such a large proportion of the cases of distemper seen among domestic animals have rarely been observed by me among our wild animals.

Gastro-Enteritis.—This disease, which has always been an important factor in the death rate of former years, especially among our native American hoofed animals, has been much less troublesome than formerly. More cases have occurred among the animals on Mountain Sheep Hill than elsewhere. A number of animals which have suffered repeated attacks of gastro-enteritis while occupying that installation are now enjoying good health in the Small-Deer House or in small macadamized corrals elsewhere. Notable cases are the chamois, markhor and arcal sheep.

There were a number of cases of acute gastro-enteritis among the smaller carnivores in the Small-Mammal collection. The symptoms in these cases were: refusal of all food, vomiting and diarrhea. The fecal discharges contained much blood-streaked mucus. In fatal cases death usually took place on the second or third day, the autopsy showing acute inflammation of the mucosa of the stomach and small intestines. Usually there was a small amount of partially digested food in the stomach. In those cases medication was of no avail, as the animals refused all food or drink so persistently that no medicines could be introduced.

Tuberculosis.—No cases of tuberculosis have occurred outside the primates collection.

Exclusive of the cases which died or were destroyed while in quarantine, there were eight cases of tuberculosis among the primates. Unfortunately, of this number the disease claimed two of the oldest inmates of the collection. The orang "Dohong" was found to be hopelessly infected, and was consequently chloroformed. The chimpanzee "Polly" died of generalized tuberculosis a few months later. The other cases of tuberculosis were principally among the lemurs.

Cage Paralysis.—Aside from the animals destroyed while in quarantine four cases occurred in our primate collection. Two of these were animals that had been in captivity four or five years. All were chloroformed just as soon as it was evident that they were passing into the terminal stage of the affection. A moor macaque, which was badly affected with cage paralysis some two years ago, has entirely recovered, with all signs of muscular atrophy and paresis entirely gone.

In addition to the administration of phosphates of lime, pure olive oil is now being given in some cases, apparently with very beneficial results. The oil is given in very small quantities at first, generally mixed with egg and milk, but it is found that the animals soon acquire a taste for the oil, after which it can be given in larger quantities. When given in small quantities the oil is easily digested and assimilated, and in a few weeks the animals take on flesh. One of the first effects noted from the oil is the improvement in the general appearance. The skin is less dry, and the hair takes on a luster which has been lacking.

Meat-Poisoning.—"Princeton," our youngest tiger, died of meat-poisoning during the past summer. He had not exhibited any symptoms whatever, but on the keeper's inspection in the morning he was found dead in his sleeping-box.

On examination, the stomach and small intestines were found to contain a large amount of half-digested, foul-smelling flesh. This meat was chocolate-colored and covered with mucus. The mucous membranes, especially those of the stomach, were swollen and congested. The muscular tissue of the heart was very soft and flabby, the blood imperfectly coagulated and granular in appearance, the liver much enlarged and showing signs of rapid decomposition. The spleen was greatly swollen and infiltrated with hemorrhagic areas. The lymph nodes of the mesentery were also enlarged.

The phenomena of meat-poisoning are essentially those of septic gastro-enteritis, the symptoms being vomiting, diarrhea and great prostration, quickly followed by collapse. Strange as it may seem, illness sometimes results from feeding meat apparently perfectly normal in appearance and taste. As a poisonous agent consists partly of bacteria and partly of ptomaines, the poison is only weakened by cooking the meat, but is not entirely removed by that process. Owing to the violence of the symptoms the trouble may be easily mistaken for mineral poisoning.

Aneurism and Thrombus with Rupture of the Left Internal

Iliac Artery in a Zebra.—On March 27 the Grant zebra mare delivered a dead foal, which apparently had been carried the full gestation period. Soon afterward she began gradually to fail in health without presenting any acute or marked symptoms of disease. Notwithstanding a remarkably good appetite, she gradually declined, exhibiting emaciation and weakness. Atrophy was most prominent in the hind limbs. During the summer she was transferred to and allowed to range in the buffalo pasture, where besides grazing she was fed daily with grain and hay. No improvement was noted in her condition, but it was noticed that, especially after slight exertion, there was a trembling of the hind limbs. This, however, would disappear after resting a little while.

After showing intermittent attacks of lameness in the hind limbs for several weeks, she was found dead in the pasture on October 10. On post-mortem examination the pelvic and abdominal cavities were found to contain a great amount of blood. The muscular and connective tissue of the left leg was deeply infiltrated with blood, and the hemorrhage was traced to the internal iliac artery, which was found to contain a very large attached thrombus near its aortic bifurcation. The artery at this point was greatly dilated, exhibiting a large sacculated aneurism. The blood vessel was markedly degenerated, and the thrombus filled the entire lumen of the vessel. The thrombus was stratified, and pale in color; the rupture of the artery irregular and ragged in appearance. Besides the condition already noted, the uterus showed a chronic inflammation apparently of some months' standing.

Parasitic Diseases.—There were fewer deaths from intestinal parasites than in any previous year. The systematic microscopic examination of the fecal discharges of new arrivals, for the presence of the ova of the different intestinal parasites, has been of great value in directing the proper medication to be carried out before these parasites could set up a serious gastritis or enteritis.

Tape-Worm Cysts.—Deaths from this troublesome disease have been mentioned among our American deer and antelope each year, but during the past year not a single case is to be recorded. Since these animals have been cut off from their large grazing ranges—which were undoubtedly infected—and placed in large macadamized corrals, where all the food is under the absolute control of the keepers, these tape-worm cysts have gradually disappeared.

LIST SHOWING CAUSES OF DEATH AMONG THE
MAMMALS DURING 1907.

	Primates	Carnivores	Rodents	Ungulates	Marsupials	Edentates	Total
Pneumonia.....	5	5	5	3	2	1	27
Killed by Cage Mates.....	2	7	4	4	.....	.....	17
In Quarantine (died or destroyed)	14	2	.....	.....	.....	1	17
Gastro-enteritis.....	7	.....	.....	2	1	1	11
Distemper.....	.....	9	1	.....	.....	.....	10
Tuberculosis.....	8	.....	.....	.....	.....	.....	8
Still-born.....	.....	3	.....	4	.....	.....	7
Malnutrition and Atrophy.....	2	1	.....	2	.....	.....	5
Osteomalacia.....	4	.....	.....	.....	.....	.....	4
Rickets.....	3	.....	.....	.....	.....	.....	3
Nephritis.....	2	.....	.....	1	.....	.....	3
Parasitic Enteritis.....	1	1	.....	1	.....	.....	3
Acute Indigestion.....	2	.....	.....	.....	.....	.....	2
Heat Exhaustion.....	.....	2	.....	.....	.....	.....	2
Septic Metritis.....	.....	1	.....	1	.....	.....	2
Peritonitis.....	.....	.....	.....	1	.....	.....	1
Chronic Hepatitis.....	.....	1	.....	.....	.....	.....	1
Aneurism and Thrombus.....	.....	.....	.....	1	.....	.....	1
Sarcoma of Lungs.....	.....	1	.....	.....	.....	.....	1
Ptomaine Poisoning.....	.....	2	.....	.....	.....	.....	2
Accidental Deaths (unavoidable)..	1	1	.....	2	.....	.....	4
No Lesions to account for death...	2	2	1	.....	2	.....	7
Unclassified.....	.....	.....	.....	1	.....	.....	1
Total.....	56	41	11	23	5	3	139

Respectfully submitted,

W. REID BLAIR, D.V.S.,
Veterinarian.



PENINSULA BEAR CAPTURED AT MOELLER BAY, ALASKA PENINSULA.

CONDITION OF WILD LIFE IN ALASKA.

By MADISON GRANT.

THE opening of the twentieth century found the game in the old territories of the United States well on the road toward the conditions that precede extinction. The bison had been practically gone for two decades. The mountain sheep had been exterminated throughout a very large part of its original range, and the number remaining in remote mountains was sadly reduced. The wapiti, while still living in herds numbering many thousand, was rapidly withdrawing to the vicinity of its last refuge, the Yellowstone Park. The prong-horn of the plains was disappearing with increasing rapidity, partly due to the increasing use of the barb-wire fences on its former ranges.

This rapid diminution of the game animals of the United States was, and is to-day, the inevitable consequence of the settlement and occupation of the best grazing lands. While there remain mountains where the game is relatively undisturbed, so far as the killing of individuals is concerned, and while these ranges in summer appear well adapted to sustain a large and varied fauna, their actual capacity to sustain life is limited to such animals as can there find sustenance during the heavy snows of winter.

Before the arrival of white men, the animals, which lived in the mountains during the summer, sought refuge in the sheltered valleys and foothills during the cold season. These favored localities, however, were at once occupied by settlers, and the game was deprived of its winter feeding-grounds. In my opinion, this has done more in recent years to exterminate the large animals of the West than the actual shooting of individuals.

During the closing years of the nineteenth century the American people had obtained no little experience in game protection, and had embodied it in Federal statutes and the game laws of the various states. Of all the regulations established for the preservation of wild life, the most practical and effective have been found to be, first, the prohibition of hide and head hunting; second, the prohibition of market hunting; third, and most important of all, the establishment of sanctuaries where game could roam and breed absolutely undisturbed. The most con-

spicuous example of such refuges is the Yellowstone Park, the unquestioned success of which is admitted on all sides.

At the end of the century, the gold discovered in the extreme northwest of Canada and in Alaska brought these territories suddenly before the public eye. Here was a district of enormous extent, lying at the extreme limit of the continent, and populated by a large and varied fauna, which was practically undisturbed. During the last ten years, thousands of prospectors and miners have gone into Alaska, and in many places worked havoc with the game. On the whole, however, the destruction of the game has not yet gone far enough to permanently injure the fauna of the region, provided the matter of protection is taken in hand scientifically and *in the immediate future*.

We have in Alaska a gigantic preserve. In it there are not only several species rich in the numbers of their individual members, but also certain species which in point of size appear to be the very culmination of their respective genera, as for example, the giant moose. The brown bear group of southern Alaska certainly contains the largest bears in the world, not even excepting the great fish bear of Kamohatka, or the extinct cave bear of Europe. The largest known wolves are found in northern Alaska, and a wolverine of exceptional size has been recently described. When this great game region was first opened up, immediate legislation was needed to protect the animals from the deliberate onslaught of hide hunters in southeastern Alaska; of head hunters, who attacked the moose, sheep and caribou of the Kenai Peninsula, and of the market hunters generally throughout the coast regions. A game law, which certainly proved effective in making it difficult for sportsmen to hunt in Alaska, was passed, and a revision of this statute is now before Congress. It is not the intention to discuss in this paper the details of the proposed legislation, beyond saying that the measure is proposed by the friends of animal life in Alaska, and has the support of the best interests in that territory.

The general principles of game protection, applicable to the situation in Alaska, are simple. It should be clearly understood that the game of Alaska, or of any other region, does not belong exclusively to the human inhabitants of that particular region, and that neither the white settlers nor the native inhabitants have any inherent right to the game, other than that conferred by law. The interest of the entire people of the United States, and to some extent that of the civilized world, is centered in the continued existence of the forms of animal life which have come

down to us from an immense antiquity through the slow process of evolution. It is no longer generally conceded that the local inhabitants of any given district have a divine commission to pollute the streams with sawdust, to destroy the forests by axe or fire, or to slaughter every living thing within reach of rifle, trap or poisoned bait. This must be thoroughly understood in advance. The game and the forests belong to the nation and not to the individual, and the use of them by the individual citizen is limited to such privileges as may be accorded him by law. The mere fact that he has the power to destroy without interference by the law, does not in itself confer a right. The destruction of game is far more often effected by local residents than it is by visiting sportsmen, but the chief evildoer, and the public enemy of all classes, is the professional hunter, either Indian or white, who kills for the market. Worse still, perhaps, is the professional dealer in heads and antlers, who employs such hunters to provide game heads for the decoration of the banquet halls of the growing class of would-be sportsmen, who enjoy the suggestion of hunting prowess conferred by a selected collection of purchased heads, mixed in with those of their own killing.

However efficient the game laws may be in limiting the killing to a given number of individuals, and to certain seasons of the year, or, better still, to the adult males of certain species, the only permanently effective way to continue in abundance and in individual vigor any species of game is, to establish proper sanctuaries, as thoroughly controlled as the Yellowstone Park, and these must contain both summer and winter ranges. In such areas no hunting or trapping, nor perhaps even dogs, should be allowed; and in them the game will then retain its native habits and breed freely, while the overflow would populate the adjoining districts. This principle has been applied in East Africa with brilliant success, where a protected strip of land on either side of the Uganda Railway is now absolutely swarming with game.

Such preserves should be set aside in Alaska, while land is yet of little value. Districts should be selected where there is but little, if any, mineral wealth; and there are abundant areas of that description in Alaska. Certain islands should also be utilized, particularly in southeastern Alaska. Beyond doubt such refuges will be ultimately established, but it is to be hoped that it can be done before the game has been decimated and the forests cut down or burned.

Another element in game protection is the relation of the Indian to the wild game. This problem is not as serious in Alaska as it is in parts of British Columbia and the Canadian Northwest, and is settling itself by the rapid decline of the Indian population. Indians, after they have been in contact with white men, certainly are extremely destructive to animal life. An Indian with a gun will shoot at anything he sees until his ammunition is gone. They seem to be entirely devoid of any idea of economy in slaughtering, even though they know that they are certain to suffer from starvation as a result of their indiscriminate waste of game. Any legislation, therefore, that gives Indians privileges superior to the whites is not based on scientific, but on sentimental considerations.

To exempt Indians from the limitation of game laws in a district partly inhabited by white men, simply puts the white hunter at a disadvantage, and always results in a contempt for the law on the part of the latter. If an Indian is allowed to hunt freely during the closed season, he is usually employed by whites for market hunting. The game he kills finds its way to the white man's market rather than to the teepees of the tribe, or is used as food by the Indian's dogs, with the ultimate result that the food supply of the entire tribe is killed off for the benefit of a few hunters.

The Indians of Alaska have, in the abundance of salmon, a food supply which is available throughout the most of the district, and are consequently not entitled to any special privileges. Alaska is, and for a long time should remain, the ward of the Federal Government—however distasteful such a course may be to some of its inhabitants. It is peculiarly the duty of the Federal Government to preserve and control the wild game of this national domain, because the people of the United States as a whole are the ones most interested in its preservation. It is to Congress, rather than to the residents of Alaska, that we must look for the enactment and enforcement of suitable laws, and to avail of the last great opportunity to preserve our native fauna on a large scale. We no doubt in the future shall restore game and perhaps forests to many districts now stripped of both, but in Alaska we have our last chance to preserve and protect rather than to restore.

The claim made by many western communities, that local state laws are sufficient, is being daily disproved by the inability of several states to control the small game supply left within their own borders. Colorado is a notable example of the rapid diminu-

tion of game under state control, where female deer and fawns are now being killed under the laws of the state. In Canada, British Columbia prides itself on the efficiency of its game laws, but the game is rapidly vanishing there, although in the eastern portion of that province it is the Stoney Indians, rather than white hunters, who are the chief destroyers.

From the point of view of game conditions, Alaska is divided into two entirely distinct regions. First the Coast Region, from Portland Canal along the base of the mountains northward and then westward to and including the Aleutian Islands.

The second region comprises the interior beyond the mountains, and is co-extensive with the region drained by the Yukon River and its various branches.

The conditions in these two regions differ widely, and practically all the sportsmen who go to Alaska hunt in the coast region. Those who cross into the interior are apt to confine their shooting to the headwaters of the Yukon in Canadian territory.

The game on the coast between Portland Canal and Mt. St. Elias consists principally of bear and the small Sitka deer. There is an abundance of goat on the mainland close enough to salt water to be easily reached.

To reach moose, caribou or sheep from the southeastern coast requires a journey over the mountains into British Columbia, which is seldom attempted, except from Fort Wrangell at the mouth of the Stikeen River.

West of the St. Elias Alps and around Cook Inlet, the principal game animals are the giant moose and white sheep of the Kenai Peninsula, the caribou and bear of the Alaska Peninsula, and the bear of some of the large islands, notably Kodiak. It is in this district that the game laws require close attention and rigid enforcement.

In the vast interior the strict enforcement of game laws is not so important, because the entire region drained by the Yukon is covered with heavy forests, and the population is largely confined to the waterways.

Black bear, lynx and moose are everywhere abundant, but seldom seen along the Yukon River. Sheep are accessible from points on the upper Yukon, notably at Eagle, and caribou occasionally cross the river in herds.

The game laws for this district should aim principally at the prevention of slaughter on a large scale for market purposes, and of hide and head hunting. There are very few sportsmen, and the miners and prospectors in the interior are difficult to control.

Wolves.—Wolves are abundant in Vancouver Island and throughout the interior. In the north, around the region drained by the Porcupine River, they assume very large dimensions; some skins measuring nearly six feet from nose to tip of tail; and a large percentage of these wolves are black. Coyotes have pushed north from the American boundary as far as White Horse, at the headwaters of the Yukon River.

Foxes.—Red, cross, silver and black foxes occur in the interior. The two latter command enormous prices, in some cases as high as \$1,000 for one skin. These animals are being killed off by the use of poison in the hands of white men, and many more are destroyed than are recovered. The natives are afraid to use poison, owing to several tragedies which have occurred from its careless handling.

Along the Arctic and Bering Sea coast white foxes abound, and blue foxes are found from the mouth of the Yukon River southward, their center of abundance being Nelson Island, in Bering Sea, near the mouth of the Kuskokwim River.

Bear.—Bear are extremely abundant in Alaska, especially on the Pacific Coast. Their great numbers are probably due to the fact that they have an abundant food supply in the great schools of salmon that ascend the rivers. Before the arrival of the salmon, these bear, like the grizzlies of our own Rockies, feed on spermophiles and grass. During the salmon season they are easily found and killed by hunters, and as this occurs during the summer season, their fur is of very little value. The period of the salmon run, in fact the entire summer, should be made a closed season for bear throughout this district. Owing to the recent decline in the price of bear skins these splendid animals have been hunted rather less than formerly.

The black bear occur in Vancouver and Queen Charlotte Islands, but, as far as I know, do not occur in any of the large islands north. They are, however, found along the mainland of the southeastern coast, and found everywhere throughout the interior in the timbered region. The blue or glacier bear is found rarely around the glaciers of the Mt. St. Elias region.

Grizzlies occur in considerable numbers along the mainland of the coast as far north as Skagway, and are found in relatively small numbers throughout the interior. There are very few grizzly bear on the Seward Peninsula, and I was unable to get any skulls or to obtain any definite data concerning them. This bear may prove an interesting type if a sufficient series of specimens could be obtained.

There is a huge bear found on the large islands around Juneau and Sitka which has been described as a separate species, and its numbers are indicated by the fact that about seventy-five animals, the majority being of this species, are killed annually around Juneau.

The brown bear group extends from this point westward along the south coast of Alaska, out into the Alaska Peninsula. Several species have been described, but they can all be safely grouped together under the common designation of Alaska brown bear. They extend far up the Copper River, but I could not obtain any definite record of the occurrence of members of this group north of the mountain region and in the area drained by the Yukon.

Polar bear occur quite abundantly north of Bering Straits. Occasionally they are found on the Seward Peninsula, and occur as far south as St. Matthew's Island, in the middle of Bering Sea.

Caribou.—Caribou of several species are found more or less numerous throughout Alaska, and occur in herds around the upper Yukon, with localities of especial abundance such as the head of Forty Mile River. An examination of the antlers found at various points, from the upper Yukon River to the sea, would indicate an almost complete transition of antler type from the Woodland (Osborn) caribou, to the Barren Ground (Grant) caribou. A further study of the caribou of this region will ultimately lead to a merging of the various species. The work of Charles Sheldon, who is now studying sheep in the Mt. McKinley district, has broken down the specific distinction of the sheep in Alaska in the same way.

That caribou were formerly very abundant on the Seward Peninsula is proved by the abundance of bleached skulls and cast antlers, apparently about twenty or twenty-five years old. The cause of their disappearance is as yet an unsolved problem. The possession of firearms by the natives, first obtained from whalers, is by some considered as the cause, and by others epidemics. The natives themselves claim that about a generation ago the winter cold continued throughout an entire year, and all the caribou perished in consequence. All these explanations leave much to be desired, as there is an abundance of caribou in the wooded district at the eastern end of the Peninsula, and the explanation of the fact that in the course of all these years the caribou have not wandered back to their old feeding grounds remains a mystery. A few scattered individuals at the very most

are all that have been seen since the founding of Nome, seven or eight years ago.

Domestic reindeer have been introduced into Alaska successfully, and form a valuable resource for the natives. I, however, saw nothing of them beyond the fact that their meat forms a part of the menu in the various restaurants at Nome.

Moose.—Moose occur everywhere throughout Alaska within the timbered region, but seldom leave the shelter of the woods. They extend close to the Arctic Ocean in the north, and occasionally wander far out on the Alaska Peninsula. The giant moose occurs on the Kenai Peninsula, but it is probable that this animal is only an outlying member of the type species, which in that district, for some unknown reason, produces antlers of extraordinary size and complexity. A few instances of moose with antlers of great size are known in the interior, but it is a matter of doubt whether or not in bodily size the Kenai Peninsula moose excels that of his kin in the interior, or in the Yukon Territory.

Mountain Sheep.—Sheep occur everywhere in the mountain regions throughout Alaska, being especially abundant in the country around the upper Yukon and around Mt. McKinley; extending thence as far south and west as the Kenai Peninsula. They also occur on the upper Porcupine River, but the great Yukon Valley in its lower reaches is without sheep.

Mountain Goat.—Goat occur throughout the mainland from the American boundary north, but are never found, as far as I know, on any of the islands lying close along the coast in southeastern Alaska. In size and abundance the mountain goat appears to culminate in the region around the White Horse Pass, where they are very abundant. They can still be seen within a half day's march of Skagway. They occur in abundance around the St. Elias Alps, and extend as far west as the head of Cook Inlet. I only heard of one doubtful case of Kennedy's goat, the horns of which have been described as lyrate.

Walrus and Whales.—Walrus are found every winter and spring in the Bering Sea, and many are killed at that season by the natives for the ivory, which sells at a dollar a pound. The walrus formerly extended down to the Alaska Peninsula and Aleutian Islands, but the rookeries there have been destroyed. This great mammal should receive absolute protection in the entire Bering Sea region, except on the Pribilof Islands, where only a few are annually killed by the natives.

Whales and porpoises occur in great abundance along the inside passage between Puget Sound and Lynn Canal and are

interesting and harmless. There are now two plants on Vancouver Island very profitably engaged in killing whale of all sizes and converting them into fertilizer. A new plant has just been established near Juneau, where whales are especially abundant. It would be an easy matter to protect these animals, especially with the co-operation of the Canadian authorities, throughout the inland passages and oceanward as far as the three mile limit. Protective legislation of this sort should be urged.

Fossils.—In any review of the present game conditions of the vast territory comprised within the district of Alaska and the Canadian Territory of the Yukon, a few remarks on the former occurrence of related forms are not without interest.

Bones of large extinct mammals, more or less fossilized, occur in abundance throughout the entire valley drained by the Yukon River from Dawson down, and in the valleys of the Colville and Porcupine Rivers, and in still greater abundance on the Seward Peninsula, that projection of Alaska which reaches to within sixty miles of Siberia. Throughout this enormous area remains of the mammoth and bison occur in such numbers as to indicate former herds of great size. We find also a smaller number of remains of horses, sheep, and at least two species of musk-ox, together with a deer closely related to our wapiti. Teeth of mastodon, although very rare as compared with those of the mammoth, indicate the former existence of that animal. It is perfectly evident that in times comparatively recent, from a geological point of view, perhaps from 10,000 to 25,000 years ago, Alaska had a fauna of large mammals not altogether dissimilar to existing animals of North America and northern Asia. The mastodon and mammoth, of course, no longer exist on this continent, but the latter is little more than a hairy relative of the Indian elephant thoroughly fitted to meet boreal conditions, and the horses in Alaska were probably not unlike the wild Prjevalsky horses of Asia to-day.

The ancient Alaskan deer were probably related to the wapiti, which swarmed over our American plains within the memory of living man, and the fossil remains of caribou and moose do not indicate any great departure from the living forms of those animals.

Sheep still occur abundantly in Alaska, and the musk-ox, while no longer found in Alaska, inhabits the no less inhospitable regions of the Barren Grounds of North America and the land masses lying still further north.

Bison skulls are quite common, and indicate an animal much larger, but probably ancestral to our living buffalo. The history

of the American bison, which migrated in summer as far north as the Saskatchewan and southward in winter to the Mexican border, suggests that it is quite possible that these animals did not habitually spend the winter in Alaska, but on the approach of the cold season migrated southward to warmer climates, or crossed into Siberia on the former land connection over what are now Bering Straits. If this hypothesis be correct, the climate of Alaska during the Pleistocene and recent periods, may not have radically differed from the climate of to-day.

The extension of placer mining in Alaska, when conducted in a more systematic manner than at present, will undoubtedly bring to light other forms of large mammals, most probably types related to those already mentioned, together with the remains of carnivorous types.

BY-LAWS
OF THE
NEW YORK ZOOLOGICAL SOCIETY

AMENDED TO JANUARY 15, 1907.

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 the Director of the Zoological Park.
7. Report of Director of the Aquarium.
8. Election of Managers.
9. Communications.
10. Miscellaneous business.
11. 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 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. All candidates for election as Managers must be Life Members, Patrons, Associate Founders, or Founders of the Society.

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, the Director of the Aquarium, 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 of the Zoological Park.
8. Report of Director of the Aquarium.
9. Election of Officers.
10. Election of Committees.
11. Election of new members.
12. Communications.
13. 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, warrants from the City, 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, Aquarium, 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 Committee, 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.

SEC. 7. The Director of the Aquarium shall be elected annually by the Executive Committee, and shall hold office until removed or his successor is chosen by said Committee. He shall be the responsible administrative officer of the Aquarium, and shall recommend to the Executive Committee all candidates for positions in the Aquarium. The Director of the Aquarium shall be *ex-officio* a member and Chairman of the Aquarium Committee. He shall perform such other duties in connection with the Aquarium 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, Park, and Aquarium, 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 and Aquarium shall be made or approved by the Executive Committee.

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

SEC. 6. The Executive Committee shall annually appoint an Aquarium Committee, whose duties and powers are set forth in Section II of Article IV of these By-Laws.

SEC. 7. 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. 8. It shall also appoint a Scientific Council, whose powers and duties are set forth in Section 2 of Article V of these By-Laws.

SEC. 9. The Committee shall make a written report at each regular meeting of the Board of Managers.

SEC. 10. 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, of the Director of the Zoological Park, and of the Director of the Aquarium, and any other accounts of the Society and shall report to the Board of Managers at its annual meeting.

SEC. 11. The Executive Committee shall annually appoint an Aquarium Committee, not to exceed eight members of this Society, who shall hold office until their successors are chosen. All vacancies shall be filled by the Executive Committee. The Director of the Aquarium shall be *ex-officio* a member and the Chairman of the Aquarium Committee, and such Committee may vest in him any or all of its powers. The Chairman of the Executive Committee and the Secretary of the Society shall also be *ex-officio* members of the Aquarium Committee. Three members shall constitute a quorum. The Executive Committee may delegate to the Aquarium Committee such powers as it may deem proper.

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 Chairman of the Executive Committee and the Secretary of the Society shall be members *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 as 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 have donated to the Society ten thousand dollars (\$10,000), or its equivalent, may be elected by the Board of Managers or the Executive Committee a Founder in Perpetuity. Such Founder in Perpetuity shall have the power to designate by a last will and testament his successor, who shall thereupon be entitled to all the rights and privileges of the original Founder in Perpetuity, including the right of designating in turn his successor.

SEC. 10. Any member who shall donate to the Society \$10,000, or any Founder who shall donate \$5,000, may be elected by the Board of Managers or Executive Committee a Benefactor. A Benefactor shall have all the rights and privileges of a Founder in Perpetuity.

SEC. 11. 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. 12. A resident member who shall have rendered marked scientific or professional services to the Society in any branch of its work may be elected by the Executive Committee a Life Member, Patron, Associate Founder, or Founder. A resident of New York who shall have rendered marked service in zoology or natural history may be elected by the Executive Committee a Permanent Fellow.

SEC. 13. 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. 14. Benefactors, Founders in Perpetuity, 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 to the Park and Aquarium 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 in Perpetuity, 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, except to meet expenditures for which the City is liable, and for which the Society will be reimbursed by warrants from the Comptroller's office.

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.

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